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August 10, 2018

Randy Nattis, On-Scene Coordinator
United States Environmental Protection Agency
805 SW Broadway, Suite 500
Portland, Oregon 97205

Re: Final Emergency Response and Removal Action Report
River Street Warehouse Fire Site
Contract Number EP-S7-13-07, Technical Direction Document Number 17-05-0003 and Task Order TO-23

Dear Mr. Nattis:

Enclosed please find the final Emergency Response and Removal Action Report for the River Street Warehouse Fire Site in Portland, Oregon. If you have any question regarding this submittal, please call me at (206) 624-9537.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Steven G. Hall
START-IV Removal Team Leader

Enclosure

cc: Erin Lynch, START PM, E & E, Portland, Oregon

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EMERGENCY RESPONSE AND REMOVAL ACTION REPORT

River Street Warehouse Fire Site
Portland, Multnomah County, Oregon
Technical Direction Document Number: 17-05-0003
Task Order: TO-23

Prepared for:

U.S. Environmental Protection Agency, Region 10
805 SW Broadway, Suite 500
Portland, Oregon 97205

Prepared by:

Ecology and Environment, Inc.
333 SW 5th Avenue, Suite 600
Portland, Oregon 97204

August 2018

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List of Acronyms

Abbreviation	Definition
%R	percent recovery
°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
µm	micrometer
AAC	Advanced American Construction, Inc.
ACM	asbestos-containing material
Advantage	Advantage Environmental, Inc.
AHERA	Asbestos Hazard and Emergency Response Act
BS	blank spike
BTEX	benzene, toluene, ethylbenzene, and Xylenes
DQO	data quality objective
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
EQM	Environmental Quality Management, Inc.
ERRS	Emergency and Rapid Response Services
f/cc	fibers per cubic centimeter
IAP	incident action plan
ICP	incident command post
ICS	Incident Command System
ISO	International Organization for Standardization
L/min	liters per minute
MCE	mixed-cellulose ester
mg/m^3	milligrams per cubic meter
MS/MSD	matrix spike/matrix spike duplicate
ODEQ	Oregon Department of Environmental Quality
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbon
PCBs	polychlorinated biphenyl
PCI/PAS	Performance Contracting, Inc. / Performance Abatement Services, Inc.

PCM	phase contrast microscopy
PEL	permissible exposure level
PLM	polarized light microscopy
PPE	personal protective equipment
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RDMP	Regional Data Management Plan
Site	River Street Warehouse Fire Site
SSDMP	Site-Specific Data Management Plan
START	Superfund Technical Assessment and Response Team
s/cc	structures per cubic centimeter
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
TCRA	time-critical removal action
TEM	transmission electron microscopy
TWA	time-weighted average
USCG	United States Coast Guard
VOC	volatile organic compound

Executive Summary

On May 14, 2017, a fire started at a warehouse located at 1300 North River Street in Portland, Oregon. The Portland Fire Department responded to attempt to control and extinguish the fire. The building and its contents were destroyed during the fire, but no injuries were reported associated with the fire. The warehouse was located on the northern/eastern bank of the Willamette River, and was constructed on wood pilings partly over the river.

On May 15, 2017, the Oregon Department of Environmental Quality's (ODEQ's) asbestos program mobilized to the River Street Warehouse Fire and Asbestos Site (Site) to conduct an inspection of the property. ODEQ's asbestos program determined that the roofing material at the warehouse potentially contained asbestos. ODEQ was notified of the presence of debris from the warehouse fire across the river at a condominium property. ODEQ collected two samples during this inspection, and the results indicated that both samples contained 90% chrysotile asbestos.

Following the inspection, ODEQ requested assistance from the United States Environmental Protection Agency (EPA) in conducting air monitoring/sampling, surveying the area for debris, and addressing mixed asbestos contamination at the warehouse and the debris deposited in the residential area across the river. EPA responded to the Site on May 16, 2017, and continued to perform emergency response and cleanup operations through late June 2017. The objectives during this emergency response phase were to assess the risk to the public from asbestos debris that had migrated throughout downtown Portland.

EPA established Unified Command with ODEQ. For the response, one of EPA's primary objectives was reconnaissance and recovery activities to search areas of downtown Portland where the asbestos-containing material (ACM) debris had dispersed and to recover any waste where found.

EPA divided the dispersal area in downtown Portland into 17 divisions. EPA's Superfund Technical Assessment and Response Team (START) and Emergency and Rapid Response Services (ERRS) contractors formed teams to search public and private areas within each division to locate any ACM from the Site. EPA's assessment also included rooftops in downtown Portland, and EPA recovered ACM debris from 140 rooftops. An estimated total of 204 pounds of ACM was recovered from downtown Portland for disposal as asbestos waste.

Additionally, EPA worked to secure and stabilize the fire-damaged warehouse structure to protect neighboring businesses and prevent future releases of asbestos and ACM. The area was secured with a chain-link fence and an exclusion zone was established. Because of structural concerns with the fire-damaged warehouse structure, site personnel were generally not allowed on the structure. The ERRS contractor recovered 211 tons of debris from the accessible perimeter of the building for off-site disposal, and then sprayed a stabilizing product on the remaining debris to minimize the release of dust and fibers.

After securing and monitoring the Site for approximately three months, EPA returned to the Site in mid-September 2017 to complete the removal of the fire-damaged warehouse structure and asbestos-contaminated debris. This time-critical removal action (TCRA) phase continued for approximately six months, through the end of February 2018. Because of concerns about the structural integrity of the fire-damaged warehouse structure, EPA installed two temporary and

independently supported trestles as work platforms for equipment and personnel to access and remove the remainder of the asbestos-contaminated debris.

During the TCRA, an additional 3,901 tons of asbestos-contaminated building debris was removed from the Site for off-site disposal as asbestos waste. At the conclusion of the TCRA, a total of 4,112 tons of building debris had been removed from the Site and properly disposed of in a landfill certified for asbestos waste. ODEQ assisted EPA in paying for waste disposal costs, with ODEQ specifically covering the disposal costs of the wood decking/foundation from the former warehouse structure (2,685 tons).

Throughout the project, EPA's ERRS and START contractors performed air monitoring and sampling to measure the risk that the Site posed to response personnel and site workers. During the emergency response phase, START collected over 200 personal and stationary air samples for asbestos analyses. Most of the results were lower than site action levels, indicating that the asbestos exposure risk to the general public was relatively low. During the TCRA to remove the asbestos-contaminated building debris, EPA's START and ERRS contractors collected over 1,000 personal and stationary samples for PCM analyses. Almost all of the samples were less than site action levels, indicating that the work was performed in a manner that was safe for site workers and the public.

Because of the large scale of the impacted area and response activities, EPA and its contractors relied on several data management tools to quickly and efficiently collect and process data to support response-related decision making and to provide stakeholders and the public with timely updates. Data management tools used throughout the response and later TCRA included mobile data collection devices, servers, databases, Scribe, and an EPA Geoplatform. Throughout the response and TCRA activities, EPA relied on Viper, a remote telemetry-based data management system, and EPA developed and updated a story map with site data and information.

At the conclusion of the TCRA, only the pilings and caps from the former warehouse structure remained on site. EPA's ERRS contractor surveyed and cleaned the surface of the riverbank for any residual building material or suspect ACM, and an Asbestos Hazard and Emergency Response Act-certified building inspector surveyed the remaining pilings and beach surface to confirm that no ACM or suspect material remained.

1 Introduction

The United States Environmental Protection Agency (EPA) has tasked Ecology and Environment, Inc. (E & E), under Superfund Technical Assessment and Response Team (START) contract number EP-S7-13-07, Technical Direction Document Number 17-05-0003, and Task Order TO-23-T1-SS1, to support EPA during an emergency response and time-critical removal action (TCRA) at the River Street Warehouse Fire Site (Site).

On May 14, 2017, a fire started at a warehouse in Portland, Oregon. The warehouse was located on the northern/eastern banks of the Willamette River, across from downtown Portland. Due to the nature and scale of the fire, asbestos-containing roofing material from the warehouse building was carried by smoke and wind across the river and into the densely populated downtown area. Following the fire, the warehouse was damaged and structurally unsound, and asbestos containing material (ACM) remained on the property. The property owner did not have the capability to address the ACM release or remove the waste remaining at the warehouse. EPA determined that the ACM posed a threat to human health and the environment, and subsequently initiated a response action in coordination with the Oregon Department of Environmental Quality (ODEQ).

EPA organized the action in three phases: an emergency response, an interim monitoring phase, and a subsequent TCRA. The main goals of the Site emergency response and TCRA were to:

- Determine the nature and extent of asbestos debris that was distributed throughout downtown Portland due to the warehouse fire.
- Assess the risk posed to the public and site workers from the asbestos debris.
- Remove asbestos debris that was deposited throughout downtown Portland following the warehouse fire.
- Secure and stabilize the Site to prevent future off-site migration of asbestos and ACM, until the remainder of the damaged structure could be safely removed during the TCRA.
- Throughout all phases of the project, conduct air particulate monitoring and air sampling to protect site workers and the public.
- During the TCRA, install engineered trestles to allow for the safe removal and disposal of the remainder of the asbestos-contaminated warehouse debris.
- Properly dispose of asbestos-contaminated debris and other waste from the warehouse location.
- Assess the sediments below the warehouse for contamination contributed as result of the fire.

The project was performed with an initial emergency response phase from May 16 through late June 2017 to stabilize the Site and assess the risk to the public from asbestos debris that had migrated throughout downtown Portland. The Site was stabilized and secured from mid-June through mid-September 2017, during which time interim air monitoring continued. From September 2017 through February 2018, EPA performed a TCRA at the Site to complete the removal of the asbestos-contaminated debris.

START was tasked to provide technical support and document site conditions and activities through logbook entries and photographs. Emergency response and removal activities were performed by Environmental Quality Management, Inc. (EQM), as EPA Region 10 Emergency

and Rapid Response Services (ERRS) contractor. The scope of this report focuses on response, assessment, removal, and cleanup activities performed by START and ERRS. Appendix A contains photographs taken during field activities at the Site.

This report is divided into the following sections:

- Section 1: Introduction;
- Section 2: Site Background
- Section 3: Timeline of Site Activities;
- Section 4: Emergency Response Phase;
- Section 5: Interim Monitoring Phase;
- Section 6: Time-Critical Removal Action Phase;
- Section 7: Sampling and Analytical Activities;
- Section 8: Waste Disposal;
- Section 9: Quality Assurance/Quality Control;
- Section 10: Community Relations;
- Section 11: Health and Safety;
- Section 12: Difficulties Encountered and Recommendations;
- Section 13: Summary and Conclusions;
- Section 14: References; and
- Appendices.

2 Site Background

2.1 Incident Background

At approximately 2200 Pacific Daylight Time on Sunday, May 14, 2017, a fire started at a warehouse located at 1300 North River Street in Portland, Oregon, and the Portland Fire Department responded to attempt to control and extinguish the fire. The building and its contents were destroyed during the fire, but no injuries were reported associated with the fire. The warehouse was located on the northern/eastern bank of the Willamette River and was constructed on wood pilings partly over the river. The building had a history of safety and other violations, and the building owner reportedly had no insurance on the building (EPA 2017a).

On May 15, 2017, the ODEQ asbestos program mobilized to the site of the fire to conduct an inspection of the property. Following the initial site inspection by an ODEQ asbestos inspector, ODEQ's asbestos program was notified of the presence of fire debris across the river at the Waterfront Pearl Condominiums by a member of the public who was familiar with asbestos roofing systems. During a follow-up investigation at that property across the river from the Site, inspectors observed suspected ACM on multiple residential properties and on landscaped/parking areas nearby. ODEQ collected two samples during this inspection, and the results indicated that both samples contained 90% chrysotile asbestos. The inspection team also noted suspected ACM at various locations around the Waterfront Pearl Condominiums, and indicated in their report that further evaluation would be needed to determine the extent of the ACM debris field (ODEQ 2017). Following the inspection, ODEQ requested EPA assistance in conducting air monitoring/sampling, surveying the area for debris, and addressing mixed asbestos contamination at the warehouse and the debris deposited in the residential area across the river. EPA and its contractors responded to the Site on May 15, 2017.

2.2 Site Location

The warehouse is located at 1300 North River Street, Portland, Oregon, along the northern/eastern bank of the Willamette River, across from downtown Portland. The latitude and longitude of the warehouse is 45.53980, -122.68208 (Figure 2-1).

This warehouse is located immediately adjacent to the Fremont Bridge in an industrial area, with a Sakrete concrete facility to the northwest and an asphalt contractor plant (KF Jacobsen and Company of Ross Island Sand and Gravel) to the southeast. A Union Pacific Railroad rail line is located on River Street directly adjacent to the Site. Across River Street from the Site is a Northwest Copper Works facility (Figure 2-2).

Wind-blown ash and debris from the warehouse fire was found southwest of the warehouse, across the river, extending to an area approximately 3 miles long and 1 mile wide, covering much of downtown Portland, Oregon. This is a densely populated mixed commercial and residential area consisting of mostly multi-story buildings.

2.3 Site Layout and Land Use

The area of the warehouse is approximately 78,000 square feet or roughly 1.8 acres in size. The warehouse structure is constructed on the northern/eastern riverbank, approximately 30 feet above the Willamette River mean water level. The structure is supported by wooden pylons and extends out over the river. From investigations and reports provided to EPA, the warehouse,

prior to the fire, was approximately 30 to 40 feet tall, creating a building volume of 115,000 cubic yards. Based on the size, age, and type of roofing material, it was estimated that approximately 20,000 cubic yards of extremely friable ACM remained at the Site after the fire was extinguished (EPA 2017b).

The warehouse was primarily used for storage of vehicles, carpet padding, and other miscellaneous materials and tools. The warehouse also contained an unpermitted marijuana growing facility in the building's northeast corner.

2.4 Site History

The warehouse was built in 1898 and was initially used for light-industrial work.
The warehouse had a history of safety, structural, and other violations. Prior to the fire, the building was condemned by the City of Portland in 2008 due to missing and damaged structural support beams. Through 2017, the building owner had been cited by the City of Portland for several safety and construction code violations (Portland Maps 2018).

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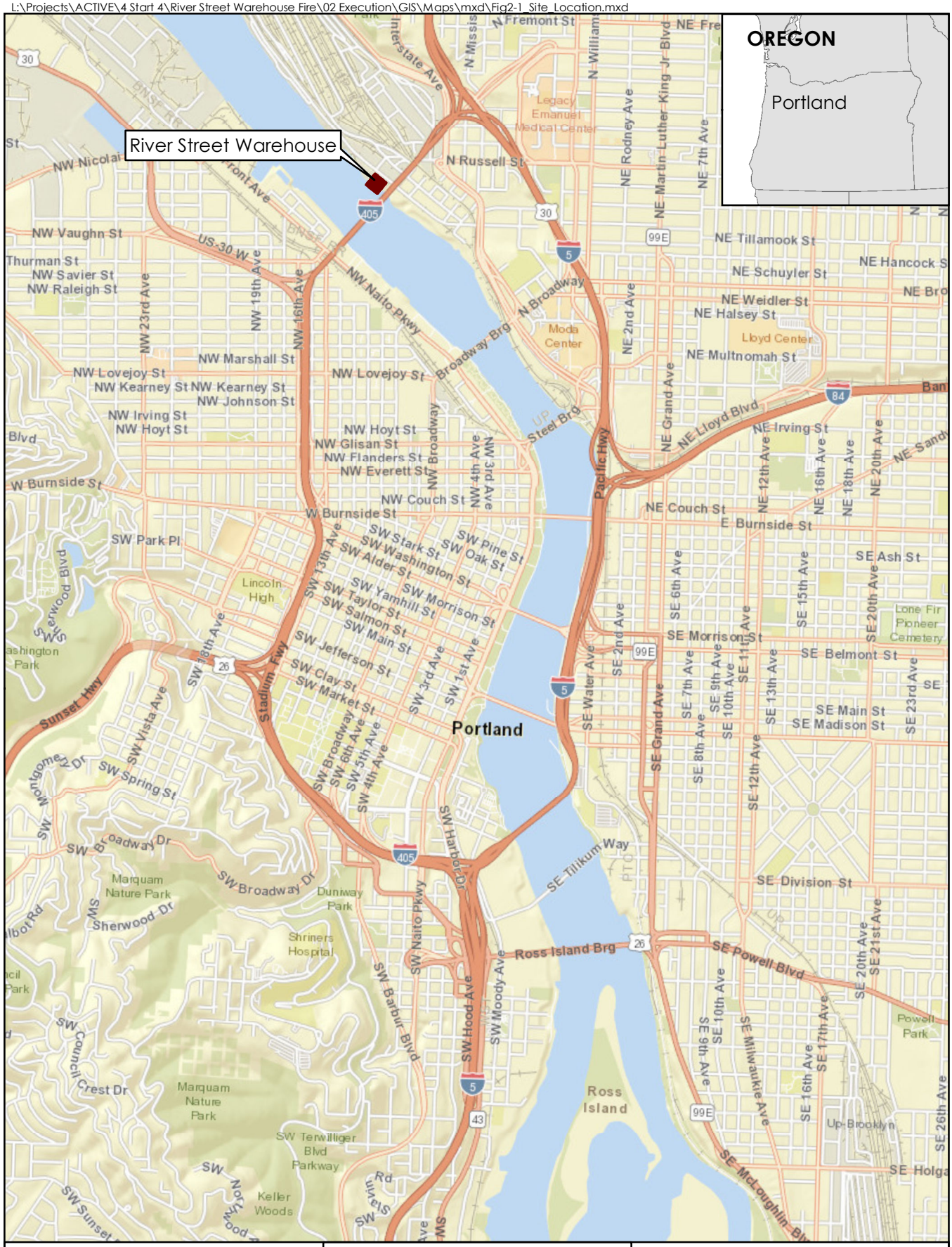

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Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

Figure 2-1
Site Location

Date: 3/19/2018

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ecology and environment, inc.
Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

0 100 200 Feet

Figure 2-2
Site Layout

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Date: 4/16/2018 | Drawn by: LG

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3 Timeline of Site Activities

The response and cleanup activities at the Site were performed in several distinct phases. The initial emergency response began in mid-May 2017 and lasted approximately five weeks. At the end of this phase the Site was stabilized, secured, and monitored for approximately two months to allow time for removal action planning. Then, beginning in September 2017, EPA performed a six-month TCRA to complete the removal of the asbestos-contaminated warehouse debris. A brief summary of this project timeline is provided below, and then each phase is described in more detail in Sections 4, 5, and 6.

Emergency Response Phase

The emergency response phase began on May 15, 2017, and continued through June 24, 2017. This phase included activities that focused on delineating the extent of off-site contamination, recovering asbestos-contaminated debris from accessible areas, air monitoring and sampling, characterizing the warehouse debris and fire site, stabilizing the warehouse debris from additional releases, and conducting a limited removal of asbestos-contaminated debris from the fire site.

Interim Monitoring Phase

The interim monitoring phase marked the period between the demobilization of emergency response personnel and activities and the TCRA. Activities during this phase primarily consisted of air monitoring and sampling of ambient air levels to ensure public safety. The Site was surrounded by a chain-link fence, and 24-hour security was present to secure all equipment and the site itself.

Time-Critical Removal Action Phase

The TCRA phase began on September 18, 2017, and continued through February 28, 2018. Activities performed during this phase included demolishing the remainder of the fire-damaged warehouse building, removing asbestos-contaminated debris and material for off-site disposal, air monitoring and sampling, and the construction and deconstruction of two trestles to aid with the removal of asbestos-contaminated material.

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4 Emergency Response Phase

The emergency response phase began on May 15, 2017, and continued through June 24, 2017. Representatives and contractors from multiple agencies, including EPA, the State of Oregon, and the City of Portland, all contributed to the response efforts. This section broadly describes the following response activities:

- Emergency response organization and management;
- Reconnaissance and recovery activities;
- Burn pile management; and
- Monitoring and sampling efforts throughout the impacted areas.

This section focuses primarily on START and ERRS activities as they related to supporting EPA. Only a few START staff participated in Incident Management Team functions. These tasks were typically related to data management. As such, the following sections focus on areas where START and/or ERRS staff participated directly.

4.1 Emergency Response Organization and Management

The following sections describe how the emergency response phase was managed by participating agencies. EPA and ODEQ served as the lead agencies during the response and employed the Incident Command System (ICS) to develop incident objectives, produce incident action plans (IAPs), manage response resources, and keep stakeholders informed.

4.1.1 Participating Organizations

EPA and ODEQ served as the lead agencies during the response. Support was provided by the United States Coast Guard (USCG) Pacific Strike Team, EPA Response Support Corps, and EPA Regions 8 and 9. Contractor support was provided by Region 10 ERRS and START. Table 4-1 contains the agencies and contractors involved during the response.

Table 4-1 Emergency Response Phase Agencies and Contractors

Organization	Contact Persons/Position
EPA	Randy Nattis, Federal On Scene Coordinator
ODEQ	Michael Greenburg, State On Scene Coordinator
USCG Pacific Strike Team	Isaac Chavalia and Dave Varela, Health & Safety Officers
Emergency and Rapid Response Services (ERRS) – EQM, Inc.	Jerry Wade, Response Manager
START– E & E, Inc.	Brad Martin, Emergency Response Phase Project Manager Erin Lynch, Interim Monitoring and Removal Action Project Manager

4.1.2 ICS Structure

EPA and ODEQ jointly formed the Unified Command and representatives from those agencies typically fulfilled the key positions in the response structure. Two representatives from the

USCG Pacific Strike Team maintained the role of Health and Safety Officers. Representatives from both EPA and ODEQ served as Public Information Officers.

EPA staff led the Operations Section of the ICS, and contractors and representatives from EPA fulfilled the Operations Section positions. The Operations Section was divided into four branches: Reconnaissance, Recovery, Community Air Monitoring, and Burn Site Management. The Reconnaissance Branch was composed of START and ODEQ staff members. The Recovery Branch was composed of START and ERRS contractors. The Community Air Sampling Branch was composed of START members. The Burn Site Management Branch was composed of ERRS staff.

EPA and ODEQ jointly formed the Planning Section of the ICS, and representatives from each agency typically fulfilled the positions in the Planning Section (with some contractor support). The Planning Section was composed of a Resource Unit, Environmental Unit, and Situation Unit. START staff primarily contributed to Planning Section functions via the Environmental Unit and overall data management during the response.

EPA formed both the Finance and Logistics Sections. Representatives from the agency typically fulfilled the key positions in those sections.

4.1.3 Incident Objectives

During the response phase, the incident objectives were to:

- Ensure the safety of citizens and response personnel.
- Control and minimize the source of the release.
- Determine the areal extent of asbestos deposition.
- Conduct source area stabilization, removal assessment, and long-term disposition of the Site.
- Protect the public from exposure to asbestos.
- Provide the public with information on how to protect themselves against asbestos exposure, what to do, and how to report suspected ACM.
- Conduct air quality monitoring and sampling to protect the public and responders.
- Contain, identify, recover, and dispose of suspect ACM.
- Ensure proper data management and timely updates.
- Keep the public and stakeholders informed of response activities.
- Maintain security and control of the Site.
- Develop a waste disposal workgroup and plan.

4.1.4 Incident Action Plans

The IAP was created to relay critical information, tasks, and objectives to all responders and was updated daily to reflect specified operational period objectives. A total of 15 IAPs were created during the response phase starting on May 17, 2017, and continuing to June 3, 2017. Each IAP included incident objectives; an organizational chart with names and titles; work assignment lists containing tasks, instructions, and contact information; a complete contact list of all responders; newly updated figures and maps; weather forecasts; daily meeting schedules; and a medical plan.

4.1.5 Site Locations

4.1.5.1 Command Post

The incident command post (ICP) was located in the ODEQ emergency operations center in Portland, Oregon (Figure 4-1).

4.1.5.2 Forward Operations Base

The forward operations base was located northwest of the Site (Figure 4-1). This location included multiple work trailers and served as a staging area for equipment and other resources. This location was also used to manage the interim monitoring phase and TCRA.

4.1.5.3 Divisions

Unified Command established 17 Divisions (A through Q) during the response phase. Divisions were established to help determine the extent of contamination and monitor asbestos reconnaissance and removal activities. Division A was designated as the warehouse fire location, while Divisions B through Q represented areas that were affected by the ACM from the warehouse fire. Division B through Q consisted of approximately 3 square miles of the City of Portland. The extent of the area that was affected by ACM went as far south as Highway 26 in Southwest Portland and spanned west to east from Northwest 11th Avenue to across the Willamette River to Southeast Water Avenue. Refer to Figure 4-1 for a map of all the divisions and Figure 4-2 for a map of the asbestos deposition throughout Portland, Oregon.

4.1.6 Data Management and Information Communication

Site data management was governed by the Region 10 Regional Data Management Plan (RDMP) and with a Site-Specific Data Management Plan (SSDMP). These documents provided guidance for site activities to ensure that data is consistent and complete within all site phases. The RDMP and SSDMP included data collection protocols, data management processes, data elements and valid values to support data storage, data quality checks, and end-use products that supported site activities. A copy of the SSDMP is included in Appendix B.

4.1.6.1 Data Quality Objectives

Several data quality objectives (DQOs) governed the response phase of site operations. These DQOs were associated with specific actions to be completed, and many DQOs required specific tools necessary to support the action. These DQOs and actions included:

- Determine if asbestos contamination is present in air;
- Document locations of asbestos debris;
- Document extent of contamination of asbestos debris;
- Determine access to parcels;
- Document hotline reports;
- Document if chemical vapors are present or released during site activities;
- Determine if asbestos is present in bulk or building materials;
- Determine if particulates are present in air during removal activities; and
- Document warehouse debris removal activities.

4.1.6.2 Data Streams

The SSDMP listed several data streams that were documented and tracked as part of the site response operations. Data streams of particular importance to this site were:

- Air monitoring;
- Spatial features;

- Asbestos reconnaissance;
- Asbestos removal;
- Public reports;
- Property access;
- Air sampling documentation;
- Asbestos sample results;
- Bulk and building material documentation; and
- Building material sample results.

4.1.6.3 Tools

START deployed several data management tools to support EPA during all phases of site activities. These tools included data collection devices, servers, databases, the EPA Geoplatform (a deployment of ESRI's ArcGIS Online) and ESRI Collector. Scribe and Viper were also used during all phases of the response.

EPA Geoplatform/ Collector/Viewers/Story Map

START utilized a site-specific geospatial database to store and access field data in real-time. Several webmaps were created on the EPA Geoplatform site, for different purposes. A collector webmap was used to support field operations pertaining to collecting and consuming spatial data. A situational webmap was used to support ICP briefings and operational support. A public story map was also deployed.

Scribe – Sampling/Analytical

Due to the large size of the response, it was necessary to separate sample documentation from analytical results interpretation. Two Scribe projects were created for the Site, and a subscription was used to combine the two projects. All samples, including air, bulk, and sediment samples, were documented in Scribe.

Viper

Viper, a remote telemetry-based data management system, was set up on site at the end of the emergency response phase and continued through to the end of the TCRA. This system collected real-time particulate results and provided notifications if action levels were exceeded. Nominally, three fixed air stations were utilized to collect data using Viper. Results were stored on viper.net databases and were available on ERT's Deployment Manager website. Daily and weekly summaries were also provided depending on site needs at the time.

4.2 Reconnaissance, Recovery, Burn Pile, and Sampling/Monitoring Operations

4.2.1 ACM Reconnaissance and Recovery Operations

Reconnaissance and recovery operations in Divisions B through Q took place for 17 days beginning on May 15, 2017. In general, the processes for reconnaissance and recovery in a division involved teams first assessing the area for ACM, recovering any of the ACM, and then performing an inspection of the division to confirm that cleanup was completed. More details on the reconnaissance and recovery operations is provided in the following sections.

4.2.1.1 Reconnaissance Operations

Reconnaissance operations commenced as soon as EPA and START contractors arrived at the Site. EPA directed START to determine the extent of ACM impacts and ensure that ACM recovery teams could find and remove the ACM. Using information from ODEQ's initial inspection of ACM locations, weather data from during the fire, and plume model maps produced by the Federal Emergency Management Agency Interagency Modeling and Atmospheric Assessment Center, START deployed teams to determine the extent of ACM impacts. To aid in coordination of field team activities, Unified Command utilized the various divisions (see Section 4.1.5.3) to communicate locations with teams, assess progress, and avoid duplication of effort.

The reconnaissance teams were generally composed of one to two START member(s) working in conjunction with an ODEQ representative (typically from the Asbestos Program)[1]. Each team performed a "calibration" prior to each day's survey by reviewing images and real examples of known ACM. This process facilitated consistent identification of ACM throughout the impacted area. Reconnaissance teams were directed to target publicly accessible areas (e.g., parks) as well as schools, childcare facilities, hospitals, elderly care centers, etc.

Each reconnaissance team carried at least one personal air sampler that collected a daily sample for asbestos fibers. These samplers were used to assess responder exposure to asbestos, but the data was also used to provide decision makers with information on the levels of ambient asbestos over a given area that a team visited on a particular day. In some instances, reconnaissance teams were tasked with deploying fixed air samplers to locations designated by Unified Command. These locations typically included childcare facilities (daycares, schools, etc.) or publicly accessible areas. More information on personal air sampling and fixed air sampling can be found in Sections 4.2.3 and 7.

Reconnaissance teams carried mobile data collection devices that allowed them to view and edit a real-time geospatial viewer that was also visible in the ICP. Using the mobile data collection devices, reconnaissance teams conducted a visual assessment within their assigned division and marked the location of ACM when discovered. Photographs of ACM and landmarks near the contaminated areas were also loaded onto the viewer. This information was used by decision makers to assess the extent of contamination in real time, identify high-priority locations, and direct ACM recovery teams to contaminated areas. More information on the recovery process is provided later in this section.

The results of personal air sampling did not indicate a respiratory hazard for reconnaissance team members (as they were directed to not disturb the ACM). As such, these team members typically wore modified Level D personal protective equipment (PPE).

In addition to publicly accessible properties, reconnaissance teams also responded to reports of suspect ACM on private property when a request to do so was received by Unified Command and the team had owner/manager permission to enter the property. Later in the response, private properties as well as rooftops were included in the regular reconnaissance operations. Rooftops posed a particular challenge to reconnaissance and recovery teams as the level of effort to coordinate access, conduct reconnaissance, and recover ACM if needed was significant. At one point in the response, Unified Command created a Rooftop Assessment Task Force, charged

[1] On some dates, EPA Community Involvement Coordinators accompanied teams to answer questions from the public about the response operations.

with conducting a desktop assessment for potential ACM contamination using geographic information system tools, gaining legal access to rooftops, scheduling visits, and tracking reconnaissance and recovery efforts. Figure 4-3 shows the rooftops that were assessed in the downtown Portland area.

4.2.1.2 Recovery Operations

Recovery teams were directed to recover ACM at locations throughout the impacted area. Recovery operations commenced as soon as the recovery teams were formed on May 15, 2017. These teams consisted of both ERRS and START contractors (and occasionally an EPA community involvement coordinator). The teams initially focused on known ACM locations (i.e., those previously identified by ODEQ) immediately across the river from the Site. Once data on other ACM locations was obtained, the recovery teams quickly deployed to those locations to recover the materials. On average, ACM recovery occurred within 18 hours after it was initially located and reported.

ERRS-subcontracted asbestos workers were responsible for collecting ACM at locations identified by the recovery teams throughout Divisions B through Q. ACM removal was generally accomplished by using a long reach/pickup tool or gloved hand to collect larger AMC pieces or by using an asbestos vacuum for smaller or dispersed pieces. Prior to handling or vacuuming, ERRS wetted the ACM to prevent further breakdown and release of asbestos fibers. ERRS personnel were also responsible for handling ACM waste during recovery operations and securing it from additional release while conducting field operations. These staff members typically dressed out in Level C PPE that included respirator use, due to their proximity to, and necessity to handle, the ACM.

Similar to the reconnaissance teams, each recovery team carried at least one personal air sampler that collected a daily sample for asbestos fibers. These samplers were used to assess responder exposure to asbestos, but the data was also used to provide decision makers with information on the levels of ambient asbestos over a given area that a team visited on a particular day. The samplers were typically worn by ERRS staff since they were tasked with collection and handling ACM, and thus had a higher risk of potential exposure. More information on personal air sampling and fixed air sampling can be found in Sections 4.2.3 and 7.

Recovery teams carried a mobile data collection device that allowed them to view and edit a real-time geospatial viewer that was also visible in the ICP. Using the mobile data collection devices, recovery teams marked areas as being cleared after the ERRS members had completed ACM recovery at a particular location. This information was used by decision makers to monitor the cleanup in real time and communicate progress to stakeholders. When a division was marked as cleaned, this triggered a rapid confirmation inspection by a reconnaissance team. Upon re-inspection, an area remained marked as complete if no additional ACM was discovered. If ACM was still present, its location was marked on the viewer and a recovery team was assigned to remove it.

4.2.1.3 Summary of Reconnaissance and Recovery Operations

Challenges posed to both reconnaissance and recovery teams throughout these operations included walking many miles per day in hot weather conditions; limited access to restroom facilities; and ACM that was occasionally remobilized from rooftops and vegetation by wind after an area had been assessed and cleaned.

Over the course of 17 days of reconnaissance and recovery operations, an average of 4.6 field teams were deployed each day, with a maximum of nine teams in the field on a single day. A total of 78 unique reconnaissance and recovery team deployments occurred during field operations. The teams identified and recovered ACM at 1,336 unique locations in the approximately 3 square mile impacted area. An estimated 204 pounds of roofing paper was recovered by teams working in Divisions B through Q. Teams were also able to identify the extent of ACM deposition in the areas downwind of the burn site. A total of 249 rooftop segments[2] were identified for assessment. Of these segments, 140 had recoverable ACM identified on and removed from them. Forty-three of the segments were not accessible due to lack of owner contact, refusal of entry, or other factors. Sixty-six segments that the reconnaissance teams visited did not have contamination on them. Figure 4-3 shows the rooftops that were assessed during the response.

4.2.2 Burn Site (Division A) Security, Stabilization, Characterization, and Disposal

From the outset of the fire, the Portland Fire Department operated at the warehouse location, extinguishing the fire, addressing hot spots, providing the initial water misting spray, and completing their investigation. These operations concluded on May 17, 2017, and then control of the Site was turned over to Unified Command. Unified Command had set objectives that tasked responders with securing the Site from unauthorized access; stabilizing, controlling, and minimizing further ACM releases; assessing the waste remaining at the Site; conducting a limited removal of waste; and developing a plan for disposal. The Burn Site Management Branch of the ICS was tasked with meeting these objectives. For safety reasons, no responder staff were permitted to walk on the warehouse flooring supported by pilings. Responders were limited to walking only as far as the solid, concrete covered ground adjacent to the burn pile extended or to using a man lift to get over the pile for assessments. An exclusion zone was established around the burn location. Within the exclusion zone, site workers were required to wear PPE that included Level C respiratory protection as well as chemical protective clothing. A contamination reduction zone was also established for PPE removal. Workers outside of the exclusion and contamination reduction zones were permitted to wear Level D PPE.

4.2.2.1 Securing the Burn Site

Site security was established by erecting chain-link fencing around the burn site along easily accessible areas (i.e., publicly accessible) and along the property lines of adjacent private properties. Since most of the warehouse was located over water on pilings, the fencing was only erected along the northern and eastern edges of the Site. A security firm was subcontracted to provide personnel to monitor the Site when site workers were not present. Personnel were also assigned to monitor the forward operations base area.

4.2.2.2 Site Stabilization

One of the response objectives was to prevent additional releases of site wastes. To accomplish this objective, a variety of technologies were used both on the burn pile and in the river below the burnt structure. An oscillating water mister was utilized initially to minimize airborne particulates and mobilization of ACM. To prevent potential mobilization of ACM from debris or runoff caused by the misting operations, the USCG Pacific Strike Team assisted in deploying boom in the Willamette River. The water misting operations were eventually replaced with an

[2] A rooftop segment was defined as either the entire rooftop (in the case of simple, single layer roofs) on a single parcel or as one level of a multi-level/tiered roof on a single parcel.

application of a soil-stabilizing product.[3] The application of this product allowed the continual misting to cease and reduce run-off into the river. It also allowed assessment activities within the perimeter to begin.

Throughout these stabilization activities, START performed daily air sampling and monitoring at the Site. Due to the hazardous conditions within the footprint of the warehouse, these activities occurred at the perimeter of the warehouse. More information on sampling and monitoring can be found in Sections 4.2.3 and 7.

At the conclusion of the partial removal of asbestos-contaminated building debris (Section 4.2.2.4), ERRS applied an additional layer of soil stabilizing product to the waste remaining at the Site to prevent off-site migration during the interim monitoring phase (see Section 5), while the TCRA was being planned.

4.2.2.3 Waste Assessment

Another objective was to determine the composition and distribution of ACM in the warehouse debris and the impact it would have on disposal. To determine this, four decision units on the perimeter of the Site were designated for the burn pile composite sampling. Each decision unit was visually surveyed via man lift and from the ground by a START Asbestos Hazard and Emergency Response Act (AHERA) certified inspector to target several locations to collect material for sampling and estimate the relative portions of debris in the area. ERRS then utilized a long-arm excavator to scoop materials from the locations identified by START. These materials were composited together with other materials from the decision unit and an assessment of the makeup was performed (see Table 4-2). These samples were submitted to a laboratory for analysis of asbestos via polarized light microscopy (PLM), Toxicity Characteristic Leaching Procedure (TCLP) for Resource Conservation and Recovery Act (RCRA) metals, polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene, and Xylenes (BTEX). Each composite sample was taken from a representative area approximately 3,000 to 5,000 square feet wide. The area sampled represents approximately 22% of the warehouse area.

Table 4-2 Emergency Response Phase Waste Composition

Material	BP01	BP02	BP03	BP04
Wood (structural)	25%	40%	40%	40%
Wood (oriented strand board)	15%	-	-	-
Wood (oriented strand board with vapor barrier)	30%	-	30%	5%
Roofing material with tar/mastic	15%	20%	20%	10%
Roofing corrugated metal	15%	20%	5%	10%
Fiberglass-like material	-	-	-	10%
Conglomerate rock	-	-	55%	-
White gravel	-	-		10%
Plaster	-	-	-	5%
Homogenized fine burn particles	-	20%	-	-
Burnt metallic material	-	-	-	10%

[3] The stabilizing product utilized was Soilworks Gorilla-Snot, a biodegradable liquid co-polymer product designed to reduce the release of airborne particulate matter.

The asbestos by PLM results indicated that:

- BP01 was a composite of small pieces of debris in the ash. No asbestos was detected in the four layers identified from this sample.
- BP02 contained <1% asbestos (trace) from a black fibrous tar layer. Three layers were identified from this sample.
- BP03 contained 40% chrysotile asbestos from a black fibrous tar layer, and 2% asbestos from a black textured tar layer. Three layers were identified from this sample.
- BP04 contained 40% chrysotile asbestos from a gray fibrous material. Six layers were identified from this sample.

More information on sampling (including samples for asbestos by PLM collected in downtown Portland) and the results of PAHs, TCLP metals, PCBs, and BTEX analysis can be found in Sections 4.2.3.4 and 7.

The results of this assessment helped determine that the two primary waste streams would include metal and ACM waste. Metal debris would be decontaminated and sent for recycling later during the TCRA. The remainder of the fire-damaged building debris contained pieces of ACM, and was also contaminated with residual asbestos fibers; this debris was - disposed of as asbestos waste in accordance with state and federal regulations.

4.2.2.4 Partial Removal and Waste Disposal

Once the Site was secure, stabilized to mitigate additional releases, and characterized for waste disposal, ERRS began removing waste on the northern and eastern edges of the burn pile. Using long-arm excavators, ERRS collected and scraped the burn pile waste located on solid ground and over the pilings where it was within safe reaching distance (typically between 20 and 30 feet into the waste pile). During the collection and scraping, ERRS used a water truck to spray water at target areas being removed to prevent additional release of asbestos. START staff continued monitoring particulates and sampling the air for asbestos as the partial removal work was conducted. More information on sampling and monitoring activities is provided in Section 4.2.3 and 7. The wastes collected during these activities were contained in lined, roll-off bins, covered as appropriate and transported off-site for disposal. ERRS transported 21 forty-cubic yard roll-off bins and disposed of approximately 211 tons of asbestos wastes during the response phase. Additional details of waste disposal are provided in Section 8.

4.2.3 Sampling and Monitoring Activities

Throughout the initial emergency response phase, START performed air monitoring and sampling activities to provide data that Unified Command could use to make response-related decisions for the protection of the public and response personnel. Air samples for asbestos analyses were collected from both response personnel and at fixed locations, and particulate air monitors were used to monitor for dust levels around the warehouse perimeter. The following subsections discuss these sampling and monitoring activities and how they contributed to Unified Command's response-related decision making. Additional details on the sampling methods and results are discussed in Section 7.

4.2.3.1 Personal Air Sampling

During the emergency response, personal air samples were collected daily during START reconnaissance and recovery activities. In addition to providing data about potential exposures to

response personnel, the personal air sampling data was reviewed by EPA to help evaluate the threat the Site and the asbestos-contaminated debris posed to the public.

Personal samples were collected from START personnel during daily reconnaissance operations. ERRS personnel and subcontracted asbestos workers also wore personal pumps while working within the exclusion zone and around the perimeter of the Site. The personal samples were collected daily using a personal air sampling pump at flow rates of approximately 3 liters per minute (L/min) worn by site personnel. Samples for PCM testing were collected on 0.8 micrometer (µm) mixed-cellulose ester (MCE) filter cassettes hung over the shoulder at approximately 4 to 6 feet above the ground, to represent a person's breathing zone. Samples were analyzed for asbestos and other fibers by phase contrast microscopy (PCM), with a subset also analyzed by transmission electron microscopy (TEM). Additionally, blank filter cassettes were sent to the lab for blank analyses.

A total of 83 samples were collected for PCM analyses during the emergency response, although one PCM sample could not be analyzed due to overloading or filter damage. Sixteen of the samples were also submitted for TEM analysis (International Organization for Standardization [ISO] Method 10312) to confirm and further analyze the PCM results.

The results for the personal air samples are presented in Table 4-3. The results were compared to the Occupational Safety and Health Administration (OSHA) permissible exposure level (PEL) of 0.1 fibers per cubic centimeter (f/cc) and a risk-based level of 0.01 f/cc. There were no exceedances of the OSHA PEL limit. Several of the field sample results for PCM and total asbestos structures by TEM were at or exceeded the risk-based level of 0.01 f/cc. However, note that the PCM method measures asbestos and other fibers, so it is possible that some of the fibers detected were not asbestos. Additionally, the ISO TEM category for total asbestos structures is a broad category that includes a variety of asbestos objects (e.g., structures and fibers) and sizes. The ISO TEM results also include a reporting category for "PCM-equivalent fibers," which measures asbestos fibers that are more directly comparable to the PCM method, the OSHA PEL, and the risk-based level. In the samples analyzed by TEM, most of the PCM-equivalent fiber concentrations were non-detect, and none of the results exceeded the risk-based level of 0.01 f/cc.

4.2.3.2 Fixed Location Sampling

Air samples were collected for PCM analyses at fixed location air stations located around the perimeter of the warehouse, and from various locations in downtown Portland, using a rotary vane air sampling pump powered by a portable generator, for a period of approximately 7 to 10 hours.

A total of 117 fixed location samples were collected for PCM analyses during the emergency response, although 10 PCM samples could not be analyzed due to overloading or filter damage. The samples were collected daily at fixed location air stations using a rotary vane air sampling pump at flow rates of approximately 10 L/min. Samples for PCM testing were collected on 0.8 µm MCE filter cassettes hung at approximately 4 to 6 feet above the ground, to represent a person's breathing zone. Additionally, blank filter cassettes were sent out for blank analyses.

Of the 117 samples, 22 were also submitted for TEM analysis to confirm the PCM results. Twenty of the samples were analyzed by TEM per ISO Method 10312, and two of the PCM samples that were overloaded with dust was analyzed by the indirect ISO TEM Method 13794.

The fixed location air sample results are presented in Table 4-4, and Table 4-5 presents a summary of the PCM results compared to the site action levels. In general, all of the PCM results and most of the TEM results were below the risk-based level of 0.01 f/cc, which indicated that the asbestos exposure risk to the public was low. The only sample that exceeded the risk-based level was the sample collected from AS04 on May 22, 2017 at the perimeter of the warehouse, during a flare-up of the fire. This sample had been overloaded with dust during the PCM analysis, and it was submitted for indirect TEM analysis. While the concentration of total asbestos structures for this sample was 0.017 structures per cubic centimeter (s/cc), no PCM-equivalent fibers were detected.

4.2.3.3 Particulate Monitoring and Sampling

START initially established ambient air monitoring stations around the perimeter of the warehouse at stations AS03, AS04, AS05, and AS15. Figure 4-4 shows the air station configuration during the response phase. Equipment at station AS03 was eventually moved to station AS24, due to logistic and environmental factors. Station AS03 was located near the north corner of the Site along the northwest side of the warehouse, adjacent to the Sakrete concrete facility. Station AS04 was located across River Street from the warehouse, along the southwest side of the Northwest Copper Works building, and occupied a parking space. Station AS05 was located near the east corner of the warehouse on the boat ramp, adjacent to the KF Jacobsen and Co. asphalt facility. Station AS15 was located near the southeast side of the warehouse under the Fremont Bridge. Station AS24 was located on the north corner of the Site, adjacent to the Sakrete concrete facility. Each station was powered using deep cycle marine batteries that were swapped out and charged on a daily basis.

Each air station had a DataRAM 4 with filter to measure particulate matter less than 2.5 micrometers in diameter (PM2.5) in ambient air around the exclusion zone. Data from the DataRAM's was broadcast from each air station via Viper. Average weekly values for the DataRAM's ranged from 5.0 micrograms per cubic meter ($\mu g/m^3$; 0.005 milligrams per cubic meter [mg/m^3]) to 9.6 $\mu g/m^3$ (0.0096 mg/m^3). These values were far below the OSHA PEL time-weighted average (TWA) for nuisance dust (particulates not otherwise regulated) of 15 mg/m^3 for total particulates and 5 mg/m^3 for respirable particulates. Table 4-6 presents the particulate data recorded with Viper during the response phase.

4.2.3.4 Bulk and Burn Pile Sampling

To determine the composition of the warehouse debris, including asbestos, START collected four bulk composite samples from the burn pile (samples BP01 through BP04). Additionally, ODEQ collected samples of the ACM roofing material from the warehouse (sample BS01), and other similar materials from various locations throughout downtown Portland (samples S1, S2, and BS02 through BS08), and START arranged for the analysis of eight of these ODEQ samples at a subcontract laboratory. All 12 bulk samples were analyzed for asbestos by PLM.

The results of the PLM analyses are summarized in Table 4-7. The results of the four composite building material samples from the Site (samples BP01 through BO04) indicate that two had individual layers that contained 40% chrysotile asbestos. Asbestos was detected at trace levels (<1%) in one and was not detected in the other.

For the 10 samples collected by ODEQ, nine contained chrysotile asbestos at concentrations ranging from 60 to 90%. In addition to the PLM analysis for asbestos, the four burn pile samples (BP01 through BP04) were collected to characterize the waste for disposal, and the samples were

submitted for TCLP RCRA metals, total PAHs, total PCBs, and total BTEX analyses. The results of these analyses are presented in Table 4-8

4.2.3.5 Activity-Based Sampling

To further assess the potential risk of the asbestos debris to the public, EPA performed activity-based sampling, in which site response workers simulated common residential activities, such as mowing, raking, and sweeping, in areas of downtown Portland where the asbestos debris was found. The purpose of the activity-based sampling was to have site response workers replicate common, everyday activities likely to be performed by members of the public, and to measure their potential exposure to airborne asbestos fibers from the asbestos debris. Activity-based sampling was performed on May 22 and 23, 2017, and the sampling locations are shown on Figure 4-5.

The samples were collected using personal air sampling pumps at flow rates of approximately 3 L/min worn by response personnel. The response personnel were also wearing Level C PPE during the activity-based sampling. Samples for PCM testing were collected on 0.8 µm MCE filter cassettes hung over the shoulder at approximately 4 to 6 feet above the ground, to represent a person's breathing zone.

All 12 samples were submitted for PCM analyses, although one of the samples could not be analyzed because of filter damage. Seven of the samples were also submitted for TEM by ISO 10312 or 13294 (indirect method). The results are presented in Table 4-9. Most of the results were either non-detect or less than the risk-based level of 0.01 f/cc. Only one of the PCM results exceeded the risk-based level with a concentration of 0.017 f/cc, but when analyzed by TEM, this sample was non-detect for both total asbestos structures and PCM-equivalent fibers. Additionally, although two of the TEM results indicated total asbestos structure concentrations greater than the risk-based level, the PCM-equivalent fiber concentrations for each were less than the risk-based level, which indicates less risk to the public.

Table 4-3

Emergency Response Phase Personal Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Analysis	Analyte	Result	Qualifier	Units
					OSHA PEL	0.1		f/cc
					Risk-Based Level	0.01		f/cc
17050006	PS01	5/17/2017	Personal	PCM	Asbestos and other fibers	0.008		f/cc
17050007	PS02	5/17/2017	Personal	PCM	Asbestos and other fibers	0.01		f/cc
17050008	PS03	5/17/2017	Personal	PCM	Asbestos and other fibers	0.006	U	f/cc
17050014	PS01	5/18/2017	Personal	PCM	Asbestos and other fibers	0.006		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.003		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001		s/cc
17050015	PS02	5/18/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050016	PS03	5/18/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc
17050018	PS05	5/18/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050019	PS06	5/18/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050020	PS07	5/18/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc
17050028	PS01	5/19/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050030	PS03	5/19/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
17050031	PS04	5/19/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
17050032	PS05	5/19/2017	Personal	PCM	Asbestos and other fibers	0.007		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050033	PS06	5/19/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
17050034	PS07	5/19/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050041	PS01	5/20/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050042	PS02	5/20/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050043	PS03	5/20/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050044	PS04	5/20/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050045	PS05	5/20/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050046	PS06	5/20/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050047	PS07	5/20/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050055	PS01	5/21/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050056	PS02	5/21/2017	Personal	PCM	Asbestos and other fibers	0.004		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050057	PS03	5/21/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050058	PS04	5/21/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050059	PS05	5/21/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050060	PS06	5/21/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050061	PS07	5/21/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050073	PS01	5/22/2017	Personal	PCM	Asbestos and other fibers	0.016		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.007		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc

Table 4-3

Emergency Response Phase Personal Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Analysis	Analyte	Result	Qualifier	Units
					OSHA PEL	0.1		f/cc
					Risk-Based Level	0.01		f/cc
17050074	PS02	5/22/2017	Personal	PCM	Asbestos and other fibers	0.005		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050075	PS03	5/22/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050076	PS04	5/22/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050077	PS05	5/22/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050078	PS06	5/22/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050079	PS07	5/22/2017	Personal	PCM	Asbestos and other fibers	0.005	U	f/cc
17050096	PS01	5/23/2017	Personal	PCM	Asbestos and other fibers	0.003		f/cc
17050097	PS02	5/23/2017	Personal	PCM	Asbestos and other fibers	Rejected		
17050098	PS03	5/23/2017	Personal	PCM	Asbestos and other fibers	0.004		f/cc
17050099	PS04	5/23/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050100	PS05	5/23/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050101	PS07	5/23/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050102	PS08	5/23/2017	Personal	PCM	Asbestos and other fibers	0.01		f/cc
				TEM ISO 10312	Total Asbestos Structures	0.011		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.002		s/cc
17050103	PS09	5/23/2017	Personal	PCM	Asbestos and other fibers	0.009	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.02		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.006		s/cc
17050104	PS10	5/23/2017	Personal	PCM	Asbestos and other fibers	0.009	U	f/cc
				TEM ISO 10312	Total Asbestos Structures	0.033		s/cc
					PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.002		s/cc
17050112	PS02	5/24/2017	Personal	PCM	Asbestos and other fibers	0.003		f/cc
17050113	PS03	5/24/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050114	PS04	5/24/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050115	PS05	5/24/2017	Personal	PCM	Asbestos and other fibers	0.007	U	f/cc
17050116	PS06	5/24/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050125	PS01	5/25/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050126	PS02	5/25/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
17050127	PS03	5/25/2017	Personal	PCM	Asbestos and other fibers	0.028	U	f/cc
17050128	PS04	5/25/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050129	PS05	5/25/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050130	PS06	5/25/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050132	PS01	5/26/2017	Personal	PCM	Asbestos and other fibers	0.008		f/cc
17050133	PS02	5/26/2017	Personal	PCM	Asbestos and other fibers	0.01		f/cc
17050134	PS03	5/26/2017	Personal	PCM	Asbestos and other fibers	0.005		f/cc
17050135	PS04	5/26/2017	Personal	PCM	Asbestos and other fibers	0.002		f/cc
17050136	PS05	5/26/2017	Personal	PCM	Asbestos and other fibers	0.005		f/cc
17050137	PS06	5/26/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050151	PS01	5/27/2017	Personal	PCM	Asbestos and other fibers	0.007	U	f/cc
17050153	PS03	5/27/2017	Personal	PCM	Asbestos and other fibers	0.008	U	f/cc
17050157	PS01	5/28/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc
17050162	PS01	5/30/2017	Personal	PCM	Asbestos and other fibers	0.008	U	f/cc
17050163	PS02	5/30/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050164	PS03	5/30/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050165	PS04	5/30/2017	Personal	PCM	Asbestos and other fibers	0.003		f/cc
17050166	PS05	5/30/2017	Personal	PCM	Asbestos and other fibers	0.006		f/cc
17050168	PS01	5/31/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050169	PS02	5/31/2017	Personal	PCM	Asbestos and other fibers	0.003		f/cc
17050170	PS03	5/31/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050171	PS04	5/31/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050175	PS01	6/1/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050176	PS02	6/1/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc
17050177	PS03	6/1/2017	Personal	PCM	Asbestos and other fibers	0.002	U	f/cc
17050178	PS04	6/1/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc

Table 4-3

Emergency Response Phase Personal Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Analysis	Analyte	Result	Qualifier	Units
					OSHA PEL	0.1		f/cc
					Risk-Based Level	0.01		f/cc
17050179	PS05	6/1/2017	Personal	PCM	Asbestos and other fibers	0.016	U	f/cc
17050187	PS01	6/2/2017	Personal	PCM	Asbestos and other fibers	0.0046	U	f/cc
17050188	PS02	6/2/2017	Personal	PCM	Asbestos and other fibers	0.0058	U	f/cc
17050206	PS01	6/7/2017	Personal	PCM	Asbestos and other fibers	0.003	U	f/cc
17050211	PS01	6/8/2017	Personal	PCM	Asbestos and other fibers	0.004	U	f/cc

Note: There were no exceedances of the OSHA PEL limit.

Key:

	= a result at or above the risk-based level of 0.01 f/cc.
f/cc	= fibers per cubic centimeter
OSHA	= Occupational Safety and Health Administration
PCM	= Phase Contract Microscopy
PEL	= Permissible Exposure Limit
Rejected	= sample could not be analyzed.
s/cc	= structures per cubic centimeter
TEM	= Transmission Electron Microscopy
U	= not detected

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Table 4-4

Emergency Response Phase Fixed Location Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Units
						Risk-Based Level	0.01		f/cc
17050001	AS01	5/17/2017	Air Station	Child's Peace Montessori School	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050002	AS02	5/17/2017	Air Station	3010 Naito Blvd Waterfront Condos	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050003	AS03	5/17/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	Overloaded		
17050004	AS04	5/17/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.002		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050005	AS05	5/17/2017	Air Station	E Burn site, along chain link fence	PCM	Asbestos and other fibers	0.001		f/cc
17050009	AS02	5/18/2017	Air Station	3010 Naito Blvd Waterfront Condos	PCM	Asbestos and other fibers	0.001	U	f/cc
17050010	AS03	5/18/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050011	AS04	5/18/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.007		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.002		s/cc
17050012	AS06	5/18/2017	Air Station	1020 NW 9th St (Senior living Apts)	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050013	AS07	5/18/2017	Air Station	Emerson School Park Playground	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050023	AS03	5/19/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050024	AS04	5/19/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.003		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050026	AS08	5/19/2017	Air Station	Waterfront Park	PCM	Asbestos and other fibers	0.001		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050027	AS09	5/19/2017	Air Station	Ironside Terrace Apts	PCM	Asbestos and other fibers	0.001		f/cc
17050036	AS03	5/20/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.003		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050037	AS04	5/20/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050038	AS09	5/20/2017	Air Station	Ironside Terrace Apts	PCM	Asbestos and other fibers	0.001	U	f/cc
17050039	AS10	5/20/2017	Air Station	Emerson School	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc

Table 4-4

Emergency Response Phase Fixed Location Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Units
						Risk-Based Level	0.01		f/cc
17050040	AS11	5/20/2017	Air Station	Lownsdale Square Area Park	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050049	AS03	5/21/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050050	AS04	5/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050051	AS12	5/21/2017	Air Station	Keller Fountain Park	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050052	AS13	5/21/2017	Air Station	Hyatt House Roof	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050053	AS14	5/21/2017	Air Station	Pioneer Square	PCM	Asbestos and other fibers	0.001	U	f/cc
17050054	AS15	5/21/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050063	AS04	5/22/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
					TEM ISO 13794 (indirect)	Total Asbestos Structures	0.017		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.01	U	s/cc
17050064	AS13	5/22/2017	Air Station	Hyatt House Roof	PCM	Asbestos and other fibers	0.001	U	f/cc
17050065	AS15	5/22/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	Rejected		
17050066	AS16	5/22/2017	Air Station	OMSI	PCM	Asbestos and other fibers	0.001	U	f/cc
17050067	AS17	5/22/2017	Air Station	Keller Fountain Park-ABS-Upwind	PCM	Asbestos and other fibers	Rejected		
17050068	AS18	5/22/2017	Air Station	Keller Fountain Park-ABS-Upwind	PCM	Asbestos and other fibers	0.001		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050081	AS03	5/23/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.002	U	f/cc
17050082	AS04	5/23/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050083	AS15	5/23/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050084	AS19	5/23/2017	Air Station	ABS Upwind Lownsdale Park	PCM	Asbestos and other fibers	0.002		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050085	AS20	5/23/2017	Air Station	ABS Downwind Lownsdale Park	PCM	Asbestos and other fibers	0.001	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050086	AS21	5/23/2017	Air Station	ABS Upwind Waterfront Park	PCM	Asbestos and other fibers	0.002	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050087	AS22	5/23/2017	Air Station	ABS Downwind Waterfront Park	PCM	Asbestos and other fibers	0.002	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001		s/cc

Table 4-4

Emergency Response Phase Fixed Location Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Units
						Risk-Based Level	0.01		f/cc
17050107	AS09	5/24/2017	Air Station	Ironside Terrace Apts	PCM	Asbestos and other fibers	0.001	U	f/cc
17050108	AS10	5/24/2017	Air Station	Emerson School	PCM	Asbestos and other fibers	0.001	U	f/cc
17050109	AS15	5/24/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050110	AS18	5/24/2017	Air Station	Keller Fountain Park-ABS-Upwind	PCM	Asbestos and other fibers	0.001	U	f/cc
17050111	AS23	5/24/2017	Air Station	Ankney Pump Station	PCM	Asbestos and other fibers	0.001	U	f/cc
17050123	AS23	5/25/2017	Air Station	Ankney Pump Station	PCM	Asbestos and other fibers	0.001	U	f/cc
17050124	AS10	5/25/2017	Air Station	Emerson School	PCM	Asbestos and other fibers	0.001	U	f/cc
17050140	AS03	5/26/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	Overloaded		
17050141	AS15	5/26/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050142	AS09	5/26/2017	Air Station	Ironside Terrace Apts	PCM	Asbestos and other fibers	0.001	U	f/cc
17050143	AS10	5/26/2017	Air Station	Emerson School	PCM	Asbestos and other fibers	0.001	U	f/cc
17050144	AS18	5/26/2017	Air Station	Keller Fountain Park-ABS-Upwind	PCM	Asbestos and other fibers	0.001	U	f/cc
17050145	AS20	5/26/2017	Air Station	ABS Downwind Lownsdale Park	PCM	Asbestos and other fibers	0.001	U	f/cc
17050146	AS23	5/26/2017	Air Station	Ankney Pump Station	PCM	Asbestos and other fibers	0.001	U	f/cc
17050148	AS03	5/27/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050149	AS15	5/27/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050150	AS04	5/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050155	AS03	5/28/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001		f/cc
17050156	AS15	5/28/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050159	AS03	5/29/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050160	AS15	5/29/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050172	AS03	5/31/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050173	AS15	5/31/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050180	AS03	6/1/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050181	AS05	6/1/2017	Air Station	E Burn site, along chain link fence	PCM	Asbestos and other fibers	Overloaded		
					TEM ISO 13794 (indirect)	Total Asbestos Structures	0.007		~~s/cc~~
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	~~s/cc~~
17050182	AS15	6/1/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050184	AS03	6/2/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.0005	U	f/cc
17050185	AS04	6/2/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0005	U	f/cc
17050186	AS15	6/2/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.0005	U	f/cc
17050190	AS03	6/3/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.0004	U	f/cc
17050191	AS04	6/3/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0005	U	f/cc
17050192	AS15	6/3/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.0004	U	f/cc
17050194	AS04	6/4/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.003		f/cc
17050195	AS15	6/4/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050196	AS03	6/4/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050198	AS03	6/5/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	Overloaded		
17050199	AS04	6/5/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc

Table 4-4

Emergency Response Phase Fixed Location Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Units
						Risk-Based Level	0.01		f/cc
17050200	AS15	6/5/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050202	AS04	6/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
17050204	AS03	6/6/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050205	AS15	6/6/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050207	AS03	6/7/2017	Air Station	Sakrete	PCM	Asbestos and other fibers	0.001	U	f/cc
17050208	AS04	6/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
17050209	AS15	6/7/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050213	AS15	6/8/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050214	AS04	6/8/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050215	AS24	6/8/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050218	AS24	6/9/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050219	AS04	6/9/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050220	AS15	6/9/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050221	AS24	6/10/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	Overloaded		
17050222	AS04	6/10/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050223	AS15	6/10/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050225	AS15	6/12/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050226	AS04	6/12/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050227	AS24	6/12/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050229	AS15	6/13/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050230	AS04	6/13/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050231	AS24	6/13/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050233	AS15	6/14/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050234	AS04	6/14/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050235	AS24	6/14/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050237	AS15	6/15/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050238	AS24	6/15/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050239	AS04	6/15/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050241	AS04	6/16/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050242	AS24	6/16/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050243	AS15	6/16/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050245	AS15	6/17/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050246	AS04	6/17/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050247	AS24	6/17/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050249	AS24	6/19/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050250	AS15	6/19/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050251	AS04	6/19/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050253	AS15	6/20/2017	Air Station	E of Burn Site, Under 405 Bridge	PCM	Asbestos and other fibers	0.001	U	f/cc
17050254	AS04	6/20/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17050255	AS24	6/20/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc

Table 4-4

Emergency Response Phase Fixed Location Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Units
						Risk-Based Level	0.01		f/cc
17050257	AS24	6/21/2017	Air Station	Sakrete Property, N. Corner of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050258	AS04	6/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc

Key:

	= at or exceeds the risk-based level of 0.01 f/cc.
f/cc	= fibers per cubic centimeter
OSHA	= Occupational Safety and Health Administration
Overloaded	= sample overloaded with particulates and could not be analyzed.
PCM	= Phase Contract Microscopy
PEL	= Permissible Exposure Limit
Rejected	= sample could not be analyzed.
s/cc	= structures per cubic centimeter
TEM	= Transmission Electron Microscopy
U	= not detected

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Table 4-5

Emergency Response Phase Fixed Location Air Sample Data Summary
River Street Warehouse Fire Site
Portland, Oregon

Location	Total PCM Samples	Overloaded/Rejected Samples	No. of PCM Results Below Action Level	No. of PCM Results Above Action Level
AS01	1	0	1	0
AS02	2	0	2	0
AS03	18	3 (overloaded)	15	0
AS04	26	3 (overloaded)	23	0
AS05	2	1 (overloaded)	1	0
AS06	1	0	1	0
AS07	1	0	1	0
AS08	1	0	1	0
AS09	4	0	4	0
AS10	4	0	4	0
AS11	1	0	1	0
AS12	1	0	1	0
AS13	2	0	2	0
AS14	1	0	1	0
AS15	27	1 (rejected)	26	0
AS16	1	0	1	0
AS17	1	1 (rejected)	0	0
AS18	3	0	3	0
AS19	1	0	1	0
AS20	2	0	2	0
AS21	1	0	1	0
AS22	1	0	1	0
AS23	3	0	3	0
AS24	12	1 (overloaded)	11	0
Total	117	10	107	0

Note: The action level is the risk-based level of 0.01 f/cc.

Key:

f/cc = fibers per cubic centimeter
No. = Number
Overloaded = sample overloaded with particulates and could not be analyzed.
PCM = Phase Contract Microscopy
Rejected = sample could not be analyzed.

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Table 4-6

Emergency Response Phase Particulate Monitoring Data
River Street Warehouse Fire Asbestos Site
Portland, Oregon

Location	Date Range	Sample Type	Weekly Min ($\mu g/m^3$)	Weekly Max ($\mu g/m^3$)	Weekly TWA ($\mu g/m^3$)	Count (minutes)
AS04	June 2-10, 2017	DataRAM at Air Station	0	378.5	8.4	22041
AS15	June 2-10, 2017	DataRAM at Air Station	0	472.3	5.0	12431
AS24	June 3-8, 2017	DataRAM at Air Station	0	358.4	8.0	11542
	June 19-24, 2017		0	967.6	6.4	7310
AS25	June 19-24, 2017	DataRAM at Air Station	0	791.4	9.6	2524
AS26	June 19-24, 2017	DataRAM at Air Station	0.1	369.1	6.2	6662

Key:

$\mu g/m^3$ = micrograms per cubic meter
Min = minimum particulate level
Max = maximum particulate level
TWA = time weighted average

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Table 4-7

Emergency Response Phase Bulk Sample Data and Results
River Street Warehouse Fire Asbestos Site
Portland, Oregon

Date	Sampler	Sample No.	Location ID	Sample Location	Layer [1]	Description	PLM Result (% Chrysotile)
Samples Collected from the Warehouse Site							
5/23/2017	START	17053008	BP01	Warehouse	1	tar	NAD
					2	fibrous material	NAD
					3	compact chalky material with paper	NAD
					4	fibrous tar	NAD
5/23/2017	**START**	**17053009**	**BP02**	**Warehouse**	**1**	**fibrous tar**	**< 1**
					2	brittle textured tar	NAD
					3	fibrous tar	NAD
5/24/2017	**START**	**17053010**	**BP03**	**Warehouse**	**1**	**fibrous tar**	**40**
					2	fibrous tar	NAD
					3	**textured tar**	**2**
5/24/2017	**START**	**17053011**	**BP04**	**Warehouse**	1	compact fibrous material	NAD
					2	loose fibrous material	NAD
					3	soft compact powder	NAD
					4	brittle compact powder	NAD
					5	fibrous tar	NAD
					6	**fibrous material**	**40**
Samples Collected from the Community							
5/15/2017	**ODEQ**	**Z7308 [2]**	**S1**	**Waterfront Pearl Condos**	**1**	**fibrous material**	**90**
5/15/2017	**ODEQ**	**Z7309 [2]**	**S2**	**Waterfront Pearl Condos**	**1**	**fibrous material**	**90**
5/18/2017	ODEQ	17053000	BS01	Division A	1	compact fibrous powder	NAD
					2	loose powder	NAD
5/20/2017	**ODEQ**	**17053001**	**BS02**	**Division G**	**1**	**fibrous material**	**60**
5/20/2017	**ODEQ**	**17053002**	**BS03**	**Division G**	**1**	**fibrous material**	**60**
5/20/2017	**ODEQ**	**17053003**	**BS04**	**Division G**	**1**	**fibrous material**	**65**
5/20/2017	**ODEQ**	**17053004**	**BS05**	**Division G**	**1**	**fibrous material**	**60**
5/20/2017	**ODEQ**	**17053005**	**BS06**	**Division K**	**1**	**fibrous material**	**60**
5/20/2017	**ODEQ**	**17053006**	**BS07**	**Division J**	**1**	**fibrous material**	**60**
5/20/2017	**ODEQ**	**17053007**	**BS08**	**Division J**	**1**	**fibrous material**	**60**

Notes: Bold type indicates asbestos was detected in that sample/layer.

(1) Per Method EPA/600/R-93/116, each layer of a multi-layer sample was analyzed and reported separately.

(2) Samples Z7308 and Z7309 were collected and submitted for PLM testing by ODEQ. ODEQ submitted its other samples through START for PLM testing.

Key:

% = percent
NAD = No Asbestos Detected by Polarized Light Microscopy
ODEQ = Oregon Department of Environmental Quality
PLM = Polarized Light Microscopy
START = Superfund Technical Assessment and Response Team

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Table 4-8

Emergency Response Phase Burn Pile Sample Data and Results
River Street Warehouse Fire Site
Portland, Oregon

Analyte	Disposal Limit	17053012	17053013	17053014	17053015
Toxicity Characteristic Leaching Procedure Metals (mg/L)					
Arsenic	5 mg/L (TCLP)	0.050 U	0.055 U	0.050 U	0.050 U
Barium	100 mg/L (TCLP)	1.0 UJL	1.0 UJL	1.0 UJL	1.0 UJL
Cadmium	1 mg/L (TCLP)	**0.003 JQ**	**0.011 JQ**	0.050 UJL	**0.002 JQ**
Chromium	5 mg/L (TCLP)	0.050 U	**0.014 JQ**	0.050 UJL	0.050 U
Lead	5 mg/L (TCLP)	**0.176**	**3.59**	**0.498**	0.050 U
Mercury	0.2 mg/L (TCLP)	0.0010 U	0.0010 U	0.0010 U	0.0010 U
Selenium	1 mg/L (TCLP)	0.10 U	0.10 U	0.10 U	0.10 U
Silver	5 mg/L (TCLP)	0.050 U	0.050 U	0.050 U	0.050 U
Polychlorinated Biphenyls (µg/kg)					
Aroclor 1016		25 U	33 U	29 U	37 U
Aroclor 1221		50 U	66 U	58 U	74 U
Aroclor 1232		25 U	33 U	29 U	37 U
Aroclor 1242		**470**	33 U	43 U	**42**
Aroclor 1248		25 U	33 U	48 U	37 U
Aroclor 1254		25 U	33 U	83 U	37 U
Aroclor 1260		**33**	33 U	**62**	37 U
Total PCBs	50,000 µg/kg (TSCA)	**503**	Non-Detect	**62**	**42**
Volatile Organic Compounds (mg/kg)					
Benzene	0.5 mg/L (TCLP) (10 mg/kg with 20X rule)	**0.15**	**0.17**	**0.12**	**0.42**
Toluene		**0.23**	**0.15**	**0.15**	**0.36**
Ethylbenzene		**0.070 JQ**	**0.038 JQ**	**0.038 JQ**	**0.10 JQ**
m,p-Xylenes		**0.22**	**0.096**	**0.095**	**0.18**
o-Xylene		**0.094 JQ**	**0.038 JQ**	**0.045 JQ**	**0.086 JQ**
Polynuclear Aromatic Hydrocarbons (µg/kg)					
2-Methylnaphthalene		**630**	**2,900**	**2,200**	**4,800**
Acenaphthene		**240 JQ**	**23,000 JL**	**2,700 JL**	**5,200 JL**
Acenaphthylene		**1,000**	**11,000**	**17,000**	**8,600**
Anthracene		**3,000**	**80,000**	**17,000**	**11,000**
Benz[a]anthracene		**3,300**	**140,000**	**54,000**	**4,600**
Benzo(b)fluoranthene		**2,200**	**230,000**	**140,000**	**9,200**
Benzo[a]pyrene		**2,200**	**200,000**	**120,000**	**7,500**
Benzo[ghi]perylene		**1,500**	**200,000**	**110,000**	**7,800**
Benzo[k]fluoranthene		**690**	**81,000**	**54,000**	**3,200**
Carbazole		**1,400**	**19,000**	**3,500**	**1,800**
Chrysene		**5,000**	**230,000**	**110,000**	**8,500**
Dibenz[a,h]anthracene		**310**	**30,000**	**16,000**	**1,100**
Dibenzofuran		**710 JL**	**2,700 JL**	**1,100 JQ**	**1,500 JL**
Fluoranthene		**8,400**	**360,000**	**170,000**	**19,000**
Fluorene		**1,000**	**5,500**	**1,900**	**4,400**
Indeno[1,2,3-cd]pyrene		**1,300**	**190,000**	**110,000**	**6,500**
Naphthalene		**3,100 JL**	**4,700 JL**	**5,100 JL**	**7,900 JL**
Phenanthrene		**17,000**	**140,000**	**20,000**	**16,000**
Pyrene		**8,800**	**460,000**	**170,000**	**25,000**

Note: Bold type indicates the sample result is above the method detection or instrument detection limit.

Key:

µg/kg = micrograms per kilogram
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
L = Low bias.
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
Q = Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.
TCLP= Toxicity Characteristic Leaching Procedure
TSCA = Toxic Substances Control Act

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ = The material was analyzed for but was not detected. The reported detection limit is estimated because quality control criteria were not met.

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Table 4-9

Emergency Response Phase Activity-Based Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analysis	Analyte	Result	Qualifier	Unit
						OSHA PEL	0.1		f/cc
						Risk-Based Level	0.01		f/cc
17050069	ABS01	5/22/2017	Activity-Based Sampling	Keller Fountain Park Sweeping-low flow	PCM	Asbestos and other fibers	0.011	U	f/cc
17050070	ABS02	5/22/2017	Activity-Based Sampling	Keller Fountain Park Raking-low flow	PCM	Asbestos and other fibers	0.011	U	f/cc
17050071	ABS03	5/22/2017	Activity-Based Sampling	Keller Fountain Park Sweeping-high Flow	PCM	Asbestos and other fibers	0.001		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.002		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001		s/cc
17050072	ABS04	5/22/2017	Activity-Based Sampling	Keller Fountain Park Raking-high flow	PCM	Asbestos and other fibers	0.001		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050088	ABS05	5/23/2017	Activity-Based Sampling	ABS Lownsdale Park Mowing-low flow	PCM	Asbestos and other fibers	0.011	U	f/cc
17050089	ABS06	5/23/2017	Activity-Based Sampling	ABS Lownsdale Park Mowing-high flow	PCM	Asbestos and other fibers	0.005	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.011		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.002		s/cc
17050090	ABS07	5/23/2017	Activity-Based Sampling	ABS Lownsdale Park Raking-low flow	PCM	Asbestos and other fibers	0.011	U	f/cc
17050091	ABS08	5/23/2017	Activity-Based Sampling	ABS Lownsdale Park Raking-high flow	PCM	Asbestos and other fibers	0.006	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050092	ABS09	5/23/2017	Activity-Based Sampling	ABS Waterfront Park Mowing-low flow	PCM	Asbestos and other fibers	0.017		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050093	ABS10	5/23/2017	Activity-Based Sampling	ABS Waterfront Park Mowing-high flow	PCM	Asbestos and other fibers	0.006	U	f/cc
					TEM ISO 10312	Total Asbestos Structures	0.012		s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc
17050094	ABS11	5/23/2017	Activity-Based Sampling	ABS Waterfront Park Raking-low flow	PCM	Asbestos and other fibers	Rejected		
17050095	ABS12	5/23/2017	Activity-Based Sampling	ABS Waterfront Park Raking-high flow	PCM	Asbestos and other fibers	0.007		f/cc
					TEM ISO 13794 (indirect)	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers (0.25-3.0, > 5 & 3:1)	0.001	U	s/cc

Note: There were no exceedances of the OSHA PEL limit.

Key:

= at or exceeds the risk-based level of 0.01 f/cc or s/cc.
f/cc = fibers per cubic centimeter
OSHA = Occupational Safety and Health Administration
PCM = Phase Contract Microscopy
PEL = Permissible Exposure Limit
Rejected = sample could not be analyzed.
s/cc = structures per cubic centimeter
TEM = Transmission Electron Microscopy
U = not detected

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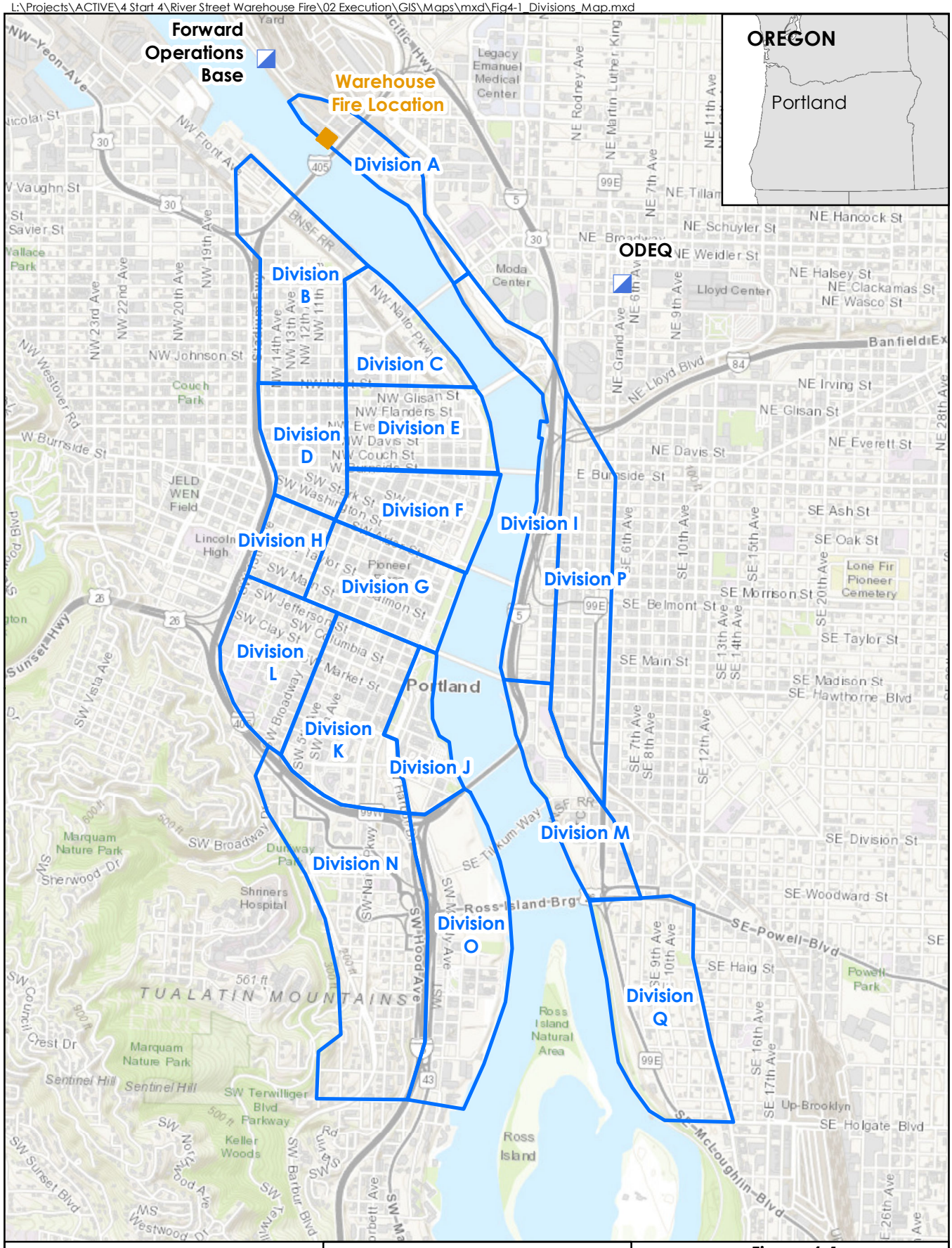

ecology and environment, inc. Global Environmental Specialists	River Street Warehouse Fire *Portland, Oregon* 0 0.25 0.5 Miles	***Figure 4-1*** Site Location and Divisions Map
		Date: 4/16/2018 Drawn by: LG

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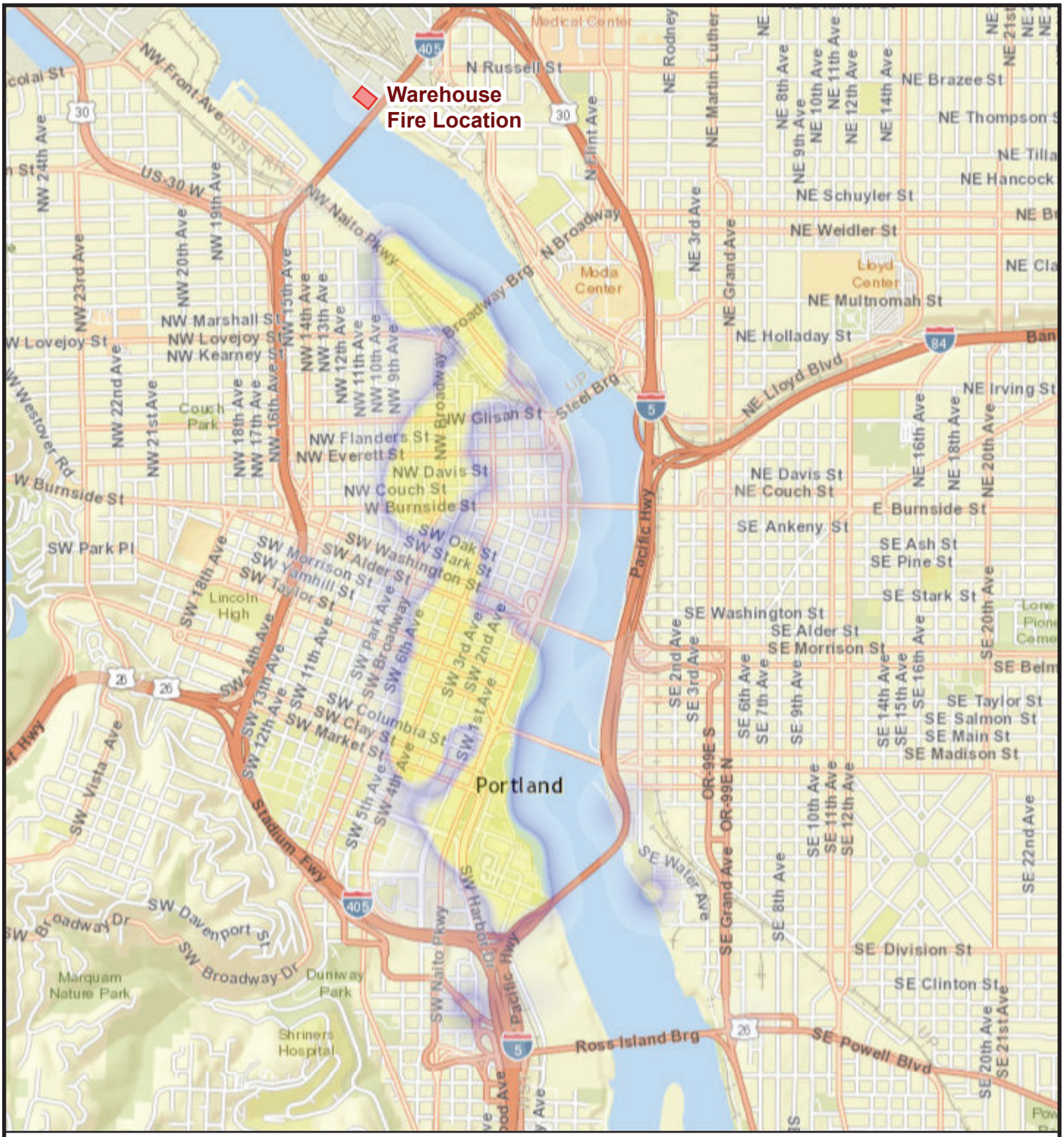

ecology and environment, inc. Global Environmental Specialists Seattle, Washington	RIVER STREET WAREHOUSE FIRE Portland, Oregon	Figure 4-2 ASBESTOS DEPOSITION MAP		
		Date: 4/19/18	Drawn by:	10:START-IV\TO23T1SS1\fig 4-2

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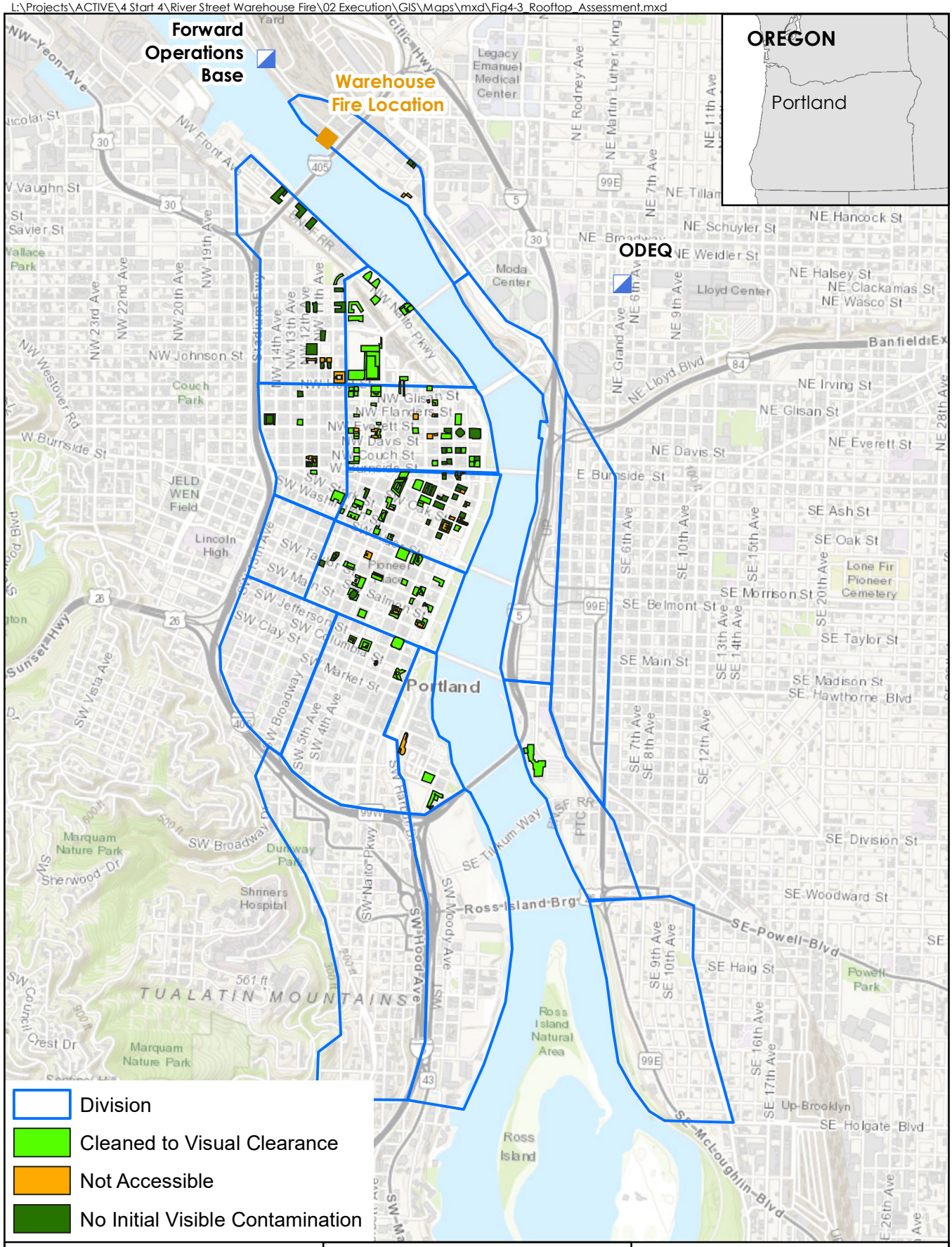

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Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

0 0.25 0.5 Miles

Figure 4-3
Rooftop Assessment

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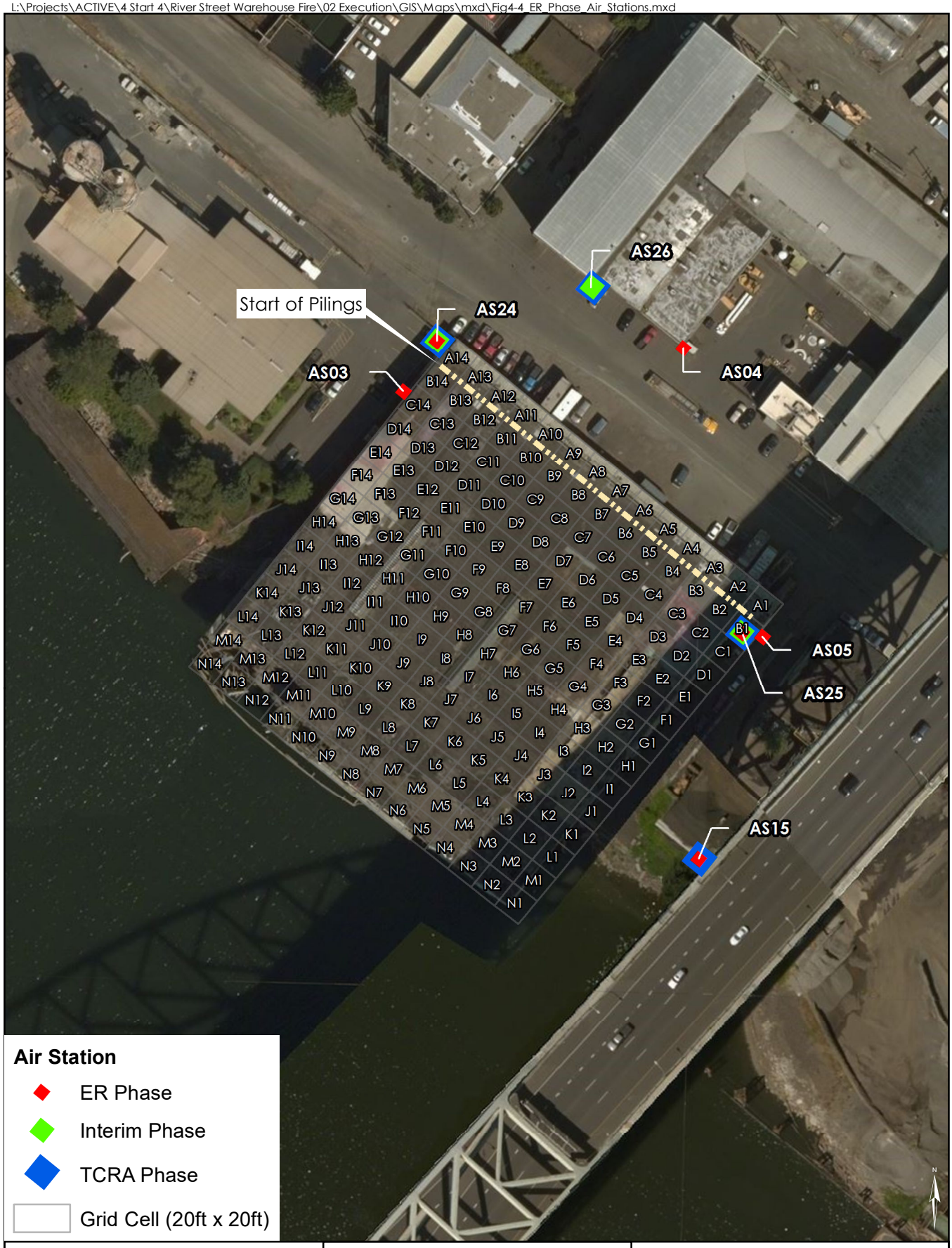

ecology and environment, inc.
Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

0 25 50 Feet

Figure 4-4
Emergency Response Phase Air Stations Configuration

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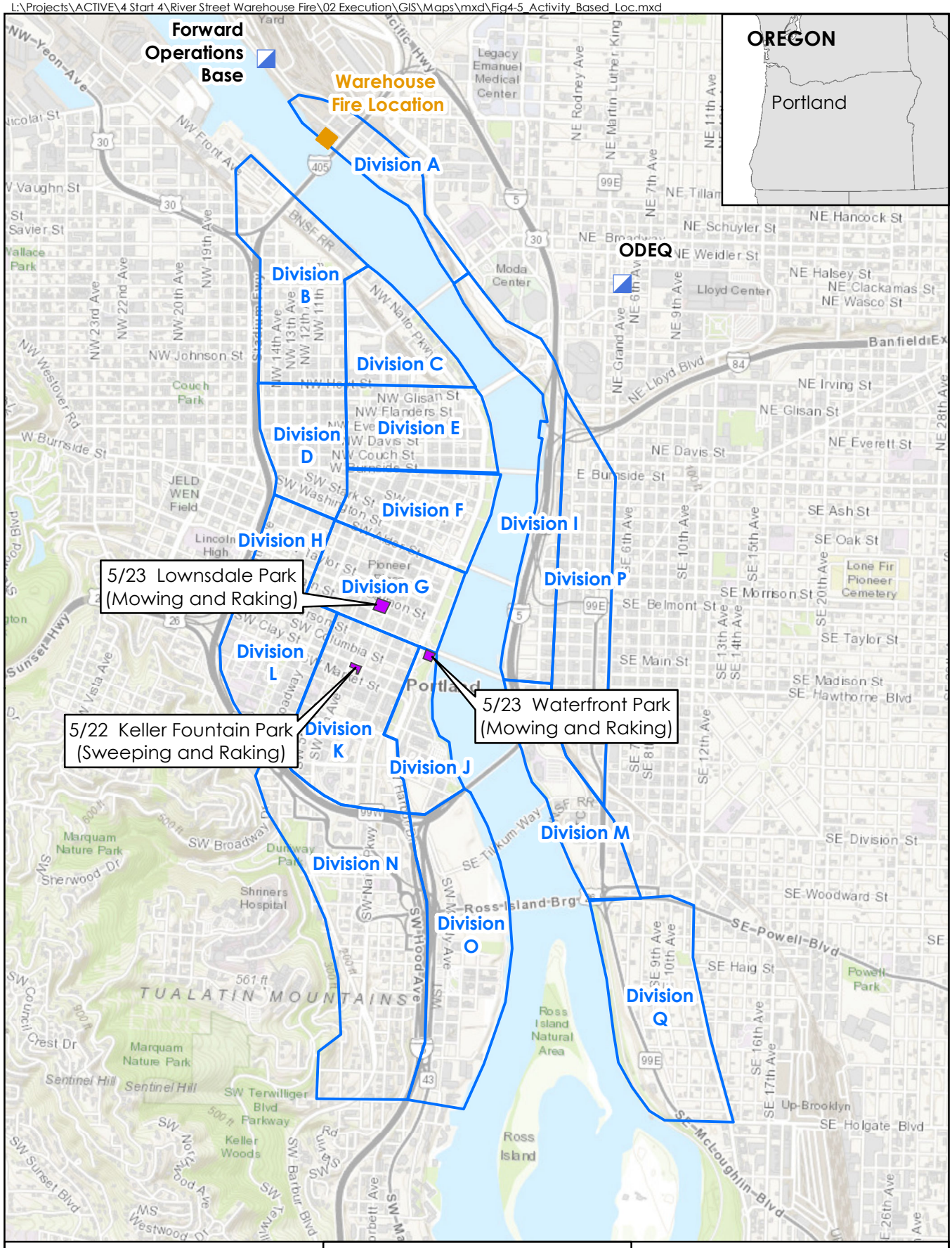

ecology and environment, inc.
Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

0 0.25 0.5 Miles

Figure 4-5
Activity Based Sampling Locations

Date: 4/19/2018 | Drawn by: LG

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5 Interim Monitoring Phase

The interim monitoring phase marked the period between the emergency response ending on June 24, 2017, and the beginning of the TCRA phase on September 18, 2017. The objectives of the interim monitoring phase included conducting ambient air quality monitoring and sampling, ensuring the safety of the public and site personnel, providing EPA with weekly updates, ensuring proper data management, and securing the Site at all times. Additional details on sampling and monitoring methods and results are discussed in Section 7.

5.1 Site Security and Stabilization

During the entirety of the interim monitoring phase, several approaches were used to secure and stabilize the Site. A temporary chain-link fence with locked gates was set up around the perimeter of the fire-damaged warehouse to secure the Site. Temporary chain-link cages with locks were built around each air monitoring station to secure the monitoring equipment. A subcontractor was hired by ERRS to maintain 24-hour security coverage of the Site, including the installation of security cameras that gave EPA and START access to web-based security cameras to monitor the Site remotely. START checked in with the site security guard whenever on site to be briefed on recent activities around the Site.

5.2 Monitoring and Sampling Activities

5.2.1 Particulate Monitoring

Three DataRAM particulate monitors were deployed at three air stations to monitor for dust leaving the Site. Station AS24 was located on the north corner of the Site, adjacent to the Sakrete concrete facility. Station AS25 was located within the contamination zone of the Site, along the southeast side of the warehouse on the boat ramp. Station AS26 occupied a couple of parking spaces across River Street from the warehouse and adjacent to Northwest Copper Works. Figure 5-1 shows the air station configuration during this monitoring phase.

Air stations AS24 and AS25 could not practically be powered using shore power and were instead powered using two Goal Zero batteries that were charged using solar power. Because of the close proximity to the Fremont Bridge, station AS25 did not have enough sunlight to charge the Goal Zero battery during the daylight hours. A solar power charging station was set up north of station AS25, along the northeast site perimeter, which fed power via extension cords to station AS25. Station AS26 was powered using shore power provided by Northwest Copper Works.

On June 30, 2017, the DataRAM and Viper equipment at station AS26 was stolen from the Site and recovered later that day. The air station cage was compromised due to the chain-link panel and chains being cut. All equipment was pulled from the air station and returned to the Portland logistics center. Based on particulate and sample data, EPA determined that two air stations were sufficient to monitor the Site for particulates and asbestos. Stations AS24 and AS25 remained functioning for the remainder of the interim monitoring phase.

The results of the interim phase dust monitoring are presented in Table 5-1. Overall, average airborne particulate results were below the site action level for dust particulates of 139 $\mu g/m^3$. Throughout the interim period, there were spikes above the site action level on a daily occurrence. However, the overall TWAs were below the action level. START investigated most

of the exceedances by using video footage from the web-based security camera. The exceedance spikes were mostly associated with high winds, truck and vehicle traffic, and neighboring sources from either the Sakrete concrete facility northwest of the Site or the gravel and asphalt facility southeast of the Site.

5.2.2 Air Station Sampling

Air samples were collected for PCM analyses at the air stations once a week using rotary vane air sampling pumps powered by a fuel generator for a period of approximately 6 to 8 hours. The samples were collected at flow rates of approximately 10 L/min. Samples for PCM testing were collected on 0.8 µm MCE filter cassettes hung at approximately 4 to 6 feet above the ground, to represent a person's breathing zone. Additionally, blank filter cassettes were sent to the lab for blank analyses. A total of 25 samples were collected for PCM analyses during the interim monitoring phase, although five of the samples could not be analyzed due to overloading or pump fault.

All perimeter air sample results are presented in Table 5-2, and Table 5-3 presents a summary of the results. All but one of the PCM samples were non-detect for asbestos and other fibers, and there were no exceedances of the risk-based level of 0.01 f/cc.

5.3 Data Management and Information Communication

5.3.1 Data Management Support

Site personnel were supported by off-site data management using Scribe for sample data and results, daily/weekly Viper reports, and specialized ERT support for any Viper issues. START prepared weekly reports containing site status, safety and security measures, air particulate monitoring data, Viper alarm data, sampling and analytical data, anticipated site personnel schedule, and other site updates to EPA and START site personnel.

5.3.2 Viper

Three air stations were set up using Viper telemetry to view real-time particulate monitoring data. Alarms were set in place to alert specified EPA and START personnel if particulate levels exceeded action levels or instruments lost connectivity. START provided EPA with daily and weekly updates of exceedances of an established 5-minute TWA of 139 $\mu g/m^3$. When an exceedance was identified by the telemetry system, START notified EPA of the alert and responded at the first available, reasonable, and safe time. As more data was gathered during the interim period, START was able to downgrade this approach, which included checking the web-based security camera for a possible cause of the exceedance. Most of these exceedances were caused by high wind gusts or nearby truck or vehicle traffic raising dust from the street.

Table 5-1

Interim Monitoring Phase Particulate Monitoring Data
River Street Warehouse Fire Site
Portland, Oregon

Location	Date Range	Sample Type	Weekly Min ($\mu g/m^3$)	Weekly Max ($\mu g/m^3$)	Weekly TWA ($\mu g/m^3$)	Count (minutes)	Count of 5 minutes TWA exceedances > 139 $\mu g/m^3$
Air Station AS24							
AS24	June 23-29, 2017	DataRAM at Air Station	0	866	6.17	217309	N/A
AS24	June 30 - July 9, 2017	DataRAM at Air Station	0	1769.9	6.3	14727	N/A
AS24	July 10-16, 2017	DataRAM at Air Station	0	1535.5	6.83	10319	47
AS24	July 17-23, 2017	DataRAM at Air Station	0	1480.9	5.06	10275	24
AS24	July 24-30, 2017	DataRAM at Air Station	0	6051	25.09	10300	243
AS24	July 31 - August 6, 2017	DataRAM at Air Station	0	1919.5	48.93	10320	731
AS24	August 7-13, 2017	DataRAM at Air Station	0	710.8	30.68	10189	6
AS24	August 14-20, 2017	DataRAM at Air Station	0.2	1500.1	11.86	8718	114
AS24	August 21-27, 2017	DataRAM at Air Station	0	983	8.08	10732	194
AS24	August 28 - September 3, 2017	DataRAM at Air Station	0	1070.6	25.23	34580	300
AS24	September 4-10, 2017	DataRAM at Air Station	0.2	537	43.8	10771	225
AS24	September 11-17, 2017	DataRAM at Air Station	0	1579.8	22.36	10286	212
Air Station AS25							
AS25	June 23-29, 2017	DataRAM at Air Station	1.1	668.7	8.59	238069	N/A
AS25	June 30 - July 9, 2017	DataRAM at Air Station	0.8	193.8	7.92	12100	N/A
AS25	July 10-16, 2017	DataRAM at Air Station	1	120	5.36	10312	0
AS25	July 17-23, 2017	DataRAM at Air Station	0.6	197.7	5.4	10276	0
AS25	July 24-30, 2017	DataRAM at Air Station	0	177.6	4.52	10284	0
AS25	July 31 - August 6, 2017	DataRAM at Air Station	0.1	2273	56.57	10293	876
AS25	August 7-13, 2017	DataRAM at Air Station	4.4	292.3	40.07	7954	7
AS25	August 14-20, 2017	DataRAM at Air Station	0	424	3.94	12610	0
AS25	August 21-27, 2017	DataRAM at Air Station	0	663.4	7.7	10284	43
AS25	August 28 - September 3, 2017	DataRAM at Air Station	0	1205.1	27.25	36556	427
AS25	September 4-10, 2017	DataRAM at Air Station	0	10030.5	82.7	9705	675
AS25	September 11-17, 2018	DataRAM at Air Station	not operational during this reporting period				
Air Station AS26							
AS26	June 23-29, 2017	DataRAM at Air Station	0	961.6	7.3	277775	N/A
AS26	June 30, 2017	DataRAM at Air Station	6.4	103.9	11.17	420	N/A
AS26	July 1 - September 17, 2017	DataRAM at Air Station	not operational during this reporting period				

Note: The action level for particulates at the Site is a TWA of 139 $\mu g/m^3$ sustained for 5 minutes.

Key:

$\mu g/m^3$ = micrograms per cubic meter
Min = minimum particulate level
Max = maximum particulate level
TWA = time weighted average

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Table 5-2

Interim Monitoring Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17050260	AS25	6/30/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	Rejected		
17050261	AS26	6/30/2017	Air Station	NW Copper Works, across street to North of warehouse	PCM	Asbestos and other fibers	Rejected		
17050262	AS24	6/30/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	Rejected		
17050264	AS25	7/7/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050265	AS24	7/7/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050267	AS24	7/13/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050268	AS25	7/13/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050270	AS24	7/21/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050271	AS25	7/21/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050273	AS24	7/28/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050274	AS25	7/28/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050276	AS25	8/3/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050277	AS24	8/3/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	Overloaded		
17050279	AS24	8/10/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	Overloaded		
17050280	AS25	8/10/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050282	AS24	8/18/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050283	AS25	8/18/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050285	AS24	8/25/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050286	AS25	8/25/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050288	AS24	9/1/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050289	AS25	9/1/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050291	AS24	9/8/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050292	AS25	9/8/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17050294	AS24	9/14/2017	Air Station	Sakrete Property, North corner of warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17050295	AS25	9/14/2017	Air Station	Cell B1, East corner of warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc

Key:

U	= not detected
PCM	= Phase Contract Microscopy
f/cc	= fibers per cubic centimeter
Overloaded	= sample overloaded with particulates and could not be analyzed.
Rejected	= sample could not be analyzed.

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Table 5-3

Interim Monitoring Phase Perimeter Air Sample Data Summary
River Street Warehouse Fire Site
Portland, Oregon

Location	Total PCM Samples	Overloaded/Rejected Samples	No. of PCM Results Below Action Level	No. of PCM Results Above Action Level
AS24	12	3 (1 rejected, 2 overloaded)	9	0
AS25	12	1 (rejected)	11	0
AS26	1	1 (rejected)	0	0
Total	25	5	20	0

Note: The action level is the risk-based level of 0.01 f/cc.

Key:

f/cc = fibers per cubic centimeter
Overloaded = sample overloaded with particulates and could not be analyzed.
PCM = Phase Contract Microscopy
Rejected = sample could not be analyzed.

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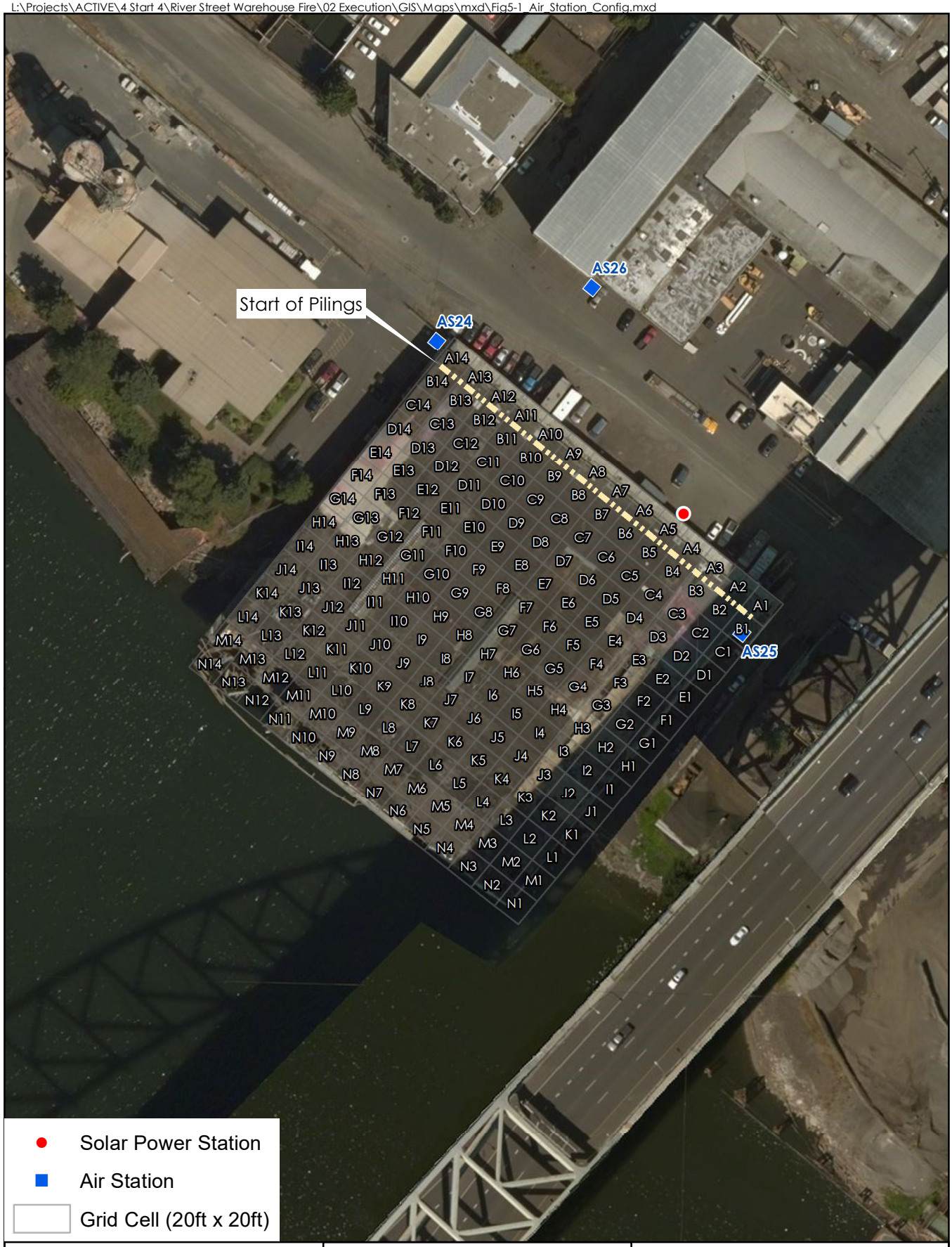

ecology and environment, inc.
Global Environmental Specialists

River Street Warehouse Fire

Portland, Oregon

0 25 50 Feet

Figure 5-1
Warehouse Grid and Air Sampling Locations

Date: 4/19/2018 | Drawn by: LG

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6 Time-Critical Removal Action

Following the emergency response phase, roughly 63,600 square feet of the burned building debris of the former warehouse building remained on site. The remains included burnt ash, charred planks and timbers, sheet metal debris, and other debris intermixed with ACM, all of which were piled on the subfloor decking, which was in turn supported by pilings. Based on an assessment during the emergency removal action, an estimated 20,000 cubic yards of ACM debris remained on the Site and required removal. To remove the asbestos-contaminated building debris from the Site for proper off-site disposal, EPA conducted a TCRA at the Site from September 2017 to February 28, 2018.

6.1 Removal Action Objectives

The removal action had two major components: trestle installation to provide access to the ACM debris, followed by debris cleanup and removal. Because of structural concerns with the fire-damaged warehouse structure, two independently supported trestles were installed at the Site to provide work platforms from which workers using equipment were able to safely reach and remove the remaining building debris.

During the interim monitoring period, EPA inspected the structural stability of the burned warehouse building. As a subcontractor to ERRS, an engineer from Bittner-Shin Consulting Engineers, Inc. assessed the Site and determined that approximately 30% of the tops of the existing piles closest to the shore were completely destroyed by the fire. Additionally, approximately 90% of the remaining piles had been modified by cutting off the upper 20 to 30 feet at the ground surface and splicing on a fresh upper section. The upper piles sections looked sound, but the bottom sections were either unexposed for inspection, or where exposed, they were observed to be in an advanced stage of decay (BSCE 2017a). Based on this assessment, the ERRS subcontract engineer designed the approach for the installation and use of the two trestles to allow heavy equipment to safely remove the debris from the elevated platform and package it for off-site disposal (BSCE 2017b).

6.2 Mobilization and Organization

EPA and its contractors performed the TCRA from September 18, 2017, through February 28, 2018. The following describes the roles and responsibilities for the participating organizations:

- **On-Scene Coordinator (OSC):** The TCRA was performed under the supervision of an EPA OSC.
- **ERRS:** TCRA construction-related activities were performed under the EPA Region 10 ERRS contract by EQM and its subcontractors. Key ERRS subcontractors are summarized below:
    - **Bittner-Shen Consulting Engineers, Inc.** inspected the fire-damaged warehouse structure, prepared a conceptual design for the construction of the two temporary trestles, and performed routine assessments of the trestle installation.
    - **Advanced American Construction, Inc. (AAC)** installed the temporary trestles that were used to allow EPA to reach and safely deconstruct the remaining sections of the structure.

- **Performance Contracting, Inc. / Performance Abatement Services, Inc. (PCI/PAS)** is a licensed asbestos abatement company that provided asbestos abatement workers and supervisors to remove and handle asbestos waste.
- **Advantage Environmental, Inc. (Advantage)** was on site to perform daily personal air sampling and analysis for worker protection.

- **START:** E & E, under the EPA Region 10 START-IV contract, provided on-site technical assistance, collected and submitted environmental samples, and documented site activities.

6.3 Site Setup and Layout

The Site was located in a crowded industrial area, with neighboring properties and other restrictions directly adjacent on all sides, including the Sakrete concrete facility to the northwest, River Street and the Union Pacific Railroad rail line to the northeast, Northwest Copper Works directly across the street to the northeast, the asphalt plant to the southeast, and the Willamette River to the southwest (see Figure 2-2). Because of these restrictions, there were limited areas at the Site for operations, materials storage, and waste load-out.

Because of the space restrictions at the Site, the ICP and support zone were located approximately 0.5 mile to the northwest on River Street, at the former location of the forward operations base, during the response phase, on land temporarily leased from Union Pacific Railroad.

An exclusion zone was established with temporary fencing around the footprint of the Site, where the trestle installation and asbestos-contaminated debris removal activities occurred. Temporary security fencing was also installed around the ICP.

The Site was located within 25 feet of the centerline of an active railroad track, so EPA was required to comply with 49 Code of Federal Regulations 218.27, a Federal Railroad Administration regulation that requires the rail to be locked out during EPA operations. EPA coordinated with the Union Pacific Railroad to establish this daily lockout and to prevent unauthorized movements of trains or unattended rolling stock.

Additionally, River Street needed to be kept open during removal activities to allow access for public traffic and area businesses. Because the traffic essentially traveled across a working part of the Site, ERRS subcontracted to a company to provide flaggers and other traffic controls throughout daily removal activities. EPA two-way radios were used by all site personnel (the OSC, ERRS, START, subcontractors, and flaggers) to safely work together to avoid traffic congestion. ERRS also subcontracted with a private security company to provide on-site security during evenings and other non-working days.

6.4 Trestle Installation

In order to gain safe physical access to the full footprint of the former warehouse site, two trestles were installed over and across the burned warehouse structure. Prior to starting the trestle construction, ERRS and AAC ensured that general work areas, and specific locations for pilings, areas were clean and free of ACM.

ERRS then created a rock pad with 3-inch minus gravel for the heavy equipment at the shore end of each trestle location. AAC directed the EQM excavator operator on where to place the gravel and how much compaction was needed. Compaction was achieved by tamping with the excavator bucket and tracking over the gravel with the excavator. Prior to gravel placement AAC placed filter fabric on the ground surface from the railroad tracks to the east to the piles to the west. ERRS also installed a secondary containment boom around the west side (water edge) of the Site to prevent the escape of any fire debris from the site footprint into the navigable waterway during removal activities.

Warehouse debris cleanup and trestle construction was conducted in incremental sections of approximately 30 feet wide by 30 feet long. Once each 30-foot section was designated, it was surveyed prior to construction to ensure that asbestos debris had been removed. The deck in the required area was then saw-cut and removed to gain access to the pile caps, which were then removed. The existing woodpile located underneath the decking was then surveyed by the design engineer, who ensured that the structural integrity met the specifications to support the trestle work platform. Piles that were in acceptable condition were used as part of the trestle installation, after being saw-cut at an elevation acceptable to receive the designed trestle installation. AAC installed additional temporary metal pilings to supplement the existing usable pilings.

AAC installed pile caps and bracing to support the first 45-foot section of trestle. AAC installed pilings utilizing a vibration hammer. The pilings were vibrated into the substrate until refusal was reached and then were hammered into place. All new piles were installed with a minimum working capacity of 27 tons/pile, which was confirmed through pile load testing performed by the design engineer. AAC then installed temporary deck panels to complete the work platform.

After the first trestle section was installed and inspected by the design engineer, ERRS used it as a platform to stage equipment and to remove asbestos-contaminated debris from sections of the damaged structure that were previously inaccessible. ERRS used a "leapfrogging" approach to clear an additional area of the warehouse structure to extend the first trestle. AAC fabricated a cradle for use with the crane to pick up and move the excavator to specific locations on installed trestle sections so ERRS could continue to remove asbestos-contaminated debris from the structure. AAC also used crane mats on sections of the warehouse deck in order to distribute the weight of the equipment.

The installation of the first trestle continued by hammering pylons to refusal and cutting them to height, installing pile caps and stringers, installing and bolting deck mats to the steel stringers, then installing deck guard rails and bulkheads. Throughout the construction of the trestles, any deviations from the trestle plan, such as where to set cribbing, bedding sand, and rock, was reviewed by the design engineer.

After the first trestle (south trestle) was completed with four spans to an approximate length of 180 feet, ERRS and AAC then used a similar approach to construct the second trestle (north trestle). By December 9, 2017, the second trestle had been installed to a length of five spans and an approximate length of 225 feet (Figure 6-1).

Later in the TCRA, after the asbestos-contaminated debris and decking had been removed from the warehouse structure, AAC deconstructed the trestles by reversing the steps described above.

6.5 Asbestos Debris Removal

During the first week of the TCRA, START collected additional bulk samples of suspect materials in the fire-damaged debris pile that were accessible from the River Street side of the warehouse. The results confirmed that ACM and asbestos contamination were present in the debris. See Section 6.7 for additional details of the sampling and results.

The trestles described in Section 6.4 were installed to provide safe access to perform debris cleanup and removal activities. Once the first section of Trestle 1 was installed and inspected by the design engineer, ERRS used it as a work platform to safely remove debris from previously inaccessible sections of the warehouse. As each new section was added to the two trestles to further extend them across the damaged structure, the trestles were used as safe work platforms to continue the cleanup work. This "leapfrogging" approach of alternating debris cleanup/removal and trestle installation continued as the removal activities proceeded from northeast to southwest.

During the cleanup and removal activities, debris was segregated into two waste groups in an effort to reduce transportation and disposal costs: scrap metal for recycling, and ACM-contaminated debris for off-site disposal. Using equipment, ERRS picked up the debris and segregated them into these waste streams for further processing.

Wherever possible, ACM was handled by the PCI/PAS asbestos workers, and bulk debris was handled by equipment. All ACM and asbestos-contaminated debris was double wrapped for off-site disposal as asbestos waste, including the placement of bulk debris in lined, roll-off bins.

By late November 2017, EPA was nearing the completion of debris removal above the warehouse deck structure. An AHERA-certified asbestos building inspector from Advantage performed an assessment and collected 31 samples for asbestos testing, including an asphalt layer over the wood decking and residual dust/debris (Advantage 2017). Based on the results of the survey, EPA determined that the deck of the former warehouse structure remained a potential source for asbestos contamination and that it should also be removed. EPA coordinated with ODEQ, who agreed to pay for the costs related to the disposal of the decking material.

After the remaining debris above the deck was removed, EPA began to remove the deck itself. AAC developed a custom, cart-mounted ripsaw to help cut the deck into smaller, manageable pieces for handling and disposal. Because of the potential for asbestos exposure, the saw was operated by PCI/PAS asbestos workers, and the deck and waste material were kept wet at all times to minimize dust. The pieces of wood decking were placed into lined, roll-off bins for off-site disposal as asbestos waste. EPA continued to remove pieces of decking in this manner until the decking was completely removed, and only the piles and beams of the former warehouse structure remained.

Towards the end of the removal action, as most of the warehouse debris and decking were removed, ERRS removed pieces of debris that had fallen on the riverbank or in the river within the containment boom. The pickup of debris was performed by PCI/PAS asbestos workers with equipment support from EQM. For debris floating within the contained surface water area, debris was removed by hand from the shore, if it was possible to do so safely, while some pieces were recovered by asbestos workers using a small vessel. The cleanup of fallen ACM and other building debris on the riverbank and in the contained surface water area was repeated several

times until removal activities were completed, and all recovered waste was double-bagged for off-site disposal as asbestos waste.

In addition, in some areas of the riverbank below the former building, ERRS used equipment to scrape the surface sediments into a stockpile. A composite sample was collected from this stockpile and submitted for TCLP volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) analyses for waste disposal profiling (see Section 7). The results indicated that the sediment stockpile could be disposed of as non-hazardous waste, and it was loaded into lined, roll-off bins for off-site transport and disposal. ERRS also received a quantity of 3-inch minus gravel to use as cover material over the scraped section of the riverbank. A composite sample of the gravel was collected for VOCs, SVOCs, PCBs, and pesticides analyses (see Section 7) and the results indicated that the material was suitable for use as fill at the Site. ERRS placed and compacted the gravel over the section of the riverbank between River Street and the remaining piles.

In late February 2018, near the completion of removal activities, an AHERA-certified asbestos building inspector from Advantage conducted a series of surveys and inspections of the riverbank and the remaining piles and beams of the former structure. During these surveys, the inspector was accompanied by asbestos workers from PCI/PAS, who picked up any remaining debris or suspect material for disposal. The inspector also collected 42 samples for asbestos testing, including 27 samples of remaining building materials from the piles/beams and 15 samples of the riverbank soil/sediment. The samples were submitted for asbestos testing by PLM, and all of the samples were non-detect (Advantage 2018).

Upon removal of all asbestos-contaminated debris, ERRS and its subcontractors began to remove the temporary trestles, including decking, pilings, and other associated materials. ERRS began decontaminating and removing equipment and other materials, and repaired the exclusion and support zones prior to demobilization of equipment and personnel.

6.6 Best Management Practices

Throughout the TCRA, EPA and its contractors utilized best management practices to the extent practicable. During the initial response phase, approximately 800 feet of containment boom was placed in the Willamette River around the Site, to capture any building debris or other material that fell into the river during removal operations. During the removal activities, a second containment boom was installed ensure the capture of any fire-related debris that may migrate from the Site. Disturbance of sediment in or on the banks of the Willamette River was avoided to extent practicable.

During asbestos material removal, ERRS suppressed fugitive dust emissions by spraying water on the debris and warehouse structure. To monitor the effectiveness of the dust suppression, START performed daily air monitoring for particulates at several fixed air stations located around the Site. Air samples were also collected from site personnel and at stationary locations around the Site to determine the effectiveness of EPA's dust control activities. The samples were analyzed for the presence of airborne asbestos and other fibers, and the results were compared to a risk-based level of 0.01 f/cc for the stationary perimeter samples and the OSHA PEL of 0.1 f/cc for personal samples.

To protect non-essential personnel and the general public, caution tape, signs, and security guards (present 24 hours per day, 7 days per week) were used. Additionally, flaggers and traffic

control procedures were implemented at the Site, due to the volume of traffic on River Street from adjacent industrial facilities and the nearby Union Pacific Railroad train yard.

6.8 Monitoring and Sampling

6.8.1 Bulk Sampling

On September 20, 2017, at the beginning of the TCRA, START collected bulk samples of suspect materials from accessible areas of the fire-damaged debris pile. The suspect materials that were sampled included roofing material, paper, wood, and asphalt. Additionally, two surface soil samples from the ground adjacent to the warehouse structure were collected. The bulk material samples were analyzed for asbestos by PLM, and the soil samples were analyzed by PLM after the California Air Resources Board 435 sample preparation. Of the 15 bulk material samples, five contained chrysotile asbestos, with concentrations between 2% and 35%. Asbestos was not detected in the two soil samples. Figure 6-2 shows the locations for these bulk samples, and the results are summarized in Table 6-1.

6.8.2 Asbestos Project Monitoring Sampling

During the TCRA, ERRS subcontracted with Advantage to perform on-site air sampling and analyses to monitor the asbestos abatement work. Advantage collected daily personal air samples from ERRS equipment operators and PCI/PAS asbestos workers. Advantage also collected daily fixed air samples from various locations inside and around the perimeter of the exclusion zone, which changed throughout the TCRA. Advantage analyzed these personal and fixed air samples by PCM every day, to measure potential asbestos exposures to site workers. Personal samples were compared to either the OSHA 30-minute short-term excursion limit of 1.0 f/cc or the PEL (8-hour TWA) of 0.1 f/cc, and there were no exceedances. Advantage issued daily reports of their sampling activities (Advantage 2018), which are on file with EPA.

6.8.3 Particulate Monitoring

START deployed three DataRAMs at three air stations located around the site perimeter to monitor for particulates during site activities. Air station AS15 was located under the Fremont Bridge, just south of the Site. Station AS24 was located on the north corner of the Site, adjacent to the Sakrete concrete facility. Station AS26 occupied a couple of parking spaces across from the warehouse and adjacent to Northwest Copper Works. Figure 6-2 shows the air station configuration during the TCRA phase. All three air stations and equipment were secured by cages constructed using chain-link panels and heavy-duty chains. Air stations AS15 and AS24 could not practically be powered using shore power and were instead powered using gas generators with a Goal Zero battery as backup power. Air stations were visited daily for DataRAM setup and sample collection. DataRAMs were shut down and charged overnight and re-deployed every morning after the daily safety meetings, and the Goal Zero batteries were charged daily. Station AS26 was powered using shore power provided by Northwest Copper Works.

The results of the particulate monitoring are summarized in Table 6-2. The action level for particulates at the Site was a 5-minute TWA of 139 $\mu g/m^3$. Although there were multiple instances of temporary dust concentration spikes that exceeded this conservative action level, the daily and weekly time-weighted dust concentrations were very low, which indicated that best management practices and dust suppression techniques were successful.

6.8.4 Air Station Sampling

START collected a total of 421 samples for PCM analyses during the TCRA phase, although 11 PCM samples could not be analyzed due to overloading, pump failure, or damage. The samples were collected daily at air stations AS15, AS24, and AS26 using rotary vane air sampling pumps at flow rates of approximately 10 L/min. Samples for PCM testing were collected on 0.8 µm MCE filter cassettes hung at approximately 4 to 6 feet above the ground, to represent a person's breathing zone. Samples were collected for approximately 4 to 8 hours daily to capture removal activity.

All perimeter air sample results are presented in Table 6-3, and Table 6-4 presents an overall summary of the PCM results. The results were compared to the risk-based level of 0.01 f/cc. Of the 410 samples analyzed by PCM, only one exceeded the risk-based level, with a concentration of 0.0135 f/cc (sample 17100097 from AS15 on October 25, 2017). This sample was submitted for TEM analysis by ISO 10312, and the results for total asbestos structures and PCM-equivalent fibers were both non-detect. Two other samples that were overloaded with dust and could not be analyzed by PCM were submitted for the indirect TEM analysis by ISO Method 13794. The concentrations of total asbestos structures in the two samples were below the risk-based level of 01 s/cc, and PCM-equivalent fibers were not detected in either sample.

6.8.5 Sediment and Gravel Fill Sampling

At the end of the TCRA, ERRS scraped the surface of the riverbank underneath the former warehouse building into a stockpile for off-site disposal. On February 2, 2018, START collected a sample from this stockpile and submitted it to an off-site laboratory for TCLP VOCs and SVOCs for waste disposal characterization. The results are summarized in Table 6-5. All of the analyzed compounds were less than the detection limit, indicating that the material could be disposed of off-site as non-hazardous waste.

On February 7, 2018, START also collected a sample of gravel that ERRS brought to the Site to use as cover material. The sample was submitted to the off-site laboratory for VOCs, pesticides, PCBs, and SVOCs. The results are summarized in Table 6-6 and indicate that the imported gravel was suitable as cover material at the Site.

6.8.6 Riverbank Sampling – Portland Harbor

The Site is located within the boundary of the Portland Harbor Superfund Site, which is listed on the National Priorities List. On February 2, 2018, as the TCRA was nearing completion, START collected two samples (a field sample and a field duplicate) from the surface of the exposed riverbank, after ERRS scraped the surface sediment for off-site disposal. The samples were submitted to an off-site laboratory for analysis of the Portland Harbor sediment contaminants of concern. The results are summarized in Table 6-7.

In addition to the two sediment samples collected on February 2, 2018, EPA tasked START to perform an additional sediment sampling event at the Site for the Portland Harbor contaminants of concern. START collected 22 sediment samples from the Site on March 27, 2018, and the results were presented in a separate report (E & E 2018a).

6.9 Data Management.

Throughout the TCRA phase, EPA utilized the same data management procedures as the interim monitoring phase.

6.9.1 Data Management Support

Site personnel were supported by off-site data management using Scribe for sample data and results, daily/weekly Viper reports, and specialized ERT support for any Viper issues. Weekly reports containing site status, safety and security measures, air particulate monitoring data, Viper alarm data, sampling and analytical data, anticipated site personnel schedule, and other site updates were sent to EPA and START site personnel.

6.9.2 Viper

Three air stations were set up using Viper telemetry to view real-time particulate monitoring data. Alarms were set in place to alert specified personnel if particulate levels exceeded action levels or instruments lost connectivity. START provided EPA with daily and weekly updates of exceedances of an established 5-minute TWA of 139 $\mu g/m^3$. When an exceedance was identified by the telemetry system, START notified EPA of the alert and responded at the first available, reasonable, and safe time.

Table 6-1

TCRA Phase Bulk Sample Data and Results
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Sample Location	Description	Analysis	PLM Result (% Chrysotile)
17090001	BL01BL	9/20/2017	Bulk	Warehouse	Black fibrous homogenous	PLM	NAD
17090002	**BL02BL**	**9/20/2017**	**Bulk**	**Warehouse**	**Black fibrous homogenous**	**PLM**	**20**
17090003	BL03BL	9/20/2017	Bulk	Warehouse	Black/brown fibrous homogenous	PLM	NAD
17090004	BL04BL	9/20/2017	Bulk	Warehouse	Black non-fibrous homogenous	PLM	NAD
17090005	**BL05BL**	**9/20/2017**	**Bulk**	**Warehouse**	**Black fibrous homogenous**	**PLM**	**35**
17090006	**BL06BL**	**9/20/2017**	**Bulk**	**Warehouse**	**Black fibrous heterogeneous**	**PLM**	**2**
17090007	BL07BL	9/20/2017	Bulk	Warehouse	Black/brown fibrous homogenous	PLM	NAD
17090008	BL08BL	9/20/2017	Bulk	Warehouse	Black fibrous homogenous	PLM	NAD
17090009	BL09BL	9/20/2017	Bulk	Warehouse	Black non-fibrous homogenous	PLM	NAD
17090010	BL10BL	9/20/2017	Bulk	Warehouse	Black fibrous homogenous	PLM	NAD
17090011	BL11BL	9/20/2017	Bulk	Warehouse	White/black fibrous heterogeneous	PLM	NAD
17090012	BL12BL	9/20/2017	Bulk	Warehouse	Black/brown fibrous homogenous	PLM	NAD
17090013	BL13BL	9/20/2017	Bulk	Warehouse	Black fibrous homogenous	PLM	NAD
17090014	BL14BL	9/20/2017	Soil	Warehouse	Soil	PLM CARB 435 Level A	< 0.25
17090015	BL15BL	9/20/2017	Soil	Warehouse	Soil	PLM CARB 435 Level A	< 0.25
17090016	**BL16BL**	**9/20/2017**	**Bulk**	**Warehouse**	**Black non-fibrous homogenous**	**PLM**	**3**
17090017	**BL17BL**	**9/20/2017**	**Bulk**	**Warehouse**	**Black non-fibrous homogenous**	**PLM**	**5**

Note: Bold type indicates asbestos was detected in that sample/layer.

Key:

NAD = No Asbestos Detected
PLM = Polarized Light Microscopy
% = percent

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Table 6-2

TCRA Phase Particulate Monitoring Data
River Street Warehouse Fire Site
Portland, Oregon

Location	Date Range	Sample Type	Weekly Min ($\mu g/m^3$)	Weekly Max ($\mu g/m^3$)	Weekly TWA ($\mu g/m^3$)	Count (minutes)	Count of 5 minutes TWA exceedances > 139 $\mu g/m^3$
Air Station AS15							
AS15	September 18-24, 2017	DataRAM at Air Station	not operational during this reporting period				
AS15	September 26 - October 1, 2017	DataRAM at Air Station	1.5	1846.2	7.42	103058	380
AS15	October 2-8, 2017	DataRAM at Air Station	1.5	4625	10.55	68601	524
AS15	October 9-15, 2017	DataRAM at Air Station	1	1073.4	7.03	80176	7
AS15	October 16-22, 2017	DataRAM at Air Station	0	913.2	4.9	86485	339
AS15	October 23-29, 2017	DataRAM at Air Station	1.1	1120.4	16.23	72562	7
AS15	October 30 - November 5, 2017	DataRAM at Air Station	0	2964.8	30.39	74587	835
AS15	November 6-12, 2017	DataRAM at Air Station	0	3320.2	13.71	81348	1016
AS15	November 13-19, 2017	DataRAM at Air Station	0	694.2	1.29	92745	45
AS15	November 20-26, 2017	DataRAM at Air Station	0	807.7	9.2	48279	0
AS15	November 27 - December 3, 2017	DataRAM at Air Station	0	327.8	1.72	100705	0
AS15	December 4-10, 2017	DataRAM at Air Station	0	1103	3.94	89277	118
AS15	December 11-17, 2017	DataRAM at Air Station	0	946	5.52	64978	152
AS15	December 18-24, 2017	DataRAM at Air Station	0	990.4	5.39	61494	113
AS15	December 25-31, 2017	DataRAM at Air Station	0	263.7	7.85	45919	0
AS15	January 1-7, 2018	DataRAM at Air Station	0	347.9	3.12	66589	0
AS15	January 8-14, 2018	DataRAM at Air Station	0	429.6	1.59	46772	0
AS15	January 15-21, 2018	DataRAM at Air Station	0	430.4	0.81	52449	0
AS15	January 22-28, 2018	DataRAM at Air Station	0	955.4	0.49	62755	193
AS15	January 29 - February 4, 2018	DataRAM at Air Station	0	139.8	2.29	65207	0
AS15	February 5-11, 2018	DataRAM at Air Station	0	238.2	7.5	63819	121
AS15	February 12-18, 2018	DataRAM at Air Station	0	1303.5	4.0	54509	0
AS15	February 19-20, 2018	DataRAM at Air Station	0	2364.5	4.8	16168	29
Air Station AS24							
AS24	September 18-24, 2017	DataRAM at Air Station	0	261.6	3.89	4800	0
AS24	September 25 - October 1, 2017	DataRAM at Air Station	0	444.6	19.97	11840	20
AS24	October 2-8, 2017	DataRAM at Air Station	0	307.2	16.7	5810	7
AS24	October 9-15, 2017	DataRAM at Air Station	0	433.9	3.8	13255	0
AS24	October 16-22, 2017	DataRAM at Air Station	0	2613	23.73	11715	310

Table 6-2

TCRA Phase Particulate Monitoring Data
River Street Warehouse Fire Site
Portland, Oregon

Location	Date Range	Sample Type	Weekly Min ($\mu g/m^3$)	Weekly Max ($\mu g/m^3$)	Weekly TWA ($\mu g/m^3$)	Count (minutes)	Count of 5 minutes TWA exceedances > 139 $\mu g/m^3$
AS24	October 23-29, 2017	DataRAM at Air Station	0	1034.1	24.53	10153	0
AS24	October 30 - November 5, 2017	DataRAM at Air Station	0	546.6	9.17	9024	0
AS24	November 6-12, 2017	DataRAM at Air Station	0	691	25.65	8961	0
AS24	November 13-19, 2017	DataRAM at Air Station	0	228.8	7.76	11736	0
AS24	November 20-26, 2017	DataRAM at Air Station	0	1020.3	12.1	7117	0
AS24	November 27 - December 3, 2017	DataRAM at Air Station	0	583.8	21.08	13517	0
AS24	December 4-10, 2017	DataRAM at Air Station	0	291.5	23.39	11607	0
AS24	December 11-17, 2017	DataRAM at Air Station	4.3	500.1	29.96	7548	4
AS24	December 18-24, 2017	DataRAM at Air Station	0	2547.5	23.06	11682	0
AS24	December 25-31, 2017	DataRAM at Air Station	0	112	28.79	10338	0
AS24	January 1-7, 2018	DataRAM at Air Station	0	128.8	14.56	11785	0
AS24	January 8-14, 2018	DataRAM at Air Station	0	138.9	8.57	10281	0
AS24	January 15-21, 2018	DataRAM at Air Station	0	330.1	8.33	10326	0
AS24	January 22-28, 2018	DataRAM at Air Station	0	78.6	2.09	10332	0
AS24	January 29 - February 4, 2018	DataRAM at Air Station	0	332.6	16.69	10330	3
AS24	February 5-11, 2018	DataRAM at Air Station	0	316.9	25.88	10274	0
AS24	February 12-18, 2018	DataRAM at Air Station	0	286.7	4.94	8809	0
AS24	February 19-20, 2018	DataRAM at Air Station	4.3	168.7	7.28	4593	0
Air Station AS26							
AS26	September 18-24, 2017	DataRAM at Air Station	0	239	6.81	4086	0
AS26	September 25 - October 1, 2017	DataRAM at Air Station	0.2	429.5	13.74	11797	540
AS26	October 2-8, 2017	DataRAM at Air Station	0.1	1504.4	29.84	10193	1039
AS26	October 9-15, 2017	DataRAM at Air Station	0	238.7	10.18	8893	7
AS26	October 16-22, 2017	DataRAM at Air Station	0	1451.8	17.72	11680	80
AS26	October 23-29, 2017	DataRAM at Air Station	1.5	129.5	14.8	9474	205
AS26	October 30 - November 5, 2017	DataRAM at Air Station	0.4	1321.3	13.07	9020	98
AS26	November 6-12, 2017	DataRAM at Air Station	0.1	6110	28.86	8958	386
AS26	November 13-19, 2017	DataRAM at Air Station	0	786.2	4.4	11706	0
AS26	November 20-26, 2017	DataRAM at Air Station	0	221.9	7.44	7125	0
AS26	November 27 - December 3, 2017	DataRAM at Air Station	0	402	12.02	13486	4

Table 6-2

TCRA Phase Particulate Monitoring Data
River Street Warehouse Fire Site
Portland, Oregon

Location	Date Range	Sample Type	Weekly Min ($\mu g/m^3$)	Weekly Max ($\mu g/m^3$)	Weekly TWA ($\mu g/m^3$)	Count (minutes)	Count of 5 minutes TWA exceedances > 139 $\mu g/m^3$
AS26	December 4-10, 2017	DataRAM at Air Station	0	1410.2	17.91	11591	80
AS26	December 11-17, 2017	DataRAM at Air Station	4.7	2009.4	19.22	8926	0
AS26	December 18-24, 2017	DataRAM at Air Station	0	517.5	14.36	10271	131
AS26	December 25-31, 2017	DataRAM at Air Station	0	195.7	20.9	10293	69
AS26	January 1-7, 2018	DataRAM at Air Station	0	884.5	9.78	11742	0
AS26	January 8-14, 2018	DataRAM at Air Station	0	572.2	8.2	10252	0
AS26	January 15-21, 2018	DataRAM at Air Station	0	521.9	4.2	10337	86
AS26	January 22-28, 2018	DataRAM at Air Station	0	886.6	2.65	10299	0
AS26	January 29 - February 4, 2018	DataRAM at Air Station	0	439.1	10.11	10287	4
AS26	February 5-11, 2018	DataRAM at Air Station	0	685.2	22.21	10290	160
AS26	February 12-18, 2018	DataRAM at Air Station	0	1475.8	15.57	8808	7
AS26	February 19-20, 2018	DataRAM at Air Station	0	633.4	14.72	5693	0

Note: The action level for particulates at the Site is a TWA of 139 $\mu g/m^3$ sustained for a period of 5 minutes.

Key:

$\mu g/m^3$ = micrograms per cubic meter
Min = minimum particulate level
Max = maximum particulate level
TWA = time weighted average

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Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
Air Station AS15									
17050312	AS15	9/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17090026	AS15	9/26/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17090030	AS15	9/28/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001	U	f/cc
17090033	AS15	9/29/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0007		f/cc
17090038	AS15	9/30/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0007		f/cc
17100003	AS15	10/2/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
17100007	AS15	10/3/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0006		f/cc
17100011	AS15	10/4/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
17100016	AS15	10/5/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17100021	AS15	10/6/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17100027	AS15	10/7/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17100033	AS15	10/10/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17100039	AS15	10/11/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
17100043	AS15	10/12/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	Rejected		
17100048	AS15	10/13/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0006		f/cc
17100053	AS15	10/16/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	Rejected		
17100057	AS15	10/16/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0022		f/cc
17100058	AS15	10/17/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
17100063	AS15	10/18/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17100068	AS15	10/19/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0006		f/cc
17100073	AS15	10/20/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0006		f/cc
17100078	AS15	10/21/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17100085	AS15	10/23/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17100090	AS15	10/24/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0023		f/cc
17100097	AS15	10/25/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0135		f/cc
					TEM ISO 10312	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers	0.001	U	s/cc
17100100	AS15	10/26/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17100107	AS15	10/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17100110	AS15	10/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0017		f/cc
17100115	AS15	10/28/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0016		f/cc
17100126	AS15	10/31/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17110003	AS15	11/1/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110010	AS15	11/2/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17110013	AS15	11/2/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17110018	AS15	11/3/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
17110021	AS15	11/3/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0019		f/cc
17110026	AS15	11/6/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
17110031	AS15	11/6/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110035	AS15	11/7/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0016		f/cc
17110039	AS15	11/7/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110042	AS15	11/8/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
17110046	AS15	11/8/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110051	AS15	11/9/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110055	AS15	11/9/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17110063	AS15	11/14/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17110067	AS15	11/14/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110072	AS15	11/15/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110077	AS15	11/15/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0021		f/cc
17110080	AS15	11/16/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110083	AS15	11/16/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110088	AS15	11/17/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0017		f/cc
17110091	AS15	11/17/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17110096	AS15	11/20/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17110099	AS15	11/20/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0019		f/cc
17110105	AS15	11/21/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110109	AS15	11/21/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17110113	AS15	11/22/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0019		f/cc
17110117	AS15	11/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110121	AS15	11/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0016		f/cc
17110125	AS15	11/28/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0019		f/cc
17110129	AS15	11/28/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
17110133	AS15	11/29/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17110137	AS15	11/29/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17110141	AS15	11/30/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17110145	AS15	11/30/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0017		f/cc
17110149	AS15	12/1/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0027		f/cc
17110153	AS15	12/1/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17110158	AS15	12/4/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0026		f/cc
17110162	AS15	12/4/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0021		f/cc
17110166	AS15	12/5/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
17110170	AS15	12/5/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
17120003	AS15	12/6/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
17120007	AS15	12/6/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc

Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17120010	AS15	12/7/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17120015	AS15	12/7/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17120019	AS15	12/8/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0016		f/cc
17120023	AS15	12/8/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
17120027	AS15	12/9/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
17120030	AS15	12/11/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17120036	AS15	12/12/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
17120042	AS15	12/13/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
17120047	AS15	12/14/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17120050	AS15	12/15/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17120055	AS15	12/16/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17120064	AS15	12/18/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
17120067	AS15	12/19/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17120072	AS15	12/20/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17120077	AS15	12/21/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
17120087	AS15	12/26/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
17120092	AS15	12/27/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
17120097	AS15	12/28/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
17120102	AS15	12/29/2017	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18010003	AS15	1/2/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
18010008	AS15	1/3/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0018		f/cc
18010013	AS15	1/4/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
18010018	AS15	1/5/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
18010023	AS15	1/6/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
18010028	AS15	1/8/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18010036	AS15	1/9/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
18010038	AS15	1/10/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
18010043	AS15	1/11/2018	Blank	East of Warehouse	PCM	Asbestos and other fibers	< LOD	U	f/cc
18010051	AS15	1/12/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0007		f/cc
18010052	AS15	1/13/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
18010059	AS15	1/15/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
18010064	AS15	1/16/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
18010071	AS15	1/17/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
18010074	AS15	1/18/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0016		f/cc
18010079	AS15	1/19/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
18010084	AS15	1/20/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
18010091	AS15	1/22/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
18010094	AS15	1/23/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
18010101	AS15	1/24/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
18010106	AS15	1/25/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
18010111	AS15	1/26/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18010116	AS15	1/27/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18010119	AS15	1/29/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
18010124	AS15	1/30/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
18010129	AS15	1/31/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
18020005	AS15	2/1/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
18020008	AS15	2/2/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
18020016	AS15	2/3/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
18020021	AS15	2/5/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18020026	AS15	2/6/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.001		f/cc
18020031	AS15	2/7/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0015		f/cc
18020037	AS15	2/8/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	Rejected		
18020042	AS15	2/9/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
18020047	AS15	2/10/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0024		f/cc
18020052	AS15	2/12/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0008		f/cc
18020057	AS15	2/13/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
18020062	AS15	2/14/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0011		f/cc
18020069	AS15	2/15/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0009		f/cc
18020074	AS15	2/16/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0012		f/cc
18020079	AS15	2/19/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0013		f/cc
18020084	AS15	2/20/2018	Air Station	East of Warehouse	PCM	Asbestos and other fibers	0.0014		f/cc
Air Station AS24									
17050304	AS24	9/25/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17050311	AS24	9/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001	U	f/cc
17090019	AS24	9/21/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001	U	f/cc
17090022	AS24	9/22/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001	U	f/cc
17090024	AS24	9/26/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001	U	f/cc
17090029	AS24	9/28/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	Overloaded		
					TEM ISO 13794 (indirect)	Total Asbestos Structures	0.003		
						PCM Equivalent Fibers	0.001	U	
17090034	AS24	9/29/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0006		f/cc
17090037	AS24	9/30/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17100001	AS24	10/2/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17100005	AS24	10/3/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
17100009	AS24	10/4/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.002		f/cc

Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17100013	AS24	10/4/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17100014	AS24	10/5/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
17100017	AS24	10/5/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0028		f/cc
17100019	AS24	10/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
17100022	AS24	10/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0032		f/cc
17100025	AS24	10/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17100028	AS24	10/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0026		f/cc
17100031	AS24	10/10/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17100037	AS24	10/11/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17100041	AS24	10/12/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.007		f/cc
17100046	AS24	10/13/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17100051	AS24	10/16/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
17100056	AS24	10/16/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17100060	AS24	10/17/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0001		f/cc
17100064	AS24	10/18/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17100069	AS24	10/19/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17100074	AS24	10/20/2017	Blank	North Corner at Sakrete Property	PCM	Asbestos and other fibers	< LOD	U	f/cc
17100079	AS24	10/21/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0008		f/cc
17100083	AS24	10/23/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.008		f/cc
17100088	AS24	10/24/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	Overloaded		
17100093	AS24	10/24/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0022		f/cc
17100095	AS24	10/25/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	Overloaded		
17100098	AS24	10/26/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
17100105	AS24	10/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
17100108	AS24	10/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0027		f/cc
17100113	AS24	10/28/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
17100118	AS24	10/23/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17100120	AS24	10/30/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
17100124	AS24	10/31/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17100127	AS24	10/31/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
17110001	AS24	11/1/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110004	AS24	11/1/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110008	AS24	11/2/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17110011	AS24	11/2/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110016	AS24	11/3/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110019	AS24	11/3/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0022		f/cc
17110024	AS24	11/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17110029	AS24	11/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
17110033	AS24	11/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
17110037	AS24	11/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110040	AS24	11/8/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110044	AS24	11/8/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110049	AS24	11/9/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110053	AS24	11/9/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
17110058	AS24	11/13/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.002		f/cc
17110059	AS24	11/13/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0019		f/cc
17110062	AS24	11/14/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110066	AS24	11/14/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110070	AS24	11/15/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
17110075	AS24	11/15/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0019		f/cc
17110078	AS24	11/16/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110081	AS24	11/16/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110086	AS24	11/17/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110089	AS24	11/17/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110094	AS24	11/20/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17110097	AS24	11/20/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
17110103	AS24	11/21/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
17110107	AS24	11/21/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110111	AS24	11/22/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17110115	AS24	11/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17110119	AS24	11/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
17110123	AS24	11/28/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110127	AS24	11/28/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17110131	AS24	11/29/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
17110135	AS24	11/29/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17110139	AS24	11/30/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
17110143	AS24	11/30/2017	Blank	North Corner at Sakrete Property	PCM	Asbestos and other fibers	< LOD	U	f/cc
17110147	AS24	12/1/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0022		f/cc
17110151	AS24	12/1/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.002		f/cc
17110156	AS24	12/4/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
17110160	AS24	12/4/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0019		f/cc
17110164	AS24	12/5/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17110168	AS24	12/5/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17120001	AS24	12/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
17120005	AS24	12/6/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc

Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17120009	AS24	12/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0019		f/cc
17120013	AS24	12/7/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17120017	AS24	12/8/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
17120021	AS24	12/8/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
17120025	AS24	12/9/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
17120031	AS24	12/11/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17120035	AS24	12/12/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0007		f/cc
17120045	AS24	12/14/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0007		f/cc
17120052	AS24	12/15/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17120056	AS24	12/16/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0008		f/cc
17120062	AS24	12/18/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17120065	AS24	12/19/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17120070	AS24	12/20/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17120075	AS24	12/21/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
17120085	AS24	12/26/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
17120090	AS24	12/27/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17120095	AS24	12/28/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
17120100	AS24	12/29/2017	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010001	AS24	1/2/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18010006	AS24	1/3/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0016		f/cc
18010011	AS24	1/4/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18010016	AS24	1/5/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18010021	AS24	1/6/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0019		f/cc
18010026	AS24	1/8/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18010034	AS24	1/9/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
18010039	AS24	1/10/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010044	AS24	1/11/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010049	AS24	1/12/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0006		f/cc
18010053	AS24	1/13/2018	Blank	North Corner at Sakrete Property	PCM	Asbestos and other fibers	< LOD	U	f/cc
18010057	AS24	1/15/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0015		f/cc
18010062	AS24	1/16/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010069	AS24	1/17/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
18010072	AS24	1/18/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010077	AS24	1/19/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18010082	AS24	1/20/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18010089	AS24	1/22/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18010092	AS24	1/23/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
18010099	AS24	1/24/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
18010104	AS24	1/25/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
18010109	AS24	1/26/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0018		f/cc
18010114	AS24	1/27/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18010117	AS24	1/29/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18010122	AS24	1/30/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18010127	AS24	1/31/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18020003	AS24	2/1/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18020006	AS24	2/2/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18020014	AS24	2/3/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0008		f/cc
18020019	AS24	2/5/2018	Blank	North Corner at Sakrete Property	PCM	Asbestos and other fibers	< LOD	U	f/cc
18020024	AS24	2/6/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18020029	AS24	2/7/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0011		f/cc
18020035	AS24	2/8/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0012		f/cc
18020040	AS24	2/9/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18020045	AS24	2/10/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
18020050	AS24	2/12/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18020055	AS24	2/13/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18020060	AS24	2/14/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0013		f/cc
18020067	AS24	2/15/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.001		f/cc
18020072	AS24	2/16/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0009		f/cc
18020077	AS24	2/19/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0014		f/cc
18020082	AS24	2/20/2018	Air Station	North Corner at Sakrete Property	PCM	Asbestos and other fibers	0.0017		f/cc
Air Station AS26									
17050303	AS26	9/25/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17050310	AS26	9/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17090018	AS26	9/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc
17090021	AS26	9/22/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17090025	AS26	9/26/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001	U	f/cc

Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17090028	AS26	9/28/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
					TEM ISO 13794 (indirect)	Total Asbestos Structures	0.001	U	s/cc
						PCM Equivalent Fibers	0.001	U	s/cc
17090035	AS26	9/29/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17090036	AS26	9/30/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17100002	AS26	10/2/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17100006	AS26	10/3/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
17100010	AS26	10/4/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17100015	AS26	10/5/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17100020	AS26	10/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17100026	AS26	10/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17100032	AS26	10/10/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
17100040	AS26	10/11/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17100042	AS26	10/12/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.008		f/cc
17100047	AS26	10/13/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17100052	AS26	10/16/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17100059	AS26	10/17/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
17100065	AS26	10/18/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17100070	AS26	10/19/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17100075	AS26	10/20/2017	Blank	NW Copper Works	PCM	Asbestos and other fibers	< LOD	U	f/cc
17100080	AS26	10/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17100084	AS26	10/23/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.008		f/cc
17100089	AS26	10/24/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
17100094	AS26	10/24/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0021		f/cc
17100096	AS26	10/25/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Overloaded		
17100099	AS26	10/26/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17100106	AS26	10/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17100109	AS26	10/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.002		f/cc
17100114	AS26	10/28/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17100119	AS26	10/30/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17100121	AS26	10/30/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0019		f/cc
17100125	AS26	10/31/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Rejected		
17100128	AS26	10/31/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
17110002	AS26	11/1/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
17110005	AS26	11/1/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17110009	AS26	11/2/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	Rejected		
17110012	AS26	11/2/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
17110017	AS26	11/3/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110020	AS26	11/3/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0018		f/cc
17110025	AS26	11/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17110030	AS26	11/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17110034	AS26	11/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
17110038	AS26	11/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110041	AS26	11/8/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17110045	AS26	11/8/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
17110050	AS26	11/9/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17110054	AS26	11/9/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110056	AS26	11/13/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110057	AS26	11/13/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17110064	AS26	11/14/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110068	AS26	11/14/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17110071	AS26	11/15/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110076	AS26	11/15/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17110079	AS26	11/16/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110082	AS26	11/16/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17110087	AS26	11/17/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
17110090	AS26	11/17/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110095	AS26	11/20/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
17110098	AS26	11/20/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0019		f/cc
17110104	AS26	11/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110108	AS26	11/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
17110112	AS26	11/22/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110116	AS26	11/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17110120	AS26	11/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17110124	AS26	11/28/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17110128	AS26	11/28/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0024		f/cc
17110132	AS26	11/29/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0019		f/cc
17110136	AS26	11/29/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.002		f/cc
17110140	AS26	11/30/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0024		f/cc
17110144	AS26	11/30/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0024		f/cc
17110148	AS26	12/1/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0027		f/cc
17110152	AS26	12/1/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17110157	AS26	12/4/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
17110161	AS26	12/4/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0024		f/cc
17110165	AS26	12/5/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc

Table 6-3

TCRA Phase Perimeter Air Sample Data
River Street Warehouse Fire Site
Portland, Oregon

Sample #	Location	Date	Sample Type	Description	Analyte	Analysis	Result	Qualifier	Unit
						Risk-Based Level	0.01		f/cc
17110169	AS26	12/5/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
17120002	AS26	12/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17120006	AS26	12/6/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
17120011	AS26	12/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17120014	AS26	12/7/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0018		f/cc
17120018	AS26	12/8/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17120022	AS26	12/8/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
17120026	AS26	12/9/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17120032	AS26	12/11/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
17120037	AS26	12/12/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17120041	AS26	12/13/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
17120046	AS26	12/14/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0007		f/cc
17120051	AS26	12/15/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17120057	AS26	12/16/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
17120063	AS26	12/18/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17120066	AS26	12/19/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
17120071	AS26	12/20/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
17120076	AS26	12/21/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
17120086	AS26	12/26/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
17120091	AS26	12/27/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
17120096	AS26	12/28/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
17120101	AS26	12/29/2017	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0024		f/cc
18010002	AS26	1/2/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0018		f/cc
18010007	AS26	1/3/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
18010012	AS26	1/4/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18010017	AS26	1/5/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010022	AS26	1/6/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010027	AS26	1/8/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010035	AS26	1/9/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010037	AS26	1/10/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18010042	AS26	1/11/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010050	AS26	1/12/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0008		f/cc
18010054	AS26	1/13/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
18010058	AS26	1/15/2018	Blank	NW Copper Works	PCM	Asbestos and other fibers	< LOD	U	f/cc
18010063	AS26	1/16/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18010070	AS26	1/17/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18010073	AS26	1/18/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
18010078	AS26	1/19/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18010083	AS26	1/20/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0014		f/cc
18010090	AS26	1/22/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010093	AS26	1/23/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc
18010100	AS26	1/24/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
18010105	AS26	1/25/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18010110	AS26	1/26/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0016		f/cc
18010115	AS26	1/27/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18010118	AS26	1/29/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18010123	AS26	1/30/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18010128	AS26	1/31/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0012		f/cc
18020004	AS26	2/1/2018	Blank	NW Copper Works	PCM	Asbestos and other fibers	< LOD	U	f/cc
18020007	AS26	2/2/2018	Blank	NW Copper Works	PCM	Asbestos and other fibers	< LOD	U	f/cc
18020015	AS26	2/3/2018	Blank	NW Copper Works	PCM	Asbestos and other fibers	< LOD		f/cc
18020020	AS26	2/5/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18020025	AS26	2/6/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.002		f/cc
18020030	AS26	2/7/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
18020036	AS26	2/8/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18020041	AS26	2/9/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0015		f/cc
18020046	AS26	2/10/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18020051	AS26	2/12/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18020056	AS26	2/13/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0013		f/cc
18020061	AS26	2/14/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18020068	AS26	2/15/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0009		f/cc
18020073	AS26	2/16/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0011		f/cc
18020078	AS26	2/19/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.001		f/cc
18020083	AS26	2/20/2018	Air Station	NW Copper Works	PCM	Asbestos and other fibers	0.0017		f/cc

Key:

	= exceeds the Risk-Based Level of 0.01 f/cc.
U	= not detected
PCM	= Phase Contract Microscopy
f/cc	= fibers per cubic centimeter
Overloaded	= sample overloaded with particulates and could not be analyzed.
Rejected	= sample could not be analyzed.
< LOD	= below the level of detection

Table 6-4

TCRA Phase Perimeter Air Sample Data Summary
River Street Warehouse Fire Site
Portland, Oregon

Location	Total PCM Samples	Overloaded/Rejected Samples	No. of PCM Results Below Action Level	No. of PCM Results Above Action Level
AS15	133	3 (rejected)	129	1
AS24	147	4 (overloaded)	143	0
AS26	142	5 (3 overloaded, 2 rejected)	137	0
Total	422	12	409	1

Note: The action level is the risk-based level of 0.01 f/cc.

Key:

PCM = Phase Contract Microscopy
f/cc = fibers per cubic centimeter
Rejected = sample could not be analyzed
Overloaded = sample overloaded with particulates and could not be analyzed
N/A = data not available

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Table 6-5

TCRA Phase Stockpile TCLP Sample Results
River Street Warehouse Fire Site
Portland, Oregon

			TCLP Levels	Waste Stockpile	
	Sample Location			Waste Stockpile	
	Sample Number			18020013	
	Sample Date			2/2/2018	
Analyte	**CAS Number**	**Units**		**Result**	**Qualifier**
TCLP Volatile Organic Compounds (8260C)					
1,1-Dichloroethene	75-35-4	µg/L	700	400	U
1,2-Dichloroethane	107-06-2	µg/L	500	200	U
2-Butanone	78-93-3	µg/L	200,000	2,000	U
Benzene	71-43-2	µg/L	500	200	U
Carbon tetrachloride	56-23-5	µg/L	500	300	U
Chlorobenzene	108-90-7	µg/L	100,000	200	U
Chloroform	67-66-3	µg/L	6,000	500	U
Tetrachloroethene	127-18-4	µg/L	700	300	U
Trichloroethene	79-01-6	µg/L	500	300	U
Vinyl chloride	75-01-4	µg/L	200	100	U
TCLP Semivolatile Organic Compounds (8270D)					
1,4-Dichlorobenzene	106-46-7	µg/L	7,500	2	U
2,4,5-Trichlorophenol	95-95-4	µg/L	400,000	2	U
2,4,6-Trichlorophenol	88-06-2	µg/L	2,000	3	U
2,4-Dinitrotoluene	121-14-2	µg/L	130	5	U
2-Methylphenol	95-48-7	µg/L	200,000	3	U
3 & 4 Methylphenol	15831-10-4	µg/L	200,000	4	U
Hexachlorobenzene	118-74-1	µg/L	130	3	U
Hexachlorobutadiene	87-68-3	µg/L	500	5	U
Hexachloroethane	67-72-1	µg/L	3,000	5	U
Nitrobenzene	98-95-3	µg/L	2,000	3	U
Pentachlorophenol	87-86-5	µg/L	100,000	25	U
Pyridine	110-86-1	µg/L	35,000	15	UJK

Key

µg/L = micrograms per liter
CAS = Chemical Abstracts Service
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
K = The bias of the sample is not known.
TCLP = Toxicity Characteristic Leaching Procedure
U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

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Table 6-6

TCRA Phase Off-Site Gravel Sample Results

River Street Warehouse Fire Site

Portland, Oregon

	Sample Location			**Off-Site Gravel**	
	Sample Number			**18020034**	
	Sample Date		**Portland Harbor**	**2/7/2018**	
Analyte	**CAS Number**	**Units**	**Cleanup Levels**	**Result**	**Qualifier**
Volatile Organic Compounds (8260C)					
1,1,1,2-Tetrachloroethane	630-20-6	µg/Kg		36	U
1,1,1-Trichloroethane	71-55-6	µg/Kg		36	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/Kg		18	U
1,1,2-Trichloroethane	79-00-5	µg/Kg		18	U
1,1-Dichloroethane	75-34-3	µg/Kg		36	U
1,1-Dichloroethene	75-35-4	µg/Kg		18	U
1,1-Dichloropropene	563-58-6	µg/Kg		36	U
1,2,3-Trichlorobenzene	87-61-6	µg/Kg		36	UJL
1,2,3-Trichloropropane	96-18-4	µg/Kg		36	U
1,2,4-Trichlorobenzene	120-82-1	µg/Kg		54	U
1,2,4-Trimethylbenzene	95-63-6	µg/Kg		36	U
1,2-Dibromo-3-Chloropropane	96-12-8	µg/Kg		230	U
1,2-Dibromoethane	106-93-4	µg/Kg		18	U
1,2-Dichlorobenzene	95-50-1	µg/Kg		36	U
1,2-Dichloroethane	107-06-2	µg/Kg		18	U
1,2-Dichloropropane	78-87-5	µg/Kg		18	U
1,3,5-Trimethylbenzene	108-67-8	µg/Kg		36	U
1,3-Dichlorobenzene	541-73-1	µg/Kg		54	U
1,3-Dichloropropane	142-28-9	µg/Kg		36	U
1,4-Dichlorobenzene	106-46-7	µg/Kg		54	U
2,2-Dichloropropane	594-20-7	µg/Kg		36	U
2-Chlorotoluene	95-49-8	µg/Kg		36	U
4-Chlorotoluene	106-43-4	µg/Kg		36	U
4-Isopropyltoluene	99-87-6	µg/Kg		36	U
Benzene	71-43-2	µg/Kg		18	U
Bromobenzene	108-86-1	µg/Kg		90	U
Bromochloromethane	74-97-5	µg/Kg		36	U
Bromodichloromethane	75-27-4	µg/Kg		36	U
Bromoform	75-25-2	µg/Kg		180	U
Bromomethane	74-83-9	µg/Kg		180	U
Carbon tetrachloride	56-23-5	µg/Kg		18	U
Chlorobenzene	108-90-7	µg/Kg		36	U
Chloroethane	75-00-3	µg/Kg		360	U
Chloroform	67-66-3	µg/Kg		36	U
Chloromethane	74-87-3	µg/Kg		90	U
cis-1,2-Dichloroethene	156-59-2	µg/Kg		36	U
cis-1,3-Dichloropropene	10061-01-5	µg/Kg		18	U
Dibromochloromethane	124-48-1	µg/Kg		36	U
Dibromomethane	74-95-3	µg/Kg		54	U
Dichlorodifluoromethane	75-71-8	µg/Kg		180	U
Ethylbenzene	100-41-4	µg/Kg		36	U
Hexachlorobutadiene	87-68-3	µg/Kg		90	U
Isopropylbenzene	98-82-8	µg/Kg		36	U
Methyl tert-butyl ether	1634-04-4	µg/Kg		36	U
Methylene Chloride	75-09-2	µg/Kg		230	U
m-Xylene & p-Xylene	179601-23-1	µg/Kg		180	U
Naphthalene	91-20-3	µg/Kg		54	U
n-Butylbenzene	104-51-8	µg/Kg		36	U
N-Propylbenzene	103-65-1	µg/Kg		36	U
o-Xylene	95-47-6	µg/Kg		36	U
sec-Butylbenzene	135-98-8	µg/Kg		36	U
Styrene	100-42-5	µg/Kg		36	U
t-Butylbenzene	98-06-6	µg/Kg		36	U
Tetrachloroethene	127-18-4	µg/Kg		18	U

Table 6-6

TCRA Phase Off-Site Gravel Sample Results

River Street Warehouse Fire Site

Portland, Oregon

	Sample Location			**Off-Site Gravel**	
	Sample Number			**18020034**	
	Sample Date		**Portland Harbor**	**2/7/2018**	
Analyte	**CAS Number**	**Units**	**Cleanup Levels**	**Result**	**Qualifier**
Toluene	108-88-3	µg/Kg		140	U
trans-1,2-Dichloroethene	156-60-5	µg/Kg		36	U
trans-1,3-Dichloropropene	10061-02-6	µg/Kg		36	U
Trichloroethene	79-01-6	µg/Kg		23	U
Trichlorofluoromethane	75-69-4	µg/Kg		180	U
Vinyl chloride	75-01-4	µg/Kg		140	U
Organochlorine Pesticides (8081B)					
Aldrin	309-00-2	µg/Kg	2	1	U
alpha-BHC	319-84-6	µg/Kg		1	U
beta-BHC	319-85-7	µg/Kg		2.1	U
delta-BHC	319-86-8	µg/Kg		1	U
gamma-BHC (Lindane)	58-89-9	µg/Kg	5	1	U
4,4'-DDD	72-54-8	µg/Kg	Total DDD = 114	**0.16**	**JQ**
4,4'-DDE	72-55-9	µg/Kg	Total DDD = 226	2.1	U
4,4'-DDT	50-29-3	µg/Kg	Total DDT = 246	2.1	U
DDx (DDD+DDE+DDT)		µg/Kg	6.1	**0.16**	
Dieldrin[a]	60-57-1	µg/Kg	0.07	2.1	U
Endosulfan I	959-98-8	µg/Kg		1	U
Endosulfan II	33213-65-9	µg/Kg		2.1	U
Endosulfan Sulfate	1031-07-8	µg/Kg		2.1	U
Endrin	72-20-8	µg/Kg		2.1	U
Endrin Aldehyde	7421-93-4	µg/Kg		2.1	U
Heptachlor Epoxide	1024-57-3	µg/Kg		1	U
Methoxychlor	72-43-5	µg/Kg		10	U
Endrin Ketone	53494-70-5	µg/Kg		2.1	U
Toxaphene	8001-35-2	µg/Kg		100	U
alpha-Chlordane	5103-71-9	µg/Kg		1	U
gamma-Chlordane	5103-74-2	µg/Kg		1	U
Total Chlordane		µg/Kg	1.4	Non-Detect	
Heptachlor	76-44-8	µg/Kg		**0.095**	**JK**
Polychlorinated Biphenyls (8082A)					
PCB-1016	12674-11-2	mg/Kg		0.026	U
PCB-1221	11104-28-2	mg/Kg		0.011	U
PCB-1232	11141-16-5	mg/Kg		0.011	U
PCB-1242	53469-21-9	mg/Kg		0.01	U
PCB-1248	12672-29-6	mg/Kg		0.011	U
PCB-1254	11097-69-1	mg/Kg		0.01	U
PCB-1260	11096-82-5	mg/Kg		0.01	U
Total PCBs		mg/Kg	0.009	Non-Detect	
Semivolatile Organic Compounds (8270D)					
1,2,4-Trichlorobenzene	120-82-1	µg/Kg		51	U
1,2-Dichlorobenzene	95-50-1	µg/Kg		51	U
1,3-Dichlorobenzene	541-73-1	µg/Kg		51	U
1,4-Dichlorobenzene	106-46-7	µg/Kg		51	U
1-Methylnaphthalene	90-12-0	µg/Kg		31	U
2,4,5-Trichlorophenol	95-95-4	µg/Kg		200	U
2,4,6-Trichlorophenol	88-06-2	µg/Kg		150	U
2,4-Dichlorophenol	120-83-2	µg/Kg		100	U
2,4-Dimethylphenol	105-67-9	µg/Kg		100	U
2,4-Dinitrophenol	51-28-5	µg/Kg		1,000	U
2,4-Dinitrotoluene	121-14-2	µg/Kg		200	U
2,6-Dinitrotoluene	606-20-2	µg/Kg		150	U
2-Chloronaphthalene	91-58-7	µg/Kg		25	U
2-Chlorophenol	95-57-8	µg/Kg		200	U
2-Methylnaphthalene	91-57-6	µg/Kg		51	U

Table 6-6

TCRA Phase Off-Site Gravel Sample Results

River Street Warehouse Fire Site

Portland, Oregon

	Sample Location			**Off-Site Gravel**	
	Sample Number			**18020034**	
	Sample Date		**Portland Harbor**	**2/7/2018**	
Analyte	**CAS Number**	**Units**	**Cleanup Levels**	**Result**	**Qualifier**
2-Methylphenol	95-48-7	µg/Kg		150	U
2-Nitroaniline	88-74-4	µg/Kg		100	U
2-Nitrophenol	88-75-5	µg/Kg		200	U
3 & 4 Methylphenol	15831-10-4	µg/Kg		200	U
3,3'-Dichlorobenzidine	91-94-1	µg/Kg		410	U
3-Nitroaniline	99-09-2	µg/Kg		200	U
4,6-Dinitro-2-methylphenol	534-52-1	µg/Kg		1000	U
4-Bromophenyl phenyl ether	101-55-3	µg/Kg		200	U
4-Chloro-3-methylphenol	59-50-7	µg/Kg		150	U
4-Chloroaniline	106-47-8	µg/Kg		1500	U
4-Chlorophenyl phenyl ether	7005-72-3	µg/Kg		200	U
4-Nitroaniline	100-01-6	µg/Kg		100	U
4-Nitrophenol	100-02-7	µg/Kg		1500	U
Acenaphthene	83-32-9	µg/Kg		25	U
Acenaphthylene	208-96-8	µg/Kg		25	U
Anthracene	120-12-7	µg/Kg		25	U
Benzo[a]anthracene[a, b]	56-55-3	µg/Kg		25	U
Benzo[a]pyrene[a,b]	50-32-8	µg/Kg	12 (cPAH BaP eq)	61	U
Benzo[b]fluoranthene[a,b]	205-99-2	µg/Kg		25	U
Benzo[g,h,i]perylene	191-24-2	µg/Kg		61	U
Benzo[k]fluoranthene[a,b]	207-08-9	µg/Kg		61	U
Benzoic acid	65-85-0	µg/Kg		2500	U
Benzyl alcohol	100-51-6	µg/Kg		4100	U
Bis(2-chloroethoxy)methane	111-91-1	µg/Kg		200	U
Bis(2-chloroethyl)ether	111-44-4	µg/Kg		200	U
Bis(2-ethylhexyl) phthalate[a]	117-81-7	µg/Kg	135	610	U
bis(chloroisopropyl) ether	108-60-1	µg/Kg		250	UJL
Butyl benzyl phthalate	85-68-7	µg/Kg		200	U
Carbazole	86-74-8	µg/Kg		150	U
Chrysene[a,b]	218-01-9	µg/Kg		61	U
Dibenz(a,h)anthracene[a,b]	53-70-3	µg/Kg		51	U
Dibenzofuran	132-64-9	µg/Kg		150	U
Diethyl phthalate	84-66-2	µg/Kg		560	U
Dimethyl phthalate	131-11-3	µg/Kg		150	U
Di-n-butyl phthalate	84-74-2	µg/Kg		510	U
Di-n-octyl phthalate	117-84-0	µg/Kg		1,000	U
Fluoranthene	206-44-0	µg/Kg		25	U
Fluorene	86-73-7	µg/Kg		25	U
Hexachlorobenzene	118-74-1	µg/Kg		51	U
Hexachlorobutadiene	87-68-3	µg/Kg		51	U
Hexachlorocyclopentadiene	77-47-4	µg/Kg		100	U
Hexachloroethane	67-72-1	µg/Kg		150	U
Indeno[1,2,3-cd]pyrene[a,b]	193-39-5	µg/Kg		41	U
Isophorone	78-59-1	µg/Kg		150	U
Naphthalene	91-20-3	µg/Kg		25	U
Nitrobenzene	98-95-3	µg/Kg		200	U

Table 6-6

TCRA Phase Off-Site Gravel Sample Results

River Street Warehouse Fire Site

Portland, Oregon

	Sample Location		**Portland Harbor Cleanup Levels**	**Off-Site Gravel**	
	Sample Number			**18020034**	
	Sample Date			**2/7/2018**	
Analyte	**CAS Number**	**Units**		**Result**	**Qualifier**
N-Nitrosodi-n-propylamine	621-64-7	µg/Kg			R
N-Nitrosodiphenylamine	86-30-6	µg/Kg		61	U
Pentachlorophenol	87-86-5	µg/Kg		410	U
Phenanthrene	85-01-8	µg/Kg		61	U
Phenol	108-95-2	µg/Kg		150	U
Pyrene	129-00-0	µg/Kg		61	U
Total PAHs		µg/Kg	23,000	Non-Detect	
cPAHs[b]		µg/Kg	12	Non-Detect	

Notes

Positive results are bolded.

[a] - Lab reporting limits and method detection limits for cPAHs, bis(2-ethylhexyl)phthalate and dieldrin are higher than cleanup levels.

[b] - Green highlights indicate a carcinogenic PAH.

Key

- µg/kg = micrograms per kilogram
- BaP = Benzo(a)pyrene
- CAS = Chemical Abstracts Service
- cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbon
- eq = Equivalent
- J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- K = The bias of the sample is not known.
- L = The sample result is biased low.
- mg/kg = milligrams per kilogram
- PAH = Polycyclic Aromatic Hydrocarbon
- PCB = Polychlorinated Biphenyl
- R = The data is rejected and unusable. The analyte may or may not be present in the sample.
- Q = Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.
- U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- UJ = The material was analyzed for but was not detected. The reported detection limit is estimated because quality control criteria were not met.

Table 6-7

TCRA Phase Portland Harbor Sediment Sample Results

River Street Warehouse Fire Site

Portland, Oregon

				River Bank		River Bank (Field Duplicate)	
	Sample Location						
	Sample Number			**18020011**		**18020012**	
	Sample Date		**Portland Harbor**	**2/2/2018**		**2/2/2018**	
Analyte	**CAS Number**	**Units**	**Cleanup Levels[a]**	**Result**	**Qualifier**	**Result**	**Qualifier**
Metals (6020A and 7471A)							
Arsenic	7440-38-2	mg/Kg	3	**5.7**		**6.7**	
Cadmium	7440-43-9	mg/Kg	0.51	**0.16**	**JQ**	**0.21**	**JQ**
Copper	7440-50-8	mg/Kg	359	**27**		**27**	
Lead	7439-92-1	mg/Kg	196	**13**	**JK**	**19**	**JK**
Mercury	7439-97-6	mg/Kg	0.085	**0.035**		**0.039**	
Zinc	7440-66-6	mg/Kg	459	**92**		**100**	
Organochlorine Pesticides (8081B)							
Aldrin	309-00-2	µg/Kg	2	0.37	U	0.4	U
alpha-Chlordane	5103-71-9	µg/Kg		**0.062**	**JQ**	0.4	U
Chlordane (technical)	57-74-9	µg/Kg		3.7	U	**0.6**	**JQ**
gamma-Chlordane	5103-74-2	µg/Kg		**0.095**	**JQ**	**0.079**	**JQ**
Total Chlordane		µg/Kg	1.4	**0.157**		**0.679**	
2,4'-DDD	53-19-0	µg/Kg		**0.14**	**JQ**	0.81	U
4,4'-DDD	72-54-8	µg/Kg		**0.61**	**JQ**	**0.23**	**JQ**
Total DDD		µg/Kg	114	**0.75**		**0.23**	
2,4'-DDE	3424-82-6	µg/Kg		0.75	U	0.81	U
4,4'-DDE	72-55-9	µg/Kg		**0.51**	**JQ**	**0.42**	**JQ**
Total DDE		µg/Kg	226	**0.51**		**0.42**	
2,4'-DDT	789-02-6	µg/Kg		**0.69**	**JQ**	**0.55**	**JQ**
4,4'-DDT	50-29-3	µg/Kg		**2.7**		**2.2**	
Total DDT		µg/Kg	246	**3.39**		**2.75**	
DDx (DDD+DDE+DDT)		µg/Kg	6.1	**4.65**		**3.4**	
Dieldrin[b]	60-57-1	µg/Kg	0.07	0.75	U	0.81	U
gamma-BHC (Lindane)	58-89-9	µg/Kg	5	0.37	U	0.4	U
Polychlorinated Biphenyls (8082A)							
PCB-1016	12674-11-2	mg/Kg		0.0031	U	0.0034	U
PCB-1221	11104-28-2	mg/Kg		0.0014	U	0.0015	U
PCB-1232	11141-16-5	mg/Kg		0.0014	U	0.0015	U
PCB-1242	53469-21-9	mg/Kg		0.0012	U	0.0013	U
PCB-1248	12672-29-6	mg/Kg		0.0014	U	0.0015	U
PCB-1254	11097-69-1	mg/Kg		0.0012	U	0.0013	U
PCB-1260	11096-82-5	mg/Kg		**0.00085**	**JQ**	**0.00063**	**JQ**
Total PCBs		mg/Kg	0.009	**0.00085**		**0.00063**	
Semivolatile Organic Compounds (8270D)							
Bis(2-ethylhexyl) phthalate	117-81-7	µg/Kg	135	**12**	**JQ**	**12**	**JQ**
Hexachlorobenzene	118-74-1	µg/Kg		3.3	U	3.3	U
Polycyclic Aromatic Hydrocarbons (8270D SIM)							
1-Methylnaphthalene	90-12-0	µg/Kg		**6.2**	**JQ**	**1.9**	**JQ**
2-Methylnaphthalene	91-57-6	µg/Kg		**9.8**	**JL**	**2.8**	**JQ**
Acenaphthene	83-32-9	µg/Kg		**6.9**		**4.3**	**JQ**
Acenaphthylene	208-96-8	µg/Kg		**22**	**JK**	**3.2**	**JQ**
Anthracene	120-12-7	µg/Kg		**22**	**JK**	**10**	**JH**
Benzo[a]anthracene [c]	56-55-3	µg/Kg		**72**	**JK**	**28**	
Benzo[a]pyrene [c]	50-32-8	µg/Kg	12 (cPAH BaP eq)	**130**	**JK**	**32**	
Benzo[b]fluoranthene [c]	205-99-2	µg/Kg		**160**	**JK**	**37**	

Table 6-7

TCRA Phase Portland Harbor Sediment Sample Results

River Street Warehouse Fire Site

Portland, Oregon

				River Bank		River Bank (Field Duplicate)	
	Sample Location						
	Sample Number			**18020011**		**18020012**	
	Sample Date		**Portland Harbor**	**2/2/2018**		**2/2/2018**	
Analyte	**CAS Number**	**Units**	**Cleanup Levels[a]**	**Result**	**Qualifier**	**Result**	**Qualifier**
Benzo[g,h,i]perylene	191-24-2	µg/Kg		**120**		**21**	
Benzo[k]fluoranthene [c]	207-08-9	µg/Kg		**63**		**14**	
Chrysene [c]	218-01-9	µg/Kg		**110**	**JK**	**36**	
Dibenz(a,h)anthracene [c]	53-70-3	µg/Kg		**20**	**JH**	**4**	**JQ**
Fluoranthene	206-44-0	µg/Kg		**240**	**JK**	**73**	
Fluorene	86-73-7	µg/Kg		**6.1**	**JQ**	**3.6**	**JQ**
Indeno[1,2,3-cd]pyrene [c]	193-39-5	µg/Kg		**130**		**23**	
Naphthalene	91-20-3	µg/Kg		**25**	**JK**	**5.7**	**JQ**
Phenanthrene	85-01-8	µg/Kg		**110**	**JK**	**39**	
Pyrene	129-00-0	µg/Kg		**300**	**JK**	**76**	
Total PAHs		µg/Kg	23,000	**1,553**		**414.5**	
cPAHs[c]		µg/Kg	12	**175.6**		**43.0**	
Semivolatile Petroleum Hydrocarbons (NWTPH-Dx)							
#2 Diesel (C10-C24)	STL00163	mg/Kg	91	66	U	68	U
Motor Oil (>C24-C36)	STL00299	mg/Kg		**31**	**JQ**	**27**	**JQ**
Organotins (Organotins GC-MS)							
Dibutyltin	1002-53-5	µg/Kg		16	U	17	UJK
Monobutyltin	2406-65-7	µg/Kg		9.6	U	11	U
Tetra-n-butyltin	1461-25-2	µg/Kg		48	U	53	UJK
Tributyltin	688-73-3	µg/Kg	3,080	8.4	U	9.2	U

Notes: Positive results are bolded.

[a] - Yellow highlights indicate results that exceed listed cleanup levels.

[b] - Lab reporting limits and method detection limits for dieldrin are higher than cleanup levels.

[c] - The indicated compound is a carcinogenic PAH.

Key

µg/kg = micrograms per kilogram
BaP = Benzo(a)pyrene
CAS = Chemical Abstracts Service
cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbon
eq = Equivalent
GC-MS = Gas Chromatography - Mass Spectrometry
H = The sample result is biased high.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
K = The bias of the sample is not known.
L = The sample result is biased low.
mg/kg = milligrams per kilogram
NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Extended Diesel Range
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
Q = Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.
SIM = Selected Ion Monitoring
U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

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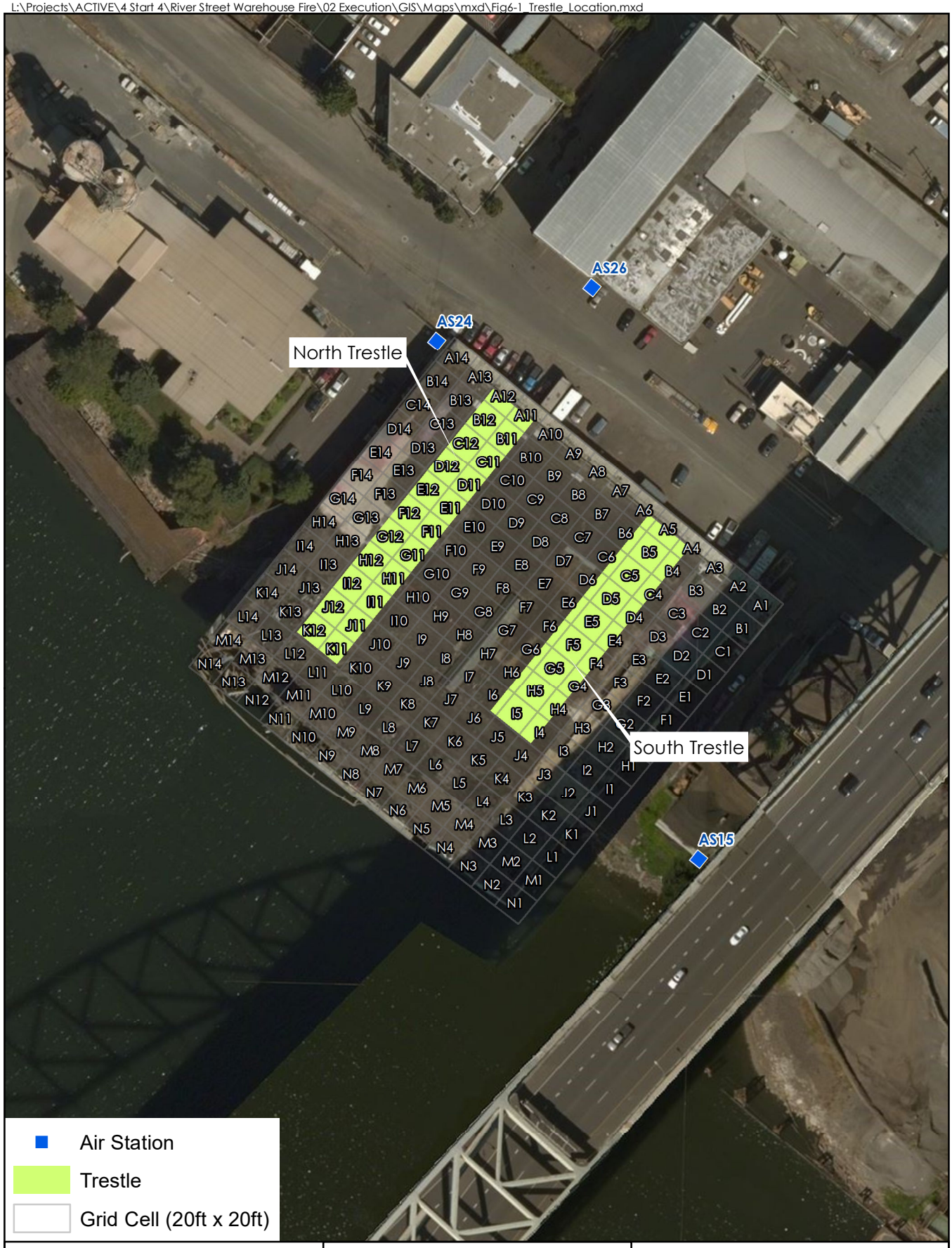

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River Street
Warehouse Fire
Portland, Oregon

0 25 50 Feet

Figure 6-1
Warehouse Trestle Locations

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ecology and environment, inc.
Global Environmental Specialists

River Street
Warehouse Fire
Portland, Oregon

0 25 50 Feet

Figure 6-2
Warehouse Grid and
Bulk Sampling Locations

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7 Sampling and Analytical Activities

Throughout all phases of the project, START and others collected samples to support EPA decision-making. Specific samples and results are presented and discussed in Sections 4, 5, and 6. This section presents general information about the types of samples collected and the analytical methods and laboratories used throughout the project. START collected samples in accordance with several Site-Specific Sampling Plans (E & E 2017a, 2017b, and 2017c) and a Sample Plan Alteration Form (E & E 2018b). Copies of these plans are included in Appendix C. Sample chain of custody records are included with the results in their respective appendices.

7.1 Bulk Sampling for Asbestos

Bulk samples of building material and debris were collected to confirm that the roofing material was ACM (i.e., containing greater than 1% asbestos as determined by PLM) and to determine whether other suspect materials in the fire-damaged warehouse were ACM. Samples of the warehouse roofing material were collected and analyzed by ODEQ during the first few days of the response. A START AHERA-certified asbestos building inspector collected bulk samples of the warehouse debris during the response phase on May 23 and 24, 2017.

During the first week of the TCRA, a START AHERA-certified building inspector also collected 17 bulk and soil samples. Later in the TCRA, an AHERA-certified asbestos building inspector from Advantage performed an asbestos survey of the remaining warehouse deck, after most of the debris had been removed, and the results indicated that some of the materials on the deck were ACM. At the conclusion of the TCRA, the Advantage building inspector surveyed the remaining pilings and caps of the former warehouse and the surface of the riverbank to confirm that ACM was no longer present (Advantage 2018).

Bulk samples from these sampling events were analyzed by PLM in accordance with EPA Method 600/R-93/116. Two soil samples collected by START during the TCRA in September 2017 were analyzed for asbestos by PLM with the California Air Resources Board 435 sample preparation. Bulk samples submitted by START for PLM testing were analyzed at LabCor Portland, Inc., during the response phase, and EMSL Analytical, Inc. during the TCRA. The results of the START bulk and soil asbestos analyses are presented in Appendix D.

7.2 Bulk Sampling for Disposal Profiling

On May 23 and 24, 2017, START collected composite bulk debris samples for waste disposal profiling. The samples were submitted to ALS Environmental in Kelso, Washington, for the following analyses:

- PAHs by SW-846 Method 8270D-Selective Ion Monitoring;
- BTEX by SW-846 Method 8260C;
- PCBs by SW-846 Method 8082A; and
- TCLP RCRA Metals by SW-846 Methods 1311, 6010C, and 7470A.

The laboratory results are presented in Appendix E.

7.3 Air Sampling for Asbestos

Throughout all phases of the project, START and others collected air samples for the analysis of asbestos and other fibers. During the response phase, air samples from fixed locations and site personnel (i.e., personal samples) were collected to determine potential asbestos exposure risks to asbestos for the public and site workers. Fixed and personal air samples were collected both at the Site and in other areas throughout downtown Portland, where response personnel were working.

All START air samples were submitted for the analysis of asbestos and other fibers by PCM in accordance with National Institute for Occupational Safety and Health Method 7400. Additionally, several air samples were further analyzed by TEM in accordance with ISO Method 10312 (direct method) or 13794 (indirect method).

During the response and interim phases of the project, START submitted air samples for PCM and TEM analyses to LabCor Portland, Inc.

During the TCRA, START was tasked with performing perimeter air sampling at the three fixed air station locations. The samples that START collected during the first week of the TCRA were submitted to EMSL Analytical, Inc. for PCM analyses. Additionally, Advantage was on site as a subcontractor to ERRS to monitor the asbestos abatement work and collect air samples from fixed exclusion zone locations and from ERRS workers and subcontractors. As a part of their scope of work, Advantage performed the PCM analysis for the air samples that they collected. As directed by the OSC, beginning the second week of the TCRA, Advantage also performed the PCM analyses of the fixed air samples that START collected (Advantage 2018).

The START air sample results for the response phase are included in Appendix F (PCM) and Appendix G (TEM). The START air samples results for the interim monitoring phase are included in Appendix H, and the START air sample results for the TCRA are included in Appendix I. The results of the PCM analyses that Advantage performed as part of asbestos project monitoring (Advantage 2018) are on file at EPA.

7.4 Riverbank Sampling – River Street TCRA

At the end of the TCRA, START collected a sample of stockpiled sediment for waste disposal characterization. The sample was submitted to TestAmerica in Tacoma, Washington, for the following analyses:

- TCLP VOCs by SW-846 Methods 1311 and 8260C; and
- TCLP SVOCs by SW-846 Methods 1311 and 8270D.

START also collected a sample of imported gravel to be used as cover material. The sample was submitted to TestAmerica in Tacoma, Washington, for the following analyses:

- VOCs by SW-846 Method 8260C;
- SVOCs by SW-846 Method 8270D;
- Organochlorine Pesticides by SW-846 Method 8081B; and
- PCBs by SW-846 Method 8082A.

The analytical data reports for these analyses are included in Appendix J.

7.5 Riverbank Sampling – Portland Harbor

At the end of the TCRA, START collected two sediment samples (a field sample and a field duplicate) for the analyses of Portland Harbor contaminants of concern. The samples were submitted to TestAmerica in Tacoma, Washington, for the following analyses:

- Metals (arsenic, cadmium, copper, lead, and zinc) by SW-846 Method 6020A;
- Mercury by SW-846 Method 7471A;
- Organochlorine Pesticides by SW-846 Method 8081B;
- PCBs by SW-846 Method 8082A;
- SVOCs (Bis[2-ethylhexyl] phthalate and Hexachlorobenzene) by SW-846 Method 8270D;
- PAHs by SW-846 Method 8270D-Selective Ion Monitoring;
- Diesel-Range Organics by Washington Department of Ecology Method NWTPH-Dx; and
- Organotins.

The analytical data reports are included in Appendix K.

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8 Waste Disposal

EPA generated waste for off-site disposal during the emergency response and TCRA phases of the project. Waste generated during the response phase included the ACM roofing material recovered from various locations around downtown Portland. Additionally, a small amount of the asbestos-contaminated building debris was disposed of during the response phase as EPA was working to stabilize the Site before the interim phase.

During the TCRA, the remainder of the fire-damaged building debris, including the remains of the building contents, the wooden platform, and several posts, were excavated and removed for off-site disposal. Off-site disposal costs during the TCRA were shared by EPA and ODEQ, with ODEQ paying for the disposal of debris generated when EPA removed the decking of the former warehouse structure.

By the end of both the response and TCRA phases of the project, approximately 4,112 tons of asbestos-contaminated building debris was removed from the Site and transported off site to a landfill licensed for asbestos waste. Additionally, EPA recovered and decontaminated 149 tons of scrap steel, which reduced disposal costs and the amount of material placed in a landfill.

A summary of the waste streams and final disposition locations is provided in Table 8-1. Copies of applicable waste disposal records are on file with EPA.

Table 8-1 Summary of Waste Disposal and Recycling

Waste Stream	Quantity	Final Waste Destination
Emergency Response		
Asbestos Waste (Recovered Roofing Material)	204 pounds	Wasco County Landfill The Dalles, Oregon
Asbestos Waste (Contaminated Building Debris)	211 tons	Wasco County Landfill The Dalles, Oregon
Time-Critical Removal Action		
Asbestos Waste (Contaminated Building Debris)	3,901 tons (1,216 tons funded by EPA, and 2,685 tons funded by ODEQ)	Wasco County Landfill The Dalles, Oregon
Scrap Steel (for Recycling)	149 tons	Bob's Metals, Inc. Portland, Oregon

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9 Quality Assurance/Quality Control

Quality assurance (QA)/quality control (QC) data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analyses are incorporated in the *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods Multi-Media Multi-Concentration ISM02.4* (EPA 2016a) and the *USEPA Contract Laboratory Program Statement of Work for Organic Superfund Methods Multi-Media Multi-Concentration SOM02.4* (EPA 2016b). These QC requirements or equivalent requirements found in the analytical methods were followed for analytical work on the project. This section describes the QA/QC measures taken for the project and provides an evaluation of the usability of data presented in this report.

Data from the START-subcontracted commercial laboratories were reviewed by a START chemist. Data qualifiers and labels were applied as necessary according to the following guidance:

- EPA (2017c) National Functional Guidelines for Inorganic Superfund Methods Data Review;
- EPA (2017d) National Functional Guidelines for Organic Superfund Methods Data Review; and
- EPA (2009) Guidance for Labeling Externally Validated Laboratory Data for Superfund Use.

In the absence of other QC guidance, method and/or standard operating procedure-specific QC limits were also utilized to apply qualifiers to the data.

Field asbestos analysis was performed using National Institute for Occupational Safety and Health Method 7400 between September 20, 2017, and February 22, 2018. The QC procedures outlined above were followed to the extent practicable for all asbestos analyses by the field laboratory. QC information for fixed laboratory asbestos analyses are included in the discussion below.

9.1 Satisfaction of Data Quality Objectives

The following EPA (2000) guidance document was used to establish DQOs for this project:

- *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055.

EPA determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the fieldwork produced sufficient data that met the DQOs stated in the Site-Specific Sampling Plans (E & E 2017a, 2017b, and 2017c) and Sample Plan Alteration Form (E & E 2018b). A detailed discussion of project objectives that were accomplished is presented in the following sections.

9.2 QA/QC Samples

Trip blank QA samples were not required as all samples analyzed for VOCs were for disposal characterization, or there was only one sample in the sample delivery group; therefore, cross-contamination was not determined to be a potential issue. Rinsate blank QA samples were not collected, as all samples were collected using dedicated sampling equipment. One or more

asbestos air sample filter blanks were submitted with each sample delivery group to the fixed laboratories. QC samples included matrix spike/matrix spike duplicate (MS/MSD) and/or blank spike (BS) samples at a rate of one MS/MSD and/or BS per 20 samples per matrix.

9.3 Project-Specific Data Quality Objectives

The laboratory data were reviewed to ensure that DQOs for the project were met. The following describes the laboratories' and/or field team's abilities to meet project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for the project.

9.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference between duplicate sample analyses. The laboratory duplicate samples or MS/MSD samples measure the precision of the analytical method. The relative percent difference values were reviewed for all applicable laboratory samples. A total of 13 samples results (approximately 1.7% of the results) were qualified as estimated quantities based on precision outliers; therefore, the project DQO for precision was met.

9.3.2 Accuracy

Accuracy indicates the conformity of the measurements to fact. Laboratory accuracy is defined as the surrogate spike percent recovery (%R) or the %Rs for all laboratory analyses. The surrogate/MS/MSD/BS %R values were reviewed for all appropriate sample analyses. A total of 25 sample results (approximately 3.2% of the data) were qualified as estimated quantities (J) based on surrogate outliers; therefore, the project DQO for accuracy of 90% was met.

9.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. A total of 11 results (approximately 1.4% of the data) were rejected (R); therefore, the project DQO for completeness of 90% was met.

9.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

9.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

9.4 Laboratory QA/QC Parameters

The laboratory data also were reviewed for holding times/temperatures/sample containers, laboratory blank samples, asbestos air filter blank samples, and serial dilution analyses. These QA/QC parameters are summarized below.

9.4.1 Holding Times/Temperatures/Sample Containers

All holding times, sample temperatures, and containers were acceptable except one asbestos sample that had incorrect packaging; this sample was not analyzed.

9.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. No potential contaminants of concern were detected in the laboratory blanks.

9.4.3 Asbestos Air Filter Blank Analyses

Asbestos air filter blank sample analyses met the frequency criteria. There were no asbestos detections in the filter blanks that affected the field sample results.

9.4.4 Serial Dilution Analyses

Serial dilution analyses met the frequency criteria. All serial dilution results were within QC limits.

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10 Community Relations

Throughout the emergency response, EPA maintained communications with responding agencies and the public. EPA and ODEQ provided technical and contact information about the response to the local community by distributing flyers, visiting neighboring businesses, and talking with the public. EPA maintained a public website (https://response.epa.gov/RiverStreetWarehouseFire) and produced daily pollution reports for the public to access as needed.

A Common Operating Picture was utilized to help maintain communication with the appropriate agencies. The Common Operating Picture consisted of tools and users to collect, update, share, process, and present site data in real-time. Real-time data and information drove the response operations by prioritizing response activities.

Additionally, EPA developed a story map during the emergency response to communicate response activities to the public and to portray the progression of the project. The story map contained photos of response activities, a map of the extent of site work activities, and asbestos air sample results. A hotline and an ODEQ website were set up for public reporting of potential ACM and public response information.

Throughout the interim monitoring and TCRA phases, EPA continued to communicate with the public by providing weekly pollution reports, and continuing to update the Site's webpage with a summary and photographs of ongoing removal activities.

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11 Health and Safety

11.1 Emergency Response Phase

During the emergency response, the EPA OSC maintained ultimate authority and responsibility for site safety and tasked the USCG Pacific Strike Team to oversee site health and safety procedures. ERRS and START each developed a site-specific safety plan. The Operations Section Chief conducted safety meetings at the beginning of each day to discuss the planned activities for that day and any task-specific health and safety issues or concerns. Personnel that attended these daily meetings included the EPA, ODEQ, ERRS, START, USCG, and Public Information Officers.

The physical hazards during the emergency response included heat, heavy vehicle traffic, long walking distances, uneven terrain, working on rooftops, sharps/biohazards, and moving equipment. Based on air sampling data, the basic level of PPE for the Site was Level D, including safety glasses, hard hat, safety vest, and steel-toed safety shoes. Level C respiratory protection and chemical protective suits were required when entering the exclusion zone. The level of PPE was downgraded to a modified Level D during the reconnaissance and removal sweep of downtown Portland, which included high-visibility safety vest and comfortable walking shoes.

The chemical hazard associated with the response was asbestos. Unified Command established an exclusion work zone around the perimeter of the warehouse where ACM was handled or disturbed. The work zone was established and maintained with the installation of chain-link safety fence around the Site. The public was encouraged to not disturb any site-related ACM that was found throughout downtown Portland. Posters, flyers, and cards that contained information about the health risks associated with asbestos were made available to the public. Reconnaissance teams were encouraged to not disturb any ACM and document the location and description of the material to reduce any health risks. Level C PPE was required for all recovery teams of certified asbestos abatement personnel when cleaning up ACM.

11.2 Interim Monitoring Phase

During the interim monitoring phase, site safety was largely related to START tasks, and personnel worked under the site-specific health and safety plan that was developed during the emergency response. Due to the general nature of site activities during the interim monitoring phase, one START member usually visited the Site once or twice a week. Site safety meetings were generally not conducted, but the START member scheduled to visit the Site checked in with the project manager and informed them of any issues or concerns they encountered.

The physical hazards during the interim monitoring phase included heat stress, uneven terrain, public and truck traffic, active rail lines, and overhead equipment. Based on air sampling data and the lack of activity on the Site, the level of PPE was downgraded to a modified level D while in the exclusion zone, which included high-visibility safety vest, steel-toe safety boots, safety glasses, and hard hats. If there were sustained particulate levels above the action level, START personnel were required to wear full-face respirators when accessing air station AS25.

The chemical hazard was asbestos. The exclusion zone established by EPA during the emergency response remained in place during the interim monitoring phase to help secure the Site, and was maintained with the chain-link safety fence around the perimeter.

11.3 TCRA Phase

During the TCRA, the OSC maintained ultimate authority and responsibility for site safety. ERRS and START each developed a site-specific health and safety plan. The OSC conducted a general site-safety meeting at the beginning of the removal action to establish the health and safety procedures for the Site. Daily safety meetings were conducted at the beginning of each day of site work and the meetings were attended by all personnel present, including the OSC, ERRS, START, traffic control, and the ERRS subcontractors. During the daily safety meetings, site personnel discussed the planned activities for that day and any task-specific health and safety issues. The daily safety meeting also included a review of any health and safety issues from the previous day and any relevant air monitoring data collected by START and Advantage.

The physical hazards at the Site included uneven terrain, public and truck traffic, heat and cold stress, limited work space due to neighboring businesses and a public road and active rail line going through the Site's staging area, overhead equipment, and the nature of working around a fire-damaged structure over water. Based on air sampling data, the minimum level of PPE for the Site was Level D, including safety glasses, hard hat, high-visibility safety vest, and steel-toed safety shoes. Level C PPE was required when entering the exclusion zone. To help manage traffic through the Site, flaggers were hired to direct traffic during all operational hours. EPA coordinated with Union Pacific Railroad to shut down the active rail line during the entire removal. Contractors utilized fall protection when working on the fire-damaged structure, due to the unstable nature of the pilings and platform.

On December 22, 2017, an incident occurred at the Site, which involved the crane nearly hitting the power line above the Sakrete concrete facility. AAC was operating the crane at the end of the workday, when the crane boom moved close to the power line. Although the boom apparently did not contact the power line, it was close enough to cause an electrical arc. No injuries, loss of power, or damage were reported. AAC took the crane out of service until it was fully inspected by an independent inspector and approved for operation. The following workday at the daily health and safety meeting, AAC brought the incident up with site personnel. As a result of the incident, site staff held additional safety meetings to reinforce worker health and safety.

The chemical hazard associated with the Site was asbestos. EPA established an exclusion work zone around the perimeter of the warehouse where asbestos contaminated material was handled or disturbed. The work zone was established and maintained with the installation of chain-link safety fence around the Site. Perimeter and personal air monitoring confirmed that site personnel should wear Level C in the exclusion work zone and Level D outside the exclusion work zone. Additionally, ERRS consistently used water from water trucks for dust and airborne asbestos fiber suppression.

The results of air sampling (personal and perimeter) and dust monitoring indicated that the site activities were performed in a manner that was safe for site personnel, nearby residents, and passers-by.

12 Difficulties Encountered and Recommendations

12.1 Emergency Response Phase

After the initial day or two of the response, the large scale and scope became apparent. With friable ACM dispersed throughout a wide area in the middle of a major city, there was a need to quickly communicate information to the public while coordinating with other stakeholder agencies and field crews. There was also a need to send out multiple field teams to gather data, and then quickly process it to send information out to the public.

The warehouse was located in an industrial area next to an active railway and a public road, and it was partially built over the Willamette River. During the emergency response, the site layout became a logistical issue with regards to having no room for site work. With the Willamette River on one side of the warehouse, surrounded by neighboring businesses, and the road and active railway being in close proximity to the front of the building, sampling and removal efforts were confined to a small work area. The ICP had to be located about 0.5 mile northwest of the Site on River Street because of the limited work space. It was challenging for ERRS to find sufficient area to stage equipment and materials to conduct waste removal. Careful coordination was used when equipment or materials were moved.

12.2 Interim Monitoring Phase

After the emergency response phase ended, and prior to the removal of the warehouse, EPA needed to secure the Site at all times due to the lack of site activity. Site security was arranged by ERRS and was present on site twenty four hours a day for seven days a week during the entirety of the interim monitoring phase. During this phase, three air monitoring stations and one solar power charging station were constructed by START to collect data. This provided a challenging situation because of the lack of site activity, homeless camps nearby, public access, and active truck traffic. On June 30, 2017, equipment from one of the air monitoring stations was stolen, despite having site security present. The issue was quickly resolved and the equipment safely returned. Security was enhanced by installing web-based security cameras to monitor the Site.

Weather and extreme heat became an issue for the equipment on site. Most of the equipment that remained on site was stored in coolers for protection from rain and dust. During portions of July and August 2017, temperatures often exceeded 90 degrees Fahrenheit (°F), and on several days temperatures exceeded 100°F. Air monitoring equipment began to malfunction at these extreme temperatures. During this time, START monitored the equipment closely and cooled the equipment by placing dry ice inside the cooler to lower the temperature. This dry icing method worked by reducing the internal cooler temperatures by up to 15°F.

12.3 TCRA Phase

During the TCRA, demolishing the fire-damaged warehouse posed a challenge because of structural concerns and limited access to the entire warehouse. EPA made the decision to construct two trestles over the existing wooden platform, which acted as independent work platforms.

Similar to the emergency response phase, the site layout proved to be difficult during the TCRA. With a limited work area and public traffic, traffic control was arranged by ERRS to safely coordinate traffic and equipment through the Site. For the duration of the removal action, EPA coordinated with Union Pacific Railroad to have the active railway in front of the warehouse temporarily shut down for safety. Rail lines were protected using plywood sheets to prevent damage while moving heavy equipment around.

13 Summary and Conclusions

EPA has completed an emergency response and TCRA at the River Street Warehouse Fire Site in Portland, Oregon. On May 14, 2017, a fire started at a warehouse in north Portland, Oregon, which was located on the northern/eastern bank of the Willamette River across from downtown Portland. Due to the nature and scale of the fire, ACM roofing material from the warehouse building was carried by smoke and wind across the river and into the densely populated downtown area. Following the fire, the warehouse was damaged and structurally unsound, and ACM remained on the property. The property owner did not have the capability to address the ACM release or remove the waste remaining at the warehouse. EPA determined that the ACM posed a threat to human health and the environment and subsequently initiated a response action in coordination with ODEQ.

EPA responded to the Site on May 15, 2017, and continued to perform emergency response and cleanup operations through late June 2017. EPA established a Unified Command with ODEQ. For the response, one of EPA's primary objectives was reconnaissance and recovery activities to search through areas of downtown Portland where the ACM debris had dispersed and to recover any waste where it was found. EPA's START and ERRS contractors worked together to search public and private areas in downtown Portland to identify and recover any ACM from the Site. An estimated total of 204 pounds of ACM was recovered from downtown Portland, including ACM collected from 140 rooftops, for disposal as asbestos waste.

Additionally, EPA worked to secure and stabilize the fire-damaged warehouse structure to protect neighboring businesses and prevent future releases of asbestos and ACM. The ERRS contractor recovered 211 tons of debris for off-site disposal from the accessible perimeter, and then sprayed a stabilizing product on the remaining debris to minimize the release of dust and fibers.

After securing and monitoring the Site for approximately three months, EPA returned to the Site in mid-September 2017 to complete the removal of the fire-damaged warehouse structure and asbestos-contaminated debris. This TCRA phase continued for approximately six months through the end of February 2018. Because of concerns about the structural integrity of the fire-damaged warehouse structure, EPA installed two temporary and independently supported trestles as work platforms for equipment and personnel to access and remove the remainder of the asbestos-contaminated debris.

During the TCRA, an additional 3,901 tons of asbestos-contaminated building debris was removed from the Site for off-site disposal as asbestos waste. At the conclusion of the TCRA, a total of 4,112 tons of building debris had been removed from the Site and properly disposed of off-site. ODEQ assisted EPA in paying for waste disposal costs, with ODEQ specifically covering the disposal costs of the wood decking/foundation from the former warehouse structure (2,685 tons).

Throughout the project, EPA's contractors performed air monitoring and sampling to measure the risk that the Site posed to response personnel and site workers. During the emergency response phase, over 200 personal and stationary air samples were collected for PCM and/or TEM analyses. Most of the results were lower than site action levels, indicating that the asbestos exposure risk to the general public was relatively low. During the TCRA to remove the asbestos-

contaminated building debris, EPA's contractors collected over 1000 personal and stationary samples for PCM analyses. Almost all of the samples were less than site action levels, indicating that the work was performed in a manner that was safe for site workers and the public.

Because of the large scale of the impacted area and response activities, EPA and its contractors relied on several data management tools to quickly and efficiently collect and process data so they could support response-related decision making and provide stakeholders and the public with timely updates. Data management tools used throughout the response and later TCRA included mobile data collection devices, servers, databases, Scribe, and an EPA Geoplatform. Throughout the response and TCRA activities, EPA relied on Viper, a remote telemetry-based data management system, and EPA developed and updated a story map with site data and information.

At the conclusion of the TCRA, only the pilings and caps from the former warehouse structure remained on site. EPA’s contractor surveyed and cleaned the surface of the riverbank for any residual building material or suspect ACM. An AHERA-certified building inspector surveyed the remaining pilings and beach surface to confirm that no ACM or suspect material remained.

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A Photographs

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River Street Warehouse Fire

Portland, Oregon

TO Number: TO23T1SS1

Photographed by: Brittany Train (BT), Erin Lynch (EL), Rachel Locke (RL), Bryan Ciecko (BC), Maren Fulton (MF), Ryan Whitchurch (RW), Unknown START (START)

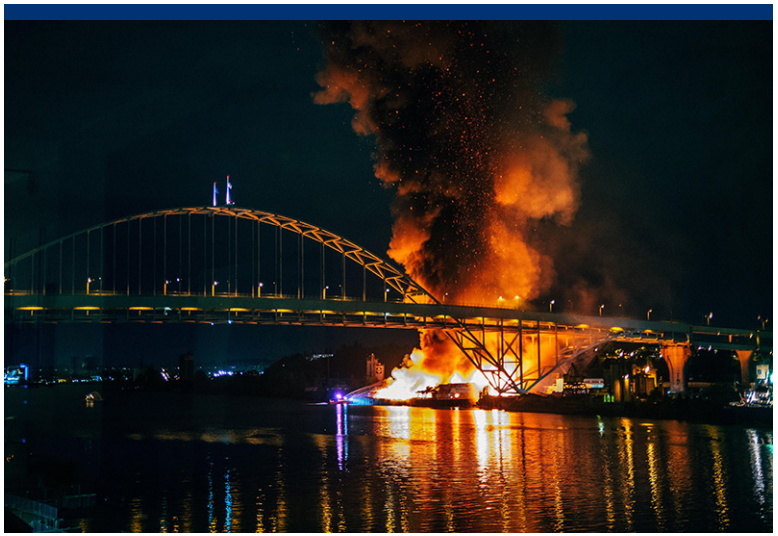

Photo 1 Warehouse on fire the evening of May 14, 2017.

Direction: North Date: 5/14/17 Time: NA Taken by: NA

Photo 2 Morning health & safety meeting with all agencies during the response phase.

Direction: North Date: 5/17 Time: NA Taken by: START

Photo 3 EPA talking with the public with an air monitoring station in the background.

Direction: NA Date: 5/17 Time: NA Taken by: START

Photo 4 Temporary air station in a park near downtown Portland, OR.

Direction: South Date: 5/18/17 Time: 11:44 Taken by: START

Photo 5 Recovery team cleaning up ACM in a park in downtown Portland, OR.

Direction: Northeast Date: 5/18/17 Time: 12:05 Taken by: START

Photo 6 Recovery team cleaning up ACM in a park in downtown Portland, OR.

Direction: NA Date: 5/18/17 Time: 12:10 Taken by: START

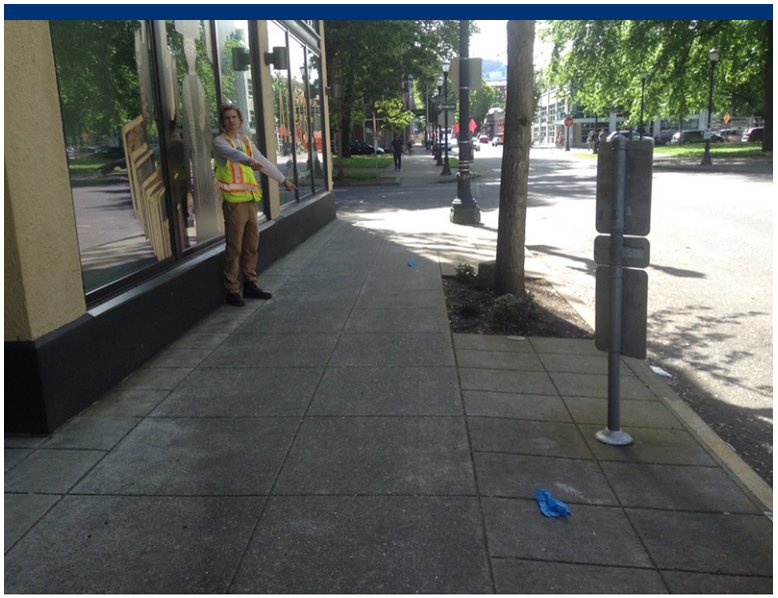

Photo 7 Recon team combing the sidewalks of downtown Portland, OR for ACM. Photo shows START member pointing to location of ACM.

Direction: East Date: 5/18/17 Time: 16:05 Taken by: BT

Photo 8 Recovery team cleaning up ACM along sidewalk in downtown Portland, OR.

Direction: East Date: 5/19/17 Time: 11:52 Taken by: START

Photo 9 Proper PPE and Dewalt vacuum used for cleaning up ACM by recovery team.

Direction: South Date: 5/24/17 Time: NA Taken by: START

Photo 10 Bulk sample material collected at the warehouse to assess the % asbestos remaining at warehouse and the potential risks/hazards.

Direction: Down Date: 5/24/17 Time: 10:57 Taken by: START

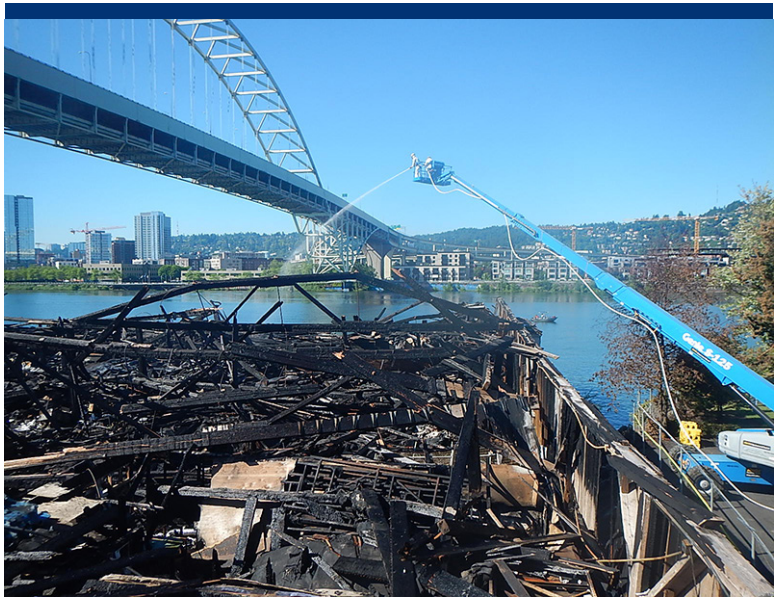

Photo 11 ERRS contractor sprays Gorilla Snot, a tackifier, to the burnt warehouse to prevent ACM from leaving the site.

Direction: Southwest Date: 5/27/17 Time: 08:37 Taken by: START

Photo 12 Condition of warehouse post-fire. Photo shows collapsed roof with ACM.

Direction: Southwest Date: 5/27/17 Time: 10:02 Taken by: START

Photo 13 Condition of warehouse deck post-fire. Collapsed floor deck revealing burned support beams.

Direction: West Date: 9/19/17 Time: 10:12 Taken by: START

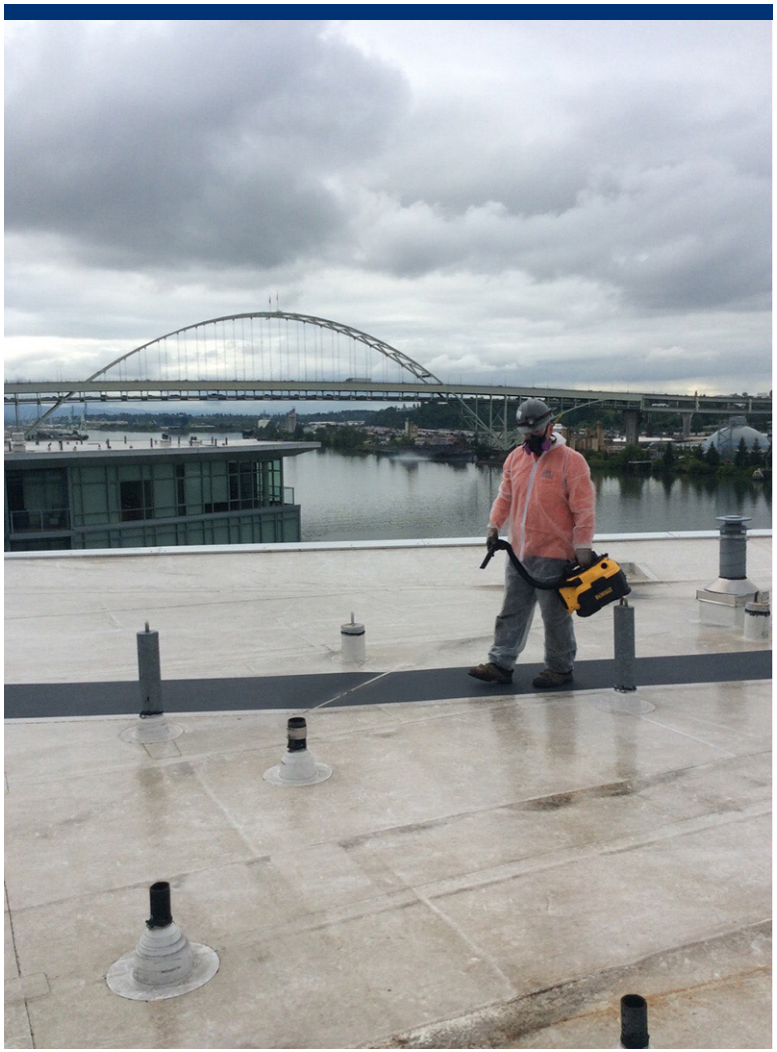

Photo 14 Recovery team cleaning up ACM on rooftop of building near downtown Portland, OR

Direction: North Date: 5/17/17 Time: 17:56 Taken by: START

Photo 15 Recovery team cleaning up ACM on private residence's balcony in NW Portland, OR.

Direction: East Date: 5/18/17 Time: 10:13 Taken by: START

Photo 16 Recovery team cleaning up ACM on rooftop of Marriott Residence Inn building near downtown Portland, OR.

Direction: Southwest Date: 5/18/17 Time: 17:55 Taken by: START

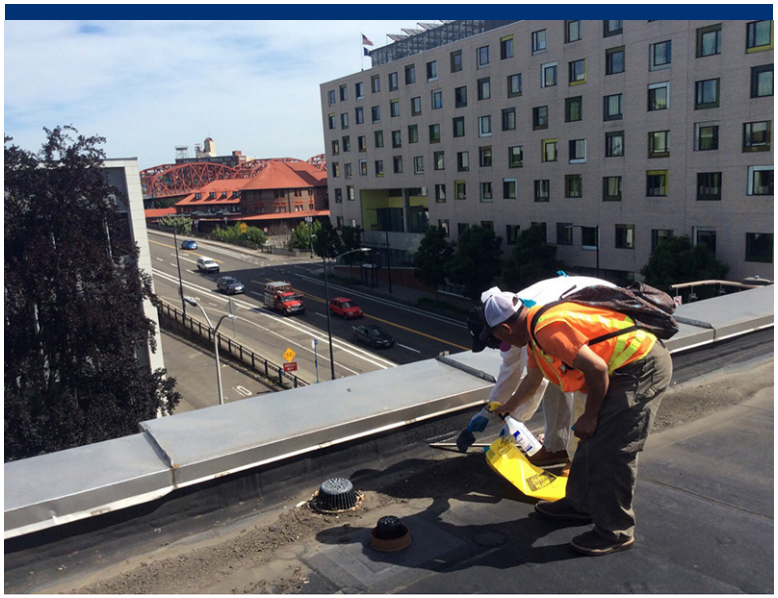

Photo 17 Recovery team cleaning up ACM on rooftop of building near downtown Portland, OR.

Direction: Northeast Date: 5/22/17 Time: 10:49 Taken by: START

Photo 18 Recovery team assessing and cleaning up ACM on rooftop of building near downtown Portland, OR.

Direction: Northwest Date: 5/24/17 Time: 14:26 Taken by: EL

Photo 19 Air Station AS-26 adjacent to NW Copper Works, east of the warehouse.

Direction: East Date: 6/13/17 Time: NA Taken by: START

Photo 20 Air Station AS-25 in the hot zone during the interim period.

Direction: West Date: 7/12/17 Time: NA Taken by: START

Photo 21 Air Station AS-24 adjacent to Sacrete along the northeast corner of the warehouse.

Direction: South Date: 10/4/17 Time: NA Taken by: BT

Photo 22 Air Station AS-26 adjacent to NW Copper Works, during the TCRA phase.

Direction: Southeast Date: 10/6/17 Time: NA Taken by: BT

Photo 23 Air Station AS-15 under Freemont Bridge, south of the warehouse.

Direction: Northeast Date: 1/3/18 Time: NA Taken by: START

Photo 24 Installing a trestle pile.

Direction: Northwest Date: 9/27/17 Time: 12:58 Taken by: BT

Photo 25 EPA contractor, ERRS, spraying water with water truck along River St. adjacent to warehouse for dust suppression.

Direction: South Date: 10/2/17 Time: 14:51 Taken by: BT

Photo 26 Abatement workers dressed in proper PPE lining roll-off bins and sealing a bin full of debris for removal from site.

Direction: South Date: 10/3/17 Time: 15:14 Taken by: BT

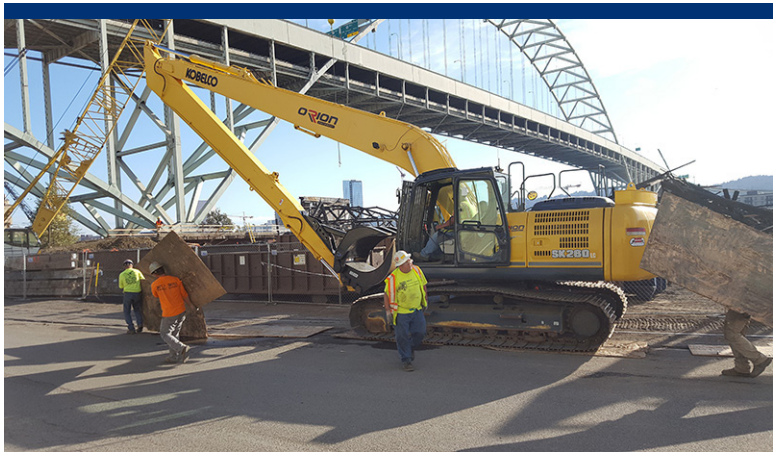

Photo 27 Placing plywood boards over active rail lines to protect them from the excavator.

Direction: South Date: 10/6/17 Time: 16:12 Taken by: BT

Photo 28 Temporary dust monitor along fence adjacent to River St. to capture dust derived from traffic along street.

Direction: South Date: 10/7/17 Time: 07:59 Taken by: BT

Photo 29 Spraying debris with water to supress dust actity while loading debris into roll-off bins.

Direction: North Date: 10/10/17 Time: 10:56 Taken by: RL

Photo 30 Crane lifting pile for trestle installation.

Direction: Northwest Date: 10/11/17 Time: 13:34 Taken by: RL

Photo 31 Lining bin for debris removal.

Direction: Southeast Date: 10/11/17 Time: 13:47 Taken by: RL

Photo 32 First section of south trestle installed with excavator and crane working on it to clear debris.

Direction: North Date: 10/17/17 Time: 10:41 Taken by: RL

Photo 33 Knocking down the northwest wall of warehouse and moving debris with excavator.

Direction: South Date: 10/18/17 Time: 08:18 Taken by: RW

Photo 34 Hole cut into warehouse decking for installation of the north trestle.

Direction: Northwest Date: 10/25/17 Time: 15:27 Taken by: BC

Photo 35 Knocking down the southwest wall wall of the warehouse.

Direction: South Date: 10/27/17 Time: 10:50 Taken by: BC

Photo 36 Completed southern trestle.

Direction: North Date: 11/13/17 Time: 07:38 Taken by: BC

Photo 37 Warehouse deck cleared of debris around the south trestle and part of the north trestle.

Direction: West Date: 11/15/17 Time: 08:43 Taken by: BC

Photo 38 Excavator loading debris into lined dump truck.

Direction: East Date: 11/16/17 Time: 08:24 Taken by: BC

Photo 39 Excavator being flown by crane onto the north trestle from the south trestle.

Direction: North Date: 11/17/17 Time: 14:35 Taken by: MF

Photo 40 Condition of piers in northeast section of warehouse, prior to removal for temporary debris stockpile construction.

Direction: Southeast Date: 12/8/17 Time: 08:39 Taken by: MF

Photo 41 ERRS placing liner in northeast temporary debris stockpile.

Direction: Northwest Date: 12/9/17 Time: 11:13 Taken by: MF

Photo 42 Abatement team cutting through warehouse deck, north of Trestle 2.

Direction: Northwest Date: 12/12/17 Time: 11:43 Taken by: RL

Photo 43 Debris floating in river being contained by boom.

Direction: Southwest Date: 12/21/17 Time: 08:53 Taken by: MF

Photo 44 Cleaning debris out of river.

Direction: Southwest Date: 12/22/17 Time: 08:37 Taken by: MF

Photo 45 Abatement team collecting debris from below the warehouse.

Direction: South Date: 12/22/17 Time: 09:08 Taken by: MF

Photo 46 Excavator and crane removing the deck of the warehouse.

Direction: Northwest Date: 12/28/17 Time: 14:21 Taken by: MF

Photo 47 Desconstructing Trestle 1 to remove the remainder of the decking. ERRS preparing to cut the decking.

Direction: Northwest Date: 1/29/18 Time: 08:18 Taken by: BC

Photo 48 Decking removed between Trestle 1 and 2.

Direction: West Date: 1/29/18 Time: 08:23 Taken by: BC

Photo 49 START collecting one of four increments of sediment from the upper riverbank in the northeast corner of the warehouse.

Direction: Southeast Date: 2/2/18 Time: 11:15 Taken by: EL

Photo 50 START collecting one of four increments of sediment from the upper riverbank in the northeast corner of the warehouse.

Direction: Down Date: 2/2/18 Time: 11:15 Taken by: RL

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B Site-Specific Data Management Plan

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	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10 1200 Sixth Avenue, Suite 900 Seattle, Washington 98101-3140 OFFICE OF ENVIRONMENTAL CLEANUP EMERGENCY RESPONSE UNIT	**Region 10 Site-Specific Data Management Plan**			
		Site Name:	River Street Warehouse Fire	**TDD Number/Site ID:**	10QD
		Author:	Renee Nordeen, David Burford, Erin Cafferty	**Company:**	Ecology & Environment, Inc.
		Date Initiated:	May 17, 2017	**Last Updated:**	September 17, 2017

This data management plan (DMP) is intended to provide guidance for data collection by field personnel and subsequent data management activities. The data collection and management practices presented in this plan are designed to ensure data integrity and consistency for all data collection personnel and from operational period to the next. Listed in this DMP are data elements, data collection equipment, and data management processes, and end-use products appropriate for supporting the EPA On-Scene Coordinator (OSC). Electronic tools and files used during data management at the site may include a GPS with a data dictionary to gather site specific data, EDD files for laboratory results, an XRF database used to validate the data, field monitoring equipment (such as air monitoring equipment), a SCRIBE database to manage all field data and analytical results, and ArcGIS to manage geospatial data. Manual data entry or Excel spreadsheets will be used to incorporate field notes and historic data when electronic data is not available.

Planning:

DQO #	Activity	Action Level	Action	Data Stream	Tool/Instrument
1	Determine if asbestos contamination is present in air	See SSSP	Submit samples to off-site fixed laboratory	Sample	Data Recon Device, Scribe, Gast Air Pumps
2	Document if chemical vapors are present or released during site activities	See Action Level Table in HASP	Back out and upgrade PPE as applicable, communicate exceedances to UC	Air Monitoring	MultiRAE Pro
3	Determine if asbestos is present in bulk or building materials	Presence/Absence	Submit samples to off-site fixed laboratory	Sample	Data Recon Device, Scribe
4	Determine if particulates are present in air during removal activities	139 $\mu g/m^3$ sustained for 5 mins *	START: Notify PM immediately Viper: Notification via email alert from ERT to pre-determined START operators on site.	Air Monitoring	VIPER, DataRAM
5	Document Warehouse Debris Removal Activities	N/A	Mark site features and removal progress in Collector	Warehouse Debris Removal	Data Recon Device

*Wildfire Smoke Guidelines for 1 hr avg. upper bound breakpoint for unhealthy AQI

Data Processing

The following table outlines the specific requirements for various data types being collected during the project.

DQO #	Data Stream	Required Data Elements	Processing Instructions	Processing Frequency	Processing Responsibility	Storage Location	Final Output [format]
	Site Documents	Site files, SSSP, SSDMP, logbook	File hard copies and electronic copies in indicated storage location	Beginning of project, and as needed	Project Manager	**Primary Digital:** Site Laptops **Backup Digital:** Network Drive **Hard Copy:** Site Doc Box	Site file deliverable

DQO #	Data Stream	Required Data Elements	Processing Instructions	Processing Frequency	Processing Responsibility	Storage Location	Final Output [format]
1	Field Sampling Scribe Project	Scribe .mdb	Publish to scribe.net Subscription ID = R10 PDX Asbestos Fire Password = proj3240	As data is loaded	Field Sample Coordinator	\02 Execution\SCRIBE	scribe.net **Project ID:** 3240 Scribe .mdb file
1	Analytical Scribe Project	Scribe .mdb	Publish to scribe.net Subscription ID = R10 PDX Analytical Password = proj3242	As data is loaded	Analytical Coordinator	\02 Execution\SCRIBE	scribe.net **Project ID:** 3242 Scribe .mdb file
1	Combined Scribe Project	Field Sampling Scribe Project & Analytical Scribe Project	Subscribe to Projects 3240 and 3242 and republish. Subscription ID = R10 MakePDXCombo Password = MakePDXCombo	Daily (dependent on publishing frequency of Field and Analytical scribe projects)	Data Manager NOTE: TO MAKE THE COMBINED PROJECT –Data Manager should be the only one who runs the subscription	\02 Execution\SCRIBE	scribe.net **Project ID:** 3245 Scribe .mdb file
1	Scribe Subscription	Read-Only Access to Combined Scribe Project	Subscription ID = R10 PDX Asbestos Combo Password = R10PDXCombo	As needed	End User	Scribe.net	End User
5	Digital Photos	Date, Device ID, Time, Direction, Description, Photographer	Photos will be downloaded from field cameras and from data recon devices and stored in site files	Daily	Project Manager	\02 Execution\Photos	Photos [.jpg], Photographic log [.xls]
1	Air Sampling Documentation	Sample No, Date, Time, Sampler, Location, flow rate, counter or time (start and stop)	Record into Scribe as needed	As Samples are added	Field Scribe Manager	Scribe	Chain-of-Custody forms, labels, tabular reports, and/or maps
7	Bulk and Building Material Documentation	Sample No, Date, Time, Sampler, Location	Record into Scribe as needed	As Samples are added	Field Scribe Manager	Scribe	Chain-of-Custody forms, labels, tabular reports, and/or maps
6	Air Monitoring DataRAM	InstrumentID, Location, Mon_Time, Mon_Date, Mon_Parameter, Mon_Measurement Mon_Meas_Units	Import into Scribe and store according to applicable Data Processing Guides	Conclusion of project or as needed	Data Manager	Scribe	Tabular reports [.xls]
1	Asbestos Sample Results	Samp. No., Date, Location, Description, PCM Results, TEM Results, TEM/PCME, Analyst Notes, Sampling Activity	Analytical Coordinator will load EDDs from lab into Analytical Scribe File.	As results are received	Analytical Coordinator	Analytical Scribe Project	Scribe.net
7	Building Material Sample Results	Location ID, sample number, sample date, sample time, analyte, result, qualifier, unit, MDL	Data will be downloaded and imported into Scribe in accordance with the Region 10 RDMP Attachment A2	Upon receipt of data	Project Manager	**Data:** Scribe **Raw:** \03 Analytical & QA\Laboratory Data	Tabular reports [.xls], Data Memoranda [.pdf]
8	VIPER Particulate Monitoring (DataRam)	All Viper Data Elements	Data Will be stored automatically on viper.net	Continual	Data Manager	Deployment Manager	Viper.net, Deployment Manager and Geoplatform

DQO #	Data Stream	Required Data Elements	Processing Instructions	Processing Frequency	Processing Responsibility	Storage Location	Final Output [format]
9	Warehouse Debris Removal	See Data Dictionary	START will document removal progress utilizing collector to provide real-time updates of progress utilizing a grid-based system	Continual	Data Manager	R10 ER Cloud SDE	Geoplatform and/or maps [.pdf]

All electronic files will be written to a CD-ROM or DVD and provided to the Task Monitor. Hard copy files will be assembled and provided to the Task Monitor. Hard copy files will include, but are not limited to, logbooks and field forms.

Reporting

Reporting Task	Data Streams/Elements	Instructions	Deliverables Format	Frequency	Responsibility
Situational Viewer	Spatial Features, Air Stations, Grid System		Geoplatform	Continuous	START
Daily Summary Report	Work Accomplished	Include .pdf created from the River Street Warehouse Fire Removal – Collector webmap showing the warehouse grid and air stations.	Email to EPA	Daily when Site activities are performed	START
Weekly Summary Report	Work Accomplished, Air Monitoring Data, Sample Data, Staffing Schedule, Budget Update	Include .pdf created from the River Street Warehouse Fire Removal – Collector webmap showing the warehouse grid and air stations.	Email to EPA	Weekly	START
Daily VIPER Summary Report	VIPER Particulate Monitoring (DataRam)	Generate Daily Summary pdf for each air station and upload to response.epa.gov site	.pdf	Daily	START
Weekly VIPER Summary Report	VIPER Particulate Monitoring (DataRam)	Generate Weekly Summary pdf for all air stations for the previous week's data. Also, export data for each air station for Air Station summary tables to be inserted into Weekly Summary Report.	.pdf, .xlsx table	Weekly	START

Geospatial Presentation

Name	Purpose	URL
River Street Warehouse Fire Removal – Collector	Webmap for Collector – Warehouse Operations	https://epa.maps.arcgis.com/home/webmap/viewer.html?webmap=c62c17e4a5d04eeb8c13a6b9089a6540

Viper Deployments

Instruments	LINCS/Locations	Alarms and Notifications	Survey Controller Location	Run ID	Deployment ID	Response.epa.gov Site ID
3 DataRAMs	See Viper Equipment Table	Notifications via email to START operators if readings are above action levels	VM 20 (remote.ertviper.org:7020) Username: VIPERREMOTE20/Viper Password: v|p3r	3303	409	12205

Viper Equipment

Instrument	Serial	Location	Location Description	Latitude	Longitude	LINC	Gateway	SSID	Power Type
DataRAM	A60823	AS15	Under 405 Bridge, E of warehouse	45.5393194	-122.6815594	.119	EPAERT80	EPAERT1	
DataRAM	A60826	AS24	Sakrete Property, N Corner of warehouse	45.540298	-122.682319	.81 (PB)	EPAERT107	EPAERT2	Battery
DataRAM	A60825	AS26	NW Copper Works, across street to N of warehouse	45.540415	-122.681880	.84	EPAERT93	EPAERT3	Shore Power

Viper Alarms

Alarm	Action
Connection Down Alarm for LINC .3001	No action. This is the sensor for the NOAA weather station and can occasionally be intermittent.
Connection Down Alarm for DataRAM LINCS (20 min)	START Portland R1 will utilize security camera software to visibly determine if Equipment is still present. If determination cannot be made, START will contact site security to have them check on equipment. If equipment is present and not tampered with, START will mobilize at the next day to troubleshoot the equipment. If equipment has been tampered with, START will notify OSC Nattis to determine next steps. Record actions taken in Viper Alarm Action Log (\River Street Warehouse Fire\02 Execution\VIPER)
5 Min TWA Exceedance (139 ug/m3)	START Portland R1 will utilize security camera software to visibly determine if a cause of the alarm can be seen. START will monitor Deployment Manager for latest readings and contact OSC Nattis to determine next steps. Record actions taken in Viper Alarm Action Log (\River Street Warehouse Fire\02 Execution\VIPER)

Viper Alarm Notification List

Name	Title	email	Text
Randy Nattis	OSC	nattis.randy@epa.gov	5036289419@vtext.com
David Burford	START	dburford@ene.com	2063272593@vtext.com
Steve Hall	START	sghall@ene.com	
Erin Cafferty	START	ErinC@EHSINTL.com	9728961373@vtext.com
Rachel Locke	START	rlocke@ene.com	

Viper Data Exports

Description	Frequency	Website	Username	Password	Instructions
Automated Data Export	Daily at Midnight	https://viper.ert.org/R10PDXWarehouse	R10PDXWarehouse	PDXWarehouse!	When looking at the data export, please remember to format the date/time correctly - down to the seconds - in order to see exactly what time a reading was received.

Spatial Data

Layer	MXD	MXD Location	Mapping Service	Data Location	Related Tables
Air Stations	PDXAsbestosFireFeatures.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.PortlandAsbestosFire:START.DBO.PDXFire_AirStations	Air Sample Results
Removal Site Features - Points	River Street Warehouse Fire - Removal.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.RiverStreetWarehouseFire_Removal: START.DBO.RSWF_ SiteFeatures _Points	Yes
Removal Site Features - Lines	River Street Warehouse Fire - Removal.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.RiverStreetWarehouseFire_Removal: START.DBO.RSWF_ SiteFeatures _Lines	No
Removal Site Features - Polygons	River Street Warehouse Fire - Removal.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.RiverStreetWarehouseFire_Removal: START.DBO.RSWF_SiteFeatures_Polygons	Yes
Asbestos Removal - Polygons	River Street Warehouse Fire - Removal.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.RiverStreetWarehouseFire_Removal: START.DBO.RSWF_AsbestosRemoval_Polygonss	Yes
River Street Warehouse Fire Grid	River Street Warehouse Fire - Removal - Grid.mxd	E:\MXDfilesforArcGISServer\START\ER\RiverStreetWarehouseFire\MXDs for Services	Feature Service	START.DBO.RiverStreetWarehouseFire_Removal: START.DBO.RSWF_Grid	No

Data Dictionary

Data Stream	Data Element	Required	Description	Format	Valid Values
Asbestos Removal	Observer	No	Name of the person making the observation	Text	NA
Asbestos Removal	Comments	No	Information regarding the entry	Text	NA
Asbestos Removal	Location	Yes	Descriptive location of the observation	Text	NA
Field Sampling Scribe Project	Activity	Yes	Specify the Activity Type for the sample	Text	Personal Sampling, Air Station Sampling, Trip Blank
Field Sampling Scribe Project	Collection	Yes	Collection Type	Text	Continuous, Blank, Bulk
Field Sampling Scribe Project	Matrix	Yes	Matrix type	Text	Air, bulk,
Analytical Results Scribe Project	EDD Filename	Yes	Rename EDD to specify lab/date/time in filename, and any other differentiators as necessary	Text	Labname-MMDDYY-HHMM-comments.csv
Air Stations	Date	Yes	Date the air sampling station is initially deployed	Month Day, Year	May ##, ####
Air Stations	Comments	No	Information regarding the entry	Text	NA
Air Stations	Location	Yes	Identification label of the sample	Text	AS##
Photograph	Date	Yes	Date the photograph is taken	Month Day, Year	May ##, ####
Photograph	Category	Yes	Type of data being collected	Text	Photo

Data Stream	Data Element	Required	Description	Format	Valid Values
Photograph	Observer	Yes	Name of person collecting the photograph	Text	NA
Photograph	Comments	No	Information about the contents of the photograph	Text	NA
Photograph	Location	Yes	Locational information	Text	Sampling station, Division, Building Name
Photograph	Sensor/Instrument	No	Sensor or instrument being used	Text	NA
Photograph	Result	No	Result from instrument used to collect observation	Numerical	NA
Photograph	Units	No	Unit of the result	Text	ug/m3, mg/m3
Field Sampling Scribe Project	Flow rate	Yes	Rate of flow to air sampler	Text	L/min
Field Sampling Scribe Project	Volume Units	Yes	Volume calculation units	Text	Liters
Field Sampling Scribe Project	Sample Type	Yes	What the sample will be used for	Text	Field Sample, Trip Blank
Field Sampling Scribe Project	Location	Yes	Air Station where sample is collected	Text	AS##, PS##
Viper Run	Name	Yes	Associated EPA OSC Site Name	Text	River Street Warehouse Fire (previous runs: PDX Warehouse Fire)
Viper Run	Description	Yes	Instrumentation and configuration elements	Text	NA
Viper Run	Location	Yes	Geographic City, State	Text	Portland, OR
Warehouse Debris Removal (Grid)	Date Initiated	No	Date Response Operations Initiated in Cell	Date	MM/DD/YY
Warehouse Debris Removal (Grid)	Status	Yes	Current Status of Cell	Text	Not Yet Started, In Progress, Inaccessible, Debris Removed - Vacuuming Needed, Vacuumed & Clean
Warehouse Debris Removal (Grid)	Date Last Assessed	No	Date of Last Assessment	Date	MM/DD/YY
Warehouse Debris Removal (Grid)	Comments	No	Comments about Operations in Cell	Text	N/A
Warehouse Debris Removal (Grid)	Composition	No	Additional Description of Composition of Cell	Text	N/A
Warehouse Debris Removal (Grid)	Date Complete	No	Date Operations Completed in Cell	Date	MM/DD/YY

Document Revision Summary

Revision	Date	Description of change
Initial Release (V 1.0)	5/17/17	Initial Release
V1.1	5/22/17	Updated based on site conditions. Data streams added: Asbestos Recon, Asbestos Removal
V2.0	5/25/17	Added data dictionary, updated responsibility for air sampling documentation, and processing instructions for asbestos removal. Added scribe subscription information.
V2.1	5/28/17	Added information to Data Dictionary for Property Access data stream.
V2.2	5/29/17	Added scribe information to data dictionary, added required information for bulk and building material samples. Changed site name and site ID.
V2.3	5/31/17	Minor updates

Revision	Date	Description of change
V2.4	6/6/17	Added Viper Particulate Monitoring DQO, Data Stream and Table. Added data collection for warehouse removal status
V2.5	6/9/17	Added Warehouse Debris Removal DQO, Data Stream and Data Dictionary.
V2.6	6/13/17	Added new coded domains to Grid Assessment Status
V3.0	6/27/17	Added VIPER Equipment Table, Added ERT VIPER data reporting, updated VIPER run ID, ICS specific terms removed, deprecated deliverables removed
V3.1	7/03/17	Added VIPER data deliverable and reporting schedule
V3.2	7/10/17	Added VIPER notification procedures, removed AS26
V3.3	7/17/17	Added Viper Alarm Action Log instructions
V4.0	9/15/17	Updates for the Removal scope of project. Removed non applicable data streams and elements. Effective 9/18/17
V4.1	9/19/17	Added Viper station information for Removal Phase Activities

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C Site-Specific Sampling Plans

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ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

May 19, 2017

Randy Nattis, On-Scene Coordinator
United States Environmental Protection Agency
805 SW Broadway, Suite 500
Portland, Oregon 97205

Re: Site Specific Sampling Plan for the River Street Warehouse Fire
Contract Number EP-S7-13-07, Technical Direction Document Number 17-05-0003

Dear Mr. Nattis:

Enclosed please find the Site Specific Sampling Plan for the River Street Warehouse Fire which is located in Portland, Oregon. If you have any question regarding this submittal, please call me at (206) 624-9537.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Steve Hall
for
Brad Martin
START-IV Emergency Response Team Leader

Enclosure

cc: Mike Boykin, OSC, EPA Region 10, Seattle, Washington
Dave Rees, OSC, EPA Region 10, Seattle, Washington
Eric Vanderboom, OSC, EPA Region 10, Boise, Idaho
Stephen Ball, OSC, EPA Region 10, Boise, Idaho
Julie Wroble, Toxicologist, EPA Region 10, Seattle, Washington
Kathy Parker, OSC, QA Coordinator, EPA Region 10, Seattle, Washington

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY MANAGEMENT PROGRAM

Site Specific Sampling Plan

Project Name: River Street (North Portland) Warehouse Fire Site ID: 10QD

Author: Julie Wroble / Steve Hall Company: EPA / E & E Date Completed: 5/18/17

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan (QAP) for the Emergency Management Program for collecting samples during this Removal Program project. The information contained herein is based on the information available at the time of preparation. As better information becomes available, this SSSP will be adjusted.

When inadequate time is available for preparing the SSSP in advance of the sampling event, a Field Sampling Form may be prepared on-site immediately prior to sampling. This full length version of the SSSP is written after the sampling event and the completed Field Sampling Form attached to it.

1. Approvals

Name, Title	Telephone, Email, Address	Signature
Michael Boykin **On-Scene Coordinator**	206-553-6362, boykin.michael@epa.gov USEPA, M/S ECL-133, 1200 Sixth Ave Suite 900 Seattle, WA 98101	
Kathy Parker **EMP Quality Assurance Coordinator**	206-553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	

I. Project Management and Organization

2. Personnel and Roles involved in the project:

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Michael Boykin	206-553-6362, boykin.michael@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	On Scene Coordinator	Yes
Brad Martin	206-624-9537, bmartin@ene.com E&E, 2101 Third Ave Suite 1700 Seattle, WA 98104	START Project Manager	Yes
Kathy Parker	206 553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	EMP Quality Assurance Coordinator	No
Mark Woodke	206-624-9537, mwoodke@ene.com, E & E 720 Third Ave, Suite 1700 Seattle, WA 98104	START Quality Assurance Reviewer	Yes

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
John Harris	206-781-0155, jharris@labcor.net, LabCor 4321 Corbett Ave Suite A, Portland, OR 97239	Laboratory contact	No

3. Physical Description and Site Contact Information:

Site Name	North Portland Warehouse Fire	
Site Location	1300 North River Road, Portland, Oregon	
Property Size	81,400 square foot parcel	
Site Contact	Eric Vanderboom	**Phone Number:** 208-530-3180
Nearest Residents	One quarter mile	**Direction:** South and Southwest
Primary Land Uses Surrounding the Site	Industrial land use including asphalt, concrete, copper works, railyard, and other mixed used commercial and industrial.	

4. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	5/17/17	5/18/15	
Mobilize to / Demobilize from Site	5/16/17	5/16/17	
Sample Collection	5/17/17	5/21/17	Assume daily sampling through Sunday, May 21.
Laboratory Sample Receipt	5/18/17	5/22/17	
Laboratory Analysis	5/18/17	5/23/17	24-Hour or less turnaround requested
Data Validation	5/19/17	5/24/17	

5. Historical and Background Information

At approximately 2200 PDT on Sunday, 14 May 2017, a fire broke out at a warehouse in North Portland, 1300 North River Road. The warehouse is located on the northern bank of the Willamette River and is constructed on wood pilings partly over the river. No one was injured in the fire. The building had a history of safety and other violations and the building owner has no insurance and does not have the financial means to address the situation. Wind-blown ash and debris have been found southwest of the river, in a densely populated residential area consisting of mostly multi-story buildings. Fire crews have been on the scene since the fire started and continue to address hot spots.

The Oregon Department of Environmental Quality (ODEQ) conducted a preliminary assessment of the warehouse and nearby properties on Monday, 15 May 2017 and determined that the roofing paper contains 90% chrysotile asbestos. The roofing paper is significantly deteriorated and friable when touched. ODEQ has requested EPA assistance in conducting air monitoring, surveying the area for debris, and addressing mixed asbestos contamination at the warehouse and the debris deposited in the residential area across the river.

6. Conceptual Site Model

Contaminants: dust particles and asbestos

Transport Mechanisms: Dust particles moving through air and asbestos fibers moving through air.

Receptors: Workers at the site, passersby, and nearby residents.

7. Decision Statement

The decision(s) to be made from this investigation is/are to:

Air Monitoring: Determine whether dust and asbestos are present at concentrations exceeding screening levels for health and safety purposes.

Air Sampling: Determine whether asbestos is present at concentrations exceeding action levels for health and safety purposes.

Debris Sampling: Determine whether debris or suspect material contains asbestos.

8. Action Level

Asbestos in Air
Site Action Level for Ambient Air: 0.01 fibers per cubic centimeter (f/cc).

Site Action Level for Personal Samples: 0.1 f/cc (OSHA Permissible Exposure Level [PEL])

Particulates in Air
Site Action Level: Greater than background

Asbestos in Debris
Site Action Level: The presence of any asbestos in a building material or piece of debris can pose a human health risk.

II. Data Acquisition and Measurement Objectives

9. Site Diagram and Sampling Areas

The site diagram is the attached Figure 1. (Insert here or attach at the end as necessary.)

10. The Decision Rules

The following statement(s) describe the decision rules to apply to this investigation:

Air Sampling
If asbestos concentrations in stationary air samples exceed the site action level, EPA will consider additional options to investigate and/or protect the public from potential exposure to airborne asbestos.

If asbestos concentrations in personal air samples exceed the site action level, site personal protective equipment (PPE) will be upgraded to Level C including respiratory protection. Or, if Level C PPE is already being used, the results will confirm that Level C PPE is appropriate.

Air Monitoring
If airborne particulate concentrations exceed the site action level, EPA will consider additional options to investigate and/or protect the public from potential exposure to airborne particulates.

Asbestos in Debris
If a suspect building material or piece of debris is encountered, it may be assumed to contain asbestos and handled as asbestos waste, rather than waiting for sampling and laboratory results.

11. Information Needed for the Decision Rule

The following inputs to the decision are necessary to interpret the analytical results:

- Weather conditions
- Action Levels
- Contaminant concentrations

12. Sampling and Analysis

Air Sampling and Monitoring:

-- As many as 15 stationary samples and 15 personal samples will be collected daily.

-- Stationary samples will be collected from fixed locations near the location of the debris pile and at key downwind locations. Air samples will be collected on a 0.8 micrometer (µm) mixed-cellulose ester (MCE) filter cassette designed for asbestos sampling and analysis using Gast air sampling pumps at a flow rate of approximately 10 liters per minute (L/min) for approximately 8 to 12 hours, for a target sample volume of approximately 4,800 to 7,200 liters.

-- Personal samples will be collected with SKC or similar personal air sampling pumps on 0.8 µm MCE filter cassettes from site personal during daily site activities. The samples will be collected at an approximate flow rate of approximately 2 to 3 L/min for approximately 4 to 6 hours, for a target sample volume of 720 L/min.

-- The stationary and personal samples will be submitted for asbestos and other fibers for Phase Contrast Microscopy (PCM) analysis with a rush (24 hours or less) turn-around time.

-- In addition to the PCM analyses, a subset of the samples will be submitted for transmission electron microscopy (TEM) analyses by a modified AHERA method (counting all fibers with a 3:1 aspect ratio or greater) or by ISO Method 10312. Depending on the specific sampling locations and purpose, some samples may be submitted for TEM analyses concurrently with the PCM analyses, while others may be performed later based on the PCM results. AHERA TEM analyses will be analyzed with a rush (24 hours or less) turn-around time. If performed, ISO 10312 TEM analyses will be performed as soon as possible based on the specific conditions of the sample (same-day if possible).

-- If any air filter is overloaded with dust, it may be subjected to an indirect preparation method (e.g., ISO 13794) prior to TEM analysis.

-- Particulate monitors (DustTraks and DataRAMs) will be stationed at fixed locations near the location of the warehouse and at downwind locations to monitor for airborne particulates.

-- Air samples will be collected daily until EPA determines that it is no longer needed. Currently, daily air monitoring and sampling is expected to continue through Sunday, May 21.

-- If suspect building material or debris is encountered, bulk grab samples may be collected for asbestos analysis by Polarized Light Microscopy (PLM) in accordance with EPA method 600/R-93/116. Bulk samples will be collected using wet techniques (i.e., sprayed with water prior to handling) to minimize fiber release.

-- Air filter cassettes for PCM and TEM analyses and bulk samples for PLM will be submitted to LabCor Portland, Inc., in Portland, Oregon.

-- One blank air filter cassette will be submitted for each batch of air samples.

13. Applicability of Data (place an X in front of the data categories needed, explain with comments)

Do the decisions to be made from the data require that the analytical data be:
1) definitive data, 2) screening data (with definitive confirmation) or 3) screening data (without definitive confirmation)?

__X__ ***A) Definitive data*** *is analytical data of sufficient quality for final decision-making. To produce definitive data on-site or off-site, the field or lab analysis will have passed full Quality Control (QC) requirements (continuing calibration checks, Method Detection Limit (MDL) study, field duplicate samples, field blank, matrix spikes, lab duplicate samples, and other method-specific QC such as surrogates) AND the analyst will have passed a Precision and Recovery (PAR) study AND the instrument will have a valid Performance Evaluation sample on file. This category of data is suitable for:* ***1) enforcement purposes, 2) determination of extent of contamination, 3) disposal, 4) RP verification or 5) cleanup confirmation.***
Comments: Air sampling for asbestos will be submitted to an off-site fixed laboratory for analysis.

___ ***B) Screening data with definitive confirmation*** *is analytical data that may be used* ***to support preliminary or intermediate decision-making*** *until confirmed by definitive data. However, even after confirmation, this data is often not as precise as definitive data. To produce this category of data, the analyst will have passed a PAR study to determine analytical error AND 10% of the samples are split and analyzed by a method that produced definitive data with a minimum of three samples above the action level and three samples below it.*
Comments:

_X__ ***C) Screening data*** *is analytical data which has not been confirmed by definitive data. The QC requirements are limited to an MDL study and continuing calibration checks. This data can be used for making decisions:* ***1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants****. This data is not of sufficient quality for final decision-making.*
Comments: Air monitoring will be conducted utilizing DustTraks and DataRAMs

14. Special Sampling or Analysis Directions

Air monitoring equipment will be calibrated as required by accepted guidance.

24-hour or less turnaround time will be requested for asbestos air samples.

15. Method Requirements

Methods must achieve lower quantitation limits of at least the action levels.

16. Sample Collection Information

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:
Field Activity Logbook SOP
Sample Packaging and Shipping SOP
Sampling Equipment Decontamination SOP
Site entry
Instrument Quick Start Guides: PID/FID Quick Start Guide
DataRAM 4 Quick Start Guide
DustTrak Quick Start Guide

17. Optimization of Sampling Plan (Maximizing Data Quality While Minimizing Time and Cost)

The format for sample number identification is summarized in Table 1. Sample collection and analysis information is summarized in Table 2.

Table 1
SAMPLE CODING

Project Name: North Portland Warehouse Fire **Site ID:** _____

SAMPLE NUMBER [1]		
Digits	**Description**	**Code (Example)**
1,2,3,4	Year and Month Code	1705 (YYMM)
5,6,7,8	Consecutive Sample Number (grouped by SA as appropriate)	0001 (First sample of SA)

SAMPLE NAME / LOCATION ID [2] ***(Optional)***		
1,2	Sampling Area	AS – Stationary Air Sample PS – Personal Sample BL – Bulk Building / Debris Sample
3,4	Consecutive Sample Number	01 – First sample of Sampling Area
5,6	Matrix Code	AR – Air QC – Quality Control WT – Water

Notes:
(1) The Sample Number is a unique, 8-digit number assigned to each sample.
(2) The Sample Name or Location ID is an optional identifier that can be used to further describe each sample or sample location.

Table 2. Sampling and Analysis

Data Quality	Sampling Area	Matrix	Sampling Pattern	Sample Type	Data Quality	Number of Field Samples	Analyte or Parameter	Method Number	Action Level	Method Quant. Limit	#/type of Sample Containers per Sample	Preservative	Hold Time	Field QC
Field Screening: Dust Monitoring	All Decision Areas	Air	Targeted	Grab	Screening	TDB	Airborne Particulates	Instrument Quick Start Guide	Background	0.1 $\mu g/m^3$	N/A	N/A	N/A	N/A
Lab Analysis: PCM	All Decision Areas	Air	Targeted	Grab	Definitive	< 15 daily	Asbestos and other particulates	NIOSH 7400	0.01 f/cc	100 $fibers/mm^2$	1 x 0.8 µm MCE filter cassette	N/A	N/A	Blank
Lab Analysis: AHERA TEM	All Decision Areas	Air	Targeted	Grab	Definitive	< 15 daily	Asbestos and other particulates	Modified AHERA	0.01 f/cc	0.0003 structures/cc (depending on volume)	1 x 0.8 µm MCE filter cassette	N/A	N/A	Blank
Lab Analysis: ISO TEM	All Decision Areas	Air	Targeted	Grab	Definitive	< 15 daily	Asbestos and other particulates	ISO 10312	0.01 f/cc	0.0003 structures/cc (depending on volume)	1 x 0.8 µm MCE filter cassette	N/A	N/A	Blank
Lab Analysis: PLM	All Decision Areas	Bulk	Targeted	Grab	Definitive	15	Asbestos	EPA 600/R-93/116	present	<1%	1 x plastic resealable bag	N/A	N/A	N/A

Note: For matrix spike and/or duplicate samples, no extra volume is required for air (unless co-located samples are collected), oil, product, or soil samples except soil VOC or NWTPH-Gx samples (triple volume). Triple volume is also required for organic water samples (double volume for inorganic).

Table 3. Common Sample Handling Information

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Metals	Metals Not including Mercury or Hexavalent chromium. Includes TAL, PP, RCRA lists)	Solid	EPA 6000 / 7000 Series	Glass Jar	200 g	n/a	None	6 months	SW-846 ch. 3
		Aqueous	EPA 6000 / 7000 Series	PTFE or HDPE	600 mL	HNO_3 to pH < 2	Not listed	6 months	SW-846 ch. 3
	Mercury	Solid	EPA 7471B	Glass Jar	200 g	n/a	$\leq 6^{o}$ C	28 days	SW-846 ch. 3
		Aqueous	EPA 7470A	PTFE or HDPE	400 mL	HNO_3 to pH < 2	Not listed	28 days	SW-846 ch. 3
	Hexavalent Chromium, (Hexachrome, Cr+6)	Solid	Lab-specific soil extraction modification, EPA 7196A	Glass Jar	100 g	n/a	$\leq 6^{o}$ C	28 days to extraction	SW-846 ch. 3
		Aqueous	EPA 218.6 (Drinking Water)	PTFE or HDPE	400 mL	n/a	$\leq 6^{o}$ C	24 hours	SW-846 ch. 3
	XRF	Solid (in situ; on the ground surface)	6200	none	n/a	none	none	Analyze Immediately	n/a
		Solid (ex situ)	6200	plastic bag	200 g	none	none	6 months	n/a
VOCs	VOCs / BTEX	Solid	EPA 5035 / 8260B	*	*	*	*	2 days to lab / 14 days	SW-846 ch. 4
		Aqueous	EPA 8260B	Amber Vial with Septa Lid	2 x 40 mL	HCl to pH< 2	$\leq 6^{o}$ C (headspace free)	14 days	SW-846 ch. 4
SVOCs	SVOCs / PAHs	Solid	EPA 8270D	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	14 days	SW-846 ch. 4
		Aqueous	EPA 8270D	Amber Glass	2 x 1 L	n/a	$\leq 6^{o}$ C	7 days	SW-846 ch. 4
PCBs and Dioxins/Furans	PCBs	Solid	EPA 8082	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	none	SW-846 ch. 4
		Aqueous	EPA 8082	Amber Glass	2 x 1 L	n/a	$\leq 6^{o}$ C	none	SW-846 ch. 4
	Dioxins/Furans	Solid	EPA 8280 or 8290	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	none	SW-846 ch. 4
		Aqueous	EPA 8280 or 8290	Amber Glass	2 x 1 L	n/a	$\leq 6^{o}$ C	none	SW-846 ch. 4
Pesticides and Herbicides	Chlorinated Pesticides	Solid	EPA 8081	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	14 days	SW-846 ch. 4
		Aqueous	EPA 8081	Amber Glass	2 x 1 L	n/a	$\leq 6^{o}$ C	7 days	SW-846 ch. 4
	Chlorinated Herbicides	Solid	EPA 8151	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	14 days	SW-846 ch. 4
		Aqueous	EPA 8151	Amber Glass	2 x 1 L	n/a	$\leq 6^{o}$ C	7 days	SW-846 ch. 4
NWTPH	Gasoline-Range Organics	Solid	TPHs/NWTPH-Gx	Amber Glass Jar with Septa Lid	4 ounces	n/a	$\leq 6^{o}$ C (headspace free)	14 days	Method
		Aqueous	TPHs/NWTPH-Gx	Amber Vial with Septa Lid	2 x 40 mL	pH < 2 with HCl	$\leq 6^{o}$ C (headspace free)	7 days unpreserved 14 days preserved	Method
	Diesel-Range Organics	Solid	3510, 3540/3550, 8000	Glass Jar	8 ounces	n/a	$\leq 6^{o}$ C	14 days	Method
		Aqueous	3510, 3540/3550,	Glass Amber	2 x 1 L	pH < 2 with HCl	$\leq 6^{o}$ C	7 days unpreserved 14 days preserved	Method

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
			8000						
Geotechnical	Particle Size Analysis	Solid	ASTM D-422	Glass Jar or Plastic Bag	2 x 8 ounce	none	n/a	n/a	Method
Miscellaneous	pH	Solid	EPA 9045	Glass Jar	8 ounces	n/a	n/a	Analyze Immediately	SW-846 ch. 3
		Aqueous	EPA 9040C	PTFE	25 mL	n/a	n/a	Analyze Immediately	SW-846 ch. 3
	Total Organic Carbon (TOC)	Solid	SW-846 9060	Glass Jar	100 mL	n/a	$\leq 6^{o}$ C	28 days	SW-846
		Aqueous	EPA 415.1	PTFE or HDPE	200 mL	store in dark HCL or H_2SO_4 to pH <2	$\leq 6^{o}$ C	7 days unpreserved 28 days preserved	Method
	Cyanide	Solid	SW-846 9013	Glass Jar	5 g	n/a	$\leq 6^{o}$ C	14 days	SW-846 ch. 3
		Aqueous	SW-846 9010C	PTFE or HDPE	500 mL	NaOH to pH > 12	$\leq 6^{o}$ C	14 days	SW-846 ch. 3
	Conductivity	Aqueous	EPA 120.1	PTFE or HDPE	100 mL	n/a	n/a	Analyze Immediately	Method
	Hardness	Aqueous	EPA 130.1	PTFE or HDPE	1 x 1 L	HNO3 to pH<2	$\leq 6^{o}$ C	28 days	Method
	Flash Point	Aqueous	EPA 1010A or 1020B	Glass Jar	2 x 250 mL	n/a	$\leq 6^{o}$ C	n/a	Method
	Total Suspended Solids	Aqueous	EPA 160.2	PTFE or HDPE	100 mL	n/a	$\leq 6^{o}$ C	7 days	Method
	Total Dissolved Solids	Aqueous	EPA 160.1	PTFE or HDPE	100 mL	n/a	$\leq 6^{o}$ C	7 days	Method
	Nitrate/nitrite	Aqueous	EPA 353.2	PTFE or HDPE	1 x 250 mL	H_2SO_4 to pH <2	$\leq 6^{o}$ C	28 days	Method
	Nitrate	Aqueous	SW-846 9210A	PTFE or HDPE	1,000 mL	n/a	$\leq 6^{o}$ C	28 days	SW-846 ch. 3
	Nitrite	Aqueous	SW-846 9216	PTFE or HDPE	25 mL	n/a	$\leq 6^{o}$ C	48 hours	SW-846 ch. 3, Method
	Fluoride	Aqueous	SW-846 9214	PTFE or HDPE	300 mL	n/a	$\leq 6^{o}$ C	28 days	SW-846 ch. 3
	Chloride	Aqueous	SW-846 9250	PTFE or HDPE	50 mL	n/a	$\leq 6^{o}$ C	28 days	SW-846 ch. 3
	Sulfate	Aqueous	SW-846 9035	PTFE or HDPE	50 mL	n/a	$\leq 6^{o}$ C	28 days	SW-846 ch. 3
	Sulfide	Solid	SW-846 9215	Glass Jar	1 x 4 ounces	Fill sample surface with 2N zinc acetate until moistened.	$\leq 6^{o}$ C (headspace free)	7 days	SW-846 ch. 3
		Aqueous	SW-846 9031	PTFE or HDPE	100 mL	4 drops 2N zinc acetate/100 mL sample; NaOH to pH>9.	$\leq 6^{o}$ C (headspace free)	7 days	SW-846 ch. 3

Key:

*	= See individual methods. We typically collect 3xEnCore-type samplers and 1x40 mL VOA vial per sample, keep at $\leq 6^{o}$C with no chemical preservative, and they must be at the lab within 48 hours of collection.				
C	= Celsius	HNO_3	= nitric acid	SVOCs	= semivolatile organic compounds
Cr	= chromium	L	= liter	SW-846	= EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
EPA	= Environmental Protection Agency	mL	= milliliter	TAL	= Target Analyte List
g	=grams	n/a	= not applicable	TPH	= total petroleum hydrocarbons
H2SO4	= sulfuric acid	NaOH	= sodium hydroxide	VOA	= Volatile Organic Analysis
HCL	= hydrochloric acid	PCBs	= polychlorinated biphenyls	VOCs	= Volatile Organic Compounds
HDPE	= high-density polyethylene	PTFE	= polytetrafluoroethylene		
Hg	= mercury	RCRA	= Resource Conservation and Recovery Act		

III. Assessment and Response

A Sample Plan Alteration Form (SPAF) will be used to describe project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work. The completed SPAF will be approved by the OSC and QAC and appended to the original SSSP.

A Field Sampling Form (FSF) may be used to capture the sampling and analysis scheme for emergency responses in the field and then the FSF pages can be inserted into the appropriate areas of the final SSSP.

Corrective actions will be assessed by the sampling team and others involved in the sampling and a corrective action report describing the problem, solution, and recommendations will be forwarded to the OSC and the EMP QAC.

IV. Data Validation and Usability

The sample collection data will be entered into Scribe and Scribe will be used to print lab Chains of Custody. Results of field and lab analyses will be entered into Scribe as they are received and uploaded to Scibe.net when the sampling and analysis has been completed.

18. Data Validation or Verification will be performed by:

EMP's general recommendation on validation is that a minimum of CLP-equivalent stage IIA verification and validation be performed for every SSSP involving laboratory analyses. However, stage IIB is preferred if the lab can provide it. Dioxins should be validated at CLP-equivalent stage 4.

	Data Verification and Validation Stages						
Performed by:	I	IIA	IIB	III	IV	Verification	Other:
E and E QA Reviewer			100% Fixed Lab		10% Fixed Lab		
EPA Region 10 QA Office							
MEL staff							
Other:							

The following qualifiers shall be used in data validation:

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

JH - The result is an estimated quantity, but the result may be biased high.

JL - The result is an estimated quantity, but the result may be biased low.

JK - The result is an estimated quantity, but the result may have an unknown bias.

JQ - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

N

0 0.25 0.5 Miles

Figure 1

Site Location

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY MANAGEMENT PROGRAM

Site Specific Sampling Plan

Project Name: ___River Street Warehouse Fire_____Site ID: _____

Author: __Dale Becker_____ Company:___EPA_____. Date Completed: _5/21/2017_____

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan (QAP) for the Emergency Management Program for collecting samples during this Removal Program project. The information contained herein is based on the information available at the time of preparation. As better information becomes available, this SSSP will be adjusted.

When inadequate time is available for preparing the SSSP in advance of the sampling event, a Field Sampling Form may be prepared on-site immediately prior to sampling. This full length version of the SSSP is written after the sampling event and the completed Field Sampling Form attached to it.

1. Approvals

Name, Title	Telephone, Email, Address	Signature
Randy Nattis **On-Scene Coordinator**	503-628-9419 Nattis.randy@epa.gov	
Kathy Parker **EMP Quality Assurance Coordinator**	206-553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	

I. Project Management and Organization

2. Personnel and Roles involved in the project:

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Randy Nattis	503-628-9419 Nattis.randy@epa.gov	On Scene Coordinator	Yes
Dale Becker	206-553-6235 Becker.dale@epa.gov	Author of SSSP, START Project Manager	Yes
Kathy Parker	206 553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	EMP Quality Assurance Coordinator	No
Mark Woodke	206-624-9537, mwoodke@ene.com, E & E 720 Third Ave, Suite 1700 Seattle, WA 98104	START Quality Assurance Reviewer	Yes
Julie Wroble	206-553-1079, wroble.julie@epa.gov, USEPA , OEA-140, 1200 Sixth Ave. Seattle, WA 98101	Toxicologist	Yes

John Harris	206-781-0155, jharris@labcor.net, LabCor 4321 Corbett Ave Suite A, Portland, OR 97239	Laboratory contact	No

3. Physical Description and Site Contact Information:

Site Name	River Street Warehouse Fire	
Site Location	(reference Figure 1, if appropriate)	
Property Size	(reference Figure 2, if appropriate)	
Site Contact	Dale Becker	**Phone Number: 205-718-6257**
Nearest Residents		**Direction:**
Primary Land Uses Surrounding the Site	Mixed residential/commercial	

4. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	5/21/2017	5/21/2017	
Mobilize to / Demobilize from Site	5/16/2017	5/30/2017	
Sample Collection	5/22/2017	5/25/2017	
Laboratory Sample Receipt	5/22/2107	5/25/2017	
Laboratory Analysis	5/23/2017	5/25/2017	24 hour
Data Validation	5/25/2017	5/30/2017	

5. Historical and Background Information

Describe briefly what you know about the site that is relevant to sampling and analysis for this investigation.

At approximately 2200 PDT on Sunday, 14 May 2017, a fire broke out at a warehouse in North Portland, 1300 North River Road. The warehouse is located on the northern bank of the Willamette River and is constructed on wood pilings partly over the river. No one was injured in the fire. The building had a history of safety and other violations and the building owner has no insurance and does not have the financial means to address the situation. Wind-blown ash and debris have been found southwest of the river, in a densely populated residential area consisting of mostly multi-story buildings. Fire crews have been on the scene since the fire started and continue to address hot spots.

The Oregon Department of Environmental Quality (ODEQ) conducted a preliminary assessment of the warehouse and nearby properties on Monday, 15 May 2017 and determined that the roofing paper contains 90% chrysotile asbestos. The roofing paper is significantly deteriorated and friable when touched. ODEQ has requested EPA assistance in conducting air monitoring, surveying the area for debris, and addressing mixed asbestos contamination at the warehouse and the debris deposited in the residential area across the river. Six bulk samples of debris deposited in the city were sampled by ODEQ on 5/20/2017; PLM analysis results confirmed initial results indicating 60% Chrysotile.

6. Conceptual Site Model

Example: Contaminant: Mercury
Transport Mechanism: vapor moving on air currents
Receptors: people living in the house

Contaminants: Chrysotile asbestos

Transport Mechanisms: asbestos fibers disturbed by surface disturbing activities resulting in air transport. Typical activities that will occur in outdoor spaces where debris was deposited may include

mowing lawns, raking, or sweeping hard surfaces.

Receptors: Workers at the site, passersby, and nearby residents or commercial workers

7. Decision Statement

Examples: 1) Determine whether surface contamination exceeds the established action level;
2) Determine appropriate disposal options for contaminated materials.

The decision(s) to be made from this investigation is/are to:

Determine if areas where ACM debris has been picked up pose an unacceptable risk to human health when routine yard maintenance or cleaning activities are simulated.

Determine if areas where ACM debris is present pose an unacceptable risk to human health when routine yard maintenance or cleaning activities are simulated

8. Action Level

State the analyte, concentration, and units for each selected action level. Describe the rationale for choosing each action level and its source (i.e. MTCA, PRG, ATSDR, etc.) Example: The action level for total mercury in soil is 6.7 mg/kg (from Regional Screening Level residential).

A risk evaluation will be completed using the data generated.

For the purposes of this sampling activity, an analytical sensitivity of 0.003 structures per cubic centimeter (s/cc) is recommended for personal samples. An analytical sensitivity of 0.001 s/cc is recommended for stationary samples set up on the perimeter.

II. Data Acquisition and Measurement Objectives

9. Site Diagram and Sampling Areas

A Sampling Area is an area within in which a specific action will be performed.
Examples : 1) Each drum on the site is a Sampling Area;
2) Each section of sidewalk in front of the residence is a Sampling Area;
3) Each sampling grid section is a Sampling Area.

Ira Keller Fountain Park – post clean-up activity site
Second site location to be determined at a location that represents pre clean-up conditions.

The site diagram is the attached Figure 2.

10. The Decision Rules

These can be written as logical If…, Then.. statements. Describe how the decisions will be made and how to address results falling within the error range of the action level. Examples: 1) In the Old Furnace Sampling Area, the soil in the area around the furnace structure will be excavated until sample analysis with XRF shows no mercury concentrations in surface soil above the lower limit of the error associated with the action level, 18.4 mg/kg. 2) If the concentrations of contaminants in a SA are less than the lower limit of the error associated with the action level, then the area may be characterized as not posing an unacceptable risk to human health or the environment and may be dismissed from additional RP activities. The area may be referred to other Federal, State or Local government agencies.

The following statement(s) describe the decision rules to apply to this investigation:

If the results of activity-based sampling indicate an increased health risk, then EPA will consider additional options to investigate and/or recommend additional steps to protect the public from potential exposure to ACM debris.

11. Information Needed for the Decision Rule

What information needs to be collected to make the decisions – this includes non-sampling info as well: action levels, climate history, direction of water flow, etc. Examples: Current and future on-site and off-site land use; wind direction, humidity and ambient temperature; contaminant concentrations in surface soil.

The following inputs to the decision are necessary to interpret the analytical results:

Each participant in activity based sampling will wear 2 air sampling pumps.
1 high flow (HF) SKC pump set to 4 LPM.
1 low flow (LF) SKC pump set to 2 LPM.

Both will run for a sampling period of 2 hours.

For each participant, the 2 samples will be evaluated and/or analyzed according to the following procedure:
If the HF sample is not overloaded, it will be analyzed directly by ISO 10312 24-hour TAT.
If the HF sample is overloaded, determine whether the LF is overloaded. If not, the LF sample will be analyzed directly by ISO 10312 (24-hour TAT).
If both are overloaded, analyze the HF sample by 10394 (indirect method) with 24-hour TAT.

A 25% overloading criteria will be used versus the normal 10% overload criteria for the ISO 10312 method.

12. Sampling and Analysis

For each SA, describe:

1. *sampling pattern (random, targeted, scheme for composite)*
2. *number of samples, how many to be collected from where, and why*
3. *sample type (grab, composite)*
4. *matrix (air, water, soil)*
5. *analytes and analytical methods*
6. *name and locations of off-site laboratories, if applicable.*

Methods from ERT SOP 2084 "Activity Based Air Sampling for Asbestos"

- Flow rate from 2 to 4 L/min (approximately 240 to 480 L) is collected for the low-flow and high-flow samples, respectively
- Samples will be collected for a 120-minute duration. Samplers will rake soil surface or sweep hard surface for 15 minutes then walk the area for 15 minutes alternating until the sample duration has completed.
- Two samplers, each wearing two SKC or similar personal sample pumps. One pump should be calibrated for low volume, one for high volume.
- Upwind and downwind stationary air samples will be collected

13. <u>Applicability of Data</u> <u>(place an X in front of the data categories needed, explain with comments)</u>

Do the decisions to be made from the data require that the analytical data be:
1) definitive data, 2) screening data (with definitive confirmation) or 3) screening data (without definitive confirmation)?

*_x __**A) Definitive data** is analytical data of sufficient quality for final decision-making. To produce definitive data on-site or off-site, the field or lab analysis will have passed full Quality Control (QC) requirements (continuing calibration checks, Method Detection Limit (MDL) study, field duplicate samples, field blank, matrix spikes, lab duplicate samples, and other method-specific QC such as surrogates) AND the analyst will have passed a Precision and Recovery (PAR) study AND the instrument will have a valid Performance Evaluation sample on file. This category of data is suitable for: **1) enforcement purposes, 2) determination of extent of contamination, 3) disposal, 4) RP verification or 5) cleanup confirmation.***
Comments: This data is going to be used to direct additional site activities.

***___B) Screening data with definitive confirmation** is analytical data that may be used **to support preliminary or intermediate decision-making** until confirmed by definitive data. However, even after confirmation, this data is often not as precise as definitive data. To produce this category of data, the analyst will have passed a PAR study to determine analytical*

error AND 10% of the samples are split and analyzed by a method that produced definitive data with a minimum of three samples above the action level and three samples below it.
Comments:

___***C) Screening data*** *is analytical data which has not been confirmed by definitive data. The QC requirements are limited to an MDL study and continuing calibration checks. This data can be used for making decisions:* ***1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants****. This data is not of sufficient quality for final decision-making.*
Comments:

14. Special Sampling or Analysis Directions

Describe any special directions for the planned sampling and analysis such as additional quality controls or sample preparation issues. Examples: 1) XRF and Lumex for sediment will be calibrated before each day of use and checked with a second source standard. 2) A field blank will be analyzed with each calibration to confirm the concentration of non-detection. 3) A Method Detection Limit determination will be performed prior to the start of analysis so that the lower quantitation limit can be determined. 4) If particle size is too large for accurate analyses, the samples will be ground prior to analysis. If the sample contains too much moisture for accurate analyses, the sample will be decanted and air dried prior to analysis.

Maximize the area disturbed during activity provided at least a ten-foot buffer can be maintained between activity sampling area and the perimeter.

15. Method Requirements

[Describe the restrictions to be considered in choosing an analytical method due to the need to meet specific regulations, policies, ARARs, and other analytical needs. Examples: 1) Methods must meet USEPA Drinking Water Program requirements. 2) Methods must achieve lower quantitation limits of less than 1/10 the action levels.3) Methods must be performed exactly as written without modification by the analytical laboratory.]

16. Sample Collection Information

[Describe any activities that will be performed related to sample collection]

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:
Field Activity Logbook SOP
Sample Packaging and Shipping SOP
Sampling Equipment Decontamination SOP
Instrument SOPs:
Other SOPs:

17. Optimization of Sampling Plan (Maximizing Data Quality While Minimizing Time and Cost)

[Describe what choices were made to reduce cost of sampling while meeting the needed level of data quality. Example: The XRF will be used in situ whenever possible to achieve accurate results. Reproducibility and accuracy of in situ XRF analyses will be checked by collecting, air drying, analyzing and comparing five in situ samples at the start of sampling. Where interferences are suspected, steps will be taken to eliminate the interferences by mechanisms such as drying, grinding or sieving the samples or analyzing them using the Lumex with soil attachment.]

The format for sample number identification is summarized in Table 1. Sample collection and analysis information is summarized in Table 2.

Table 1
SAMPLE CODING

Project Name: _____ **Site ID:** _____

SAMPLE NUMBER [1]		
Digits	**Description**	**Code (Example)**
1,2,3,4	Year and Month Code	1705 (YYMM)
5,6,7,8	Consecutive Sample Number (grouped by SA as appropriate)	0001 (First sample of SA)

SAMPLE NAME / LOCATION ID [2] ***(Optional)***		
1,2	Sampling Area	AS - Stationary Air Sample PS - Personal Sample BL - Bulk Building /Debris Sample AB – Activity Based Sampling
3,4	Consecutive Sample Number	01 – First sample of Sampling Area
5,6	Matrix Code	AR – Air GW – Groundwater PR – Product SB – Subsurface Soil SD – Sediment SS – Surface Soil SW – Surface Water QC – Quality Control WT – Water
7,8	Depth (Optional)	01 (feet below ground surface)

Notes:
(1) The Sample Number is a unique, 8-digit number assigned to each sample.
(2) The Sample Name or Location ID is an optional identifier that can be used to further describe each sample or sample location.

Table 2. Sampling and Analysis

Data Quality	Sampling Area	Matrix	Sampling Pattern	Sample Type	Data Quality	Number of Field Samples	Analyte or Parameter	Method Number	Action Level	Method Quant. Limit	#/type of Sample Containers per Sample	Preservative	Hold Time	Field QC
Lab Analysis: ISO TEM	Activity Based Sampling	Air	Targeted	Grab	Definitive	6	Asbestos	ISO 10312	0.01 s/cc	0.001 s/cc	1 x 0.8 µm MCE filter cassette	N/A	N/A	Blank

Note: For matrix spike and/or duplicate samples, no extra volume is required for air (unless co-located samples are collected), oil, product, or soil samples except soil VOC or NWTPH-Gx samples (triple volume). Triple volume is also required for organic water samples (double volume for inorganic).

Table 3. Common Sample Handling Information

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Metals	Metals Not including Mercury or Hexavalent chromium. Includes TAL, PP, RCRA lists)	Solid	EPA 6000 / 7000 Series	Glass Jar	200 g	n/a	None	6 months	SW-846 ch. 3
		Aqueous	EPA 6000 / 7000 Series	PTFE or HDPE	600 mL	HNO_3 to pH < 2	Not listed	6 months	SW-846 ch. 3
	Mercury	Solid	EPA 7471B	Glass Jar	200 g	n/a	≤ 6° C	28 days	SW-846 ch. 3
		Aqueous	EPA 7470A	PTFE or HDPE	400 mL	HNO_3 to pH < 2	Not listed	28 days	SW-846 ch. 3
	Hexavalent Chromium, (Hexachrome, Cr+6)	Solid	Lab-specific soil extraction modification, EPA 7196A	Glass Jar	100 g	n/a	≤ 6° C	28 days to extraction	SW-846 ch. 3
		Aqueous	EPA 218.6 (Drinking Water)	PTFE or HDPE	400 mL	n/a	≤ 6° C	24 hours	SW-846 ch. 3
	XRF	Solid (in situ; on the ground surface)	6200	none	n/a	none	none	Analyze Immediately	n/a
		Solid (ex situ)	6200	plastic bag	200 g	none	none	6 months	n/a
VOCs	VOCs / BTEX	Solid	EPA 5035 / 8260B	*	*	*	*	2 days to lab / 14 days	SW-846 ch. 4
		Aqueous	EPA 8260B	Amber Vial with Septa Lid	2 x 40 mL	HCl to pH< 2	≤ 6° C (headspace free)	14 days	SW-846 ch. 4
SVOCs	SVOCs / PAHs	Solid	EPA 8270D	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8270D	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
PCBs and Dioxins/Furans	PCBs	Solid	EPA 8082	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8082	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
	Dioxins/Furans	Solid	EPA 8280 or 8290	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8280 or 8290	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
Pesticides and Herbicides	Chlorinated Pesticides	Solid	EPA 8081	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8081	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
	Chlorinated Herbicides	Solid	EPA 8151	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8151	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
NWTPH	Gasoline-Range Organics	Solid	TPHs/NWTPH-Gx	Amber Glass Jar with Septa Lid	4 ounces	n/a	≤ 6° C (headspace free)	14 days	Method
		Aqueous	TPHs/NWTPH-Gx	Amber Vial with Septa Lid	2 x 40 mL	pH < 2 with HCl	≤ 6° C (headspace free)	7 days unpreserved 14 days preserved	Method
	Diesel-Range Organics	Solid	3510, 3540/3550, 8000	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	Method

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
		Aqueous	3510, 3540/3550, 8000	Glass Amber	2 x 1 L	pH < 2 with HCl	≤ 6º C	7 days unpreserved 14 days preserved	Method
Geotechnical	Particle Size Analysis	Solid	ASTM D-422	Glass Jar or Plastic Bag	2 x 8 ounce	none	n/a	n/a	Method
Miscellaneous	pH	Solid	EPA 9045	Glass Jar	8 ounces	n/a	n/a	Analyze Immediately	SW-846 ch. 3
		Aqueous	EPA 9040C	PTFE	25 mL	n/a	n/a	Analyze Immediately	SW-846 ch. 3
	Total Organic Carbon (TOC)	Solid	SW-846 9060	Glass Jar	100 mL	n/a	≤ 6º C	28 days	SW-846
		Aqueous	EPA 415.1	PTFE or HDPE	200 mL	store in dark HCL or H_2SO_4 to pH <2	≤ 6º C	7 days unpreserved 28 days preserved	Method
	Cyanide	Solid	SW-846 9013	Glass Jar	5 g	n/a	≤ 6º C	14 days	SW-846 ch. 3
		Aqueous	SW-846 9010C	PTFE or HDPE	500 mL	NaOH to pH > 12	≤ 6º C	14 days	SW-846 ch. 3
	Conductivity	Aqueous	EPA 120.1	PTFE or HDPE	100 mL	n/a	n/a	Analyze Immediately	Method
	Hardness	Aqueous	EPA 130.1	PTFE or HDPE	1 x 1 L	HNO3 to pH<2	≤ 6º C	28 days	Method
	Flash Point	Aqueous	EPA 1010A or 1020B	Glass Jar	2 x 250 mL	n/a	≤ 6º C	n/a	Method
	Total Suspended Solids	Aqueous	EPA 160.2	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Total Dissolved Solids	Aqueous	EPA 160.1	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Nitrate/nitrite	Aqueous	EPA 353.2	PTFE or HDPE	1 x 250 mL	H_2SO_4 to pH <2	≤ 6º C	28 days	Method
	Nitrate	Aqueous	SW-846 9210A	PTFE or HDPE	1,000 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Nitrite	Aqueous	SW-846 9216	PTFE or HDPE	25 mL	n/a	≤ 6º C	48 hours	SW-846 ch. 3, Method
	Fluoride	Aqueous	SW-846 9214	PTFE or HDPE	300 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Chloride	Aqueous	SW-846 9250	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfate	Aqueous	SW-846 9035	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfide	Solid	SW-846 9215	Glass Jar	1 x 4 ounces	Fill sample surface with 2N zinc acetate until moistened.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3
		Aqueous	SW-846 9031	PTFE or HDPE	100 mL	4 drops 2N zinc acetate/100 mL sample; NaOH to pH>9.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3

Key:

*	= See individual methods. We typically collect 3xEnCore-type samplers and 1x40 mL VOA vial per sample, keep at ≤ 6ºC with no chemical preservative, and they must be at the lab within 48 hours of collection.				
C	= Celsius	HNO_3	= nitric acid	SVOCs	= semivolatile organic compounds
Cr	= chromium	L	= liter	SW-846	= EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
EPA	= Environmental Protection Agency	mL	= milliliter	TAL	= Target Analyte List
g	=grams	n/a	= not applicable	TPH	= total petroleum hydrocarbons
H2SO4	= sulfuric acid	NaOH	= sodium hydroxide	VOA	= Volatile Organic Analysis
HCL	= hydrochloric acid	PCBs	= polychlorinated biphenyls	VOCs	= Volatile Organic Compounds
HDPE	= high-density polyethylene	PTFE	= polytetrafluoroethylene		
Hg	= mercury	RCRA	= Resource Conservation and Recovery Act		

III. Assessment and Response

A Sample Plan Alteration Form (SPAF) will be used to describe project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work. The completed SPAF will be approved by the OSC and QAC and appended to the original SSSP.

A Field Sampling Form (FSF) may be used to capture the sampling and analysis scheme for emergency responses in the field and then the FSF pages can be inserted into the appropriate areas of the final SSSP.

Corrective actions will be assessed by the sampling team and others involved in the sampling and a corrective action report describing the problem, solution, and recommendations will be forwarded to the OSC and the EMP QAC.

IV. Data Validation and Usability

The sample collection data will be entered into Scribe and Scribe will be used to print lab Chains of Custody. Results of field and lab analyses will be entered into Scribe as they are received and uploaded to Scibe.net when the sampling and analysis has been completed.

18. Data Validation or Verification will be performed by:

EMP's general recommendation on validation is that a minimum of CLP-equivalent stage IIA verification and validation be performed for every SSSP involving laboratory analyses. However, stage IIB is preferred if the lab can provide it. Dioxins should be validated at CLP-equivalent stage 4.

	Data Verification and Validation Stages						
Performed by:	I	IIA	IIB	III	IV	Verification	Other:
E and E QA Reviewer			100% Fixed Lab		10% Fixed Lab		
EPA Region 10 QA Office							
MEL staff							
Other:							

Data validation should be performed consistent with **TEM VALIDATION PROCESS GUIDELINES For Asbestos Data Review (October 2016)**

The following qualifiers shall be used in data validation:

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

JH - The result is an estimated quantity, but the result may be biased high.

JL - The result is an estimated quantity, but the result may be biased low.

JK - The result is an estimated quantity, but the result may have an unknown bias.

JQ - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.

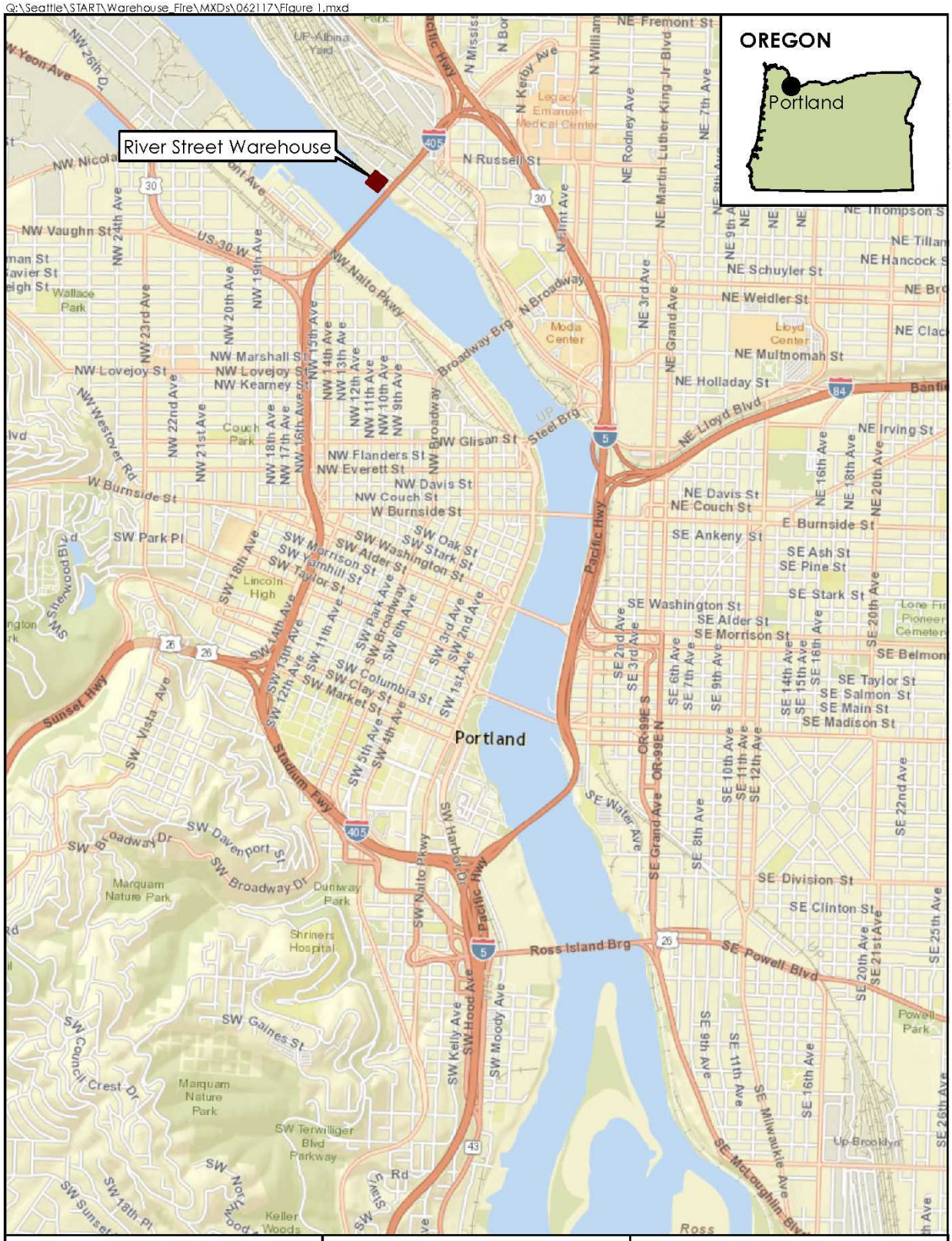
NJ - The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.

UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

C - The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatograph/ Mass Spectrometer (GC/MS).

Q:\Seattle\START\Warehouse_Fire\MXDs\062117\Figure 1.mxd



ecology and environment, inc.
Global Environmental Specialists

River Street Warehouse Fire
Portland, Oregon

0 1,000 2,000 Feet

Figure 1.
Project Location

Date: 6/22/2017

Drawn by: N.H.

Figure 2

SW Columbia St
SW 3rd Ave
SW 5th Ave
SW Clay St
Koin Center
AS12
SW Market St
Keller Fountain Park
26
Keller Auditorium
SW 4th Ave
26
Market Center Building
X-Psu Urban
r-SW 5th & Mill
SW

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY MANAGEMENT PROGRAM

Site Specific Sampling Plan

Project Name: __River Street Warehouse Asbestos Removal Action__ Site ID: ____10QD_____

Author: _Rachel Locke_ Company: _E & E_ Date Completed: _9/20/17__

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan (QAP) for the Emergency Management Program for collecting samples during this Removal Program project. The information contained herein is based on the information available at the time of preparation. As better information becomes available, this SSSP will be adjusted.

When inadequate time is available for preparing the SSSP in advance of the sampling event, a Field Sampling Form may be prepared on-site immediately prior to sampling. This full length version of the SSSP is written after the sampling event and the completed Field Sampling Form attached to it.

1. Approvals

Name, Title	Telephone, Email, Address	Signature
Randy Nattis **On-Scene Coordinator**	503-628-9419, nattis.randy@epa.gov U.S. EPA Region X – Oregon Operations Office 805 SW Broadway, Suite 500, Portland, OR 97205	
Kathy Parker **EMP Quality Assurance Coordinator**	206-553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	

I. Project Management and Organization

2. Personnel and Roles involved in the project:

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Randy Nattis	503-628-9419, nattis.randy@epa.gov U.S. EPA Region X – Oregon Operations Office 805 SW Broadway, Suite 500, Portland, OR 97205	On Scene Coordinator	Yes
Steve Hall	206-920-1739, sghall@ene.com E&E, 2101 Third Ave Suite 1700 Seattle, WA 98104	START Removal Team Leader	Yes
Erin Lynch	(503) 201-8113, elynch@ene.com E&E, 333 SW 5th Ave Suite 600, Portland, OR 97204	START Project Manager	No

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Kathy Parker	206 553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-133, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	EMP Quality Assurance Coordinator	No
Mark Woodke	206-624-9537, mwoodke@ene.com, E & E 720 Third Ave, Suite 1700 Seattle, WA 98104	START Quality Assurance Reviewer	Yes
Robin Ray	856-303-2556 , rray@emsl.com EMSL Analytical, Inc., 200 Route 130 North, Cinnaminson, NJ 08077	Laboratory Contact	No

3. Physical Description and Site Contact Information:

Site Name	River Street Warehouse Asbestos Removal Action	
Site Location	1300 North River Road, Portland, Oregon	
Property Size	81,400 square foot parcel	
Site Contact	Randy Nattis	**Phone Number:** 503-628-9419
Nearest Residents	One quarter mile	**Direction:** South and Southwest
Primary Land Uses Surrounding the Site	Industrial land use including asphalt, concrete, copper works, railyard, and other mixed used commercial and industrial.	

4. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	9/20/17	9/22/17	
Mobilize to / Demobilize from Site	9/18/17	1/16/18	
Sample Collection	9/20/17	12/6/17	ACM removal activities are estimated to be completed by December 6, 2017; assume daily sampling until then.
Laboratory Sample Receipt	9/21/17	12/7/17	
Laboratory Analysis	9/22/17	12/8/17	24-Hour turn-around requested
Data Validation	9/25/17	12/15/17	

5. Historical and Background Information

At approximately 2200 PDT on Sunday, 14 May 2017, a fire broke out at a warehouse in North Portland, 1300 North River Road. The warehouse is located on the northern bank of the Willamette River and is constructed on wood pilings partly over the river. No one was injured in the fire. The building had a history of safety and other violations and the building owner had no insurance and did not have the financial means to address the situation. Wind-blown ash and debris were found southwest of the river, in a densely populated residential area consisting of mostly multi-story buildings. Fire crews were on the scene once the fire started and continued to address hot spots until the fire was out.

The Oregon Department of Environmental Quality (ODEQ) conducted a preliminary assessment of the warehouse and nearby properties on Monday, 15 May 2017 and determined that the roofing paper contained 90% chrysotile asbestos. The roofing paper was

significantly deteriorated and friable when touched. At the request of ODEQ, EPA responded and provided assistance in conducting air monitoring, surveying the area for debris, and addressing mixed asbestos contamination at the warehouse and the debris deposited in the residential area across the river.

The warehouse building is constructed on pilings on the bank of the Willamette River. The eastern portion of the building is at ground level, and the western portion of the warehouse structure is elevated approximately 30 feet above the river surface. Most of the warehouse structure above the subfloor decking was destroyed by the fire. The subfloor decking and pilings remain, but the structural stability is unknown. EPA removed asbestos-contaminated debris for off-site disposal from the eastern perimeter of the warehouse structure which could be safely accessed from the ground.

At the end of June 2017, as the initial response phase was concluded, EPA applied a tackifier to the remaining asbestos-contaminated debris, secured the site, and demobilized most equipment and personnel. Since then, EPA's START contractor performed daily dust monitoring and weekly air sampling from several location around the perimeter of the site.

EPA obtained funding for the removal action to remove the remaining asbestos-contaminated debris from the site. Mobilization for the removal action will begin on September 18, 2017. During the removal action, the remaining asbestos-contaminated debris will be removed from the warehouse structure. Because the structural stability of the remaining pilings and subfloor decking are unknown, an ERRS subcontractor will install an independently supported trestle above the subfloor. This trestle will provide a secure platform from which ERRS will stage equipment and personnel to remove the remaining asbestos-contaminated debris.

During the removal action air sampling will be performed to monitor for worker and public safety, and bulk material samples will be collected to characterize materials for disposal.

6. Conceptual Site Model

Contaminants: dust particles and asbestos

Transport Mechanisms: Dust particles moving through air and asbestos fibers moving through air.

Receptors: Workers at the site, passersby, and nearby residents/workers.

7. Decision Statement

The decision(s) to be made from this investigation is/are to:

Air Monitoring: Determine whether dust and asbestos are present at concentrations exceeding action levels for health and safety purposes.

Air Sampling: Determine whether asbestos is present at concentrations exceeding action levels for health and safety purposes.

Bulk Material / Debris Sampling: Determine whether debris or suspect material contains asbestos.

Soil Sampling: Determine whether surface soil adjacent to the former warehouse structure contains asbestos.

8. Action Level

Asbestos in Air
Site Action Level for Ambient Air: 0.01 fibers per cubic centimeter (f/cc).

Site Action Level for Personal Samples: 0.1 f/cc (OSHA Permissible Exposure Level [PEL])

Particulates in Air
Site Action Level: 139 micrograms per cubic meter (µg/m3)

Bulk Materials / Debris Sampling
Site Action Level: 1% asbestos as determined by polarized light microscopy (PLM). If a bulk material sample contains greater than 1% asbestos by PLM, then it is considered asbestos-containing material (ACM).

Soil Sampling
Site Action Level: method reporting limit of 0.25%.

II. Data Acquisition and Measurement Objectives

9. Site Diagram and Sampling Areas

The site diagram is the attached Figure 1.

10. The Decision Rules

The following statement(s) describe the decision rules to apply to this investigation:

Air Sampling
If asbestos concentrations in stationary air samples around the perimeter of the exclusion zone where removal activities are performed exceed the site action level for ambient air, then dust suppression methods (i.e., spraying debris with water) and/or the locations of the exclusion zone boundaries will be re-evaluated.

If asbestos concentrations in personal air samples exceed the site action level, then it will confirm that Level C personal protective equipment (PPE) including respiratory protection is appropriate inside the exclusion zone.

Air Monitoring
If airborne particulate concentrations exceed the site action level, then dust suppression methods (i.e., spraying debris with water) and/or the locations of the exclusion zone boundaries will be re-evaluated.

Bulk Material / Debris Sampling
Debris from the warehouse fire will be assumed to contain asbestos and handled as asbestos waste, with the exception of specific materials (e.g., steel beams) that do not contain asbestos and that can be decontaminated. Additional samples of suspect building materials and debris/ash/sludge from the fire will be sampled to determine whether asbestos is present. If a sample of bulk material contains greater than 1% asbestos by PLM, then it is ACM.

Soil Sampling
If asbestos is detected in soil samples adjacent to the former warehouse structure, EPA will further assess the nature and extent of the contamination and may consider additional removal options.

11. Information Needed for the Decision Rule

The following inputs to the decision are necessary to interpret the analytical results:

- Weather conditions
- Action Levels
- Contaminant concentrations

12. Sampling and Analysis

Air Sampling:

-- As many as three stationary samples will be collected daily.

-- Stationary samples will be collected from three fixed locations on the perimeter of the exclusion zone around the warehouse structure where removal activities will take place.

-- Air samples will be collected on a 0.8 micrometer (µm) mixed-cellulose ester (MCE) filter cassette designed for asbestos sampling and analysis using Gast air sampling pumps at a flow rate of approximately 10 liters per minute (L/min) for approximately 8 to 12 hours, for a target sample volume of approximately 4,800 to 7,200 liters.

-- Currently, ERRS will have an industrial hygienist on site to collect personal samples from site workers and to analyze them using Phase Contrast Microscopy (PCM). If necessary, START can also collect personal samples with SKC or similar personal air sampling pumps on 0.8 µm MCE filter cassettes. The samples would be collected at an approximate flow rate of approximately 2 to 3 L/min for approximately 4 to 6 hours, for a target sample volume of 720 L/min.

-- Air samples will be submitted for the analysis of asbestos and other fibers by PCM analysis (NIOSH Method 7400) with a rush (24 hours or less) turn-around time.

-- In addition to the PCM analyses, a small subset of the samples may be submitted for transmission electron microscopy (TEM) analyses by ISO Method 10312 to confirm any significant PCM result.. If an air filter is overloaded with dust, it may be subjected to an indirect preparation method (e.g., ISO 13794) prior to TEM analysis. As many as 10 samples for TEM analysis are assumed.

-- One blank air filter cassette will be submitted for each batch of air samples.

-- Air samples will be collected daily until EPA determines that it is no longer needed. Currently, daily air monitoring and sampling is expected to continue through December 6, 2017. As the removal action proceeds, the air sampling results will be reviewed relative to the site action levels. If the results indicate that dust suppression activities are consistently successful at preventing off-site migration of asbestos and other fibers, EPA may decide to submit samples with slower turn-around times or reduce the number of samples collected/submitted to the laboratory. Currently, a total of approximately 200 PCM samples are estimated.

-- Air filter cassettes for PCM and/or TEM analyses will be submitted to EMSL Analytical, Inc. of Cinnaminson, New Jersey.

Air Monitoring

-- Particulate monitors (DustTraks and/or DataRAMs) will be stationed daily at the three fixed air sampling locations near the perimeter of the warehouse to monitor for airborne particulates.

Bulk Material / Debris Sampling

-- Bulk grab samples may be collected from suspect materials observed in the debris pile or on the former warehouse structure by an Asbestos Hazard Emergency Response Act (AHERA)-certified Building Inspector. Bulk samples will be collected as targeted grab samples using wet techniques (i.e., sprayed with water prior to handling) to minimize fiber release.

-- The number of samples to be collected will depend on whether suspect ACM is observed in inaccessible areas of the debris pile. For the purpose of this SSSP, as many as 20 bulk material / debris samples are assumed.

-- Bulk material samples will be analyzed for asbestos by Polarized Light Microscopy (PLM) in accordance with EPA method 600/R-93/116.
-- Bulk samples from wood beams or decking may be collected as wood chips or cores; depending on their condition, they may be analyzed with a digestion preparation followed by suspension on a MCE filter and then analyzed by TEM in accordance with ISO Method 10312.

-- Samples will be analyzed at EMSL Analytical Inc. of Cinnaminson, New Jersey.

Soil Sampling
-- Bulk grab samples may be collected from surface soil adjacent to the warehouse structure to determine whether asbestos fibers are present.

-- For the purpose of this SSSP, as many as 10 soil samples are assumed.

-- Soil samples will be prepared using California Air Resources Board (CARB) Method 435 and analyzed by PLM with a reporting limit of 0.25%.

-- Samples will be analyzed at EMSL Analytical Inc. of Cinnaminson, New Jersey.

13. Applicability of Data (place an X in front of the data categories needed, explain with comments)

Do the decisions to be made from the data require that the analytical data be:
1) definitive data, 2) screening data (with definitive confirmation) or 3) screening data (without definitive confirmation)?

__X_***A) Definitive data*** *is analytical data of sufficient quality for final decision-making. To produce definitive data on-site or off-site, the field or lab analysis will have passed full Quality Control (QC) requirements (continuing calibration checks, Method Detection Limit (MDL) study, field duplicate samples, field blank, matrix spikes, lab duplicate samples, and other method-specific QC such as surrogates) AND the analyst will have passed a Precision and Recovery (PAR) study AND the instrument will have a valid Performance Evaluation sample on file. This category of data is suitable for:* ***1) enforcement purposes, 2) determination of extent of contamination, 3) disposal, 4) RP verification or 5) cleanup confirmation.***
Comments: Air sampling for asbestos and bulk materials will be submitted to an off-site fixed laboratory for analysis.

___***B) Screening data with definitive confirmation*** *is analytical data that may be used* ***to support preliminary or intermediate decision-making*** *until confirmed by definitive data. However, even after confirmation, this data is often not as precise as definitive data. To produce this category of data, the analyst will have passed a PAR study to determine analytical error AND 10% of the samples are split and analyzed by a method that produced definitive data with a minimum of three samples above the action level and three samples below it.*
Comments:

_X__***C) Screening data*** *is analytical data which has not been confirmed by definitive data. The QC requirements are limited to an MDL study and continuing calibration checks. This data can be used for making decisions:* ***1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants****. This data is not of sufficient quality for final decision-making.*
Comments: Air monitoring will be conducted utilizing DustTraks and/or DataRAMs

14. Special Sampling or Analysis Directions

Air monitoring equipment will be calibrated as required by accepted guidance.

24-hour turn-around time will be requested for asbestos air samples.

Blank filter cassettes (up to one per filter cassette type per day of sampling) may be submitted as quality control (QC) samples.

The NIOSH 7400 PCM method analyzes for asbestos and other fibers and cannot positively identify asbestos. If it becomes necessary to confirm the presence of asbestos in a sample, it will be analyzed by TEM by ISO Method 10312.

15. Method Requirements

Methods must achieve lower quantitation limits of at least the action levels.

16. Sample Collection Information

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:

Field Activity Logbook SOP
Sample Packaging and Shipping SOP
Sampling Equipment Decontamination SOP
Site entry
NIOSH Method 7400
DataRAM 4 Quick Start Guide
DustTrak Quick Start Guide

17. Optimization of Sampling Plan (Maximizing Data Quality While Minimizing Time and Cost)

Not applicable

The format for sample number identification is summarized in Table 1. Sample collection and analysis information is summarized in Table 2.

Table 1
SAMPLE CODING

Project Name: River Street Warehouse Asbestos Removal Action **Site ID:** 10QD

SAMPLE NUMBER [1]

Digits	Description	Code (Example)
1,2,3,4	Year and Month Code	1709 (YYMM)
5,6,7,8	Consecutive Sample Number (grouped by SA as appropriate)	0001 (First sample of SA)

SAMPLE NAME / LOCATION ID [2]
(Optional)

1,2	Sampling Area	AS – Stationary Air Sample BL – Bulk Building / Debris Sample PS – Personal Sample
3,4	Consecutive Sample Number	01 – First sample of Sampling Area
5,6	Matrix Code	AR – Air BL – Bulk QC – Quality Control WT – Water

Notes:
(1) The Sample Number is a unique, 8-digit number assigned to each sample.
(2) The Sample Name or Location ID is an optional identifier that can be used to further describe each sample or sample location.

Table 2. Sampling and Analysis

Data Quality	Sampling Area	Matrix	Sampling Pattern	Sample Type	Data Quality	Number of Field Samples	Analyte or Parameter	Method Number	Action Level	Method Quant. Limit	#/type of Sample Containers per Sample	Preservative	Hold Time	Field QC
Field Screening: Dust Monitoring	All Decision Areas	Air	Targeted	Grab	Screening	TBD	Airborne Particulates	Instrument Quick Start Guide	Background	0.1 µg/m^3	N/A	N/A	N/A	N/A
Lab Analysis: PCM	All Decision Areas	Air	Targeted	Grab	Definitive	200	Asbestos and other particulates	NIOSH 7400	0.01 f/cc (perimeter) 0.1 f/cc (personal)	100 fibers/mm^2	1 x 0.8 µm MCE filter cassette	N/A	N/A	Up to 1 Blank per day
Lab Analysis: ISO TEM	All Decision Areas	Air	Targeted	Grab	Definitive	10	Asbestos and other particulates	ISO 10312	0.01 f/cc	0.0003 structures/cc (depending on volume)	1 x 0.8 µm MCE filter cassette	N/A	N/A	1 Blank
Lab Analysis: PLM	All Decision Areas	Bulk	Targeted	Grab	Definitive	10	Asbestos	EPA 600/R-93/116	present	<1%	1 x plastic resealable bag	N/A	N/A	N/A
Lab Analysis: CARB/PLM	All Decision Areas	Soil	Targeted	Grab	Definitive	10	Asbestos	CARB 435 and EPA 600/R-93/116	present	<0.25%	1 x plastic resealable bag	N/A	N/A	N/A

Table 3. Common Sample Handling Information

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Metals	Metals Not including Mercury or Hexavalent chromium. Includes TAL, PP, RCRA lists)	Solid	EPA 6000 / 7000 Series	Glass Jar	200 g	n/a	None	6 months	SW-846 ch. 3
		Aqueous	EPA 6000 / 7000 Series	PTFE or HDPE	600 mL	HNO_3 to pH < 2	Not listed	6 months	SW-846 ch. 3
	Mercury	Solid	EPA 7471B	Glass Jar	200 g	n/a	≤ 6° C	28 days	SW-846 ch. 3
		Aqueous	EPA 7470A	PTFE or HDPE	400 mL	HNO_3 to pH < 2	Not listed	28 days	SW-846 ch. 3
	Hexavalent Chromium, (Hexachrome, Cr+6)	Solid	Lab-specific soil extraction modification, EPA 7196A	Glass Jar	100 g	n/a	≤ 6° C	28 days to extraction	SW-846 ch. 3
		Aqueous	EPA 218.6 (Drinking Water)	PTFE or HDPE	400 mL	n/a	≤ 6° C	24 hours	SW-846 ch. 3
	XRF	Solid (in situ; on the ground surface)	6200	none	n/a	none	none	Analyze Immediately	n/a
		Solid (ex situ)	6200	plastic bag	200 g	none	none	6 months	n/a
VOCs	VOCs / BTEX	Solid	EPA 5035 / 8260B	*	*	*	*	2 days to lab / 14 days	SW-846 ch. 4
		Aqueous	EPA 8260B	Amber Vial with Septa Lid	2 x 40 mL	HCl to pH< 2	≤ 6° C (headspace free)	14 days	SW-846 ch. 4
SVOCs	SVOCs / PAHs	Solid	EPA 8270D	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8270D	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
PCBs and Dioxins/Furans	PCBs	Solid	EPA 8082	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8082	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
	Dioxins/Furans	Solid	EPA 8280 or 8290	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8280 or 8290	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
Pesticides and Herbicides	Chlorinated Pesticides	Solid	EPA 8081	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8081	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
	Chlorinated Herbicides	Solid	EPA 8151	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8151	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
NWTPH	Gasoline-Range Organics	Solid	TPHs/NWTPH-Gx	Amber Glass Jar with Septa Lid	4 ounces	n/a	≤ 6° C (headspace free)	14 days	Method
		Aqueous	TPHs/NWTPH-Gx	Amber Vial with Septa Lid	2 x 40 mL	pH < 2 with HCl	≤ 6° C (headspace free)	7 days unpreserved 14 days preserved	Method
	Diesel-Range Organics	Solid	3510, 3540/3550, 8000	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	Method

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
		Aqueous	3510, 3540/3550, 8000	Glass Amber	2 x 1 L	pH < 2 with HCl	≤ 6º C	7 days unpreserved 14 days preserved	Method
Geotechnical	Particle Size Analysis	Solid	ASTM D-422	Glass Jar or Plastic Bag	2 x 8 ounce	none	n/a	n/a	Method
Miscellaneous	pH	Solid	EPA 9045	Glass Jar	8 ounces	n/a	n/a	Analyze Immediately	SW-846 ch. 3
		Aqueous	EPA 9040C	PTFE	25 mL	n/a	n/a	Analyze Immediately	SW-846 ch. 3
	Total Organic Carbon (TOC)	Solid	SW-846 9060	Glass Jar	100 mL	n/a	≤ 6º C	28 days	SW-846
		Aqueous	EPA 415.1	PTFE or HDPE	200 mL	store in dark HCL or H_2SO_4 to pH <2	≤ 6º C	7 days unpreserved 28 days preserved	Method
	Cyanide	Solid	SW-846 9013	Glass Jar	5 g	n/a	≤ 6º C	14 days	SW-846 ch. 3
		Aqueous	SW-846 9010C	PTFE or HDPE	500 mL	NaOH to pH > 12	≤ 6º C	14 days	SW-846 ch. 3
	Conductivity	Aqueous	EPA 120.1	PTFE or HDPE	100 mL	n/a	n/a	Analyze Immediately	Method
	Hardness	Aqueous	EPA 130.1	PTFE or HDPE	1 x 1 L	HNO3 to pH<2	≤ 6º C	28 days	Method
	Flash Point	Aqueous	EPA 1010A or 1020B	Glass Jar	2 x 250 mL	n/a	≤ 6º C	n/a	Method
	Total Suspended Solids	Aqueous	EPA 160.2	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Total Dissolved Solids	Aqueous	EPA 160.1	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Nitrate/nitrite	Aqueous	EPA 353.2	PTFE or HDPE	1 x 250 mL	H_2SO_4 to pH <2	≤ 6º C	28 days	Method
	Nitrate	Aqueous	SW-846 9210A	PTFE or HDPE	1,000 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Nitrite	Aqueous	SW-846 9216	PTFE or HDPE	25 mL	n/a	≤ 6º C	48 hours	SW-846 ch. 3, Method
	Fluoride	Aqueous	SW-846 9214	PTFE or HDPE	300 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Chloride	Aqueous	SW-846 9250	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfate	Aqueous	SW-846 9035	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfide	Solid	SW-846 9215	Glass Jar	1 x 4 ounces	Fill sample surface with 2N zinc acetate until moistened.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3
		Aqueous	SW-846 9031	PTFE or HDPE	100 mL	4 drops 2N zinc acetate/100 mL sample; NaOH to pH>9.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3

Key:

*	= See individual methods. We typically collect 3xEnCore-type samplers and 1x40 mL VOA vial per sample, keep at ≤ 6ºC with no chemical preservative, and they must be at the lab within 48 hours of collection.				
C	= Celsius	HNO_3	= nitric acid	SVOCs	= semivolatile organic compounds
Cr	= chromium	L	= liter	SW-846	= EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
EPA	= Environmental Protection Agency	mL	= milliliter	TAL	= Target Analyte List
g	=grams	n/a	= not applicable	TPH	= total petroleum hydrocarbons
H2SO4	= sulfuric acid	NaOH	= sodium hydroxide	VOA	= Volatile Organic Analysis
HCL	= hydrochloric acid	PCBs	= polychlorinated biphenyls	VOCs	= Volatile Organic Compounds
HDPE	= high-density polyethylene	PTFE	= polytetrafluoroethylene		
Hg	= mercury	RCRA	= Resource Conservation and Recovery Act		

III. Assessment and Response

A Sample Plan Alteration Form (SPAF) will be used to describe project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work. The completed SPAF will be approved by the OSC and QAC and appended to the original SSSP.

A Field Sampling Form (FSF) may be used to capture the sampling and analysis scheme for emergency responses in the field and then the FSF pages can be inserted into the appropriate areas of the final SSSP.

Corrective actions will be assessed by the sampling team and others involved in the sampling and a corrective action report describing the problem, solution, and recommendations will be forwarded to the OSC and the EMP QAC.

IV. Data Validation and Usability

The sample collection data will be entered into Scribe and Scribe will be used to print lab Chains of Custody. Results of field and lab analyses will be entered into Scribe as they are received and uploaded to Scibe.net when the sampling and analysis has been completed.

18. Data Validation or Verification will be performed by:

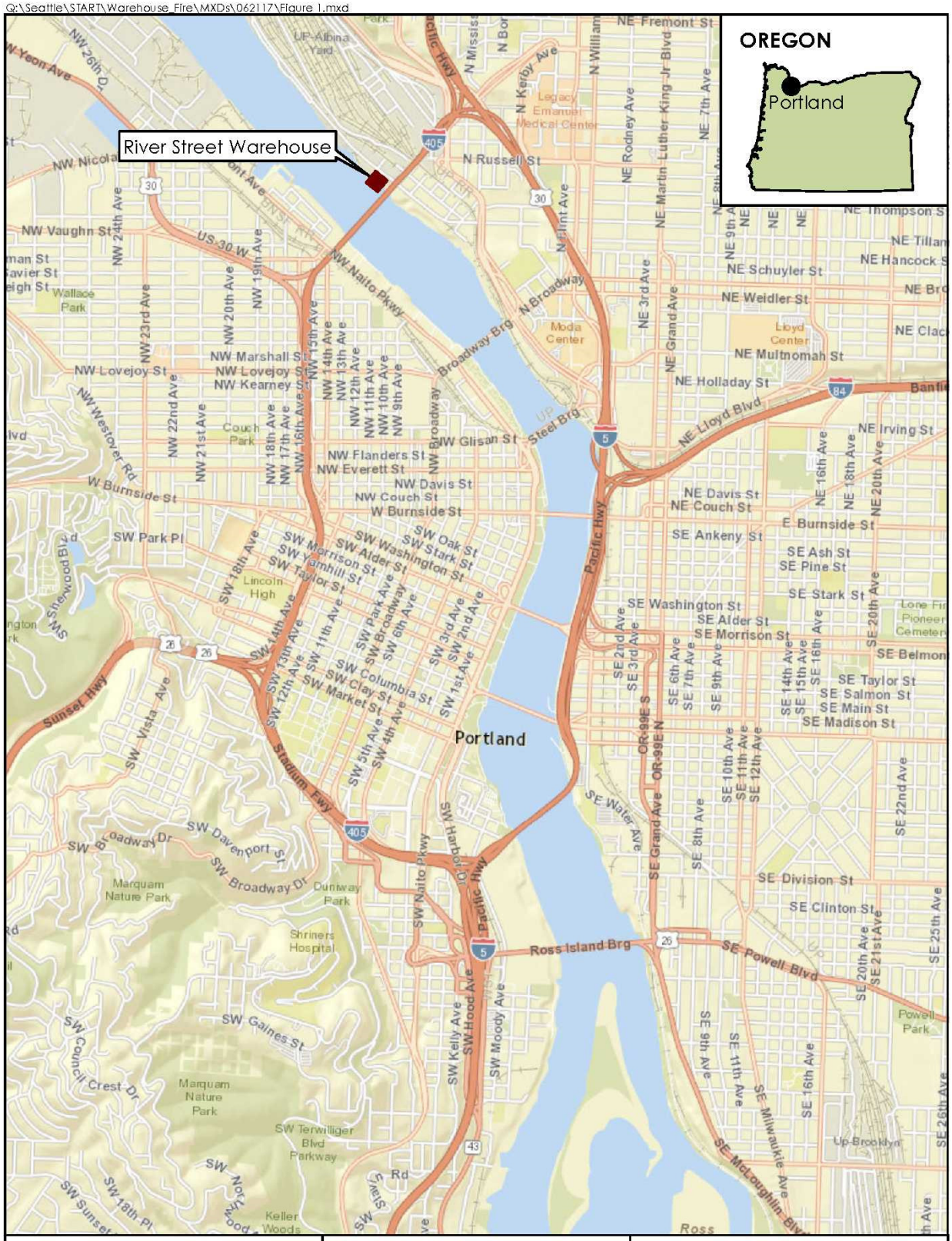
EMP's general recommendation on validation is that a minimum of CLP-equivalent stage IIA verification and validation be performed for every SSSP involving laboratory analyses. However, stage IIB is preferred if the lab can provide it. Dioxins should be validated at CLP-equivalent stage 4.

	Data Verification and Validation Stages						
Performed by:	I	IIA	IIB	III	IV	Verification	Other:
E and E QA Reviewer			100% Fixed Lab		10% Fixed Lab		
EPA Region 10 QA Office							
MEL staff							
Other:							

The following qualifiers shall be used in data validation:

- U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- JH - The result is an estimated quantity, but the result may be biased high.
- JL - The result is an estimated quantity, but the result may be biased low.
- JK - The result is an estimated quantity, but the result may have an unknown bias.
- JQ - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
- NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
- UJ - The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Q:\Seattle\START\Warehouse_Fire\MXDs\062117\Figure 1.mxd



ecology and environment, inc.
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River Street Warehouse Fire
Portland, Oregon

0 1,000 2,000 Feet

Figure 1.
Project Location

Date: 6/22/2017

Drawn by: N.H.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY MANAGEMENT PROGRAM

Site Specific Sampling Plan Alteration Form

Project Name: River Street Warehouse Fire Site ID: 10QD

Author: Rachel Locke Company: E&E Date Completed: 2/21/18

Changes from Final SSSP (include rationale, decision area, matrices, parameters, equipment, personnel, etc.:

Rationale

EPA has been performing a time-critical removal action to remove asbestos-contaminated debris and building materials from the fire-damaged warehouse on the banks of the Willamette River. As the removal of the warehouse and building debris nears completion, EPA is evaluating the newly exposed river bank where the former warehouse was located prior to the placement of rock to armor and prevent erosion from weathering or trespassers. Additional sampling and analyses were performed to evaluate the river bank sediments and other materials. Specific objectives included:

- Because the River Street site is located within the boundary of the Portland Harbor Superfund Site, samples from the newly exposed river bank were collected and analyzed for that site's contaminants of concern.
- A sample was collected from a stockpile of waste sediment to allow for off-site disposal profiling.
- A sample was collected from a gravel material that will be used to stabilize the river bank, to ensure that new contaminants are not brought on site.

Action Levels

Samples were collected from the following media:

- Sediment from the newly exposed river bank;
- Waste sediment from the inside of the hollow trestle pylons, which was stockpiled for off-site disposal after the trestles were removed from the bank; and
- Gravel from an off-site quarry brought to the site to armor the river bank.

Three different sets of analytes were requested for each sample.

Samples collected from the newly exposed river bank were analyzed for the sediment contaminants of concern for the Portland Harbors Superfund Site. The results will be compared to the Portland Harbor Record of Decision (ROD) sediment cleanup levels (see ROD Table 17 in Attachment 1).

The sample collected from the waste pile were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) for disposal profiling.

The sample collected from the gravel cover/fill material from an off-site quarry will be analyzed for polychlorinated biphenyls (PCBs), pesticides, VOCs, and SVOCs to ensure the suitability of the gravel as a cover material.

Sampling Area

Sediment sampling will be limited to areas of the exposed river bank within the footprint of the former warehouse location that are accessible and safe to sample. Composite samples will also be collected from the waste the waste sediment stockpile and the off-site gravel fill stockpile. These areas are indicated on Figure 1.

Sampling and Analysis

Portland Harbor Superfund Site Preliminary Sample (metals, mercury, TPH Diesel, Organotins, pesticides, PCBs, SVOCS (Bis(2-ethylhexyl)phthalate and hexachlorobenzene), and PAHs.)

1. Sampling Pattern: Representative composite from four aliquots along the surface (0 to 12 inches) of the newly exposed river bank. Three aliquots were taken from north of Trestle 2 and one aliquot south of Trestle 1.
2. Number of Samples: Two composite samples (includes 1 duplicate).
3. Sample Type: Composite.
4. Matrix: Sediments.
5. Sample containers: 2 x 8-oz sample jars per sample.
6. Analyses: Pesticides (Method 8081B), PCBs (Method 8082A), SVOCs (Bis(2-ethylhexyl)phthalate and hexachlorobenzene; Method 8270D), PAHs (Method 8270-SIM); Metals (arsenic, cadmium, copper, lead, and zinc; Method 6020); Mercury (Method 7471A); Northwest Total Petroleum Hydrocarbons-Diesel Range (NWTPH-Dx); and Organotins.
7. Laboratory: TestAmerica Laboratory, Tacoma, WA.

Waste Stockpile Sampling (TCLP VOCs and SVOCs)

8. Sampling Pattern: Representative composite of waste sediment contained within the stockpile.
9. Number of Samples: One composite sample.
10. Sample Type: Composite.
11. Matrix: Sediment.
12. Sample containers: 2 x 8-oz sample.
13. Analyses: TCLP SVOCs and VOCs
14. Laboratory: TestAmerica Laboratory, Tacoma, WA.

Gravel Sampling (PCBs, pesticides, SVOCs, and VOCs)

1. Sampling Pattern: Representative composite of sediment contained within the stockpile.
2. Number of Samples: One composite sample.
3. Sample Type: Composite
4. Matrix: Gravel and sediments.
5. Sample Container: 2 x 8-oz sample jars, and 2 core-in-one containers per sample.
6. Analyses: Pesticides (Method 8081), PCBs (Method 8082), VOCs (Method 8260), and SVOCs (Method 8270).
7. Laboratory: TestAmerica Laboratory, Tacoma, WA.

Approvals of SSSP Alteration Form		
Name	**Title**	**Signature**
Randy Nattis	On-Scene Coordinator (OSC)	RANDY NATTIS Digitally signed by RANDY NATTIS Date: 2018.03.07 11:36:56 -08'00'
Kathy Parker	Emergency Management Program (EMP) Quality Assurance Coordinator (QAC) or alternate	Kathy Parker Digitally signed by Kathy Parker Date: 2018.03.07 12:10:29 -08'00'

ROD Table 17

	Surface Water (1)			Groundwater (2)			River Bank Soil/Sediment (3)			Fish Tissue (4)		
Contaminant	**Unit**	**Conc.**	**Basis**	**Unit**	**Conc.**	**Basis**	**Unit**	**Conc.**	**Basis**	**Unit**	**Conc.**	**Basis**
Aldrin	µg/L	0.00000077	A				µg/kg	2	R	µg/kg	0.06	R
Arsenic	µg/L	0.018	A	µg/L	0.018	A	mg/kg	3	B	mg/kg	0.001	R
Benzene				µg/L	0.44	A						
BEHP	µg/L	0.2	A				µg/kg	135	R	µg/kg	72	R
Cadmium				µg/L	0.091	A/R(5)	mg/kg	0.51	R			
Chlordanes	µg/L	0.000081	A				µg/kg	1.4	R	µg/kg	3	R
Chlorobenzene				µg/L	64	R						
Chromium	µg/L	100	A	µg/L	11	A						
Copper	µg/L	2.74	A	µg/L	2.74	A/R	mg/kg	359	R			
Cyanide				µg/L	4	A						
DDx	µg/L	0.01	R	µg/L	0.001	A	µg/kg	6.1	R	µg/kg	3	R
DDD	µg/L	0.000031	A	µg/L	0.000031	A	µg/kg	114	R			
DDE	µg/L	0.000018	A	µg/L	0.000018	A	µg/kg	226	R			
DDT	µg/L	0.000022	A	µg/L	0.000022	A	µg/kg	246	R			
1,1-Dichloroethene				µg/L	7	A						
cis-1,2-Dichloroethene				µg/L	9.9	A						
Dieldrin							µg/kg	0.07	R	µg/kg	0.06	R
2,4-Dichlorophenoxyacetic acid				µg/L	70	A						
Ethylbenzene	µg/L	7.3	R	µg/L	7.3	R						
Hexachlorobenzene	µg/L	0.000029	A				µg/kg			µg/kg	0.6	R
Lindane							µg/kg	5	R			
Lead				µg/L	0.54	A/R	mg/kg	196	R			
Manganese				µg/L	430	R						
MCPP	µg/L	16	R									
Mercury							mg/kg	0.085	R	mg/kg	0.031	A
Pentachlorophenol	µg/L	0.03	A	µg/L	0.03	A				µg/kg	2.5	R
Perchlorate				µg/L	15	A						
PBDEs										µg/kg	26	R
PCBs	µg/L	0.0000064	A	µg/L	0.014	A/R	µg/kg	9	B	µg/kg	0.25 (6)	R
PAHs							µg/kg	23000				
cPAHs (BaP eq)	µg/L	0.00012	A	µg/L	0.00012	A	µg/kg	12 (7)	B	µg/kg	7.1	R
Acenaphthene				µg/L	23	R						
Acenaphthylene												
Anthracene				µg/L	0.73	R						
Benzo(a)anthracene	µg/L	0.0012	A	µg/L	0.0012	A						
Benzo(a)pyrene	µg/L	0.00012	A	µg/L	0.00012	A						
Benzo(b)fluoranthene	µg/L	0.0012	A	µg/L	0.0012	A						
Benzo(g,h,i)perylene												
Benzo(k)fluoranthene	µg/L	0.0013	A	µg/L	0.0013	A						
Chrysene	µg/L	0.0013	A	µg/L	0.0013	A						

Dibenz(a,h)anthracene	µg/L	0.00012	A	µg/L	0.00012	A						
Fluoranthene												
Fluorene												
Indeno(1,2,3-c,d)pyrene	µg/L	0.0012	A	µg/L	0.0012	A						
2-Methylnaphthalene												
Naphthalene	µg/L	12	R									
Phenanthrene												
Pyrene												
Dioxins/Furans (2,3,7,8-TCDD eq)	µg/L	0.0000000005	A									
1,2,3,4,7,8-HxCDF							µg/kg	0.0004	B	µg/kg	0.00008	R
1,2,3,7,8-PeCDD							µg/kg	0.0002	B	µg/kg	0.000008	R
2,3,4,7,8-PeCDF							µg/kg	0.0003	B	µg/kg	0.00003	R
2,3,7,8-TCDF							µg/kg	0.00040658	R	µg/kg	0.00008	R
2,3,7,8-TCDD							µg/kg	0.0002	B	µg/kg	0.000008	R
Tetrachloroethene				µg/L	0.24	A						
Toluene				µg/L	9.8	R						
TPH-Diesel							mg/kg	91	R			
TPH-Diesel (C10-C12 Aliphatic)				µg/L	2.6	R						
Tributyltin	µg/L	0.063	A				µg/kg	3080	R			
Trichloroethene				µg/L	0.6	A						
2,4,5-Trichlorophenol				µg/L	50	A						
Vanadium				µg/L	20	R						
Vinyl Chloride				µg/L	0.022	A						
Xylenes				µg/L	13	R						
Zinc	µg/L	36.5	R	µg/L	36.5	R	mg/kg	459	R			

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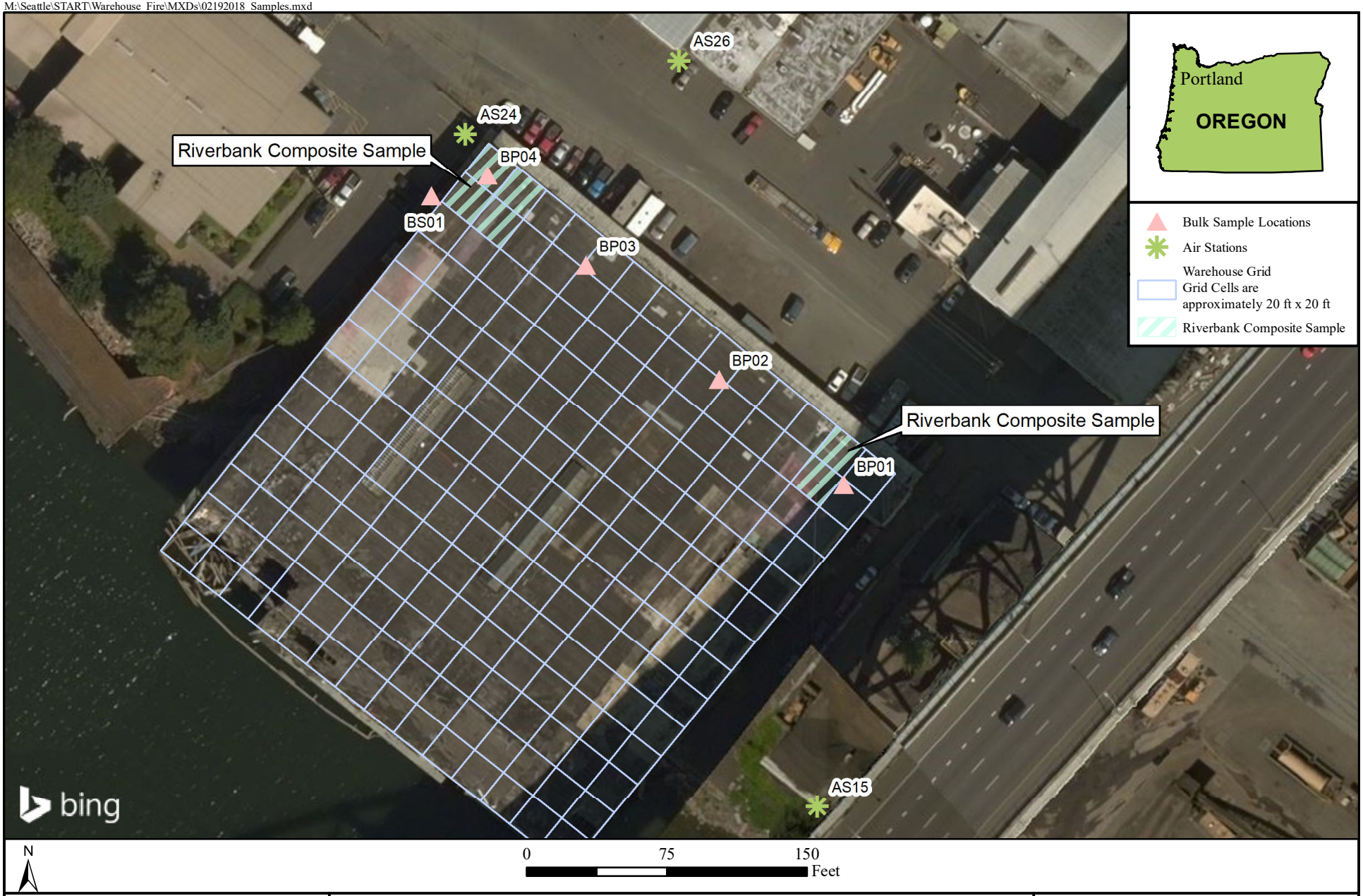

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RIVER STREET (NORTH PORTLAND)
WAREHOUSE FIRE
Portland, Oregon

Figure 1
RIVER STREET WAREHOUSE

2/19/2018

D Analytical Data – Bulk Asbestos Sampling

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LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Client: Oregon DEQ
700 NE Multnomah St.
Suite 600
Portland, OR 97232

Report Number: 172759R01
Report Date: 05/15/2017

P.O. No: n/a

Job Number: **172759**
Project Name: 1300 N. River
Project Number:
Project Notes:

Client Sample ID: **Z7308** **Sample ID:** S1 **Date Analyzed:** 05/15/2017
Client Sample Description: Grey/white felt paper **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite			**Percent Asbestos:**
Homogeneous							
fibrous material, gray/black	100 %	90 %	-	-			**90 %**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
	-	-	-	-	-	-	10 %

Client Sample ID: **Z7309** **Sample ID:** S2 **Date Analyzed:** 05/15/2017
Client Sample Description: Grey/white felt paper **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite			**Percent Asbestos:**
Homogeneous							
fibrous material, gray/black	100 %	90 %	-	-			**90 %**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
	-	-	-	-	-	-	10 %

NVLAP LAB CODE 200741-0

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: **172759**

Report Number: 172759R01
Report Date: 05/15/2017

This laboratory participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Testing method is per 40 CFR 763 Subpart F, Appendix A, PLM. This report and the data contained therein cannot be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

- "NAD" is No Asbestos Detected.
- Asbestos consists of the following minerals: chrysotile, amosite, crocidolite, tremolite, actinolite, anthophyllite.
- Material binders, such as those found in vinyl floor tiles, may prevent the detection of small diameter asbestos fibers. A gravimetric preparation and point-count is recommended for such samples.
- Quantitative analysis by PLM point count or TEM may be recommended for samples testing at < or = to 1% asbestos.
- The following estimate of error for this method by visual estimation of asbestos percent are as follows:
1% asbestos: 0-3% error, 5% asbestos: 1-9% error, 10% asbestos: 5-15% error, 20% asbestos: 10-30% error.
- This report pertains only to the samples listed on the report. Report considered valid only when signed by analyst.

Reviewed by:

X

Ryan Brown
Analyst

NVLAP LAB CODE 200741-0

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 7, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of one bulk sample collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Polarized light microscopy (PLM) (Method 40 CFR 763, Subpart F, Appendix A, PLM) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The sample was numbered: 17053000

Data Qualifications:

The sample was collected on May 18, 2017, and was analyzed on May 19, 2017. No discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Client: Ecology & Environment, Inc.
720 Third Ave
Suite 1700
Seattle, WA 98104

Report Number: 172886R06
Report Date: 06/27/2017

Job Number: 172886
Project Name:
Project Number: PDX-02
Project Notes:

P.O. No: n/a

Client Sample ID: 17050009 **Sample ID:** S1 **Date Analyzed:** 05/19/2017
Client Sample Description: AS02 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050010 **Sample ID:** S2 **Date Analyzed:** 05/19/2017
Client Sample Description: AS03 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050011 **Sample ID:** S3 **Date Analyzed:** 05/19/2017
Client Sample Description: AS04 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050012 **Sample ID:** S4 **Date Analyzed:** 05/19/2017
Client Sample Description: AS06 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050013 **Sample ID:** S5 **Date Analyzed:** 05/19/2017
Client Sample Description: AS07 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050014 **Sample ID:** S6 **Date Analyzed:** 05/19/2017
Client Sample Description: PS01 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

NVLAP
NVLAP LAB CODE 200741-0

MW 9717

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172886

Report Number: 172886R06
Report Date: 06/27/2017

Client Sample ID: 17050015 **Sample ID:** S7 **Date Analyzed:** 05/19/2017
Client Sample Description: PS02 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050016 **Sample ID:** S8 **Date Analyzed:** 05/19/2017
Client Sample Description: PS03 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050018 **Sample ID:** S9 **Date Analyzed:** 05/19/2017
Client Sample Description: PS05 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050019 **Sample ID:** S10 **Date Analyzed:** 05/19/2017
Client Sample Description: PS06 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050020 **Sample ID:** S11 **Date Analyzed:** 05/19/2017
Client Sample Description: PS07 **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050021 **Sample ID:** S12 **Date Analyzed:** 05/19/2017
Client Sample Description: Blank **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17050022 **Sample ID:** S13 **Date Analyzed:** 05/19/2017
Client Sample Description: Blank **Analyst:** Stephanie Golden
Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

NVLAP
NVLAP LAB CODE 200741-0

MW 9-7-17

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172886

Report Number: 172886R06
Report Date: 06/27/2017

Client Sample ID: Blank
Client Sample Description:
Sample ID: B1
Date Analyzed: 05/19/2017
Analyst: Stephanie Golden

Comments: Air sample analyzed by PCM, please see NIOSH 7400 report.

Client Sample ID: 17053000
Client Sample Description: BS01
Sample ID: S14
Date Analyzed: 05/19/2017
Analyst: Stephanie Golden

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite	Percent Asbestos:
Layer 01					
compact fibrous powder, white	90 %	-	-	-	NAD
Layer 02					
loose powder, off-white	10 %	-	-	-	NAD

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
Layer 01	10 %	3 %	-	-	-	-	87 %
Layer 02	3 %	1 %	-	-	-	-	96 %

This laboratory participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Testing method is per 40 CFR 763 Subpart F, Appendix A, PLM. This report and the data contained therein cannot be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

- "NAD" is No Asbestos Detected.
- Asbestos consists of the following minerals: chrysotile, amosite, crocidolite, tremolite, actinolite, anthophyllite.
- Material binders, such as those found in vinyl floor tiles, may prevent the detection of small diameter asbestos fibers. A gravimetric preparation and point-count is recommended for such samples.
- Quantitative analysis by PLM point count or TEM may be recommended for samples testing at < or = to 1% asbestos.
- The following estimate of error for this method by visual estimation of asbestos percent are as follows:
1% asbestos: 0-3% error, 5% asbestos: 1-9% error, 10% asbestos: 5-15% error, 20% asbestos: 10-30% error.
- This report pertains only to the samples listed on the report. Report considered valid only when signed by analyst.

Reviewed by:

x

Ryan Brown
Analyst

NVLAP
NVLAP LAB CODE 200741-0

MW 7-17

172886 p1/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050009	AS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	5155.02	Liters	5/18/2017	520	9.9135	L/min
	17050010	AS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	2658.15	Liters	5/18/2017	267	9.9556	L/min
	17050011	AS04	Asbestos PCM	Air	MCE Cassette	5/18/2017	2742.85	Liters	5/18/2017	272	10.084	L/min
	17050012	AS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	3971.74	Liters	5/18/2017	392	10.132	L/min
	17050013	AS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	4549.06	Liters	5/18/2017	442	10.292	L/min
	17050014	PS01	Asbestos PCM	Air	MCE Cassette	5/18/2017	1198.2	Liters	5/18/2017	400	2.9955	L/min
	17050015	PS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	1244.74	Liters	5/18/2017	429	2.9015	L/min
	17050016	PS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	765.08	Liters	5/18/2017	248	3.085	L/min
	17050018	PS05	Asbestos PCM	Air	MCE Cassette	5/18/2017	1057.94	Liters	5/18/2017	352	3.0055	L/min
	17050019	PS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	1314.67	Liters	5/18/2017	449	2.928	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/18/17 2005	[signature] LABCOR PORTLAND INC	5/19/17 4:50 AM	

172886 p2/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050020	PS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	724.98	Liters	5/18/2017	233	3.1115	L/min
	17050021	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17050022	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17053000	BS01	Asbestos PLM	Bulk		5/18/2017						

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Caffee	5/18/17 2005	LABCOR PORTLAND INC.	5/19/17 4:50 pm	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 25, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 bulk samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Polarized light microscopy (PLM) (Method 40 CFR 763 Subpart F, Appendix A) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17053008 17053009 17053010 17053011

Data Qualifications:

The samples were collected on May 23 and 24, 2017, and were analyzed by May 25, 2017. No issues were noted in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Client: Ecology & Environment, Inc.
720 Third Ave
Suite 1700
Seattle, WA 98104

Report Number: 173015R01
Report Date: 05/25/2017

Job Number: **173015**
Project Name: Site #: 10QD
Project Number: PDX-09
Project Notes:

P.O. No: n/a

Client Sample ID: **17053008** **Sample ID:** S1 **Date Analyzed:** 05/25/2017
Client Sample Description: Vapor Barrier; Paper Backing; Roofing Material With Tar Or Mastic **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite	**Percent Asbestos:**
Layer 01					
tar, black	20 %	-	-	-	**NAD**
Layer 02					
fibrous material, brown/black	40 %	-	-	-	**NAD**
Layer 03					
compact chalky material with paper, tan	30 %	-	-	-	**NAD**
Layer 04					
fibrous tar, black	10 %	-	-	-	**NAD**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
Layer 01	-	15 %	-	-	-	-	85 %
Layer 02	-	65 %	-	-	-	-	35 %
Layer 03	-	-	-	-	-	-	100 %
Layer 04	12 %	-	-	-	-	-	88 %

NVLAP
NVLAP LAB CODE 200741-0

MW 5-25-17

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 173015

Report Number: 173015R01
Report Date: 05/25/2017

Client Sample ID: 17053009 **Sample ID:** S2 **Date Analyzed:** 05/25/2017
Client Sample Description: Roofing Material With Tar Or Mastic **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite	Percent Asbestos:
Layer 01					
fibrous tar, black	65 %	Trace	-	-	**< 1 %**
Layer 02					
brittle textured tar, black	10 %	-	-	-	**NAD**
Layer 03					
fibrous tar, black	25 %	-	-	-	**NAD**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
Layer 01	10 %	10 %	-	-	-	-	80 %
Layer 02	-	-	-	-	-	-	100 %
Layer 03	-	20 %	-	-	-	-	80 %

Client Sample ID: 17053010 **Sample ID:** S3 **Date Analyzed:** 05/25/2017
Client Sample Description: Roofing Material With Tar Or Mastic; Vapor Barrier **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite	Percent Asbestos:
Layer 01					
fibrous tar, black	45 %	40 %	-	-	**40 %**
Layer 02					
fibrous tar, black	45 %	-	-	-	**NAD**
Layer 03					
textured tar, black	10 %	2 %	-	-	**2 %**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other		Matrix
Layer 01	-	-	-	-	-	-	60 %
Layer 02	-	25 %	-	-	-	-	75 %
Layer 03	-	-	-	-	-	-	98 %

NVLAP
NVLAP LAB CODE 200741-0

MW 52577

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 173015

Report Number: 173015R01
Report Date: 05/25/2017

Client Sample ID: 17053011 **Sample ID:** S4 **Date Analyzed:** 05/25/2017
Client Sample Description: Fiberglass Mix; Roofing Material; Vapor Barrier **Analyst:** Ryan Brown

Asbestos Mineral Fibers	Layer Percent:	Chrysotile	Amosite	Crocidolite	Percent Asbestos:
Layer 01					
compact fibrous material, dark tan/black	25 %	-	-	-	**NAD**
Layer 02					
loose fibrous material, gray	25 %	-	-	-	**NAD**
Layer 03					
soft compact powder, gray	5 %	-	-	-	**NAD**
Layer 04					
brittle compact powder, dark gray/black	5 %	-	-	-	**NAD**
Layer 05					
fibrous tar, black	25 %	-	-	-	**NAD**
Layer 06					
fibrous material, gray	15 %	40 %	-	-	**40 %**

Other Fibers	Fibrous Glass	Cellulose	Mineral Wool	Synthetic	Other			Matrix
Layer 01	35 %	35 %	-	-	-	-		20 %
							Perlite	10 %
Layer 02	99 %	-	-	-	-	-		1 %
Layer 03	-	-	-	-	-	-		100 %
Layer 04	-	-	-	-	-	-		100 %
Layer 05	10 %	10 %	-	-	-	-		80 %
Layer 06	-	-	-	-	-	-		60 %

NVLAP
NVLAP LAB CODE 200741-0

MW 5-25-17

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

BULK SAMPLE ASBESTOS ANALYSIS

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: **173015**

Report Number: 173015R01
Report Date: 05/25/2017

This laboratory participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Testing method is per 40 CFR 763 Subpart F, Appendix A, PLM. This report and the data contained therein cannot be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

- "NAD" is No Asbestos Detected.
- Asbestos consists of the following minerals: chrysotile, amosite, crocidolite, tremolite, actinolite, anthophyllite.
- Material binders, such as those found in vinyl floor tiles, may prevent the detection of small diameter asbestos fibers. A gravimetric preparation and point-count is recommended for such samples.
- Quantitative analysis by PLM point count or TEM may be recommended for samples testing at < or = to 1% asbestos.
- The following estimate of error for this method by visual estimation of asbestos percent are as follows:
1% asbestos: 0-3% error, 5% asbestos: 1-9% error, 10% asbestos: 5-15% error, 20% asbestos: 10-30% error.
- This report pertains only to the samples listed on the report. Report considered valid only when signed by analyst.

Reviewed by:

x

Ryan Brown
Analyst

NVLAP
NVLAP LAB CODE 200741-0

MW S-2577

173015

USEPA
DateShipped: 5/24/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name:
Contact Phone:

No: PDX-09
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Sample_Remarks	Sampler
	17053008	BP01	Asbestos PLM	Bulk	5/23/2017	18:00	vapor barrier, paper backing, roofing material with tar or mastic.	Cafferty
	17053009	BP02	Asbestos PLM	Bulk	5/23/2017	15:05	Roofing material with tar or mastic,	Cafferty
	17053010	BP03	Asbestos PLM	Bulk	5/24/2017	10:26	Roofing material with tar or mastic, vapor barrier.	Cafferty
	17053011	BP04	Asbestos PLM	Bulk	5/24/2017	11:18	Fiberglass mix, roofing material, vapor barrier	Cafferty

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Cafferty	5/24/17 1900	A Bohn	5/25 0800	OK

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 26, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-F1-SS1 PAN: 1004539.0023.001.01

The data quality assurance review of 15 bulk samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Polarized light microscopy (PLM) (EPA Method 600/R-93/116) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17090001	17090002	17090003	17090004	17090005
17090006	17090007	17090008	17090009	17090010
17090011	17090012	17090013	17090016	17090017

Data Qualifications:

The samples were collected on September 20 and 21, 2017, and were analyzed by September 25, 2017. No issues were noted in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order: 041727922
Customer ID: ECOL44
Customer PO:
Project ID: BOA

Attention: Mark Woodke
Ecology & Environment, Inc.
720 3rd Ave
Suite 1700
Seattle, WA 98104
Project: Site: # 10QD (BOA)

Phone: (206) 624-9537
Fax: (206) 621-9832
Received Date: 09/22/2017 9:15 AM
Analysis Date: 09/25/2017
Collected Date: 09/20/2017

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
17090001 *041727922-0001* *Recommend TEM*	BL01BL	Black Fibrous Homogeneous	30% Cellulose 10% Synthetic	60% Non-fibrous (Other)	None Detected
17090002 *041727922-0002*	BL02BL	Black Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
17090003 *041727922-0003*	BL03BL	Brown/Black Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17090004 *041727922-0004*	BL04BL	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17090005 *041727922-0005*	BL05BL	Black Fibrous Homogeneous		65% Non-fibrous (Other)	35% Chrysotile
17090006 *041727922-0006*	BL06BL	Black Fibrous Heterogeneous	20% Cellulose	78% Non-fibrous (Other)	2% Chrysotile
17090007 *041727922-0007*	BL07BL	Brown/Black Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17090008 *041727922-0008*	BL08BL	Black Fibrous Homogeneous	35% Cellulose	65% Non-fibrous (Other)	None Detected
17090009 *041727922-0009*	BL09BL	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17090010 *041727922-0010*	BL10BL	Black Fibrous Homogeneous	20% Cellulose 20% Glass	60% Non-fibrous (Other)	None Detected
17090011 *041727922-0011* *Recommend TEM*	BL11BL	White/Black Fibrous Heterogeneous	50% Cellulose	50% Non-fibrous (Other)	None Detected
17090012 *041727922-0012*	BL12BL	Brown/Black Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
17090013 *041727922-0013*	BL13BL	Black Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
17090016 *041727922-0016*	BL16BL	Black Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
17090017 *041727922-0017*	BL17BL	Black Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile

Initial report from: 09/26/2017 09:06:49

MW 9-26-17

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041727922
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Analyst(s)
William Nguyen (15)

Robyn Ray for
Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 09/26/2017 09:06:49

USEPA
DateShipped: 9/21/2017

CHAIN OF CUSTODY RECORD
Site # 10QD
Contact Name Steve Hall
Contact Phone. 206-920-1739

041727922

No: PDX-51
Lab: EMSL Analytical Inc
Lab Phone: 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090001	BL01BL	Asbestos PLM	Bulk		9/20/2017					
	17090002	BL02BL	Asbestos PLM	Bulk		9/20/2017					
	17090003	BL03BL	Asbestos PLM	Bulk		9/20/2017					
	17090004	BL04BL	Asbestos PLM	Bulk		9/20/2017					
	17090005	BL05BL	Asbestos PLM	Bulk		9/20/2017					
	17090006	BL06BL	Asbestos PLM	Bulk		9/20/2017					
	17090007	BL07BL	Asbestos PLM	Bulk		9/20/2017					
	17090008	BL08BL	Asbestos PLM	Bulk		9/20/2017					
	17090009	BL09BL	Asbestos PLM	Bulk		9/20/2017					
	17090010	BL10BL	Asbestos PLM	Bulk		9/20/2017					
	17090011	BL11BL	Asbestos PLM	Bulk		9/20/2017					
	17090012	BL12BL	Asbestos PLM	Bulk		9/20/2017					
	17090013	BL13BL	Asbestos PLM	Bulk		9/20/2017					
	17090014	BL14BL	Asbestos by CARB 435/PLM (0.25%)	Soil		9/20/2017					
	17090015	BL15BL	Asbestos by CARB 435/PLM (0 25%)	Soil		9/20/2017					

SEP 22 2017

Special Instructions: Please process samples using a standard TAT of 5 days Please send results to sghall@ene.com, rlocke@ene com, mwoodke@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	START E&E	9/21/17 15:30	Stewlett EMSL	9/22/17 0915	Acceptable

OrderID: 041727922

USEPA
DateShipped: 9/21/2017

CHAIN OF CUSTODY RECORD
Site # 10QD
Contact Name: Steve Hall
Contact Phone 206-920-1739

No: PDX-51
Lab: EMSL Analytical Inc
Lab Phone. 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090016	BL16BL	Asbestos PLM	Bulk		9/21/2017					
	17090017	BL17BL	Asbestos PLM	Bulk		9/21/2017					

SEP 22 2017

Special Instructions: Please process samples using a standard TAT of 5 days. Please send results to sghall@ene.com, rlocke@ene.com, mwoodke@ene com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	START E&E	9/21/17 15:30	Sheerlett EMSL	9/22/17 0915	Acceptable

OrderID: 041727922

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 28, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 bulk samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Polarized light microscopy (PLM) (EPA Method 600/R-93/116) with CARB 435 Prep Milling Level A for 0.25% asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered: 17090014 17090015

Data Qualifications:

The samples were collected on September 20, 2017, and were analyzed by September 28, 2017. No issues were noted in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041727922
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Mark Woodke Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	**Phone:**	(206) 624-9537
		Fax:	(206) 621-9832
		Received:	09/22/2017 9:15 AM
		Analysis Date:	09/28/2017
		Collected:	09/20/2017
Project:	Site: # 10QD (BOA)		

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
17090014 *041727922-0014*	BL14BL	Brown Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	**None Detected**
17090015 *041727922-0015*	BL15BL	Brown Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	**None Detected**

Analyst(s)

William Nguyen (2)

Dawn John McDaniel for
Benjamin Ellis, Laboratory Manager
or other approved signatory

MW 9-28-17

This report relates only to the samples listed above and may not be reproduced except in full, without EMSL's written approval. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. EMSL is not responsible for sample collection activities or method limitations. Some samples may contain asbestos fibers below the resolution limit of PLM. EMSL recommends that samples reported as none detected or less than the limit of detection undergo additional analysis via TEM. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 09/28/2017 09:43:12

USEPA
DateShipped: 9/21/2017

CHAIN OF CUSTODY RECORD
Site # 10QD
Contact Name Steve Hall
Contact Phone. 206-920-1739

041727922

No: PDX-51
Lab: EMSL Analytical Inc
Lab Phone: 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090001	BL01BL	Asbestos PLM	Bulk		9/20/2017					
	17090002	BL02BL	Asbestos PLM	Bulk		9/20/2017					
	17090003	BL03BL	Asbestos PLM	Bulk		9/20/2017					
	17090004	BL04BL	Asbestos PLM	Bulk		9/20/2017					
	17090005	BL05BL	Asbestos PLM	Bulk		9/20/2017					
	17090006	BL06BL	Asbestos PLM	Bulk		9/20/2017					
	17090007	BL07BL	Asbestos PLM	Bulk		9/20/2017					
	17090008	BL08BL	Asbestos PLM	Bulk		9/20/2017					
	17090009	BL09BL	Asbestos PLM	Bulk		9/20/2017					
	17090010	BL10BL	Asbestos PLM	Bulk		9/20/2017					
	17090011	BL11BL	Asbestos PLM	Bulk		9/20/2017					
	17090012	BL12BL	Asbestos PLM	Bulk		9/20/2017					
	17090013	BL13BL	Asbestos PLM	Bulk		9/20/2017					
	17090014	BL14BL	Asbestos by CARB 435/PLM (0.25%)	Soil		9/20/2017					
	17090015	BL15BL	Asbestos by CARB 435/PLM (0 25%)	Soil		9/20/2017					

SEP 22 2017

Special Instructions: Please process samples using a standard TAT of 5 days Please send results to sghall@ene.com, rlocke@ene com, mwoodke@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	START E&E	9/21/17 15:30	Stewlett EMSL	9/22/17 0915	Acceptable

OrderID: 041727922

USEPA
DateShipped: 9/21/2017

CHAIN OF CUSTODY RECORD
Site # 10QD
Contact Name: Steve Hall
Contact Phone 206-920-1739

No: PDX-51
Lab: EMSL Analytical Inc
Lab Phone. 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090016	BL16BL	Asbestos PLM	Bulk		9/21/2017					
	17090017	BL17BL	Asbestos PLM	Bulk		9/21/2017					

SEP 22 2017

Special Instructions: Please process samples using a standard TAT of 5 days. Please send results to sghall@ene.com, rlocke@ene.com, mwoodke@ene com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	START E&E	9/21/17 15:30	Sheerlett EMSL	9/22/17 0915	Acceptable

OrderID: 041727922

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E Analytical Data – Bulk Disposal Profiling Sampling

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ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 16, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 solid samples collected from the River Street Warehouse Fired site in Portland, Oregon, has been completed. Polycyclic aromatic hydrocarbon (PAH) analyses (EPA Method 8270 SIM) were performed by ALS Environmental, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered:

17053012 17053013 17053014 17053015

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained and received within the QC limits of 0°C to 6°C. The samples were collected on May 23 or 24, 2017, were extracted on June 2, 3017, and analyzed on June 5, 2017, therefore meeting holding time criteria of less than 14 days between collection and extraction and less than 40 days between extraction and analysis.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Acceptable.

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) were within the QC limits.

4. Continuing Calibration: Acceptable.

All RRFs were within the QC limits. All % differences were within the QC limits.

5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. **System Monitoring Compounds (SMCs): Acceptable.**

All SMC recoveries were within QC limits except when diluted due to high analyte concentrations. No actions were taken based on the diluted SMC outliers.

7. **Blank Spike (BS) Analysis: Satisfactory.**

BS analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits except naphthalene, acenaphthene, and dibenzofuran with low recoveries; associated positive results and sample quantitation limits were qualified as estimated quantities with a low bias (JL or UJL).

8. **Duplicate Analysis: Acceptable.**

Duplicate and spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All duplicate and/or spike duplicate results were within QC limits.

9. **Internal Standards: Acceptable.**

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

10. **Precision and Bias Determination: Not Performed.**

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

11. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

12. **Overall Assessment of Data for Use**

A total of 76 results were validated in this data memorandum. No sample results were qualified as estimated quantities based on duplicate precision outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. A total of 12 sample results were qualified as estimated quantities with a low bias (JL or UJL) based on spike accuracy outliers. No potential contaminants of concern were detected in the laboratory blanks. No sample results were rejected.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2017". Based upon the information provided, the data are acceptable for use with the above stated data

qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polynuclear Aromatic Hydrocarbons

Sample Name:	17053012	**Units:**	ug/Kg
Lab Code:	K1705391-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	3100	D JL	280	34	10	06/02/17	06/05/17	KWG1704560	*
2-Methylnaphthalene	630	D	280	22	10	06/02/17	06/05/17	KWG1704560	
Acenaphthylene	1000	D	280	33	10	06/02/17	06/05/17	KWG1704560	
Acenaphthene	240	J JL	280	43	10	06/02/17	06/05/17	KWG1704560	*
Dibenzofuran	710	D JL	280	36	10	06/02/17	06/05/17	KWG1704560	*
Fluorene	1000	D	280	34	10	06/02/17	06/05/17	KWG1704560	
Phenanthrene	17000	D	280	78	10	06/02/17	06/05/17	KWG1704560	
Anthracene	3000	D	280	33	10	06/02/17	06/05/17	KWG1704560	
Carbazole	1400	D	280	130	10	06/02/17	06/05/17	KWG1704560	
Fluoranthene	8400	D	280	55	10	06/02/17	06/05/17	KWG1704560	
Pyrene	8800	D	280	43	10	06/02/17	06/05/17	KWG1704560	
Benz(a)anthracene	3300	D	280	41	10	06/02/17	06/05/17	KWG1704560	
Chrysene	5000	D	280	45	10	06/02/17	06/05/17	KWG1704560	
Benzo(b)fluoranthene†	2200	D	280	52	10	06/02/17	06/05/17	KWG1704560	
Benzo(k)fluoranthene	690	D	280	49	10	06/02/17	06/05/17	KWG1704560	
Benzo(a)pyrene	2200	D	280	43	10	06/02/17	06/05/17	KWG1704560	
Indeno(1,2,3-cd)pyrene	1300	D	280	49	10	06/02/17	06/05/17	KWG1704560	
Dibenz(a,h)anthracene	310	D	280	45	10	06/02/17	06/05/17	KWG1704560	
Benzo(g,h,i)perylene	1500	D	280	48	10	06/02/17	06/05/17	KWG1704560	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	99	38-104	06/05/17	Acceptable
Fluoranthene-d10	93	39-109	06/05/17	Acceptable
Terphenyl-d14	97	38-113	06/05/17	Acceptable

† **Analyte Comments**

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

MW 6/6/17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polynuclear Aromatic Hydrocarbons

Sample Name:	17053013	**Units:**	ug/Kg
Lab Code:	K1705391-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	4700	D	JL	1700	210	50	06/02/17	06/05/17	KWG1704560	*
2-Methylnaphthalene	2900	D		1700	140	50	06/02/17	06/05/17	KWG1704560	
Acenaphthylene	11000	D		1700	200	50	06/02/17	06/05/17	KWG1704560	
Acenaphthene	23000	D	JL	1700	260	50	06/02/17	06/05/17	KWG1704560	*
Dibenzofuran	2700	D	JL	1700	220	50	06/02/17	06/05/17	KWG1704560	*
Fluorene	5500	D		1700	210	50	06/02/17	06/05/17	KWG1704560	
Phenanthrene	140000	D		1700	480	50	06/02/17	06/05/17	KWG1704560	
Anthracene	80000	D		1700	200	50	06/02/17	06/05/17	KWG1704560	
Carbazole	19000	D		1700	780	50	06/02/17	06/05/17	KWG1704560	
Fluoranthene	360000	D		1700	340	50	06/02/17	06/05/17	KWG1704560	
Pyrene	460000	D		1700	260	50	06/02/17	06/05/17	KWG1704560	
Benz(a)anthracene	140000	D		1700	250	50	06/02/17	06/05/17	KWG1704560	
Chrysene	230000	D		1700	270	50	06/02/17	06/05/17	KWG1704560	
Benzo(b)fluoranthene†	230000	D		1700	320	50	06/02/17	06/05/17	KWG1704560	
Benzo(k)fluoranthene	81000	D		1700	300	50	06/02/17	06/05/17	KWG1704560	
Benzo(a)pyrene	200000	D		1700	260	50	06/02/17	06/05/17	KWG1704560	
Indeno(1,2,3-cd)pyrene	190000	D		1700	300	50	06/02/17	06/05/17	KWG1704560	
Dibenz(a,h)anthracene	30000	D		1700	270	50	06/02/17	06/05/17	KWG1704560	
Benzo(g,h,i)perylene	200000	D		1700	290	50	06/02/17	06/05/17	KWG1704560	

Nu

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	136	38-104	06/05/17	Outside Control Limits
Fluoranthene-d10	82	39-109	06/05/17	Acceptable
Terphenyl-d14	106	38-113	06/05/17	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments: MW 6-6-17

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polynuclear Aromatic Hydrocarbons

Sample Name:	17053014	**Units:**	ug/Kg
Lab Code:	K1705391-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	5100	D JL	1500	170	50	06/02/17	06/05/17	KWG1704560	*
2-Methylnaphthalene	2200	D	1500	110	50	06/02/17	06/05/17	KWG1704560	
Acenaphthylene	17000	D	1500	170	50	06/02/17	06/05/17	KWG1704560	
Acenaphthene	2700	DV JL	1500	220	50	06/02/17	06/05/17	KWG1704560	*
Dibenzofuran	1100	JD nQ	1500	180	50	06/02/17	06/05/17	KWG1704560	*
Fluorene	1900	D	1500	180	50	06/02/17	06/05/17	KWG1704560	
Phenanthrene	20000	D	1500	400	50	06/02/17	06/05/17	KWG1704560	
Anthracene	17000	D	1500	170	50	06/02/17	06/05/17	KWG1704560	
Carbazole	3500	D	1500	650	50	06/02/17	06/05/17	KWG1704560	
Fluoranthene	170000	D	1500	280	50	06/02/17	06/05/17	KWG1704560	
Pyrene	170000	D	1500	220	50	06/02/17	06/05/17	KWG1704560	
Benz(a)anthracene	54000	D	1500	210	50	06/02/17	06/05/17	KWG1704560	
Chrysene	110000	D	1500	230	50	06/02/17	06/05/17	KWG1704560	
Benzo(b)fluoranthene†	140000	D	1500	260	50	06/02/17	06/05/17	KWG1704560	
Benzo(k)fluoranthene	54000	D	1500	250	50	06/02/17	06/05/17	KWG1704560	
Benzo(a)pyrene	120000	D	1500	220	50	06/02/17	06/05/17	KWG1704560	
Indeno(1,2,3-cd)pyrene	110000	D	1500	250	50	06/02/17	06/05/17	KWG1704560	
Dibenz(a,h)anthracene	16000	D	1500	230	50	06/02/17	06/05/17	KWG1704560	
Benzo(g,h,i)perylene	110000	D	1500	240	50	06/02/17	06/05/17	KWG1704560	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	113	38-104	06/05/17	Outside Control Limits
Fluoranthene-d10	77	39-109	06/05/17	Acceptable
Terphenyl-d14	97	38-113	06/05/17	Acceptable

† **Analyte Comments**

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

MW 6/6/17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polynuclear Aromatic Hydrocarbons

Sample Name:	17053015	**Units:**	ug/Kg
Lab Code:	K1705391-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	7900	D	JL	700	84	10	06/02/17	06/05/17	KWG1704560	*
2-Methylnaphthalene	4800	D		700	55	10	06/02/17	06/05/17	KWG1704560	
Acenaphthylene	8600	D		700	83	10	06/02/17	06/05/17	KWG1704560	
Acenaphthene	5200	D	JL	700	110	10	06/02/17	06/05/17	KWG1704560	*
Dibenzofuran	1500	D	JL	700	89	10	06/02/17	06/05/17	KWG1704560	*
Fluorene	4400	D		700	86	10	06/02/17	06/05/17	KWG1704560	
Phenanthrene	16000	D		700	200	10	06/02/17	06/05/17	KWG1704560	
Anthracene	11000	D		700	82	10	06/02/17	06/05/17	KWG1704560	
Carbazole	1800	D		700	330	10	06/02/17	06/05/17	KWG1704560	
Fluoranthene	19000	D		700	140	10	06/02/17	06/05/17	KWG1704560	
Pyrene	25000	D		700	110	10	06/02/17	06/05/17	KWG1704560	
Benz(a)anthracene	4600	D		700	110	10	06/02/17	06/05/17	KWG1704560	
Chrysene	8500	D		700	120	10	06/02/17	06/05/17	KWG1704560	
Benzo(b)fluoranthene†	9200	D		700	130	10	06/02/17	06/05/17	KWG1704560	
Benzo(k)fluoranthene	3200	D		700	130	10	06/02/17	06/05/17	KWG1704560	
Benzo(a)pyrene	7500	D		700	110	10	06/02/17	06/05/17	KWG1704560	
Indeno(1,2,3-cd)pyrene	6500	D		700	130	10	06/02/17	06/05/17	KWG1704560	
Dibenz(a,h)anthracene	1100	D		700	120	10	06/02/17	06/05/17	KWG1704560	
Benzo(g,h,i)perylene	7800	D		700	120	10	06/02/17	06/05/17	KWG1704560	

MW

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	96	38-104	06/05/17	Acceptable
Fluoranthene-d10	79	39-109	06/05/17	Acceptable
Terphenyl-d14	84	38-113	06/05/17	Acceptable

† **Analyte Comments**

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments: MW 6/6/17

ecology and environment, inc.
Global Environmental Specialists

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MEMORANDUM

DATE: June 16, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 solid samples collected from the River Street Warehouse Fired site in Portland, Oregon, has been completed. Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) analyses (EPA Method 8260) was performed by ALS Environmental, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered:

17053012 17053013 17053014 17053015

Data Qualifications:

1. **Sample Holding Times: Acceptable.**

The samples were maintained and received within the QC limits of 4°C ± 2°C. The samples were collected on May 23 and 24, 2017, were received at the laboratory on May 26, 2017, and were analyzed by June 2, 2017, therefore meeting QC criteria of less than 14 days between collection and analysis for No actions were taken based on the sample containers for these solid samples.

2. **Tuning: Acceptable.**

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. **Initial Calibration: Acceptable.**

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) and/or correlation coefficients were within the QC limits.

4. **Continuing Calibration: Acceptable.**

All RRFs were within the QC limits. All % differences were within the QC limits.

recycled paper

5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank. A trip blank was not collected for these solid samples; no actions were taken.

6. **System Monitoring Compounds (SMCs): Acceptable.**

All SMC recoveries were within QC limits.

7. **Blank Spike (BS)/BS Duplicate (BSD) Analysis: Acceptable.**

BS and BSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

8. **Matrix Spike (MS)/MS Duplicate (MSD) Analysis: Acceptable.**

MS and MSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

9. **Duplicate Analysis: Acceptable.**

Spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits.

10. **Internal Standards: Acceptable.**

All internal standards were within ± 30 seconds of the continuing calibration internal standard retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

11. **Precision and Bias Determination: Not Performed.**

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

12. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

13. **Overall Assessment of Data for Use**

A total of 20 results were validated in this data memorandum. No sample results were qualified as estimated quantities based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks. No sample results were rejected.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2017". Based upon the information provided, the data are acceptable for use with the above stated data

qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Volatile Organic Compounds

Sample Name:	17053012	**Units:**	mg/Kg
Lab Code:	K1705391-001	**Basis:**	Dry
Extraction Method:	EPA 5030A/5030B	**Level:**	Med
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.15**		0.11	0.014	1	06/02/17	06/02/17	KWG1704587	
Toluene	**0.23**		0.11	0.012	1	06/02/17	06/02/17	KWG1704587	
Ethylbenzene	**0.070**	J Q	0.11	0.011	1	06/02/17	06/02/17	KWG1704587	
m,p-Xylenes	**0.22**		0.11	0.025	1	06/02/17	06/02/17	KWG1704587	
o-Xylene	**0.094**	J Q	0.11	0.017	1	06/02/17	06/02/17	KWG1704587	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	55-132	06/02/17	Acceptable
Toluene-d8	105	81-124	06/02/17	Acceptable
4-Bromofluorobenzene	95	64-132	06/02/17	Acceptable

Comments: MW 6/6/17

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Volatile Organic Compounds

Sample Name:	17053013	**Units:**	mg/Kg
Lab Code:	K1705391-002	**Basis:**	Dry
Extraction Method:	EPA 5030A/5030B	**Level:**	Med
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.17**		0.095	0.012	1	06/02/17	06/02/17	KWG1704587	
Toluene	**0.15**		0.095	0.011	1	06/02/17	06/02/17	KWG1704587	
Ethylbenzene	**0.038**	J Q	0.095	0.0095	1	06/02/17	06/02/17	KWG1704587	
m,p-Xylenes	**0.096**		0.095	0.021	1	06/02/17	06/02/17	KWG1704587	
o-Xylene	**0.038**	J Q	0.095	0.015	1	06/02/17	06/02/17	KWG1704587	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	93	55-132	06/02/17	Acceptable
Toluene-d8	107	81-124	06/02/17	Acceptable
4-Bromofluorobenzene	95	64-132	06/02/17	Acceptable

MW 6/6/17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Volatile Organic Compounds

Sample Name:	17053014	**Units:**	mg/Kg
Lab Code:	K1705391-003	**Basis:**	Dry
Extraction Method:	EPA 5030A/5030B	**Level:**	Med
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.12**		0.086	0.011	1	06/02/17	06/02/17	KWG1704587	
Toluene	**0.15**		0.086	0.0093	1	06/02/17	06/02/17	KWG1704587	
Ethylbenzene	**0.038**	J Q	0.086	0.0086	1	06/02/17	06/02/17	KWG1704587	
m,p-Xylenes	**0.095**		0.086	0.019	1	06/02/17	06/02/17	KWG1704587	
o-Xylene	**0.045**	J Q	0.086	0.013	1	06/02/17	06/02/17	KWG1704587	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	55-132	06/02/17	Acceptable
Toluene-d8	106	81-124	06/02/17	Acceptable
4-Bromofluorobenzene	94	64-132	06/02/17	Acceptable

Comments: MW 6/6/17

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Volatile Organic Compounds

Sample Name:	17053015	**Units:**	mg/Kg
Lab Code:	K1705391-004	**Basis:**	Dry
Extraction Method:	EPA 5030A/5030B	**Level:**	Med
Analysis Method:	8260C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.42**		0.12	0.015	1	06/02/17	06/02/17	KWG1704587	
Toluene	**0.36**		0.12	0.013	1	06/02/17	06/02/17	KWG1704587	
Ethylbenzene	**0.10**	J Q	0.12	0.012	1	06/02/17	06/02/17	KWG1704587	
m,p-Xylenes	**0.18**		0.12	0.027	1	06/02/17	06/02/17	KWG1704587	
o-Xylene	**0.086**	J Q	0.12	0.018	1	06/02/17	06/02/17	KWG1704587	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	55-132	06/02/17	Acceptable
Toluene-d8	107	81-124	06/02/17	Acceptable
4-Bromofluorobenzene	95	64-132	06/02/17	Acceptable

MW 6/6/17

Comments:

ecology and environment, inc.
Global Environmental Specialists

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MEMORANDUM

DATE: June 16, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 solid samples collected from the River Street Warehouse Fired site in Portland, Oregon, has been completed. Polychlorinated biphenyls (PCBs) analyses (EPA Method 8082) was performed by ALS Environmental, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered:

17053012 17053013 17053014 17053015

Data Qualifications:

1. **Sample Holding Times: Acceptable.**

The samples were maintained at 0°C to 6°C. The samples were collected on May 23 and 24, 2017, extracted on June 2, 2017, and were analyzed by June 2, 2017. There are no holding time limits for Method 8082 PCB analyses.

2. **Instrument Performance: Acceptable.**

The surrogate retention time percent difference between the initial calibration standards and the remaining standards and samples was $\leq$ 0.3% for capillary column analyses.

3. **Initial and Continuing Calibration: Satisfactory.**

All initial calibration relative standard deviations (RSDs) were within QC limits. All second source calibration results were within QC limits except one PCB 1016 peak with a low recovery on May 2, 2017; no actions were taken based on one low second source outlier. All continuing calibration % differences (% D) were within QC limits.

4. **Error Determination: Not Provided.**

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although the flags are not found on the Form I's.

5. **Blanks: Acceptable.**

A method blank was prepared at the required frequency of every time samples were extracted for each matrix and for each concentration level, or every 20 samples, whichever is greater, and for each analytical system. No target analytes were detected in the laboratory blanks.

6. **Performance Evaluation Samples: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

7. **System Monitoring Compounds (SMCs): Acceptable.**

All recoveries of the SMCs were within the established control limits.

8. **Blank Spike (BS) and BS Duplicate (BSD) Analyses: Acceptable.**

BS and BSD recoveries were within QC limits.

9. **Duplicates: Acceptable.**

Relative Percent Differences (RPDs) of all spiked analytes were within QC limits.

10. **Compound Identification: Satisfactory.**

All results were dual-column confirmed with differences between the columns less than 25% except PCB 1260 in sample 17053014. Positive sample results with percent differences between the columns greater than 25% were qualified as estimated quantities with an unknown bias (JK) and the lower result was reported.

11. **Target Compound Quantitation and Quantitation Limits: Acceptable.**

Sample results and quantitation limits were correctly calculated.

12. **Laboratory Contact**

No laboratory contact was required.

13. **Overall Assessment**

A total of 28 results were validated in this data memorandum. No sample results were qualified as estimated quantities based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks. No sample results were rejected.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January

2017". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polychlorinated Biphenyls (PCBs)

Sample Name:	17053012	**Units:**	ug/Kg
Lab Code:	K1705391-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	~~ND~~	U	25 U	25	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1221	~~ND~~	U	50	50	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1232	ND	~~U~~	25	25	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1242	**470**		25	25	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1248	~~ND~~	U	25 U	25	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1254	ND	~~U~~	25 U	25	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1260	**33**		25	25	1	06/02/17	06/02/17	KWG1704457	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	104	43-148	06/02/17	Acceptable

MW 6-16-17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polychlorinated Biphenyls (PCBs)

Sample Name:	17053013	**Units:**	ug/Kg
Lab Code:	K1705391-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1221	ND	U	66	66	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1232	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1242	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1248	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1254	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1260	ND	U	33	33	1	06/02/17	06/02/17	KWG1704457	

MW

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	43-148	06/02/17	Acceptable

MW 6/6/17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polychlorinated Biphenyls (PCBs)

Sample Name:	17053014	**Units:**	ug/Kg
Lab Code:	K1705391-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	~~ND~~	~~U~~	29	29	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1221	~~ND~~	~~U~~	58	58	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1232	~~ND~~	~~U~~	29	29	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1242	~~ND~~	~~Ui~~	43	43	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1248	~~ND~~	~~Ui~~	48	48	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1254	~~ND~~	~~Ui~~	83	83	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1260	62		29	29	1	06/02/17	06/02/17	KWG1704457	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	52	43-148	06/02/17	Acceptable

MW 6-16-17

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/2017
Sample Matrix:	Solid	**Date Received:**	05/26/2017

Polychlorinated Biphenyls (PCBs)

Sample Name:	17053015	**Units:**	ug/Kg
Lab Code:	K1705391-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8082A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	~~ND~~	U	37	37	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1221	~~ND~~	U	74	74	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1232	ND	~~U~~	37	37	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1242	**42**		37	37	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1248	~~ND~~	U	37	37	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1254	~~ND~~	U	37	37	1	06/02/17	06/02/17	KWG1704457	
Aroclor 1260	~~ND~~	~~U~~	37	37	1	06/02/17	06/02/17	KWG1704457	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	91	43-148	06/02/17	Acceptable

Comments: MW 6/6/17

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MEMORANDUM

DATE: June 16, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Inorganic Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 solid samples collected from the River Street Warehouse Fired site in Portland, Oregon, has been completed. Toxicity Characteristic Leaching Procedure (TCLP) metals analyses (EPA Methods 1311, 6010, and 7470) were performed by ALS Environmental, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered:

17053012 17053013 17053014 17053015

Data Qualifications:

1. **Sample Holding Times: Acceptable.**

The samples were maintained at < 6°C (only applies to mercury). The samples were collected on May 23 and 24, 2017, and were extracted and analyzed by June xx, 2017, therefore meeting QC criteria of less than 6 months between collection, extraction, and analysis (28 days for mercury).

2. **Initial and Continuing Calibration: Acceptable.**

A minimum of one calibration standard and a blank were analyzed at the beginning of the ICP analysis sequence and after every 10 samples. No results were greater than 110% of the highest calibration standard. All ICP recoveries were within the QC limits. All AA recoveries were within QC limits and the initial calibration correlation coefficient was > 0.995.

3. **Blanks: Satisfactory.**

A preparation blank was analyzed for each 20 samples or per matrix per concentration level. Blanks were analyzed after each Initial or Continuing Calibration Verification. There were no detections in any blanks that affected sample results except arsenic (0.023 mg/L) in the method blank. Associated sample results were qualified as not detected (U) if the sample result was less than five times the positive blank concentration.

4. **ICP Interference Check Sample: Acceptable.**

An Interference Check Sample (ICS) was analyzed at the beginning of each sequence or at least

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twice every 8 hours, whichever was more frequent. All applicable ICS (solution AB) results were within QC limits of 80% - 120% recovery.

5. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

6. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

7. ICP Serial Dilution: Acceptable.

A serial dilution analysis was performed per matrix per concentration or per sample delivery group, whichever was more frequent. All serial dilution results were within QC limits.

8. Matrix Spike Analysis: Satisfactory.

A matrix spike analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. Spike recoveries were within the QC limits except barium with a low recovery. Associated barium positive results and sample quantitation limits were qualified as estimated quantities with a low bias (JL or UJL).

9. Duplicate Analysis: Acceptable.

A laboratory duplicate analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. All duplicate results were within QC limits.

10. Laboratory Control Sample Analysis: Acceptable.

A Laboratory Control Sample (LCS) was analyzed per SDG per matrix. All LCS results were within the established control limits.

11. Overall Assessment of Data for Use

A total of 32 results were validated in this data memorandum. No sample results were qualified as estimated quantities based on duplicate precision outliers, holding time outliers, incorrect sample containers, serial dilution outliers, or sample temperature outliers. A total of 4 sample results were qualified as estimated quantities based on spike accuracy outliers. The following potential contaminant of concern was detected in the laboratory blanks: arsenic. No sample results were rejected.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/17
Sample Matrix:	Solid	**Date Received:**	05/26/17 12:50
Sample Name:	17053012	**Basis:**	NA
Lab Code:	K1705391-001		

TCLP Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6010C	~~**0.036 J**~~ Q	mg/L	0.050 U	0.020	5	06/01/17 10:28	05/31/17	
Barium	6010C	~~ND U~~	mg/L	1.0 U	~~0.5~~	5	06/01/17 10:28	05/31/17	
Cadmium	6010C	**0.003 J** Q	mg/L	0.050	0.001	5	06/01/17 10:28	05/31/17	
Chromium	6010C	~~ND U~~	mg/L	0.050 U	0.010	5	06/01/17 10:28	05/31/17	
Lead	6010C	**0.176**	mg/L	0.050	0.015	5	06/01/17 10:28	05/31/17	
Mercury	7470A	~~ND~~ U	mg/L	0.0010 U	0.0001	1	06/01/17 09:27	06/01/17	
Selenium	6010C	~~ND~~ U	mg/L	0.10	0.02	5	06/01/17 10:28	05/31/17	
Silver	6010C	ND U	mg/L	0.050	0.004	5	06/01/17 10:28	05/31/17	

MW 6-16-17

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/23/17
Sample Matrix:	Solid	**Date Received:**	05/26/17 12:50
Sample Name:	17053013	**Basis:**	NA
Lab Code:	K1705391-002		

TCLP Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6010C	**0.055** U	mg/L	0.050	0.020	5	06/01/17 10:41	05/31/17	
Barium	6010C	~~ND U~~	mg/L	1.0 UJL	0.5	5	06/01/17 10:41	05/31/17	
Cadmium	6010C	**0.011 J** Q	mg/L	0.050	0.001	5	06/01/17 10:41	05/31/17	
Chromium	6010C	**0.014 J** Q	mg/L	0.050	0.010	5	06/01/17 10:41	05/31/17	
Lead	6010C	**3.59**	mg/L	0.050	0.015	5	06/01/17 10:41	05/31/17	
Mercury	7470A	~~ND U~~	mg/L	0.0010 U	0.0001	1	06/01/17 09:33	06/01/17	
Selenium	6010C	~~ND U~~	mg/L	0.10	0.02	5	06/01/17 10:41	05/31/17	
Silver	6010C	~~ND U~~	mg/L	0.050	0.004	5	06/01/17 10:41	05/31/17	

JMW 6/6/17

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/17
Sample Matrix:	Solid	**Date Received:**	05/26/17 12:50
Sample Name:	17053014	**Basis:**	NA
Lab Code:	K1705391-003		

TCLP Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6010C	~~0.029 J~~	mg/L	0.050	0.020	5	06/01/17 10:43	05/31/17	
Barium	6010C	ND U	mg/L	1.0	0.5	5	06/01/17 10:43	05/31/17	
Cadmium	6010C	ND U	mg/L	0.050	0.001	5	06/01/17 10:43	05/31/17	
Chromium	6010C	ND U	mg/L	0.050	0.010	5	06/01/17 10:43	05/31/17	
Lead	6010C	**0.498**	mg/L	0.050	0.015	5	06/01/17 10:43	05/31/17	
Mercury	7470A	ND U	mg/L	0.0010	0.0001	1	06/01/17 09:35	06/01/17	
Selenium	6010C	ND U	mg/L	0.10	0.02	5	06/01/17 10:43	05/31/17	
Silver	6010C	ND U	mg/L	0.050	0.004	5	06/01/17 10:43	05/31/17	

Superset Reference: MW 6-16-17

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Ecology And Environment, Inc.	**Service Request:**	K1705391
Project:	START BOA - 2017	**Date Collected:**	05/24/17
Sample Matrix:	Solid	**Date Received:**	05/26/17 12:50
Sample Name:	17053015	**Basis:**	NA
Lab Code:	K1705391-004		

TCLP Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6010C	~~0.026 J~~	mg/L	0.050 U	0.020	5	06/01/17 10:55	05/31/17	
Barium	6010C	~~ND U~~	mg/L	1.0 UJL	0.5	5	06/01/17 10:55	05/31/17	
Cadmium	6010C	**0.002 J** Q	mg/L	0.050	0.001	5	06/01/17 10:55	05/31/17	
Chromium	6010C	ND U	mg/L	0.050 U	0.010	5	06/01/17 10:55	05/31/17	
Lead	6010C	ND U	mg/L	0.050	0.015	5	06/01/17 10:55	05/31/17	
Mercury	7470A	ND U	mg/L	0.0010	0.0001	1	06/01/17 09:36	06/01/17	
Selenium	6010C	ND U	mg/L	0.10	0.02	5	06/01/17 10:55	05/31/17	
Silver	6010C	ND U	mg/L	0.050	0.004	5	06/01/17 10:55	05/31/17	

MW

Printed 6/1/2017 5:23:27 PM

Superset Reference: MW 6-16-17

K1706391

USEPA

DateShipped: 5/26/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name:

Contact Phone:

No: PDX-11

Lab: ALS Environmental, Inc.

Lab Phone: 360 577-7222

Lab Address: 1317 S 13th Ave

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	17053012	BP01	TCLP RCRA 8 Metals	Building Material	5/23/2017	1	8 oz glass jar	None	N
	17053012	BP01	Total PCBs	Building Material	5/23/2017	1	8 oz glass jar	None	N
	17053013	BP02	TCLP RCRA 8 Metals	Building Material	5/23/2017	1	8 oz glass jar	None	N
	17053013	BP02	Total PCBs	Building Material	5/23/2017	1	8 oz glass jar	None	N
	17053014	BP03	TCLP RCRA 8 Metals	Building Material	5/24/2017	1	8 oz glass jar	None	N
	17053014	BP03	Total PCBs	Building Material	5/24/2017	1	8 oz glass jar	None	N
	17053015	BP04	TCLP RCRA 8 Metals	Building Material	5/24/2017	1	8 oz glass jar	None	Y
	17053015	BP04	Total PCBs	Building Material	5/24/2017	1	8 oz glass jar	None	Y

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Sighature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	RNorden / START	5/26/17 1250	[signature]	1250 5/26/17	

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F Analytical Data – Response PCM Air Sampling

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ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 19, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 8 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050001	17050002	17050003	17050004	17050005
17050006	17050007	17050008		

Data Qualifications:

The samples were collected on May 17, 2017, and were analyzed by May 18, 2017. The laboratory could not analyze sample 17050003 as it was overloaded with material. A field blank was not submitted; however, three sample results were below detection limits and the method blank had no detections, therefore, no actions were taken based on this discrepancy.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172834 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172834R01
Date Received: 5/18/2017

Analyst: PK 5/18/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050001	AS01	3169.4	4.5	100	< 7.0 U	< 0.001 U	0 - 0.002	0.001
S2	17050002	AS02	2797.8	4	100	< 7.0 U	< 0.001 U	0 - 0.002	0.001
S4	17050004	AS04	2654.4	9	100	11.704	0.002	0.001 - 0.003	0.001
S5	17050005	AS05	2585.0	7.5	100	9.753	0.001	0.001 - 0.003	0.001
S6	17050006	PS01	391.2	6.5	100	8.453	0.008	0.003 - 0.017	0.007
S7	17050007	PS02	458.96	9	100	11.704	0.01	0.004 - 0.019	0.006
S8	17050008	PS03	420.48	4	100	< 7.0 U	< 0.006 U	0.001 - 0.012	0.006
B1	Blank		0	1	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x Paulina Kho

Paulina Kho
Analyst

MW 5-18-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

172834

USEPA

DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-01

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050001	AS01	Asbestos PCM	Air	MCE Cassette	5/17/2017	3169.37	Liters	5/17/2017	315	10.0615	L/min
	17050002	AS02	Asbestos PCM	Air	MCE Cassette	5/17/2017	2797.79	Liters	5/17/2017	278	10.064	L/min
	17050003	AS03	Asbestos PCM	Air	MCE Cassette	5/17/2017	2661.69	Liters	5/17/2017	270	9.8581	L/min
	17050004	AS04	Asbestos PCM	Air	MCE Cassette	5/17/2017	2654.39	Liters	5/17/2017	264	10.0545	L/min
	17050005	AS05	Asbestos PCM	Air	MCE Cassette	5/17/2017	2585.02	Liters	5/17/2017	260	9.9424	L/min
	17050006	PS01	Asbestos PCM	Air	MCE Cassette	5/17/2017	391.2	Liters	5/17/2017	140	2.7943	L/min
	17050007	PS02	Asbestos PCM	Air	MCE Cassette	5/17/2017	458.96	Liters	5/17/2017	160	2.8685	L/min
	17050008	PS03	Asbestos PCM	Air	MCE Cassette	5/17/2017	420.48	Liters	5/17/2017	143	2.9404	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary adn full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Gates	5/17/17 2004	LABCOR PORTLAND, INC	5/18/17 5:13 am	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 13 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050009	17050010	17050011	17050012	17050013
17050014	17050015	17050016	17050018	17050019
17050020	17050021	17050022		

Data Qualifications:

The samples were collected on May 18, 2017, and were analyzed by May 19, 2017. Two field blanks were submitted. There were no detections in the field or laboratory blanks. No discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R01
Date Received: 5/19/2017

Analyst: SG 5/19/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050009	AS02	5155.0	0.333	100	< 7.0	< 0.001	0 - 0	0.001
S2	17050010	AS03	2658.2	1.833	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050011	AS04	2742.9	1.333	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050012	AS06	3971.7	2.833	100	< 7.0	< 0.001	0 - 0.001	0.001
S5	17050013	AS07	4549.1	2.333	100	< 7.0	< 0.001	0 - 0.001	0.001
S6	17050014	PS01	1198.2	14.33	100	18.639	0.006	0.003 - 0.01	0.002
S7	17050015	PS02	1244.7	1.333	100	< 7.0	< 0.002	0 - 0.002	0.002
S8	17050016	PS03	765.08	0.333	100	< 7.0	< 0.004	0 - 0.002	0.004
S9	17050018	PS05	1057.9	1.333	100	< 7.0	< 0.003	0 - 0.003	0.003
S10	17050019	PS06	1314.7	0	100	< 7.0	< 0.002	0 - 0.001	0.002
S11	17050020	PS07	724.98	0.333	100	< 7.0	< 0.004	0 - 0.003	0.004
S12	17050021	Blank	0	0	100	< 7.0			
S13	17050022	Blank	0	1	100	< 7.0			
B1	Blank		0	1	100	< 7.0			

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 5-24-17

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R01
Date Received: 5/19/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

JMW 52417

172886 p1/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050009	AS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	5155.02	Liters	5/18/2017	520	9.9135	L/min
	17050010	AS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	2658.15	Liters	5/18/2017	267	9.9556	L/min
	17050011	AS04	Asbestos PCM	Air	MCE Cassette	5/18/2017	2742.85	Liters	5/18/2017	272	10.084	L/min
	17050012	AS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	3971.74	Liters	5/18/2017	392	10.132	L/min
	17050013	AS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	4549.06	Liters	5/18/2017	442	10.292	L/min
	17050014	PS01	Asbestos PCM	Air	MCE Cassette	5/18/2017	1198.2	Liters	5/18/2017	400	2.9955	L/min
	17050015	PS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	1244.74	Liters	5/18/2017	429	2.9015	L/min
	17050016	PS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	765.08	Liters	5/18/2017	248	3.085	L/min
	17050018	PS05	Asbestos PCM	Air	MCE Cassette	5/18/2017	1057.94	Liters	5/18/2017	352	3.0055	L/min
	17050019	PS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	1314.67	Liters	5/18/2017	449	2.928	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/18/17 2005	[signature] LABCOR PORTLAND INC	5/19/17 4:50 AM	

172886 p2/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050020	PS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	724.98	Liters	5/18/2017	233	3.1115	L/min
	17050021	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17050022	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17053000	BS01	Asbestos PLM	Bulk		5/18/2017						

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Caffee	5/18/17 2005	LABCOR PORTLAND INC.	5/19/17 4:50 pm	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 11 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050023	17050024	17050026	17050027	17050028
17050030	17050031	17050032	17050033	17050034
17050035				

Data Qualifications:

The samples were collected on May 19, 2017, and were analyzed by May 20, 2017. One field blank was submitted. There were no detections in the field or laboratory blanks. No discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R01
Date Received: 5/20/2017

Analyst: SG 5/20/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050023	AS03	2280.2	3.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S2	17050024	AS04	2376.4	2.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S3	17050026	AS08	2667.0	0	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050027	AS09	2659.4	0	100	< 7.0	< 0.001	0 - 0.001	0.001
S5	17050028	PS01	1448.0	5	100	< 7.0	< 0.002	0.001 - 0.004	0.002
S6	17050030	PS03	1452.9	0.5	100	< 7.0	< 0.002	0 - 0.001	0.002
S7	17050031	PS04	1330.5	0.5	100	< 7.0	< 0.002	0 - 0.001	0.002
S8	17050032	PS05	389.99	1.5	100	< 7.0	< 0.007	0 - 0.009	0.007
S9	17050033	PS06	1297.5	0.5	100	< 7.0	< 0.002	0 - 0.001	0.002
S10	17050034	PS07	1336.5	1.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S11	17050035	Blank	0	0	100	< 7.0			
B1	Blank		0	1	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 5-24-17

172918

USEPA
DateShipped: 5/19/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-03
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050023	AS03	Asbestos PCM	Air	MCE Cassette	5/19/2017	2280.23	Liters	226	10.0895	L/min
	17050024	AS04	Asbestos PCM	Air	MCE Cassette	5/19/2017	2376.39	Liters	234	10.1555	L/min
	17050026	AS08	Asbestos PCM	Air	MCE Cassette	5/19/2017	2667.03	Liters	262	10.1795	L/min
	17050027	AS09	Asbestos PCM	Air	MCE Cassette	5/19/2017	2659.43	Liters	262	10.1505	L/min
	17050028	PS01	Asbestos PCM	Air	MCE Cassette	5/19/2017	1448.04	Liters	486	2.9795	L/min
	17050030	PS03	Asbestos PCM	Air	MCE Cassette	5/19/2017	1452.91	Liters	470	3.0913	L/min
	17050031	PS04	Asbestos PCM	Air	MCE Cassette	5/19/2017	1330.45	Liters	436	3.0515	L/min
	17050032	PS05	Asbestos PCM	Air	MCE Cassette	5/19/2017	389.99	Liters	128	3.0468	L/min
	17050033	PS06	Asbestos PCM	Air	MCE Cassette	5/19/2017	1297.53	Liters	430	3.0175	L/min
	17050034	PS07	Asbestos PCM	Air	MCE Cassette	5/19/2017	1336.45	Liters	441	3.0305	L/min
	17050035	Blank	Asbestos PCM	Air	MCE Cassette	5/19/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/19/17 1900	[signature] LABCORPORTLAND INC	5/20/17 4:45 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 13 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050036	17050037	17050038	17050039	17050040
17050041	17050042	17050043	17050044	17050045
17050046	17050047	17050048		

Data Qualifications:

The samples were collected on May 20, 2017, and were analyzed by May 21, 2017. One field blank was submitted. There were no detections in the field or laboratory blanks. No discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R01
Date Received: 5/21/2017

Analyst: TH 5/21/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050036	AS03	2663.2	5.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S2	17050037	AS04	2722.1	0.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050038	AS09	2769.2	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050039	AS10	2904.0	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S5	17050040	AS11	3025.6	0	100	< 7.0	< 0.001	0 - 0.001	0.001
S6	17050041	PS01	858.27	5	100	< 7.0	< 0.003	0.001 - 0.007	0.003
S7	17050042	PS02	1527.1	3.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S8	17050043	PS03	1373.5	2	100	< 7.0	< 0.002	0 - 0.003	0.002
S9	17050044	PS04	1422.4	0	100	< 7.0	< 0.002	0 - 0.001	0.002
S10	17050045	PS05	691.61	5	100	< 7.0	< 0.004	0.001 - 0.008	0.004
S11	17050046	PS06	1265	0	100	< 7.0	< 0.002	0 - 0.001	0.002
S12	17050047	PS07	1131.6	0	100	< 7.0	< 0.002	0 - 0.002	0.002
S13	17050048	Blank	0	2	100	< 7.0			
B1	Blank		0	1	100	< 7.0			

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW
52417

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R01
Date Received: 5/21/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Tracy Handrich
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 52417

172913

USEPA
DateShipped: 5/20/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-04
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050036	AS03	Asbestos PCM	Air	MCE Cassette	5/20/2017	2663.18	Liters	260	10.243	L/min
	17050037	AS04	Asbestos PCM	Air	MCE Cassette	5/20/2017	2722.08	Liters	265	10.272	L/min
	17050038	AS09	Asbestos PCM	Air	MCE Cassette	5/20/2017	2769.18	Liters	273	10.1435	L/min
	17050039	AS10	Asbestos PCM	Air	MCE Cassette	5/20/2017	2904.04	Liters	286	10.154	L/min
	17050040	AS11	Asbestos PCM	Air	MCE Cassette	5/20/2017	3025.55	Liters	294	10.291	L/min
	17050041	PS01	Asbestos PCM	Air	MCE Cassette	5/20/2017	858.27	Liters	282	3.0435	L/min
	17050042	PS02	Asbestos PCM	Air	MCE Cassette	5/20/2017	1527.12	Liters	511	2.9885	L/min
	17050043	PS03	Asbestos PCM	Air	MCE Cassette	5/20/2017	1373.51	Liters	457	3.0055	L/min
	17050044	PS04	Asbestos PCM	Air	MCE Cassette	5/20/2017	1422.41	Liters	477	2.982	L/min
	17050045	PS05	Asbestos PCM	Air	MCE Cassette	5/20/2017	691.61	Liters	231	2.994	L/min
	17050046	PS06	Asbestos PCM	Air	MCE Cassette	5/20/2017	1265	Liters	424	2.9835	L/min
	17050047	PS07	Asbestos PCM	Air	MCE Cassette	5/20/2017	1131.57	Liters	381	2.97	L/min
	17050048	Blank	Asbestos PCM	Air	MCE Cassette	5/20/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/20/17 1907	[signature]	5/21/17 4:45AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 14 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050049	17050050	17050051	17050052	17050053
17050054	17050055	17050056	17050057	17050058
17050059	17050060	17050061	17050062	

Data Qualifications:

The samples were collected on May 21, 2017, and were analyzed by May 22, 2017. One field blank was submitted. There were no detections in the field or laboratory blanks. No discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R01
Date Received: 5/22/2017

Analyst: SG 5/22/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050049	AS03	2968.6	0.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050050	AS04	3120.2	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050051	AS12	3335.1	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050052	AS13	3403.8	4	100	< 7.0	< 0.001	0 - 0.002	0.001
S5	17050053	AS14	3204.7	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S6	17050054	AS15	2609.2	1	100	< 7.0	< 0.001	0 - 0.001	0.001
S7	17050055	PS01	1062.7	2.5	100	< 7.0	< 0.003	0 - 0.003	0.003
S8	17050056	PS02	1024.2	9	100	11.704	0.004	0.002 - 0.008	0.003
S9	17050057	PS03	1244.4	2	100	< 7.0	< 0.002	0 - 0.003	0.002
S10	17050058	PS04	1384.4	5.5	100	< 7.0	< 0.002	0.001 - 0.005	0.002
S11	17050059	PS05	1323.6	2.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S12	17050060	PS06	1103.7	4	100	< 7.0	< 0.002	0 - 0.005	0.002
S13	17050061	PS07	1180.7	4	100	< 7.0	< 0.002	0 - 0.004	0.002
S14	17050062	Blank	0	1	100	< 7.0			
B1	Blank		0	1	100	< 7.0			

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 5-24-17

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R01
Date Received: 5/22/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 5247

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

172921

USEPA
DateShipped: 5/21/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-06
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050049	AS03	Asbestos PCM	Air	MCE Cassette	5/21/2017	2968.62	Liters	292	10.1665	L/min
	17050050	AS04	Asbestos PCM	Air	MCE Cassette	5/21/2017	3120.15	Liters	305	10.23	L/min
	17050051	AS12	Asbestos PCM	Air	MCE Cassette	5/21/2017	3335.14	Liters	326	10.2305	L/min
	17050052	AS13	Asbestos PCM	Air	MCE Cassette	5/21/2017	3403.77	Liters	340	10.0111	L/min
	17050053	AS14	Asbestos PCM	Air	MCE Cassette	5/21/2017	3204.65	Liters	315	10.1735	L/min
	17050054	AS15	Asbestos PCM	Air	MCE Cassette	5/21/2017	2609.18	Liters	262	9.9587	L/min
	17050055	PS01	Asbestos PCM	Air	MCE Cassette	5/21/2017	1062.65	Liters	352	3.0189	L/min
	17050056	PS02	Asbestos PCM	Air	MCE Cassette	5/21/2017	1024.2	Liters	348	2.9431	L/min
	17050057	PS03	Asbestos PCM	Air	MCE Cassette	5/21/2017	1244.39	Liters	410	3.0351	L/min
	17050058	PS04	Asbestos PCM	Air	MCE Cassette	5/21/2017	1384.42	Liters	467	2.9645	L/min
	17050059	PS05	Asbestos PCM	Air	MCE Cassette	5/21/2017	1323.63	Liters	437	3.0289	L/min
	17050060	PS06	Asbestos PCM	Air	MCE Cassette	5/21/2017	1103.7	Liters	363	3.0405	L/min
	17050061	PS07	Asbestos PCM	Air	MCE Cassette	5/21/2017	1180.68	Liters	388	3.043	L/min
	17050062	Blank	Asbestos PCM	Air	MCE Cassette	5/21/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/21/17 1845	[signature] LABCOR PORTLAND, INC	5/22/17 6:00 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 18 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050063	17050064	17050065	17050066	17050067
17050068	17050069	17050070	17050071	17050072
17050073	17050074	17050075	17050076	17050077
17050078	17050079	17050080		

Data Qualifications:

The samples were collected on May 22, 2017, and were analyzed by May 23, 2017. Samples 17050063 (overloaded filter), 17050065 (filter blown out), and 17050067 (filter blown out) were not analyzed. One field blank was submitted. There were no detections in the field or laboratory blanks. No other discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R01
Date Received: 5/23/2017

Analyst: SG 5/23/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S2	17050064	AS13	3939	5	100	< 7.0 U	< 0.001 U	0 - 0.001	0.001
S4	17050066	AS16	2821	5.5	100	< 7.0 U	< 0.001 U	0 - 0.002	0.001
S6	17050068	AS18	3538.9	6	100	7.802	0.001	0 - 0.002	0.001
S7	17050069	ASB01	253.91	4	100	< 7.0 U	< 0.011 U	0.002 - 0.02	0.011
S8	17050070	ASB02	248.94	3.5	100	< 7.0 U	< 0.011 U	0.002 - 0.021	0.011
S9	17050071	ASB03	493.34	9.5	100	12.354	0.01	0.005 - 0.019	0.005
S10	17050072	ASB04	485.4	9.5	100	12.354	0.01	0.005 - 0.019	0.006
S11	17050073	PS01	1321.4	42.5	100	55.267	0.016	0.011 - 0.022	0.002
S12	17050074	PS02	1259	11.5	100	14.954	0.005	0.002 - 0.008	0.002
S13	17050075	PS03	1248.7	4.5	100	< 7.0 U	< 0.002 U	0 - 0.004	0.002
S14	17050076	PS04	1113.2	2	100	< 7.0	< 0.002	0 - 0.003	0.002
S15	17050077	PS05	1371.6	1.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S16	17050078	PS06	1202.1	2.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S17	17050079	PS017	522.84	5	100	< 7.0	< 0.005	0.002 - 0.011	0.005
S18	17050080	Blank	0	0.5	100	< 7.0			
B1	Blank		0	1	100	< 7.0			
B2	Blank		0	0	100	< 7.0			

MW 5-24-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R01
Date Received: 5/23/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 5-24-17

172958

USEPA
DateShipped: 5/22/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-07
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
1	17050063	AS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	3752.18	Liters	369	10.1685	L/min
2	17050064	AS13	Asbestos PCM	Air	MCE Cassette	5/22/2017	3938.97	Liters	381	10.3385	L/min
3	17050065	AS15	Asbestos PCM	Air	MCE Cassette	5/22/2017	2696.64	Liters	265	10.176	L/min
4	17050066	AS16	Asbestos PCM	Air	MCE Cassette	5/22/2017	2821	Liters	280	10.075	L/min
5	17050067	AS17	Asbestos PCM	Air	MCE Cassette	5/22/2017	3444.41	Liters	343	10.042	L/min
6	17050068	AS18	Asbestos PCM	Air	MCE Cassette	5/22/2017	3538.88	Liters	347	10.1985	L/min
7	17050069	ASB01	Asbestos PCM	Air	MCE Cassette	5/22/2017	253.91	Liters	125	2.0313	L/min
8	17050070	ASB02	Asbestos PCM	Air	MCE Cassette	5/22/2017	248.94	Liters	124	2.0076	L/min
9	17050071	ASB03	Asbestos PCM	Air	MCE Cassette	5/22/2017	493.34	Liters	122	4.0438	L/min
10	17050072	ASB04	Asbestos PCM	Air	MCE Cassette	5/22/2017	485.4	Liters	121	4.0116	L/min
11	17050073	PS01	Asbestos PCM	Air	MCE Cassette	5/22/2017	1321.41	Liters	440	3.0032	L/min
12	17050074	PS02	Asbestos PCM	Air	MCE Cassette	5/22/2017	1258.97	Liters	419	3.0047	L/min
13	17050075	PS03	Asbestos PCM	Air	MCE Cassette	5/22/2017	1248.68	Liters	409	3.053	L/min
14	17050076	PS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	1113.15	Liters	370	3.0085	L/min
15	17050077	PS05	Asbestos PCM	Air	MCE Cassette	5/22/2017	1371.62	Liters	447	3.0685	L/min
16	17050078	PS06	Asbestos PCM	Air	MCE Cassette	5/22/2017	1202.12	Liters	397	3.028	L/min
17	17050079	PS07	Asbestos PCM	Air	MCE Cassette	5/22/2017	522.84	Liters	173	3.0222	L/min
18	17050080	Blank	Asbestos PCM	Air	MCE Cassette	5/22/2017		Liters			L/min

Special Instructions: Please process ASB03 and ASB04 for early PCM reads first, then refer to email from shall@ene.com for further analytical instructions
Please proceses all samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/22/17 1934	[signature] LABCOR PORTLAND INC, 5/23/17	5/23/17 10:10 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 24, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 25 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050081	17050082	17050083	17050084	17050085
17050086	17050087	17050088	17050089	17050090
17050091	17050092	17050093	17050094	17050095
17050096	17050097	17050098	17050099	17050100
17050101	17050102	17050103	17050104	17050105

Data Qualifications:

The samples were collected on May 23, 2017, and were analyzed by May 24, 2017. Samples 17050094 (filter packaged incorrectly), 17050097 (filter blown out), and 17050105 (field blank; not analyzed) were not analyzed. One field blank was submitted. There were no detections in the laboratory blanks and the majority of the samples did not have a positive result; therefore, no actions were taken based on the absence of a field blank analysis. No other discrepancies were noted by the laboratory in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R01
Date Received: 5/24/2017

Analyst: SG 5/24/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050081	AS03	1721.0	5	100	< 7.0	< 0.002	0 - 0.003	0.002
S2	17050082	AS04	2194.4	3.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S3	17050083	AS15	2071.4	3.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S4	17050084	AS19	1868.3	7	100	9.103	0.002	0.001 - 0.004	0.001
S5	17050085	AS20	1820.5	1.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S6	17050086	AS21	1619.5	3.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S7	17050087	AS22	1457.0	1.5	100	< 7.0	< 0.002	0 - 0.002	0.002
S8	17050088	ABS05	254.55	0	100	< 7.0	< 0.011	0 - 0.007	0.011
S9	17050089	ABS06	499.2	5.5	100	< 7.0	< 0.005	0.002 - 0.013	0.005
S10	17050090	ABS07	245.45	1.5	100	< 7.0	< 0.011	0 - 0.015	0.011
S11	17050091	ABS08	486.59	2.5	100	< 7.0	< 0.006	0 - 0.007	0.006
S12	17050092	ABS09	253.94	8.5	100	11.053	0.017	0.007 - 0.031	0.011
S13	17050093	ABS10	478.05	4	100	< 7.0	< 0.006	0.001 - 0.011	0.006
S15	17050095	ABS12	473.84	7	100	9.103	0.007	0.003 - 0.015	0.006
S16	17050096	PS01	1581.4	9.5	100	12.354	0.003	0.002 - 0.006	0.002
S18	17050098	PS03	1302.6	10.5	100	13.654	0.004	0.002 - 0.007	0.002
S19	17050099	PS04	1108.6	1.5	100	< 7.0	< 0.002	0 - 0.003	0.002
S20	17050100	PS05	782.18	1.5	100	< 7.0	< 0.003	0 - 0.005	0.003
S21	17050101	PS07	1332.8	4.5	100	< 7.0	< 0.002	0 - 0.004	0.002
S22	17050102	PS08	339.9	6.5	100	8.453	0.01	0.003 - 0.019	0.008
S23	17050103	PS09	294	4	100	< 7.0	< 0.009	0.002 - 0.017	0.009

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 5-24-17

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R01
Date Received: 5/24/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
B1	Blank		0	1	100	< 7.0			
B2	Blank		0	0	100	< 7.0			
S24	17050104	PS10	309	4.5	100	< 7.0	< 0.009	0.002 - 0.017	0.009

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 52417

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

172985 pv2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050081	AS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1721.03	Liters	176	9.7786	L/min
	17050082	AS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	2194.39	Liters	220	9.9745	L/min
	17050083	AS15	Asbestos PCM	Air	MCE Cassette	5/23/2017	2071.44	Liters	210	9.864	L/min
	17050084	AS19	Asbestos PCM	Air	MCE Cassette	5/23/2017	1868.28	Liters	181	10.322	L/min
	17050085	AS20	Asbestos PCM	Air	MCE Cassette	5/23/2017	1820.46	Liters	182	10.0025	L/min
	17050086	AS21	Asbestos PCM	Air	MCE Cassette	5/23/2017	1619.54	Liters	154	10.5165	L/min
	17050087	AS22	Asbestos PCM	Air	MCE Cassette	5/23/2017	1457.03	Liters	145	10.0485	L/min
	17050088	ABS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	254.55	Liters	126	2.0202	L/min
	17050089	ABS06	Asbestos PCM	Air	MCE Cassette	5/23/2017	499.2	Liters	122	4.0918	L/min
	17050090	ABS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	245.45	Liters	122	2.0119	L/min
	17050091	ABS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	486.59	Liters	120	4.0549	L/min
	17050092	ABS099	Asbestos PCM	Air	MCE Cassette	5/23/2017	253.94	Liters	122	2.0815	L/min
	17050093	ABS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	478.05	Liters	121	3.9508	L/min
	17050094	ABS11	Asbestos PCM	Air	MCE Cassette	5/23/2017	258.68	Liters	122	2.1203	L/min
	17050095	ABS12	Asbestos PCM	Air	MCE Cassette	5/23/2017	473.84	Liters	121	3.916	L/min
	17050096	PS01	Asbestos PCM	Air	MCE Cassette	5/23/2017	1581.36	Liters	528	2.995	L/min
	17050097	PS02	Asbestos PCM	Air	MCE Cassette	5/23/2017	621.29	Liters	209	2.9727	L/min
	17050098	PS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1302.6	Liters	445	2.9272	L/min
	17050099	PS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	1108.56	Liters	372	2.98	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] LABCOR PORTLAND INC.	5/24/17 3:45AM	

172985 pg 2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050100	PS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	782180	Liters	259	3.02	L/min
	17050101	PS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	1332.78	Liters	445	2.995	L/min
	17050102	PS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	339.9	Liters	165	2.06	L/min
	17050103	PS09	Asbestos PCM	Air	MCE Cassette	5/23/2017	294	Liters	150	1.96	L/min
	17050104	PS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	309	Liters	150	2.06	L/min
	17050105	BLANK	Asbestos PCM	Air	MCE Cassette	5/23/2017	BLANK	NOT SUBMITTED			

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] → LABCOR PORTLAND INC.	5/24/17 3:45pm SG	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: May 25, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 11 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050107	17050108	17050109	17050110	17050111
17050112	17050113	17050114	17050115	17050116
17050117				

Data Qualifications:

The samples were collected on May 24, 2017, and were analyzed by June 29, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173014 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173014R02
Date Received: 5/24/2017

Analyst: SG 5/25/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	TotalFields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050107	AS09	5269.3	0	100	< 7.0	< 0.0005	0 - 0.0004	0.0005
S2	17050108	AS10	4704.8	2.5	100	< 7.0	< 0.0006	0 - 0.0008	0.0006
S3	17050109	AS15	2316.7	1.5	100	< 7.0	< 0.0012	0.0001 - 0.0016	0.0012
S4	17050110	AS18	4586	0.5	100	< 7.0	< 0.0006	0 - 0.0004	0.0006
S5	17050111	AS23	3258.5	4.5	100	< 7.0	< 0.0008	0.0002 - 0.0016	0.0008
S6	17050112	PS02	1155.8	8	100	10.4031	0.003	0.0015 - 0.0068	0.0023
S7	17050113	PS03	1359.2	3.5	100	< 7.0	< 0.002	0.0004 - 0.0038	0.002
S8	17050114	PS04	1167.8	1.5	100	< 7.0	< 0.0023	0.0001 - 0.0031	0.0023
S9	17050115	PS05	388.7	2	100	< 7.0	< 0.0069	0.0003 - 0.0093	0.0069
S10	17050116	PS06	1592.3	4.5	100	< 7.0	< 0.0017	0.0003 - 0.0032	0.0017
S11	17050117	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x Kate March
Kate March
Analyst

MW 5-25-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173014

USEPA
DateShipped: 5/24/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name:
Contact Phone:

No: PDX-10
Lab: LA
Lab Phone: 281-292-5277
Lab Address: 1544 Sawdust Road

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	17050107	AS09	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050108	AS10	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050109	AS15	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050110	AS18	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050111	AS23	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050112	PS02	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050114	PS04	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050115	PS05	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050116	PS06	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050117	Blank	Asbestos PCM	Air	5/24/2017	1	MCE Cassette		
	17050113	PS03	Asbestos PCM	Air	5/24/2017	1			

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	R Vorder	5/24/17 1900	A Sohn Latter Pastel	5/24/17 @	8:50pm OK

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 6, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 8 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050123	17050124	17050125	17050126	17050127
17050128	17050129	17050130		

Data Qualifications:

The samples were collected on May 25, 2017, and were analyzed by May 26, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173067 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173067R01
Date Received: 5/26/2017

Analyst: SG 5/26/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050123	AS23	3802.9	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050124	AS10	3505.7	4.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050125	PS01	940.28	3	100	< 7.0	< 0.003	0 - 0.005	0.003
S4	17050126	PS02	1216	6	100	7.802	0.002	0.001 - 0.005	0.002
S5	17050127	PS03	98.08	1	100	< 7.0	< 0.028	0 - 0.028	0.028
S6	17050128	PS04	802.34	5	100	< 7.0	< 0.003	0.001 - 0.007	0.003
S7	17050129	PS05	877.63	1	100	< 7.0	< 0.003	0 - 0.003	0.003
S8	17050130	PS06	936.51	4	100	< 7.0	< 0.003	0.001 - 0.005	0.003
S9	17050131	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

JMW 6-8-17

173067

USEPA
DateShipped: 5/25/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-12
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	17050123	AS23	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050124	AS10	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050125	PS01	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050126	PS02	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050127	PS03	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050128	PS04	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050129	PS05	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050130	PS06	Asbestos PCM	Air	5/25/2017	1	MCE Cassette		
	17050131	Blank	Asbestos PCM		5/25/2017	1	MCE Cassette		

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide pertiminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sample delivery	R Worden / START	5/25/17 1925			

ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 14 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050132	17050133	17050134	17050135	17050136
17050137	17050140	17050141	17050142	17050143
17050144	17050145	17050146	17050147	

Data Qualifications:

The samples were collected on May 26, 2017, and were analyzed by May 27, 2017. Sample 17050140 was overloaded and was not analyzed. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173090 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173090R01
Date Received: 5/30/2017

Analyst: SG 5/30/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050132	PS01	586.86	9	100	11.704	0.008	0.004 - 0.015	0.005
S2	17050133	PS02	647.57	13	100	16.905	0.01	0.005 - 0.017	0.004
S3	17050134	PS03	1277.1	11.5	100	14.954	0.005	0.002 - 0.008	0.002
S4	17050135	PS04	1315.4	6	100	7.802	0.002	0.001 - 0.005	0.002
S5	17050136	PS05	684.24	7	100	9.103	0.005	0.002 - 0.011	0.004
S6	17050137	PS06	888.04	4	100	< 7.0	< 0.003	0.001 - 0.006	0.003
S8	17050141	AS15	2750.9	3	100	< 7.0	< 0.001	0 - 0.002	0.001
S9	17050142	AS09	3920.1	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S10	17050143	AS10	4049.3	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S11	17050144	AS18	4195.7	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S12	17050145	AS20	4010.6	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S13	17050146	AS23	3509	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S14	17050147	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

MW 6-5-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173090

USEPA
DateShipped: 5/26/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-13
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050132	PS01	Asbestos PCM	Air	MCE Cassette	5/26/2017	586.86	Liters	197	2.979	L/min
	17050133	PS02	Asbestos PCM	Air	MCE Cassette	5/26/2017	647.57	Liters	218	2.9705	L/min
	17050134	PS03	Asbestos PCM	Air	MCE Cassette	5/26/2017	1277.06	Liters	422	3.0262	L/min
	17050135	PS04	Asbestos PCM	Air	MCE Cassette	5/26/2017	1315.37	Liters	437	3.01	L/min
	17050136	PS05	Asbestos PCM	Air	MCE Cassette	5/26/2017	684.24	Liters	220	3.1102	L/min
	17050137	PS06	Asbestos PCM	Air	MCE Cassette	5/26/2017	888.04	Liters	298	2.98	L/min
	17050140	AS03	Asbestos PCM	Air	MCE Cassette	5/26/2017	2676.7	Liters	264	10.139	L/min
	17050141	AS15	Asbestos PCM	Air	MCE Cassette	5/26/2017	2750.91	Liters	279	9.8599	L/min
	17050142	AS09	Asbestos PCM	Air	MCE Cassette	5/26/2017	3920.09	Liters	390	10.0515	L/min
	17050143	AS10	Asbestos PCM	Air	MCE Cassette	5/26/2017	4049.29	Liters	404	10.023	L/min
	17050144	AS18	Asbestos PCM	Air	MCE Cassette	5/26/2017	4195.67	Liters	426	9.849	L/min
	17050145	AS20	Asbestos PCM	Air	MCE Cassette	5/26/2017	4010.6	Liters	400	10.0265	L/min
	17050146	AS23	Asbestos PCM	Air	MCE Cassette	5/26/2017	3509	Liters	353	9.9405	L/min
	17050147	Blank	Asbestos PCM			5/26/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sample drop	R Nordeen / START	5/26/17 1921	LABCOR PORTLAND INC	5/30/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 7 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050148	17050149	17050150	17050151	17050152
17050153	17050154			

Data Qualifications:

The samples were collected on May 27, 2017, and were analyzed by May 28, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173091 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173091R01
Date Received: 5/30/2017

Analyst: SG 5/30/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050148	AS03	4824.7	4.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050149	AS15	5003.8	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050150	AS04	4988.5	3.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050151	PS01	389.52	5.5	100	< 7.0	< 0.007	0.003 - 0.017	0.007
S5	17050152	PS02	1123.8	2	100	< 7.0	< 0.002	0 - 0.003	0.002
S6	17050153	PS03	327.19	3	100	< 7.0	< 0.008	0.001 - 0.013	0.008
S7	17050154	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

JMW 6-5-17

173091

USEPA
DateShipped: 5/27/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-14
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050148	AS03		Air	MCE Cassette	5/27/2017	4824709.6	cc	488	9.8867	L/min
	17050149	AS15		Air	MCE Cassette	5/27/2017	5003.76	Liters	511	9.7921	L/min
	17050150	AS04		Air	MCE Cassette	5/27/2017	4988.54	Liters	504	9.8979	L/min
	17050151	PS01		Air	MCE Cassette	5/27/2017	389.52	Liters	127	3.0671	L/min
	17050152	PS02		Air	MCE Cassette	5/27/2017	1123.78	Liters	364	3.0873	L/min
	17050153	PS03		Air	MCE Cassette	5/27/2017	327.19	Liters	108	3.0295	L/min
	17050154	Blank		Air	MCE Cassette	5/27/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	R Woodson / START	1730 5/27/17	LABCOR-PORTLAND INC	5/30/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 7 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050148	17050149	17050150	17050151	17050152
17050153	17050154			

Data Qualifications:

The samples were collected on May 28, 2017, and were analyzed by May 29, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173092 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173092R01
Date Received: 5/30/2017

Analyst: SG 5/30/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050155	AS03	4405.7	6	100	7.802	0.001	0 - 0.001	0.001
S2	17050156	AS15	4430.5	3.5	100	< 7.0 U	< 0.001 U	0 - 0.001	0.001
S3	17050157	PS01	619.29	1.5	100	< 7.0	< 0.004 U	0 - 0.006	0.004
S4	17050158	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

JW 6-5-17

173092

USEPA

DateShipped: 5/28/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-15

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050155	AS03	Asbestos PCM	Air	MCE Cassette	5/28/2017	4405722.5	cc	445	9.9005	L/min
	17050156	AS15	Asbestos PCM	Air	MCE Cassette	5/28/2017	4430.5	Liters	448	9.8895	L/min
	17050157	PS01	Asbestos PCM	Air	MCE Cassette	5/28/2017	619.29	Liters	311	1.9913	L/min
	17050158	Blank	Asbestos PCM	Air	MCE Cassette	5/28/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sample delivery	Brodie / START	5/28/17 1645	5/30/17 LABCOR PORTLAND INC	5/30/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050159 17050160 17050161

Data Qualifications:

The samples were collected on May 29, 2017, and were analyzed by May 30, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173093 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173093R01
Date Received: 5/30/2017

Analyst: SG 5/30/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050159	AS03	4369.2	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050160	AS15	4208.2	3.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050161	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173093

USEPA
DateShipped: 5/29/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-16
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050159	AS03		Air	MCE Cassette	5/29/2017	4369.19	Liters	433	10.0905	L/min
	17050160	AS15		Air	MCE Cassette	5/29/2017	4208.23	Liters	421	9.9958	L/min
	17050161	Blank		Air	MCE Cassette	5/29/2017					

Special Instructions:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Renee Lynorden / START	5/29/17 1530	LABCOR Portland Inc	5/30/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 6 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050162 17050163 17050164 17050165 17050166
17050167

Data Qualifications:

The samples were collected on May 30, 2017, and were analyzed by May 31, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173128 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173128R01
Date Received: 5/31/2017

Analyst: SG 5/31/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050162	PS01	337.96	2.5	100	< 7.0 U	< 0.008 U	0 - 0.011	0.008
S2	17050163	PS02	1409.9	4	100	< 7.0	< 0.002	0 - 0.004	0.002
S3	17050164	PS03	890.23	3.5	100	< 7.0	< 0.003	0.001 - 0.006	0.003
S4	17050165	PS04	1622.4	9	100	11.704	0.003	0.001 - 0.005	0.002
S5	17050166	PS05	753.65	9.5	100	12.354	0.006	0.003 - 0.012	0.004
S6	17050167	Blank	0	0	100	< 7.0 U			
B1	Blank		0	0	100	< 7.0 U			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-5-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173128 p 1/2

USEPA
DateShipped: 5/30/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-17
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050162	PS01		Air	MCE Cassette	5/30/2017	337.96	Liters	112	3.0175	L/min
	17050163	PS02		Air	MCE Cassette	5/30/2017	1409.86	Liters	472	2.987	L/min
	17050164	PS03		Air	MCE Cassette	5/30/2017	890.23	Liters	294	3.028	L/min
	17050165	PS04		Air	MCE Cassette	5/30/2017	1622.43	Liters	540	3.0045	L/min
	17050166	PS05		Air	MCE Cassette	5/30/2017	*	Liters			L/min
	17050167	Blank			MCE Cassette	5/30/2017		Liters			

* SEE p2 FOR UPDATED VOLUME - SG 5/31/17

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
6	START	5/30/17 18:00	LABCOR PORTLAND INC	5/31/17 8:00am	

173128 p2/2

USEPA

DateShipped: 5/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-17

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050162	PS01	Asbestos PCM	Air	MCE Cassette	5/30/2017	337.96	Liters	112	3.0175	L/min
	17050163	PS02	Asbestos PCM	Air	MCE Cassette	5/30/2017	1409.86	Liters	472	2.987	L/min
	17050164	PS03	Asbestos PCM	Air	MCE Cassette	5/30/2017	890.23	Liters	294	3.028	L/min
	17050165	PS04	Asbestos PCM	Air	MCE Cassette	5/30/2017	1622.43	Liters	540	3.0045	L/min
	17050166	PS05	Asbestos PCM	Air	MCE Cassette	5/30/2017	753.65	Liters	255	2.9555	L/min
	17050167	Blank	Asbestos PCM	Air	MCE Cassette	5/30/2017		Liters			

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 7 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050168	17050169	17050170	17050171	17050172
17050173	17050174			

Data Qualifications:

The samples were collected on May 31, 2017, and were analyzed by June 1, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173159 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173159R01
Date Received: 6/1/2017

Analyst: SG 6/1/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050168	PS01	824.03	4.5	100	< 7.0	< 0.003	0.001 - 0.006	0.003
S2	17050169	PS02	1656.2	10.5	100	13.654	0.003	0.001 - 0.006	0.002
S3	17050170	PS03	1050	2.5	100	< 7.0	< 0.003	0 - 0.003	0.003
S4	17050171	PS04	1243.5	3	100	< 7.0	< 0.002	0 - 0.004	0.002
S5	17050172	AS03	4972.7	5	100	< 7.0	< 0.001	0 - 0.001	0.001
S6	17050173	AS15	5266.9	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S7	17050174	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 6-5-17

173159

USEPA
DateShipped: 5/31/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 2066-920-1739

No: PDX-19
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050168	PS01	Asbestos PCM	Air	MCE Cassette	5/31/2017	824.03	Liters	276	2.9856	L/min
	17050169	PS02	Asbestos PCM	Air	MCE Cassette	5/31/2017	1656.18	Liters	554	2.9895	L/min
	17050170	PS03	Asbestos PCM	Air	MCE Cassette	5/31/2017	1049.97	Liters	349	3.0085	L/min
	17050171	PS04	Asbestos PCM	Air	MCE Cassette	5/31/2017	1243.48	Liters	399	3.1165	L/min
	17050172	AS03	Asbestos PCM	Air	MCE Cassette	5/31/2017	4972.73	Liters	498	9.9854	L/min
	17050173	AS15	Asbestos PCM	Air	MCE Cassette	5/31/2017	5266.94	Liters	527	9.9942	L/min
	17050174	Blank		Air	MCE Cassette	5/31/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SAMPLES	RWoodke / START	5/31/17 1800	6/1/17 LABCOR PORTLAND INC.	6/1/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 9 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050175	17050176	17050177	17050178	17050179
17050180	17050181	17050182	17050183	

Data Qualifications:

The samples were collected on June 1, 2017, and were analyzed by June 2, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173201 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173201R02
Date Received: 6/2/2017

Analyst: SG 6/2/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	TotalFields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050175	PS01	1133.1	5.5	100	< 7.0	< 0.0024	0.001 - 0.0058	0.0024
S2	17050176	PS02	710.43	3	100	< 7.0	< 0.0038	0.0004 - 0.0062	0.0038
S3	17050177	PS03	1113.4	1.5	100	< 7.0	< 0.0024	0.0001 - 0.0032	0.0024
S4	17050178	PS04	826.09	3	100	< 7.0	< 0.0033	0.0004 - 0.0053	0.0033
S5	17050179	PS05	164.61	2.5	100	< 7.0	< 0.0164	0.0007 - 0.022	0.0164
S6	17050180	AS03	4719.4	3	100	< 7.0	< 0.0006	0.0001 - 0.0009	0.0006
S8	17050182	AS15	5182.1	0.5	100	< 7.0	< 0.0005	0 - 0.0004	0.0005
S9	17050183	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x Kate March
Kate March
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

MW 6-5-17

173201

USEPA

DateShipped: 6/1/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-20

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050175	PS01		Air	MCE Cassette	6/1/2017	1133.09	Liters	381	2.974	L/min
	17050176	PS02		Air	MCE Cassette	6/1/2017	710.43	Liters	239	2.9725	L/min
	17050177	PS03		Air	MCE Cassette	6/1/2017	1113.4	Liters	372	2.993	L/min
	17050178	PS04		Air	MCE Cassette	6/1/2017	826.09	Liters	271	3.0483	L/min
	17050179	PS05		Air	MCE Cassette	6/1/2017	164.61	Liters	56	2.9395	L/min
	17050180	AS03		Air	MCE Cassette	6/1/2017	4719.36	Liters	473	9.9775	L/min
	17050181	AS05		Air	MCE Cassette	6/1/2017	5049.03	Liters	496	10.1795	L/min
	17050182	AS15		Air	MCE Cassette	6/1/2017	5182.11	Liters	510	10.161	L/min
	17050183	Blank		Air	MCE Cassette	6/1/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature] START	6/1/17 1816	[signature] LABCOR PORTLAND, INC	6/2/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 7 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050175	17050176	17050177	17050178	17050179
17050180	17050181	17050182	17050183	

Data Qualifications:

The samples were collected on June 1, 2017, and were analyzed by June 5, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173230 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173230R01
Date Received: 6/5/2017

Analyst: SG 6/5/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050184	AS03	5900.9	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S2	17050185	AS04	5767.7	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S3	17050186	AS15	5931.9	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S4	17050187	PS01	585.29	3.5	100	< 7.0	< 0.0046	0.0009 - 0.0088	0.0046
S5	17050188	PS02	465.31	3	100	< 7.0	< 0.0058	0.0007 - 0.0094	0.0058
S6	17050189	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-5-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173230

USEPA
DateShipped: 6/2/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-21
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050184	AS03	Asbestos PCM	Air	MCE Cassette	6/2/2017	5900.94	Liters	590	10.0016	L/min
	17050185	AS04	Asbestos PCM	Air	MCE Cassette	6/2/2017	5767.67	Liters	569	10.1365	L/min
	17050186	AS15	Asbestos PCM	Air	MCE Cassette	6/2/2017	5931.86	Liters	590	10.054	L/min
	17050187	PS01	Asbestos PCM	Air	MCE Cassette	6/2/2017	585.29	Liters	195	3.0015	L/min
	17050188	PS02	Asbestos PCM	Air	MCE Cassette	6/2/2017	465.31	Liters	155	3.002	L/min
	17050189	Blank	Asbestos PCM	Air	MCE Cassette	6/2/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	R Woodke / START	6/2/17 1930	LABCOR PORTLAND WL	6/5/17	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 6 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050184 17050185 17050186 17050187 17050188
17050189

Data Qualifications:

The samples were collected on June 2, 2017, and were analyzed by June 5, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173230 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173230R01
Date Received: 6/5/2017

Analyst: SG 6/5/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050184	AS03	5900.9	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S2	17050185	AS04	5767.7	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S3	17050186	AS15	5931.9	2	100	< 7.0	< 0.0005	0 - 0.0006	0.0005
S4	17050187	PS01	585.29	3.5	100	< 7.0	< 0.0046	0.0009 - 0.0088	0.0046
S5	17050188	PS02	465.31	3	100	< 7.0	< 0.0058	0.0007 - 0.0094	0.0058
S6	17050189	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

6-5-17

173230

USEPA
DateShipped: 6/2/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-21
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050184	AS03	Asbestos PCM	Air	MCE Cassette	6/2/2017	5900.94	Liters	590	10.0016	L/min
	17050185	AS04	Asbestos PCM	Air	MCE Cassette	6/2/2017	5767.67	Liters	569	10.1365	L/min
	17050186	AS15	Asbestos PCM	Air	MCE Cassette	6/2/2017	5931.86	Liters	590	10.054	L/min
	17050187	PS01	Asbestos PCM	Air	MCE Cassette	6/2/2017	585.29	Liters	195	3.0015	L/min
	17050188	PS02	Asbestos PCM	Air	MCE Cassette	6/2/2017	465.31	Liters	155	3.002	L/min
	17050189	Blank	Asbestos PCM	Air	MCE Cassette	6/2/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	R Woodke / START	6/2/17 1930	LABCOR PORTLAND WL	6/5/17	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050190 17050191 17050192 17050193

Data Qualifications:

The samples were collected on June 3, 2017, and were analyzed by June 5, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173231 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173231R01
Date Received: 6/5/2017

Analyst: SG 6/5/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050190	AS03	6719	1	100	< 7.0	< 0.0004	0 - 0.0004	0.0004
S2	17050191	AS04	4982.2	2	100	< 7.0	< 0.0005	0 - 0.0007	0.0005
S3	17050192	AS15	6727.8	2	100	< 7.0	< 0.0004	0 - 0.0005	0.0004
S4	17050193	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

JM 6-5-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

17327

USEPA

DateShipped: 6/3/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-22

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050190	AS03	Asbestos PCM	Air	MCE Cassette	6/3/2017	6718.97	Liters	662	10.1495	L/min
	17050191	AS04	Asbestos PCM	Air	MCE Cassette	6/3/2017	4982.18	Liters	497	10.0245	L/min
	17050192	AS15	Asbestos PCM	Air	MCE Cassette	6/3/2017	6727.79	Liters	663	10.1475	L/min
	17050193	Blank	Asbestos PCM	Air	MCE Cassette	6/3/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL Samples/To LAB	Ryan Whitchurch 6/3/2017 RIO START	6/3/2017 1944	6/5/17 LABCORPORTLAND IN.	6/5/17 8:04am	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 5, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050194 17050195 17050196 17050197

Data Qualifications:

The samples were collected on June 4, 2017, and were analyzed by June 5, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173232 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173232R01
Date Received: 6/5/2017

Analyst: SG 6/5/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050195	AS15	4001.5	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050196	AS03	4144	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050197	Blank	0	0	100	< 7.0			
S4	17050194	AS04	3221.0	20	100	26.008	0.003	0.002 - 0.005	0.001
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-5-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173232

USEPA
DateShipped: 6/4/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-23
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050195	AS15	Asbestos PCM	Air	MCE Cassette	6/4/2017	4001.46	Liters	394	10.156	L/min
	17050196	AS03	Asbestos PCM	Air	MCE Cassette	6/4/2017	4143.99	Liters	409	10.132	L/min
	17050197	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017					
	17050194	AS04	Asbestos PCM	Air	MCE Cassette	6/4/2017	3221.02	Liters	318	10.129	L/min

Special Instructions: Please process these samples ASAP or within 24 hrs

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment		6/4/2017 17:45	LABCOR PORTLAND, INC.	6/5/17 8:00AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 6, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire Site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050198 17050198 17050199 17050200

Data Qualifications:

The samples were collected on June 5, 2017, and were analyzed by June 6, 2017. Sample 17050198 was overloaded and was not analyzed. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173274 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173274R01
Date Received: 6/6/2017

Analyst: SG 6/6/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S2	17050199	AS04	4160.7	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050200	AS15	3618.7	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050201	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-6-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173274

USEPA

DateShipped: 6/5/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-24

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050198	AS03	Asbestos PCM		MCE Cassette	6/5/2017	4223.52	Liters	419	10.08	L/min
	17050199	AS04	Asbestos PCM		MCE Cassette	6/5/2017	4160.7	Liters	414	10.05	L/min
	17050200	AS15	Asbestos PCM		MCE Cassette	6/5/2017	3618.73	Liters	357	10.1365	L/min
	17050201	Blank	Asbestos PCM		MCE Cassette	6/5/2017					

Special Instructions: Please process these samples ASAP or within 24 hrs	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL TO LAB	Ryan Whitchurch / START R10	6/5/2017 1750	LABCOR PORTLAND OR	6/6/17 8:20am	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 7, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050203 17050204 17050205 17050206

Data Qualifications:

The samples were collected on June 6, 2017, and were analyzed by June 7, 2017. Sample 17050203 was overloaded and was not analyzed. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173305 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173305R01
Date Received: 6/7/2017

Analyst: SG 6/7/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S2	17050204	Blank	0	0	100	< 7.0			
S3	17050205	AS03	4155.8	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050206	AS15	4522.4	1	100	< 7.0	< 0.001	0 - 0.001	0.001
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

6-7-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173305

USEPA
DateShipped: 6/6/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-25
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050202	AS04	Asbestos PCM	Air	MCE Cassette	6/6/2017	4843.44	Liters	480	10.0905	L/min
	17050203	Blank	Asbestos PCM		MCE Cassette	6/6/2017					
	17050204	AS03	Asbestos PCM	Air	MCE Cassette	6/6/2017	4155.81	Liters	415	10.014	L/min
	17050205	AS15	Asbestos PCM	Air	MCE Cassette	6/6/2017	4522.44	Liters	446	10.14	L/min

Special Instructions: Please process these samples ASAP or within 24hrs.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment	[signature]	6/6/2017 17:33	[signature]	8:00AM	
			LabCor PDX	6-7-17	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 8, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 5 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050206 17050207 17050208 17050209 17050210

Data Qualifications:

The samples were collected on June 7, 2017, and were analyzed by June 8, 2017. Sample 17050208 was overloaded and was not analyzed. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173339 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173339R01
Date Received: 6/8/2017

Analyst: SG 6/8/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050206	PS01	1005.9	2	100	< 7.0	< 0.003	0 - 0.004	0.003
S2	17050207	AS03	4802.6	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050209	AS15	4365.1	0	100	< 7.0	< 0.001	0 - 0	0.001
S5	17050210	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

JW 6/8/17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

17 3339 p42

USEPA

DateShipped: 6/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-26

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050206	PS01	Asbestos PCM	Air	MCE Cassette	6/7/2017		Liters			L/min
	17050207	AS03	Asbestos PCM	Air	MCE Cassette	6/7/2017	4802.6	Liters	476	10.0895	L/min
	17050208	AS04	Asbestos PCM	Air	MCE Cassette	6/7/2017	4562.33	Liters	450	10.1385	L/min
	17050209	AS15	Asbestos PCM	Air	MCE Cassette	6/7/2017	4365.08	Liters	429	10.175	L/min
	17050210	Blank	Asbestos PCM		MCE Cassette	6/7/2017					
			* SEE P2 FOR	MISSING	VOLUME	INFORMATION	6/8/17 SG				

Special Instructions: Please process these samples ASAP or within 24hrs.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment	START	6/7/17 18:31	Labcor Portland	6/8/17	0800 ok

173339 p2/2

USEPA

DateShipped: 6/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-26

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050206	PS01	Asbestos PCM	Air	MCE Cassette	6/7/2017	1005.92	Liters	340	2.9586	L/min
	17050207	AS03	Asbestos PCM	Air	MCE Cassette	6/7/2017	4802.6	Liters	476	10.0895	L/min
	17050208	AS04	Asbestos PCM	Air	MCE Cassette	6/7/2017	4562.33	Liters	450	10.1385	L/min
	17050209	AS15	Asbestos PCM	Air	MCE Cassette	6/7/2017	4365.08	Liters	429	10.175	L/min
	17050210	Blank	Asbestos PCM		MCE Cassette	6/7/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs

Please provide perliminary and full data package and email to erinc@ehsintl.com, bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 12, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 5 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050211 17050212 17050213 17050214 17050215

Data Qualifications:

The samples were collected on June 8, 2017, and were analyzed by June 9, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc.
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173385 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173385R01
Date Received: 6/9/2017

Analyst: SG 6/9/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050211	PS01	703.32	3.5	100	< 7.0	< 0.004	0.001 - 0.007	0.004
S2	17050212	Blank	0	1	100	< 7.0			
S3	17050213	AS15	4039.8	4	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050214	AS04	3921.1	3.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S5	17050215	AS03	3356.9	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
B1	Blank	Blank	0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

JMW 6-12-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

175505

USEPA

DateShipped: 6/8/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-27

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050211	PS01	Asbestos PCM	Air	MCE Cassette	6/8/2017	703.32	Liters	240	2.9305	L/min
	17050212	Blank	Asbestos PCM		MCE Cassette	6/7/2017					
	17050213	AS15	Asbestos PCM	Air	MCE Cassette	6/8/2017	4039.76	Liters	431	9.373	L/min
	17050214	AS04	Asbestos PCM	Air	MCE Cassette	6/8/2017	3921.06	Liters	390	10.054	L/min
	17050215	~~AS24~~ AS03	Asbestos PCM AS 6/9/17	Air	MCE Cassette	6/8/2017	3356.85	Liters	353	9.5095	L/min

Special Instructions: Please process samples ASAP or within 24hrs.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature]	17:47 6/8/17	[signature] Lab Cor PDX	6-9-17 10:04AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 12, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050217 17050218 17050219 17050220

Data Qualifications:

The samples were collected on June 9, 2017, and were analyzed by June 12, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173412 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173412R01
Date Received: 6/12/2017

Analyst: SG 6/12/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050217	Blank	0	0	100	< 7.0			
S2	17050218	AS24	4669	4	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050219	ABS04	4507.5	0	100	< 7.0	< 0.001	0 - 0	0.001
S4	17050220	AS15	4282.6	2	100	< 7.0	< 0.001	0 - 0.001	0.001
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-12-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173412

USEPA
DateShipped: 6/10/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-28
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050217	Blank	Asbestos PCM		MCE Cassette	6/9/2017					
	17050218	AS24	Asbestos PCM	Air	MCE Cassette	6/9/2017	4668.98	Liters	456	10.239	L/min
	17050219	ABS04	Asbestos PCM	Air	MCE Cassette	6/9/2017	4507.51	Liters	449	10.039	L/min
	17050220	AS15	Asbestos PCM	Air	MCE Cassette	6/9/2017	4282.6	Liters	413	10.3695	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	Ryan Whitlock / START	6/9/2017 18:30	[illegible]	6/12/17	OK @ 0800

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 13, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Fire Site, Portland, Oregon

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050221 17050222 17050223 17050224

Data Qualifications:

The samples were collected on June 10, 2017, and were analyzed by June 12, 2017. Sample 17050221 was not analyzed as the sample was overloaded. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173422 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173422R01
Date Received: 6/12/2017

Analyst: SG 6/12/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S2	17050222	AS04	4860.7	5.5	100	< 7.0 U	< 0.001 U	0 - 0.001	0.001
S3	17050223	AS15	4740.1	2.5	100	< 7.0	< 0.001 U	0 - 0.001	0.001
S4	17050224	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-13-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173422

USEPA
DateShipped: 6/10/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-29
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050221	AS24	Asbestos PCM	Air	MCE Cassette	6/10/2017	3379.65	Liters	329	10.2725	L/min
	17050222	AS04	Asbestos PCM	Air	MCE Cassette	6/10/2017	4860.65	Liters	479	10.1475	L/min
	17050223	AS15	Asbestos PCM	Air	MCE Cassette	6/10/2017	4740.12	Liters	456	10.395	L/min
	17050224	Blank	Asbestos PCM	Air	MCE Cassette	6/10/2017					

Special Instructions: Please process these samples ASAP or within 24hrs.	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	6/10/17 17:04		6/12/17 10:35	OK

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 14, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050225 17050226 17050227 17050228

Data Qualifications:

The samples were collected on June 12, 2017, and were analyzed by June 13, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173479 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173479R01
Date Received: 6/13/2017

Analyst: SG 6/13/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050225	AS15	4996.8	1	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050226	AS04	5039.3	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050227	AS24	5228.3	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050228	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-14-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173479

USEPA

DateShipped: 6/12/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-30

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050225	AS15	Asbestos PCM	Air	MCE Cassette	6/12/2017	4996.8	Liters	493	10.1355	L/min
	17050226	AS04	Asbestos PCM	Air	MCE Cassette	6/12/2017	5039.31	Liters	503	10.0185	L/min
	17050227	AS24	Asbestos PCM	Air	MCE Cassette	6/12/2017	5228.27	Liters	499	10.4775	L/min
	17050228	Blank	Asbestos PCM	Air	MCE Cassette	6/12/2017					

Special Instructions: Please process these samples ASAP.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sampling	START	18:25 6/12/17			
			LabCor PDX 11:45AM		
			6-13-17		

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 15, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050229 17050230 17050231 17050232

Data Qualifications:

The samples were collected on June 13, 2017, and were analyzed by June 14, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173514 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173514R01
Date Received: 6/14/2017

Analyst: SG 6/14/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050229	AS15	4593.5	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050230	AS04	4452.5	0.5	100	< 7.0	< 0.001	0 - 0	0.001
S3	17050231	AS24	4313.5	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050232	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

JAW 6-15-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173514

USEPA
DateShipped: 6/13/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-31
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050229	AS15	Asbestos PCM	Air	MCE Cassette	6/13/2017	4593.52	Liters	456	10.0735	L/min
	17050230	AS04	Asbestos PCM	Air	MCE Cassette	6/13/2017	4452.45	Liters	445	10.0055	L/min
	17050231	AS24	Asbestos PCM	Air	MCE Cassette	6/13/2017	4313.46	Liters	435	9.916	L/min
	17050232	Blank	Asbestos PCM	Air	MCE Cassette	6/13/2017	-				

Special Instructions: Please proceses these samples ASAP or within 24hrs

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment	EPA-START	6/13/17 16:36	LabCor PDX		
			6-14-17 11:14AM		

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 19, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050233 17050234 17050235 17050236

Data Qualifications:

The samples were collected on June 14, 2017, and were analyzed by June 15, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173540 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173540R01
Date Received: 6/15/2017

Analyst: SG 6/15/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050233	AS15	4686.0	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050234	AS04	4605.4	5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050235	AS24	4404.6	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050236	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

USEPA
DateShipped: 6/14/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-32
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050233	AS15	Asbestos PCM	Air	MCE Cassette	6/14/2017	4686.02	Liters	463	10.121	L/min
	17050234	AS04	Asbestos PCM	Air	MCE Cassette	6/14/2017	4605.42	Liters	458	10.0555	L/min
	17050235	AS24	Asbestos PCM	Air	MCE Cassette	6/14/2017	4404.62	Liters	440	10.0105	L/min
	17050236	Blank	Asbestos PCM	Air	MCE Cassette	6/14/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
		6/15/17		6/15/17 0945	ok

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 18, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050237 17050238 17050239 17050240

Data Qualifications:

The samples were collected on June 15, 2017, and were analyzed by June 16, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173587 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173587R01
Date Received: 6/16/2017

Analyst: SG 6/16/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050237	AS15	4500.3	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050238	AS24	4383.4	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050239	AS04	4376.2	0.5	100	< 7.0	< 0.001	0 - 0	0.001
S4	17050240	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6/8/17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

17558'7

USEPA
DateShipped: 6/15/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-33
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050237	AS15	Asbestos PCM	Air	MCE Cassette	6/15/2017	4500.33	Liters	453	9.9345	L/min
	17050238	AS24	Asbestos PCM	Air	MCE Cassette	6/15/2017	4383.36	Liters	442	9.9171	L/min
	17050239	AS04	Asbestos PCM	Air	MCE Cassette	6/15/2017	4376.18	Liters	436	10.0371	L/min
	17050240	Blank	Asbestos PCM	Air	MCE Cassette	6/15/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	[signature]	6/15/17 16:27	A Johnson	6/16/7 10:00	ok

ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 20, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050241 17050242 17050243 17050244

Data Qualifications:

The samples were collected on June 16, 2017, and were analyzed by June 19, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173621 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173621R01
Date Received: 6/19/2017

Analyst: SG 6/19/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050241	AS04	4458.2	0.5	100	< 7.0	< 0.001	0 - 0	0.001
S2	17050242	AS24	4883.6	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050243	AS15	4941.4	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050244	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 8-20-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

USEPA
DateShipped:

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-34
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050241	AS04	Asbestos PCM	Air	MCE Cassette	6/16/2017	4458.2	Liters	444	10.041	L/min
	17050242	AS24	Asbestos PCM	Air	MCE Cassette	6/16/2017	4883.63	Liters	494	9.8859	L/min
	17050243	AS15	Asbestos PCM	Air	MCE Cassette	6/16/2017	4941.35	Liters	489	10.105	L/min
	17050244	Blank	Asbestos PCM	Air	MCE Cassette	6/16/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	16:41 6/17/17	Labcor	6/19/17 08:15	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 20, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050245 17050246 17050247 17050248

Data Qualifications:

The samples were collected on June 17, 2017, and were analyzed by June 19, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173672 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173672R01
Date Received: 6/20/2017

Analyst: SG 6/20/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050249	AS24	2550.4	0.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050250	AS15	2715.7	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050251	AS04	2608	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050252	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-20-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173672

USEPA
DateShipped: 6/17/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-36
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050249	AS24	Asbestos PCM	Air	MCE Cassette	6/19/2017	2550.38	Liters	249	10.2425	L/min
	17050250	AS15	Asbestos PCM	Air	MCE Cassette	6/19/2017	2715.69	Liters	271	10.021	L/min
	17050251	AS04	Asbestos PCM	Air	MCE Cassette	6/19/2017	2607.99	Liters	258	10.1085	L/min
	17050252	Blank	Asbestos PCM	Blank	MCE Cassette	6/19/2017	0	Liters	-550	0	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Courier Pickup	[signature]	6/19/17 15:40	Jillian Lambert	6-20-17	
			[signature]	10:56AM	
			LabCor PDX		

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 21, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050249 17050250 17050251 17050252

Data Qualifications:

The samples were collected on June 19, 2017, and were analyzed by June 20, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173672 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173672R01
Date Received: 6/20/2017

Analyst: SG 6/20/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050249	AS24	2550.4	0.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050250	AS15	2715.7	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050251	AS04	2608	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050252	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MN 6-21-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173672

USEPA
DateShipped: 6/17/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-36
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050249	AS24	Asbestos PCM	Air	MCE Cassette	6/19/2017	2550.38	Liters	249	10.2425	L/min
	17050250	AS15	Asbestos PCM	Air	MCE Cassette	6/19/2017	2715.69	Liters	271	10.021	L/min
	17050251	AS04	Asbestos PCM	Air	MCE Cassette	6/19/2017	2607.99	Liters	258	10.1085	L/min
	17050252	Blank	Asbestos PCM	Blank	MCE Cassette	6/19/2017	0	Liters	-550	0	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Courier Pickup	[signature]	6/19/17 15:40	Jillian Lambert	6-20-17	
			[signature]	10:56AM	
			LabCor PDX		

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: June 22, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050253 17050254 17050255 17050256

Data Qualifications:

The samples were collected on June 20, 2017, and were analyzed by June 21, 2017. One field blank was submitted. There were no detections in the field or laboratory blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc.
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173699 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173699R01
Date Received: 6/21/2017

Analyst: SG 6/21/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050253	AS15	3317.9	0.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050254	AS04	3692.1	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050255	AS24	3538.9	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S4	17050256	Blank	0	1	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	5/2/2017

Reviewed by:

x

Stephanie Golden
Technical Manager

MW 6-22-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173699

USEPA

DateShipped: 6/20/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-37

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050253	AS15	Asbestos PCM	Air	MCE Cassette	6/20/2017	3317.93	Liters	325	10.209	L/min
	17050254	AS04	Asbestos PCM	Air	MCE Cassette	6/20/2017	3692.14	Liters	359	10.2845	L/min
	17050255	AS24	Asbestos PCM	Air	MCE Cassette	6/20/2017	3538.9	Liters	344	10.2875	L/min
	17050256	Blank	Asbestos PCM	Blank	MCE Cassette	6/20/2017	0	Liters	-550	0	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment	START	16:13 6/20/17	William Gramberg	6-21-17	OK
			Lab Cor PDX	11:08AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of three air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered: 17050257 17050258 17050259

The samples were analyzed on June 22, 2017. No issues were noted in the case narrative.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 173732 **PDX**

Report Number: 173732R02
Report Date: 6/29/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-38
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
173732 - S1	17050257 - AS24	NIOSH 7400 - PCM		6/22/2017
173732 - S2	17050258 - AS04	NIOSH 7400 - PCM		6/22/2017
173732 - S3	17050259 - Blank	NIOSH 7400 - PCM		6/22/2017

NIOSH 7400 - PCM Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x KMarch

Kate March
Analyst

MW 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173732 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173732R02
Date Received: 6/22/2017

Analyst: SG 6/22/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	TotalFields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050257	AS24	3579	1	100	< 7.0 U	< 0.0008 U	0 - 0.0008	0.0008
S2	17050258	AS04	4347.5	2.5	100	< 7.0 U	< 0.0006 U	0 - 0.0008	0.0006
S3	17050259	Blank	0	0	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x Kate March
Kate March
Analyst

MW 4-2018

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

173752

USEPA
DateShipped: 6/21/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-38

Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050257	AS24	Asbestos PCM	Air	MCE Cassette	6/21/2017	3578.98	Liters	344	10.404	L/min
	17050258	AS04	Asbestos PCM	Air	MCE Cassette	6/21/2017	4347.54	Liters	415	10.476	L/min
	17050259	Blank	Asbestos PCM	Blank	MCE Cassette	6/21/2017	0	Liters	-550	0	L/min

Special Instructions: Please process these samples ASAP

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	6/21/17 17:42		6-22-17	
			Labcor PDX	9:53AM	

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G Analytical Data – Response TEM Air Sampling

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ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 3 air filter samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered: 17050001 17050002 17050004

The samples were analyzed by May 18, 2017. No issues were noted in the case narrative.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172834 **PDX**

Report Number: 172834R03
Report Date: 6/20/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-01
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172834 - S1	17050001 - AS01	ISO 10312 - Direct		5/18/2017
172834 - S2	17050002 - AS02	ISO 10312 - Direct		5/18/2017
172834 - S4	17050004 - AS04	ISO 10312 - Direct		5/18/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Tracy Handrich
Analyst

MW 42018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172834 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172834R03
Date Received: 5/18/2017

Lab/Cor Sample No.: S1
Client Sample No.: 17050001
Description: AS01

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/18/2017	Philips CM12	15000

Volume (L) : 3169.37
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 12
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1248
Analytical Sens. (struc/cc) : 0.00097
Detection Limit. (struc/cc) : 0.00291

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172834 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172834R03
Date Received: 5/18/2017

Lab/Cor Sample No.: S2
Client Sample No.: 17050002
Description: AS02

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/18/2017	Philips CM12	15000

Volume (L) : 2797.79
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 14
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1456
Analytical Sens. (struc/cc) : 0.00095
Detection Limit. (struc/cc) : 0.00283

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	6.9	0.001	0 - 0.005 - Poisson	1	
Total Asbestos Structures	6.9	0.001	0 - 0.005 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	6.9	0.001	0 - 0.005 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	6.9	0.001	0 - 0.005 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	6.9	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172834 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172834R03
Date Received: 5/18/2017

Lab/Cor Sample No.: S4
Client Sample No.: 17050004
Description: AS04

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/18/2017	Philips CM12	15000

Volume (L) : 2654.39
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 15
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.156
Analytical Sens. (struc/cc) : 0.00093
Detection Limit. (struc/cc) : 0.00278

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x
Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

Mn 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172834 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-01

Report Number: 172834R03
Date Received: 5/18/2017

Lab/Cor Sample No: S1
Client Sample No: 17050001
Description: AS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C51				NSD							
G1	2	C52				NSD							
G1	3	B42				NSD							
G1	4	C42				NSD							
G1	5	E41				NSD							
G1	6	E42				NSD							
G2	7	F61				NSD							
G2	8	F62				NSD							
G2	9	C54				NSD							
G2	10	E53				NSD							
G2	11	E54				NSD							
G2	12	E42				NSD							

Lab/Cor Sample No: S2
Client Sample No: 17050002
Description: AS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	E61				NSD							
G1	2	E62				NSD							
G1	3	F61				NSD							
G1	4	E53				NSD							
G1	5	F53	CDQ	1		MD 1-0	6	2.92	2.1	Chrysotile			PAOS, AS>5, 3:1
G1	5	F53	CDQ		1	MF	2.8	0.08	35	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30655SP	TH 5/18/2017	
Diffraction	Pc30655DF	TH 5/18/2017	0.53 nm ROW SPACING
Brightfield	Pc30655BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	6	G54				NSD							
G1	7	G44				NSD							
G2	8	E61				NSD							
G2	9	E62				NSD							
G2	10	C53				NSD							
G2	11	C51				NSD							
G2	12	F51				NSD							
G2	13	F52				NSD							
G2	14	G52				NSD							

MW 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172834 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-01

Report Number: 172834R03
Date Received: 5/18/2017

Lab/Cor Sample No: S4
Client Sample No: 17050004
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	G62				NSD							
G1	2	E53				NSD							
G1	3	F53				NSD							
G1	4	F54				NSD							
G1	5	E51				NSD							
G1	6	E52				NSD							
G1	7	F51				NSD							
G2	8	C61				NSD							
G2	9	C62				NSD							
G2	10	B54				NSD							
G2	11	E53				NSD							
G2	12	E54				NSD							
G2	13	C42				NSD							
G2	14	C32				NSD							
G2	15	E23				NSD							

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

MW 7-2018

172834

USEPA

DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-01

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050001	AS01	Asbestos PCM	Air	MCE Cassette	5/17/2017	3169.37	Liters	5/17/2017	315	10.0615	L/min
	17050002	AS02	Asbestos PCM	Air	MCE Cassette	5/17/2017	2797.79	Liters	5/17/2017	278	10.064	L/min
	17050003	AS03	Asbestos PCM	Air	MCE Cassette	5/17/2017	2661.69	Liters	5/17/2017	270	9.8581	L/min
	17050004	AS04	Asbestos PCM	Air	MCE Cassette	5/17/2017	2654.39	Liters	5/17/2017	264	10.0545	L/min
	17050005	AS05	Asbestos PCM	Air	MCE Cassette	5/17/2017	2585.02	Liters	5/17/2017	260	9.9424	L/min
	17050006	PS01	Asbestos PCM	Air	MCE Cassette	5/17/2017	391.2	Liters	5/17/2017	140	2.7943	L/min
	17050007	PS02	Asbestos PCM	Air	MCE Cassette	5/17/2017	458.96	Liters	5/17/2017	160	2.8685	L/min
	17050008	PS03	Asbestos PCM	Air	MCE Cassette	5/17/2017	420.48	Liters	5/17/2017	143	2.9404	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary adn full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Gates	5/17/17 2004	LABCOR PORTLAND, INC	5/18/17 5:13 am	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 6 air filter samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050011 17050012 17050013 17050014 17050015
17050018

The samples were analyzed by May 20, 2017. No issues were noted in the case narrative.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172886 **PDX**

Report Number: 172886R05
Report Date: 6/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-02
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172886 - S3	17050011 - AS04	ISO 10312 - Direct		5/19/2017
172886 - S4	17050012 - AS06	ISO 10312 - Direct		5/19/2017
172886 - S5	17050013 - AS07	ISO 10312 - Direct		5/19/2017
172886 - S6	17050014 - PS01	ISO 10312 - Direct		5/19/2017
172886 - S7	17050015 - PS02	ISO 10312 - Direct		5/19/2017
172886 - S9	17050018 - PS05	ISO 10312 - Direct		5/19/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Tracy Handrich
Analyst

Mw 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
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Portland, OR 97239

Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S3
Client Sample No.: 17050011
Description: AS04

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000

Volume (L) : 2742.85
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 14
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1456
Analytical Sens. (struc/cc) : 0.00096
Detection Limit. (struc/cc) : 0.00288

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	41.2	0.006	0.002 - 0.013 - Poisson	6	
Total Asbestos Structures	48.1	0.007	0.003 - 0.014 - Poisson		7
Primary Asb and Libby-Other Amphibole Structure	48.1	0.007	0.003 - 0.014 - Poisson	7	
Total Asb & Libby-OtherAmph Structures	54.9	0.008	0.003 - 0.015 - Poisson		8
Asbestos Fibers and Bundles > 5um and 3:1	6.9	0.001	0 - 0.005 - Poisson		1
Asbestos Structures >5um and 3:1	13.7	0.002	0 - 0.007 - Poisson	2	
PCM Equivalent Fibers-ISO	13.7	0.002	0 - 0.007 - Poisson		2
PCM Equivalent Fibers-NIOSH	13.7	0.002	0 - 0.007 - Poisson		2
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	13.7	0.002	0 - 0.007 - Poisson		2
PCM Equivalent Structures-ISO	6.9	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Structures-NIOSH	6.9	0.001	0 - 0.005 - Poisson	1	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4/20/18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S4
Client Sample No.: 17050012
Description: AS06

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000

Volume (L) : 3971.74
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 10
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.104
Analytical Sens. (struc/cc) : 0.00093
Detection Limit. (struc/cc) : 0.00279

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

JMr 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S5
Client Sample No.: 17050013
Description: AS07

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000

Volume (L) : 4549.06
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 9
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.0936
Analytical Sens. (struc/cc) : 0.0009
Detection Limit. (struc/cc) : 0.0027

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.003 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.003 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S6
Client Sample No.: 17050014
Description: PS01

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000

Volume (L) : 1198.2
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 31
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.3224
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00298

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	9.3	0.003	0.001 - 0.009 - Poisson	3	
Total Asbestos Structures	9.3	0.003	0.001 - 0.009 - Poisson		3
imary Asb and Libby-Other Amphibole Structure	9.3	0.003	0.001 - 0.009 - Poisson	3	
Total Asb & Libby-OtherAmph Structures	9.3	0.003	0.001 - 0.009 - Poisson		3
Asbestos Fibers and Bundles > 5um and 3:1	3.1	0.001	0 - 0.006 - Poisson		1
Asbestos Structures >5um and 3:1	3.1	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Fibers-ISO	3.1	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Fibers-NIOSH	3.1	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	3.1	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S7
Client Sample No.: 17050015
Description: PS02

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000

Volume (L) : 1244.74
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 30
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.312
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
Primary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No.: S9
Client Sample No.: 17050018
Description: PS05

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/19/2017	Philips CM12	15000
TH	5/20/2017	Philips CM12	15000

Volume (L) : 1057.94
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 35
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.364
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00299

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	2.7	0.001	0 - 0.006 - Poisson	1	
Total Asbestos Structures	2.7	0.001	0 - 0.006 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	2.7	0.001	0 - 0.006 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	2.7	0.001	0 - 0.006 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x

Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S3
Client Sample No: 17050011
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	H62				NSD							
G1	2	C51	CDQ	1		MD 1-0	1.66	0.97	1.7	Chrysotile			PAOS
G1	2	C51	CDQ		1	MB	1.45	0.17	8.5	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30657SP	TH 5/19/2017	
Diffraction	Pc30657DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30657BF		

G1	2	C51	ADQ	2		MD 1-0	3.97	3.61	1.1	Actinolite			PAOS
G1	2	C51	ADQ		2	MF	2.65	0.34	7.8	Actinolite	Mg, Al, Si, K, Ca, Mn, Fe	High Al	TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30658SP	TH 5/19/2017	
Diffraction	Pc30658DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30658BF		

G1	3	E51				NSD							
G1	4	E52	CD	3		MD 1-1	16.52	16	1	Chrysotile			PAOS, AS>5, 3:1
G1	4	E52	CD		3	MB	10.89	0.42	25.9	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc30659DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30659BF		

G1	4	E52	NAM	4		MD 1-1	6.59	4.04	1.6	Non Asbestos Mineral			
G1	4	E52	NAM		4	MF	6.51	1.33	4.9	Non Asbestos Mineral		Possible hornblende	

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30660BF		

G1	5	G52	NAM	5		MD 1-1	11.58	6.3	1.8	Non Asbestos Mineral			
G1	5	G52	NAM		5	MF	8.6	1.31	6.6	Non Asbestos Mineral			

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30661BF		

G1	6	H51	CD	6		MD 1-0	4.64	0.55	8.4	Chrysotile			PAOS

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S3
Client Sample No: 17050011
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	6	H51	CD		6	MB	4.64	0.22	21.1	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	Pc30662DF				TH 5/19/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30662BF						
G1	7	H52	NAM	7		MD 1-1	11.64	6.57	1.8	Non Asbestos Mineral			
G1	7	H52	NAM		7	MF	8.99	2.6	3.5	Non Asbestos Mineral			
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	Pc30663BF						
G1	8	C43	CD	8		MD 2-0	3.55	0.94	3.8	Chrysotile			PAOS
G1	8	C43	CD		8	MF	3.54	0.1	35.4	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	Pc30664DF				TH 5/19/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30664BF						
G1	8	C43	CD		9	MF	2.43	0.06	40.5	Chrysotile			TAOS
G1	9	C44				NSD							
G1	10	F42				NSD							
G1	11	G41				NSD							
G2	12	B62	ADQ	9		MD 1-1	8.48	1.88	4.5	Winchite			PAOS, PCMES-NIOSH, PCMES-ISO
G2	12	B62	ADQ		10	MF	8.48	0.8	10.6	Winchite	Na, Mg, Al, Si, K, Ca, Fe		TAOS, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30665SP				TH 5/19/2017		
						Diffraction	Pc30665DF				TH 5/19/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30665BF						
G2	12	B62	NAM	10		MD 1-1	8.72	4.85	1.8	Non Asbestos Mineral			
G2	12	B62	NAM		11	MB	8.72	2.04	4.3	Non Asbestos Mineral			
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	Pc30666BF						
G2	13	C54	CD	11		MD 1-0	15.28	11.89	1.3	Chrysotile			PAOS, AS>5, 3:1

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S3
Client Sample No: 17050011
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	13	C54	CD		12	MF	1.48	0.1	14.8	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc30667DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30667BF		

G2	14	F53				NSD							

Lab/Cor Sample No: S4
Client Sample No: 17050012
Description: AS06

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C61				NSD							
G1	2	C62				NSD							
G1	3	E61				NSD							
G1	4	E62				NSD							
G1	5	F61				NSD							
G1	6	F62				NSD							
G2	7	F62				NSD							
G2	8	G61				NSD							
G2	9	G54				NSD							
G2	10	E44				NSD							

Lab/Cor Sample No: S5
Client Sample No: 17050013
Description: AS07

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C62				NSD							
G1	2	C54				NSD							
G1	3	E53				NSD							
G1	4	C51				NSD							
G1	5	E41				NSD							
G1	6	E42				NSD							
G2	7	E63				NSD							
G2	8	E41				NSD							
G2	9	C34				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S6
Client Sample No: 17050014
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B62				NSD							
G1	2	C61				NSD							
G1	3	C62	ADQ	1		MD 1-0	4.71	0.87	5.4	Actinolite	Mg, Al, Si, Ca, Mn, Fe		PAOS
G1	3	C62	ADQ		1	MF	4.71	0.63	7.5	Actinolite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30668SP	TH 5/19/2017	
Diffraction	Pc30668DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30668BF		

G1	4	E61				NSD							
G1	5	E62				NSD							
G1	6	F61				NSD							
G1	7	F62				NSD							
G1	8	G61				NSD							
G1	9	G62				NSD							
G1	10	B54				NSD							
G1	11	C53				NSD							
G1	12	F53				NSD							
G1	13	F54				NSD							
G1	14	G53				NSD							
G1	15	G54				NSD							
G1	16	B51				NSD							
G1	17	C44				NSD							
G1	18	B34				NSD							
G2	19	B54				NSD							
G2	20	C53				NSD							
G2	21	C54	CDQ	2		MD 1-0	0.86	0.56	1.5	Chrysotile			PAOS
G2	21	C54	CDQ		2	MF	0.71	0.11	6.5	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30669SP	TH 5/19/2017	
Brightfield	Pc30669BF		
Diffraction	Pc30669DF	TH 5/19/2017	0.53 nm ROW SPACING - very faint, some surrounding particulate

G2	22	E42				NSD							
G2	23	E24				NSD							
G2	24	G23				NSD							
G2	25	G24				NSD							
G3	26	E42				NSD							
G3	27	F41				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S6
Client Sample No: 17050014
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G3	28	F42	ADQ	3		MD 1-1	5.51	3.3	1.7	Actinolite			PAOS, AS>5, 3:1
G3	28	F42	ADQ		3	MF	5.51	0.93	5.9	Actinolite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30670SP	TH 5/19/2017	
Diffraction	Pc30670DF	TH 5/19/2017	0.53 nm ROW SPACING
Brightfield	Pc30670BF		

G3	29	H41				NSD							
G3	30	H42				NSD							
G3	31	F33	NAM	4	4	F	6.61	0.85	7.8	Non Asbestos Mineral			

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ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S7
Client Sample No: 17050015
Description: PS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	E62				NSD							
G1	2	F61				NSD							
G1	3	F53				NSD							
G1	4	H53				NSD							
G1	5	F52				NSD							
G1	6	G52				NSD							
G1	7	E44				NSD							
G1	8	H43				NSD							
G1	9	H41				NSD							
G1	10	H42				NSD							
G1	11	G33				NSD							
G1	12	G34				NSD							
G1	13	H33				NSD							
G1	14	E32				NSD							
G1	15	F32				NSD							
G1	16	G32				NSD							
G1	17	H31				NSD							
G1	18	H32				NSD							
G1	19	C24				NSD							
G1	20	G24				NSD							
G1	21	H23				NSD							
G1	22	E21				NSD							
G1	23	F21				NSD							
G1	24	F22				NSD							
G2	25	C62				NSD							
G2	26	E61				NSD							
G2	27	E62				NSD							
G2	28	F53				NSD							
G2	29	F54				NSD							
G2	30	C52				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S9
Client Sample No: 17050018
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B62				NSD							
G1	2	C61				NSD							
G1	3	E61				NSD							
G1	4	G61	NAM	1	1	F	8.48	1.7	5	Non Asbestos Mineral			

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30671BF		

G1	5	C54				NSD							
G1	6	E53				NSD							
G1	7	E54				NSD							
G1	8	H53	NAM	2	2	F	13.03	1.67	7.8	Non Asbestos Mineral			

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30672BF		

G1	9	B51				NSD							
G1	10	B52				NSD							
G1	11	C43				NSD							
G1	12	C44				NSD							
G1	13	F43				NSD							
G1	14	F44				NSD							
G1	15	F41				NSD							
G1	16	F42				NSD							
G1	17	G42				NSD							
G1	18	E33				NSD							
G1	19	E34				NSD							
G1	20	F33				NSD							
G1	21	F34				NSD							
G1	22	G34				NSD							
G1	23	H33				NSD							
G1	24	H34				NSD							
G1	25	E32				NSD							
G1	26	F31				NSD							
G1	27	F32	ADQ	3		MD 1-0	2.3	0.86	2.7	Actinolite			PAOS

MW 4/2018

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Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172886 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-02

Report Number: 172886R05
Date Received: 5/19/2017

Lab/Cor Sample No: S9
Client Sample No: 17050018
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	27	F32	ADQ		3	MF	2.3	0.48	4.8	Actinolite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30673SP	TH 5/20/2017	
Diffraction	Pc30673DF	TH 5/20/2017	0.53 nm ROW SPACING
Brightfield	Pc30673BF		

G1	28	H32	NSD
G1	29	G24	NSD
G2	30	E62	NSD
G2	31	F61	NSD
G2	32	F62	NSD
G2	33	G61	NSD
G2	34	H53	NSD
G2	35	E52	NSD

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

MW 5-20-18

172886 p1/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050009	AS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	5155.02	Liters	5/18/2017	520	9.9135	L/min
	17050010	AS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	2658.15	Liters	5/18/2017	267	9.9556	L/min
	17050011	AS04	Asbestos PCM	Air	MCE Cassette	5/18/2017	2742.85	Liters	5/18/2017	272	10.084	L/min
	17050012	AS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	3971.74	Liters	5/18/2017	392	10.132	L/min
	17050013	AS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	4549.06	Liters	5/18/2017	442	10.292	L/min
	17050014	PS01	Asbestos PCM	Air	MCE Cassette	5/18/2017	1198.2	Liters	5/18/2017	400	2.9955	L/min
	17050015	PS02	Asbestos PCM	Air	MCE Cassette	5/18/2017	1244.74	Liters	5/18/2017	429	2.9015	L/min
	17050016	PS03	Asbestos PCM	Air	MCE Cassette	5/18/2017	765.08	Liters	5/18/2017	248	3.085	L/min
	17050018	PS05	Asbestos PCM	Air	MCE Cassette	5/18/2017	1057.94	Liters	5/18/2017	352	3.0055	L/min
	17050019	PS06	Asbestos PCM	Air	MCE Cassette	5/18/2017	1314.67	Liters	5/18/2017	449	2.928	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/18/17 2005	[signature] LABCOR PORTLAND INC	5/19/17 4:50 AM	

172886 p2/2

USEPA
DateShipped: 5/17/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-02
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Start_Date	Total_Time	Avg_Flow	Flow_Units
	17050020	PS07	Asbestos PCM	Air	MCE Cassette	5/18/2017	724.98	Liters	5/18/2017	233	3.1115	L/min
	17050021	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17050022	Blank	Asbestos PCM	Air	MCE Cassette	5/18/2017		Liters	5/18/2017			L/min
	17053000	BS01	Asbestos PLM	Bulk		5/18/2017						

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	E Caffee	5/18/17 2005	LABCOR PORTLAND INC.	5/19/17 4:50 pm	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of six air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050023	17050024	17050026	17050028	17050032	17050034

The samples were analyzed by May 22, 2017. No issues were noted in the case narrative.

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Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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Job Number: 172918 **PDX**

Report Number: 172918R03
Report Date: 6/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-03
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172918 - S1	17050023 - AS03	ISO 10312 - Direct		5/20/2017
172918 - S2	17050024 - AS04	ISO 10312 - Direct		5/20/2017
172918 - S3	17050026 - AS08	ISO 10312 - Direct		5/20/2017
172918 - S5	17050028 - PS01	ISO 10312 - Direct		5/20/2017
172918 - S8	17050032 - PS05	ISO 10312 - Direct		5/20/2017
172918 - S10	17050034 - PS07	ISO 10312 - Direct		5/20/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Tracy Handrich
Analyst

MW 4-2018

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Portland, OR 97239

Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S1
Client Sample No.: 17050023
Description: AS03

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/22/2017	Philips CM12	15000

Volume (L) : 2280.23
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 17
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1768
Analytical Sens. (struc/cc) : 0.00095
Detection Limit. (struc/cc) : 0.00286

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	11.3	0.002	0 - 0.007 - Poisson	2	
Total Asbestos Structures	11.3	0.002	0 - 0.007 - Poisson		2
rimary Asb and Libby-Other Amphibole Structure	11.3	0.002	0 - 0.007 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	11.3	0.002	0 - 0.007 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	5.7	0.001	0 - 0.005 - Poisson		1
Asbestos Structures >5um and 3:1	5.7	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	5.7	0.001	0 - 0.005 - Poisson		1
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	5.7	0.001	0 - 0.005 - Poisson	1	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172918 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S2
Client Sample No.: 17050024
Description: AS04

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/21/2017	Philips CM12	15000
TH	5/21/2017	H-7000	20000
TH	5/22/2017	Philips CM12	15000
TH	5/22/2017	H-7000	20000

Volume (L) : 2376.39
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 16
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1664
Analytical Sens. (struc/cc) : 0.00097
Detection Limit. (struc/cc) : 0.00291

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	18	0.003	0.001 - 0.009 - Poisson	3	
Total Asbestos Structures	18	0.003	0.001 - 0.009 - Poisson		3
rimary Asb and Libby-Other Amphibole Structure	18	0.003	0.001 - 0.009 - Poisson	3	
Total Asb & Libby-OtherAmph Structures	18	0.003	0.001 - 0.009 - Poisson		3
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	6	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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ISO 10312 - Direct Summary Data

Job Number: 172918 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S3
Client Sample No.: 17050026
Description: AS08

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/21/2017	Philips CM12	15000
TH	5/22/2017	Philips CM12	15000

Volume (L) : 2667.03
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 14
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1456
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	6.9	0.001	0 - 0.006 - Poisson	1	
Total Asbestos Structures	6.9	0.001	0 - 0.006 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	6.9	0.001	0 - 0.006 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	6.9	0.001	0 - 0.006 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S5
Client Sample No.: 17050028
Description: PS01

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/22/2017	Philips 410	18000

Volume (L) : 1448.04
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 25
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.2725
Analytical Sens. (struc/cc) : 0.00098
Detection Limit. (struc/cc) : 0.00292

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
Primary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures > 5um and 5:1	0	< 0.001	0 - 0.004 - Poisson	0	
Asbestos Fibers and Bundles > 5um and 5:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Portland, OR 97239

Final Report

Phone: (503) 224-5055
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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S8
Client Sample No.: 17050032
Description: PS05

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/20/2017	Philips CM12	15000
PK	5/21/2017	Philips CM12	15000

Volume (L) : 389.99
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 95
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.988
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00299

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	2	0.002	0 - 0.007 - Poisson	2	
Total Asbestos Structures	2	0.002	0 - 0.007 - Poisson		2
rimary Asb and Libby-Other Amphibole Structure	2	0.002	0 - 0.007 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	2	0.002	0 - 0.007 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	1	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

JMW 4-20-18

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Final Report

Asbestos and Environmental Analysis

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ISO 10312 - Direct Summary Data

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No.: S10
Client Sample No.: 17050034
Description: PS07

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/20/2017	Philips CM12	15000

Volume (L) : 1336.45
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 28
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.2912
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	3.4	0.001	0 - 0.006 - Poisson	1	
Total Asbestos Structures	3.4	0.001	0 - 0.006 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	3.4	0.001	0 - 0.006 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	3.4	0.001	0 - 0.006 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x
Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

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ISO 10312 - Direct Raw Data

Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S1
Client Sample No: 17050023
Description: AS03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	F61	NAM	1		MD 1-1	6.49	3.62	1.8	Non Asbestos Mineral			
G1	1	F61	NAM		1	MF	5.22	1.55	3.4	Non Asbestos Mineral			
G1	2	H61	ADQ	2		MD 1-1	24.89	7.12	3.5	Actinolite			PAOS, AS>5, 3:1, PCMES-NIOSH
G1	2	H61	ADQ		2	MB	24.89	5.54	4.5	Actinolite	Mg, Al, Si, K, Ca, Ti, Fe	High Al	TAOS, AFB>5, 3:1, PCMEF-NIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30690SP	TH 5/22/2017	
Diffraction	Pc30690DF	TH 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30690BF		

G1	3	E54				NSD							
G1	4	F53	NAM	3		MD 1-1	7.07	2.61	2.7	Non Asbestos Mineral			
G1	4	F53	NAM		3	MF	6.18	1.57	3.9	Non Asbestos Mineral			
G1	5	F54				NSD							
G1	6	E52				NSD							
G1	7	F51	NAM	4	4	F	5.87	1.65	3.6	Non Asbestos Mineral			
G1	8	F52				NSD							
G1	9	G51				NSD							
G1	10	F43				NSD							
G2	11	C61	NAM	5		MD 1-1	5.73	2.24	2.6	Non Asbestos Mineral			
G2	11	C61	NAM		5	MF	5.47	1.63	3.4	Non Asbestos Mineral			
G2	12	C62				NSD							
G2	13	E61	NAM	6	6	F	6.94	1.37	5.1	Non Asbestos Mineral			
G2	13	E61	CDQ	7		MD 1-0	3.67	2.74	1.3	Chrysotile			PAOS

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Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S1
Client Sample No: 17050023
Description: AS03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	13	E61	CDQ		7	MF	1.17	0.09	13	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30692SP	TH 5/22/2017	
Diffraction	Pc30692DF	TH 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30692BF		

G2	14	F61	NAM	8		MD 1-1	7.7	1.8	4.3	Non Asbestos Mineral			
G2	14	F61	NAM		8	MF	6.78	1.8	3.8	Non Asbestos Mineral			
G2	15	C53				NSD							
G2	16	C54				NSD							
G2	17	E53				NSD							

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Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S2
Client Sample No: 17050024
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	F61				NSD							
G1	2	F62				NSD							
G1	3	G61				NSD							
G1	4	G62				NSD							
G1	5	F53				NSD							
G1	6	F54				NSD							
G1	7	G53				NSD							
G1	8	G54				NSD							
G1	9	E51	ADQ	1		MD 1-0	20.15	13.88	1.5	Actinolite			PAOS, AS>5, 3:1
G1	9	E51	ADQ		1	MF	4.06	0.82	5	Actinolite	Na, Mg, Al, Si, K, Ca, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30680DF	TH 5/21/2017	0.53 nm ROW SPACING
Brightfield	H30680BF		
Spectra	Pc30680SP	TH 5/22/2017	

G1	9	E51	NAM		2	MR	4.22	0.28	15.1	Non Asbestos Mineral		1-0	
G1	10	E52	CDQ	2		MD 1-0	2.74	1.56	1.8	Chrysotile			PAOS
G1	10	E52	CDQ		3	MF	2.74	0.11	24.9	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30684DF	TH 5/21/2017	0.53 nm ROW SPACING
Brightfield	H30684BF		
Spectra	Pc30684SP	TH 5/22/2017	

G1	10	E52	CD	3		MD 1-0	3.5	0.53	6.6	Chrysotile			PAOS
G1	10	E52	CD		4	MF	3.5	0.11	31.8	Chrysotile		See image H30684BF	TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30685DF	TH 5/21/2017	0.53 nm ROW SPACING

G1	11	H51	NAM	4		MD 1-1	22.09	21.64	1	Non Asbestos Mineral			
G1	11	H51	NAM		5	MF	5.7	0.76	7.5	Non Asbestos Mineral			
G1	12	G52				NSD							
G2	13	G61				NSD							
G2	14	G62				NSD							
G2	15	F54	NAM	5		MD 1-1	6.81	2.43	2.8	Non Asbestos Mineral			

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Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S2
Client Sample No: 17050024
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	15	F54	NAM		6	MF	6.81	1.02	6.7	Non Asbestos Mineral			
G2	16	G53	NAM	6		MD 1-1	7.71	3.42	2.3	Non Asbestos Mineral			
G2	16	G53	NAM		7	MF	6.43	1.92	3.3	Non Asbestos Mineral			

Lab/Cor Sample No: S3
Client Sample No: 17050026
Description: AS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	E51	NAM	1	1	F	16	2	8	Non Asbestos Mineral			
G1	2	E43				NSD							
G1	3	F43	NAM	2	2	F	6	1.5	4	Non Asbestos Mineral			
G1	4	F44	NAM	3	3	F	5.3	1	5.3	Non Asbestos Mineral			
G1	5	G43				NSD							
G1	6	G44				NSD							
G1	7	E41	ADQ	4	4	F	1.6	0.46	3.5	Actinolite			TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30688SP	PK 5/21/2017	
Diffraction	Pc30688DF	PK 5/21/2017	0.53 nm ROW SPACING
Brightfield	Pc30688BF		

G1	8	E42				NSD							
G2	9	E61				NSD							
G2	10	E62				NSD							
G2	11	F61	NAM	5		MD 1-1	9.26	8.06	1.1	Non Asbestos Mineral			
G2	11	F61	NAM		5	MF	8.4	2.55	3.3	Non Asbestos Mineral			
G2	12	F62				NSD							
G2	13	E53				NSD							
G2	14	E54				NSD							

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Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S5
Client Sample No: 17050028
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B31				NSD							
G1	2	B32				NSD							
G1	3	C31				NSD							
G1	4	C32				NSD							
G1	5	E31				NSD							
G1	6	E32				NSD							
G1	7	F31				NSD							
G1	8	F32				NSD							
G1	9	G31				NSD							
G1	10	G32				NSD							
G1	11	H31				NSD							
G1	12	H32				NSD							
G1	13	E33				NSD							
G1	14	E34				NSD							
G2	15	C41				NSD							
G2	16	C42				NSD							
G2	17	E41				NSD							
G2	18	E42				NSD							
G2	19	F41				NSD							
G2	20	F42				NSD							
G2	21	G41				NSD							
G2	22	G42				NSD							
G2	23	H41				NSD							
G2	24	H42				NSD							
G2	25	F43				NSD							

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Job Number: 172918 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S8
Client Sample No: 17050032
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C62				NSD							
G1	2	E61				NSD							
G1	3	E62				NSD							
G1	4	F61				NSD							
G1	5	F62				NSD							
G1	6	G61				NSD							
G1	7	B53				NSD							
G1	8	B54	NAM	1	1	F	18	3	6	Non Asbestos Mineral			
G1	9	E53				NSD							
G1	10	F53				NSD							
G1	11	F54				NSD							
G1	12	G54				NSD							
G1	13	H53				NSD							
G1	14	H54				NSD							
G1	15	E52				NSD							
G1	16	F51	NAM	2	2	F	7	2	3.5	Non Asbestos Mineral			
G1	17	G52				NSD							
G1	18	H51				NSD							
G1	19	F43	NAM	3	3	F	22	5	4.4	Non Asbestos Mineral			
G1	20	F44				NSD							
G1	21	G43				NSD							
G1	22	G44	ADQ	4	4	F	3.22	1.05	3.1	Actinolite	Mg, Al, Si, Ca, Mn, Fe		TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30678SP	PK 5/21/2017	
Diffraction	Pc30678DF	PK 5/21/2017	0.53 nm ROW SPACING
Brightfield	Pc30678BF		

G1	23	H43				NSD							
G1	24	B41	NAM	5	5	F	7	1.5	4.7	Non Asbestos Mineral			
G1	25	B42				NSD							
G1	26	C41				NSD							
G1	27	G41				NSD							
G1	28	G42				NSD							

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Job Number: 172918 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S8
Client Sample No: 17050032
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	29	G33	NAM	6	6	F	7	1	7	Non Asbestos Mineral			
G2	30	E62				NSD							
G2	31	F61				NSD							
G2	32	F62	NAM	7	7	F	10	3	3.3	Non Asbestos Mineral			
G2	33	G61				NSD							
G2	34	F53				NSD							
G2	35	F54				NSD							
G2	36	G53				NSD							
G2	37	G54				NSD							
G2	38	E52				NSD							
G2	39	F51				NSD							
G2	40	F52				NSD							
G2	41	G51	NAM	8	8	F	6.5	1	6.5	Non Asbestos Mineral			
G2	42	H51				NSD							
G2	43	H52				NSD							
G2	44	E43				NSD							
G2	45	E44				NSD							
G2	46	F43	NAM	9	9	F	9.5	3	3.2	Non Asbestos Mineral			
G2	47	F44				NSD							
G2	48	G43				NSD							
G2	49	G44	NAM	10	10	F	80	4	20	Non Asbestos Mineral		2X Grid Bar Rule, RB	
G2	50	H43				NSD							
G2	51	H44				NSD							
G2	52	E41				NSD							
G2	53	E42				NSD							
G2	54	F41				NSD							
G2	55	F42				NSD							
G2	56	G41				NSD							
G2	57	G42				NSD							
G2	58	H41	NAM	11	11	F	5.5	1.2	4.6	Non Asbestos Mineral			

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Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S8
Client Sample No: 17050032
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	59	E33				NSD							
G2	60	E34				NSD							
G2	61	F33	NAM	12	12	F	6	1.1	5.5	Non Asbestos Mineral			
G2	62	G33				NSD							
G2	63	H33				NSD							
G2	64	H34				NSD							
G2	65	C32				NSD							
G2	66	E31	NAM	13	13	F	6.5	2	3.2	Non Asbestos Mineral			
G2	67	E32				NSD							
G2	68	F31				NSD							
G2	69	F32				NSD							
G2	70	G31				NSD							
G2	71	G32	ADQ	14		MD 1-0	5.2	2.63	2	Actinolite			PAOS, AS>5, 3:1
G2	71	G32	ADQ		14	MB	4.88	1.06	4.6	Actinolite	Mg, Al, Si, Ca, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30683SP	PK 5/21/2017	
Diffraction	Pc30683DF	PK 5/21/2017	0.53 nm ROW SPACING
Brightfield	Pc30683BF		

G2	72	H31				NSD							
G2	73	E23				NSD							
G2	74	E24				NSD							
G2	75	F23				NSD							
G2	76	F24				NSD							
G2	77	G23				NSD							
G3	78	C62				NSD							
G3	79	E61				NSD							
G3	80	E62				NSD							
G3	81	G61				NSD							
G3	82	C54				NSD							
G3	83	G53				NSD							
G3	84	G54				NSD							
G3	85	E51	NAM	15	15	F	100	4	25	Non Asbestos Mineral		2X Grid Bar Rule, RB	
G3	86	E52				NSD							

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Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S8
Client Sample No: 17050032
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G3	87	F51				NSD							
G3	88	F52				NSD							
G3	89	G51	NAM	16	16	F	11	1.5	7.3	Non Asbestos Mineral			
G3	90	G52	NAM	17	17	F	6	1	6	Non Asbestos Mineral			
G3	91	G43	NAM	18	18	F	21	6	3.5	Non Asbestos Mineral			
G3	92	G44				NSD							
G3	93	E44				NSD							
G3	94	G41				NSD							
G3	95	G42	NAM	19	19	F	5.73	1.84	3.1	Non Asbestos Mineral			

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Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Lab/Cor Sample No: S10
Client Sample No: 17050034
Description: PS07

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C53	CDQ	1		MD 1-0	1.44	1.1	1.3	Chrysotile			PAOS
G1	1	C53	CDQ		1	MF	0.76	0.05	15.2	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30675SP	PK 5/20/2017	
Diffraction	Pc30675DF	PK 5/20/2017	0.53 nm ROW SPACING
Brightfield	Pc30675BF		

G1	2	C54				NSD							
G1	3	E53				NSD							
G1	4	E54				NSD							
G1	5	F53				NSD							
G1	6	F54				NSD							
G1	7	G53				NSD							
G1	8	C52				NSD							
G1	9	E51				NSD							
G1	10	E52				NSD							
G1	11	F51				NSD							
G1	12	F52				NSD							
G1	13	G52				NSD							
G1	14	H51				NSD							
G1	15	C31				NSD							
G1	16	C32	NAM	2	2	F	12.7	3.2	4	Non Asbestos Mineral			

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30676BF		

G1	17	E31				NSD							
G1	18	E32				NSD							
G1	19	F31				NSD							
G1	20	F24				NSD							
G2	21	C43				NSD							
G2	22	C44				NSD							
G2	23	E43				NSD							
G2	24	E44				NSD							
G2	25	F43				NSD							
G2	26	F44				NSD							
G2	27	G43				NSD							
G2	28	G44				NSD							

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Project Name:
Project No.: PDX-03

Report Number: 172918R03
Date Received: 5/20/2017

Count Categories

AFB>5	Asbestos Fibers and Bundles > 5um and 5:1	AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5	Asbestos Structures > 5um and 5:1
AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0	mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1
PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures	PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1
PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH
PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH	TAOS	Total Asb & Libby-OtherAmph Structures
TAS	Total Asbestos Structures				

Reviewed by:

x

Tracy Handrich
Analyst

MW 4-2018

172918

USEPA
DateShipped: 5/19/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-03
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050023	AS03	Asbestos PCM	Air	MCE Cassette	5/19/2017	2280.23	Liters	226	10.0895	L/min
	17050024	AS04	Asbestos PCM	Air	MCE Cassette	5/19/2017	2376.39	Liters	234	10.1555	L/min
	17050026	AS08	Asbestos PCM	Air	MCE Cassette	5/19/2017	2667.03	Liters	262	10.1795	L/min
	17050027	AS09	Asbestos PCM	Air	MCE Cassette	5/19/2017	2659.43	Liters	262	10.1505	L/min
	17050028	PS01	Asbestos PCM	Air	MCE Cassette	5/19/2017	1448.04	Liters	486	2.9795	L/min
	17050030	PS03	Asbestos PCM	Air	MCE Cassette	5/19/2017	1452.91	Liters	470	3.0913	L/min
	17050031	PS04	Asbestos PCM	Air	MCE Cassette	5/19/2017	1330.45	Liters	436	3.0515	L/min
	17050032	PS05	Asbestos PCM	Air	MCE Cassette	5/19/2017	389.99	Liters	128	3.0468	L/min
	17050033	PS06	Asbestos PCM	Air	MCE Cassette	5/19/2017	1297.53	Liters	430	3.0175	L/min
	17050034	PS07	Asbestos PCM	Air	MCE Cassette	5/19/2017	1336.45	Liters	441	3.0305	L/min
	17050035	Blank	Asbestos PCM	Air	MCE Cassette	5/19/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/19/17 1900	[signature] LABCORPORTLAND INC	5/20/17 4:45 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of six air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050036	17050039	17050040	17050041	17050042	17050045

The samples were analyzed on May 22, 2017. No issues were noted in the case narrative.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172919 **PDX**

Report Number: 172919R03
Report Date: 6/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-04
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172919 - S1	17050036 - AS03	ISO 10312 - Direct		5/21/2017
172919 - S4	17050039 - AS10	ISO 10312 - Direct		5/21/2017
172919 - S5	17050040 - AS11	ISO 10312 - Direct		5/21/2017
172919 - S6	17050041 - PS01	ISO 10312 - Direct		5/21/2017
172919 - S7	17050042 - PS02	ISO 10312 - Direct		5/21/2017
172919 - S10	17050045 - PS05	ISO 10312 - Direct		5/21/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Tracy Handrich
Analyst

MW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Summary Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S1
Client Sample No.: 17050036
Description: AS03

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/22/2017	Philips CM12	15000

Volume (L) : 2663.18
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 14
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1456
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00297

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	20.6	0.003	0.001 - 0.009 - Poisson	3	
Total Asbestos Structures	20.6	0.003	0.001 - 0.009 - Poisson		3
Primary Asb and Libby-Other Amphibole Structure	20.6	0.003	0.001 - 0.009 - Poisson	3	
Total Asb & Libby-OtherAmph Structures	20.6	0.003	0.001 - 0.009 - Poisson		3
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	13.7	0.002	0 - 0.007 - Poisson	2	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S4
Client Sample No.: 17050039
Description: AS10

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/22/2017	Philips CM12	15000

Volume (L) : 2904.04
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 13
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1352
Analytical Sens. (struc/cc) : 0.00098
Detection Limit. (struc/cc) : 0.00293

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	14.8	0.002	0 - 0.007 - Poisson	2	
Total Asbestos Structures	14.8	0.002	0 - 0.007 - Poisson		2
Primary Asb and Libby-Other Amphibole Structure	14.8	0.002	0 - 0.007 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	14.8	0.002	0 - 0.007 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	14.8	0.002	0 - 0.007 - Poisson	2	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-2018

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ISO 10312 - Direct Summary Data

Job Number: 172919 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S5
Client Sample No.: 17050040
Description: AS11

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/22/2017	Philips CM12	15000

Volume (L) : 3025.55
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 13
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1352
Analytical Sens. (struc/cc) : 0.00094
Detection Limit. (struc/cc) : 0.00281

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	7.4	0.001	0 - 0.005 - Poisson	1	
Total Asbestos Structures	7.4	0.001	0 - 0.005 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	7.4	0.001	0 - 0.005 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	7.4	0.001	0 - 0.005 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

JMN 4-20-18

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

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ISO 10312 - Direct Summary Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S6
Client Sample No.: 17050041
Description: PS01

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/22/2017	H7000FA	20000

Volume (L) : 858.27
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 42
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.4578
Analytical Sens. (struc/cc) : 0.00098
Detection Limit. (struc/cc) : 0.00293

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
Primary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Summary Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S7
Client Sample No.: 17050042
Description: PS02

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/22/2017	Philips 410	18000

Volume (L) : 1527.12
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 24
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.2616
Analytical Sens. (struc/cc) : 0.00096
Detection Limit. (struc/cc) : 0.00288

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim	Structure Count[1] Total
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

JMW 4-20-18

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

Asbestos and Environmental Analysis

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ISO 10312 - Direct Summary Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No.: S10
Client Sample No.: 17050045
Description: PS05

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/22/2017	Philips 410	18000

Volume (L) : 691.61
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 52
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.5668
Analytical Sens. (struc/cc) : 0.00098
Detection Limit. (struc/cc) : 0.00294

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	1.8	0.001	0 - 0.005 - Poisson	1	
Total Asbestos Structures	1.8	0.001	0 - 0.005 - Poisson		1
Primary Asb and Libby-Other Amphibole Structure	1.8	0.001	0 - 0.005 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	1.8	0.001	0 - 0.005 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x

Tracy Handrich
Analyst

JMW 4-20-18

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Raw Data

Job Number: 172919 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S1
Client Sample No: 17050036
Description: AS03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B52				NSD							
G1	2	C51				NSD							
G1	3	C52				NSD							
G1	4	E51				NSD							
G1	5	E52	NAM	1	1	F	8	2.5	3.2	Non Asbestos Mineral			
G1	5	E52	ADQ	2	2	MC 1-0	6	3.7	1.6	Actinolite	Mg, Al, Si, K, Ca, Ti, Fe		TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30695SP	PK 5/22/2017	
Diffraction	Pc30695DF	PK 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30695BF		

G1	6	F51				NSD							
G1	7	F52	CDQ	3	3	MC 1-0	8	5.4	1.5	Chrysotile		2X Grid Bar Rule, TB	TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30696SP	PK 5/22/2017	
Diffraction	Pc30696DF	PK 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30696BF		

G1	8	G51				NSD							
G1	9	G52				NSD							
G2	10	E33	NAM	4	4	F	7	2.1	3.3	Non Asbestos Mineral			
G2	11	E34				NSD							
G2	12	F33	NAM	5	5	F	5.5	1.5	3.7	Non Asbestos Mineral			
G2	13	F34	ADQ	6		MD 1-0	2.7	1	2.7	Actinolite			PAOS
G2	13	F34	ADQ		6	MF	2.7	0.72	3.8	Actinolite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30697SP	PK 5/22/2017	
Diffraction	Pc30697DF	PK 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30697BF		

G2	14	C32				NSD							

Mm 4-20-18

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Lab/Cor Portland, Inc.
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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S4
Client Sample No: 17050039
Description: AS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B33				NSD							
G1	2	B34				NSD							
G1	3	C33	ADQ	1		MD 1-0	6.67	5.54	1.2	Actinolite			PAOS, AS>5, 3:1
G1	3	C33	ADQ		1	MF	4.1	1.05	3.9	Actinolite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30698SP	PK 5/22/2017	
Diffraction	Pc30698DF	PK 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30698BF		

G1	4	C34				NSD							
G1	5	E33				NSD							
G1	6	E34				NSD							
G1	7	F33	AQ	2	2	MC 2-0	6.5	6	1.1	Actinolite	Mg, Al, Si, K, Ca, Ti, Mn, Fe		TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30699SP	PK 5/22/2017	
Brightfield	Pc30699BF		

G1	8	F34				NSD							
G2	9	C44				NSD							
G2	10	E43				NSD							
G2	11	E44				NSD							
G2	12	F43				NSD							
G2	13	F44				NSD							

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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S5
Client Sample No: 17050040
Description: AS11

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C52				NSD							
G1	2	E51				NSD							
G1	3	E52				NSD							
G1	4	F51				NSD							
G1	5	F52				NSD							
G1	6	G51				NSD							
G1	7	G52				NSD							
G2	8	C42				NSD							
G2	9	E41				NSD							
G2	10	E42	ADQ	1	1	F	1.74	0.41	4.2	Tremolite	Mg, Al, Si, Ca, Cr, Fe		TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30700SP	PK 5/22/2017	
Diffraction	Pc30700DF	PK 5/22/2017	0.53 nm ROW SPACING
Brightfield	Pc30700BF		

G2	10	E42	NAM	2	2	F	5.1	0.9	5.7	Non Asbestos Mineral			
G2	11	F41				NSD							
G2	12	F42				NSD							
G2	13	G41				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S6
Client Sample No: 17050041
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C33				NSD							
G1	2	C34				NSD							
G1	3	E33				NSD							
G1	4	E34				NSD							
G1	5	F33				NSD							
G1	6	F34				NSD							
G1	7	G33				NSD							
G1	8	G34				NSD							
G1	9	B42				NSD							
G1	10	C41				NSD							
G1	11	C42				NSD							
G1	12	E41				NSD							
G1	13	E42				NSD							
G1	14	F41				NSD							
G1	15	F42				NSD							
G1	16	G41				NSD							
G1	17	G42				NSD							
G1	18	H41				NSD							
G1	19	H42				NSD							
G1	20	H51				NSD							
G1	21	G52				NSD							
G1	22	G51				NSD							
G1	23	F52				NSD							
G1	24	F51				NSD							
G1	25	E52				NSD							
G2	26	B32				NSD							
G2	27	C31				NSD							
G2	28	C32				NSD							
G2	29	E31				NSD							
G2	30	E32				NSD							
G2	31	F31				NSD							
G2	32	F32				NSD							
G2	33	G31				NSD							
G2	34	G32				NSD							
G2	35	H31				NSD							
G2	36	H42				NSD							
G2	37	H41				NSD							
G2	38	G42				NSD							

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Final Report

Asbestos and Environmental Analysis

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ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S6
Client Sample No: 17050041
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	39	G41				NSD							
G2	40	F42				NSD							
G2	41	F41				NSD							
G2	42	E42				NSD							

Lab/Cor Sample No: S7
Client Sample No: 17050042
Description: PS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C31				NSD							
G1	2	C32				NSD							
G1	3	E31				NSD							
G1	4	E32				NSD							
G1	5	F31				NSD							
G1	6	F32				NSD							
G1	7	G31				NSD							
G1	8	G32				NSD							
G1	9	H31				NSD							
G1	10	H32				NSD							
G1	11	E33				NSD							
G1	12	E34				NSD							
G2	13	E31				NSD							
G2	14	E32				NSD							
G2	15	F31				NSD							
G2	16	F32				NSD							
G2	17	G31				NSD							
G2	18	G32				NSD							
G2	19	H31				NSD							
G2	20	H32				NSD							
G2	21	F33				NSD							
G2	22	F34				NSD							
G2	23	G33				NSD							
G2	24	G34				NSD							

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Asbestos and Environmental Analysis

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ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S10
Client Sample No: 17050045
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B31				NSD							
G1	2	B32				NSD							
G1	3	C31				NSD							
G1	4	C32				NSD							
G1	5	E31				NSD							
G1	6	E32				NSD							
G1	7	F31				NSD							
G1	8	F32				NSD							
G1	9	G31				NSD							
G1	10	G32				NSD							
G1	11	H31				NSD							
G1	12	H32				NSD							
G1	13	K31				NSD							
G1	14	C42				NSD							
G1	15	E41				NSD							
G1	16	E42				NSD							
G1	17	F41				NSD							
G1	18	F42				NSD							
G1	19	G41				NSD							
G1	20	G42				NSD							
G1	21	H41				NSD							
G1	22	H42				NSD							
G1	23	H43				NSD							
G1	24	H44				NSD							
G2	25	B41				NSD							
G2	26	B42				NSD							
G2	27	C41				NSD							
G2	28	C42				NSD							
G2	29	E41	ADQ	1	1	F	2.5	0.65	3.8	Actinolite	Mg, Al, Si, Ca, Fe		TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	P30693SP	DW 5/22/2017	
Diffraction	P30693DF	DW 5/22/2017	0.53nm ROW SPACING
Brightfield	P30693BF		

G2	30	E42				NSD							
G2	31	F41				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Lab/Cor Sample No: S10
Client Sample No: 17050045
Description: PS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	32	F42	NAM	2	2	F	22	1.5	14.7	Non Asbestos Mineral	Mg, Al, Si, P, S		

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30694BF		

G2	33	G41	NSD
G2	34	G42	NSD
G2	35	H41	NSD
G2	36	H42	NSD
G2	37	K41	NSD
G2	38	C43	NSD
G2	39	C44	NSD
G2	40	E43	NSD
G2	41	E44	NSD
G2	42	F43	NSD
G2	43	F44	NSD
G2	44	G43	NSD
G2	45	G44	NSD
G2	46	H43	NSD
G2	47	H44	NSD
G2	48	K43	NSD
G2	49	C52	NSD
G2	50	E51	NSD
G2	51	E52	NSD
G2	52	F51	NSD

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172919 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-04

Report Number: 172919R03
Date Received: 5/21/2017

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

Mar 4 2018

172913

USEPA
DateShipped: 5/20/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-04
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050036	AS03	Asbestos PCM	Air	MCE Cassette	5/20/2017	2663.18	Liters	260	10.243	L/min
	17050037	AS04	Asbestos PCM	Air	MCE Cassette	5/20/2017	2722.08	Liters	265	10.272	L/min
	17050038	AS09	Asbestos PCM	Air	MCE Cassette	5/20/2017	2769.18	Liters	273	10.1435	L/min
	17050039	AS10	Asbestos PCM	Air	MCE Cassette	5/20/2017	2904.04	Liters	286	10.154	L/min
	17050040	AS11	Asbestos PCM	Air	MCE Cassette	5/20/2017	3025.55	Liters	294	10.291	L/min
	17050041	PS01	Asbestos PCM	Air	MCE Cassette	5/20/2017	858.27	Liters	282	3.0435	L/min
	17050042	PS02	Asbestos PCM	Air	MCE Cassette	5/20/2017	1527.12	Liters	511	2.9885	L/min
	17050043	PS03	Asbestos PCM	Air	MCE Cassette	5/20/2017	1373.51	Liters	457	3.0055	L/min
	17050044	PS04	Asbestos PCM	Air	MCE Cassette	5/20/2017	1422.41	Liters	477	2.982	L/min
	17050045	PS05	Asbestos PCM	Air	MCE Cassette	5/20/2017	691.61	Liters	231	2.994	L/min
	17050046	PS06	Asbestos PCM	Air	MCE Cassette	5/20/2017	1265	Liters	424	2.9835	L/min
	17050047	PS07	Asbestos PCM	Air	MCE Cassette	5/20/2017	1131.57	Liters	381	2.97	L/min
	17050048	Blank	Asbestos PCM	Air	MCE Cassette	5/20/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/20/17 1907	[signature]	5/21/17 4:45AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of five air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050051	17050052	17050054	17050056	17050061

The samples were analyzed by May 23, 2017. No issues were noted in the case narrative.

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Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

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Job Number: 172921 **PDX**

Report Number: 172921R03
Report Date: 6/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-06
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172921 - S3	17050051 - AS12	ISO 10312 - Direct		5/22/2017
172921 - S4	17050052 - AS13	ISO 10312 - Direct		5/22/2017
172921 - S6	17050054 - AS15	ISO 10312 - Direct		5/22/2017
172921 - S8	17050056 - PS02	ISO 10312 - Direct		5/22/2017
172921 - S13	17050061 - PS07	ISO 10312 - Direct		5/22/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Tracy Handrich
Analyst

JMW 4-20-18

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Lab/Cor Portland, Inc.
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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No.: S3
Client Sample No.: 17050051
Description: AS12

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/23/2017	Philips CM12	15000

Volume (L) : 3335.14
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 12
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1248
Analytical Sens. (struc/cc) : 0.00092
Detection Limit. (struc/cc) : 0.00277

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	8	0.001	0 - 0.005 - Poisson	1	
Total Asbestos Structures	8	0.001	0 - 0.005 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	8	0.001	0 - 0.005 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	8	0.001	0 - 0.005 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.003 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.003 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.003 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.003 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.003 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

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Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No.: S4
Client Sample No.: 17050052
Description: AS13

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/23/2017	Philips CM12	15000

Volume (L) : 3403.77
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 11
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1144
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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ISO 10312 - Direct Summary Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No.: S6
Client Sample No.: 17050054
Description: AS15

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/23/2017	H7000FA	20000

Volume (L) : 2609.18
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 14
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.1526
Analytical Sens. (struc/cc) : 0.00097
Detection Limit. (struc/cc) : 0.00289

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

4/20/18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Summary Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No.: S8
Client Sample No.: 17050056
Description: PS02

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/23/2017	H7000FA	20000

Volume (L) : 1024.2
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 35
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.3815
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00295

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	2.6	0.001	0 - 0.005 - Poisson	1	
Total Asbestos Structures	2.6	0.001	0 - 0.005 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	2.6	0.001	0 - 0.005 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	2.6	0.001	0 - 0.005 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	2.6	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No.: S13
Client Sample No.: 17050061
Description: PS07

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/23/2017	H7000FA	20000

Volume (L) : 1180.68
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 31
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.3379
Analytical Sens. (struc/cc) : 0.00097
Detection Limit. (struc/cc) : 0.00289

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
Primary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x

Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Raw Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-06

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No: S3
Client Sample No: 17050051
Description: AS12

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B41				NSD							
G1	2	B42				NSD							
G1	3	C41				NSD							
G1	4	C42				NSD							
G1	5	E41				NSD							
G1	6	E42	ADQ	1		MD 1-0	3.92	3.07	1.3	Actinolite			PAOS
G1	6	E42	ADQ		1	MB	3.92	0.68	5.8	Actinolite	Mg, Al, Si, Ca, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30702SP	PK 5/23/2017	
Diffraction	Pc30702DF	PK 5/23/2017	0.53 nm ROW SPACING
Brightfield	Pc30702BF		

G1	7	F41				NSD							
G1	8	F42				NSD							
G1	9	G41				NSD							
G2	10	F34	NAM	2		MD 1-1	10.32	2.58	4	Non Asbestos Mineral			
G2	10	F34	NAM		2	MF	10.32	2.58	4	Non Asbestos Mineral	Na, Mg, Al, Si, K, Ca, Mn, Fe		

ItemType	ItemNum	Confirmed	Comment
Brightfield	Pc30704BF		

G2	11	G33				NSD							
G2	12	G34				NSD							

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Asbestos and Environmental Analysis

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ISO 10312 - Direct Raw Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-06

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No: S4
Client Sample No: 17050052
Description: AS13

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	F53				NSD							
G1	2	G51				NSD							
G1	3	E44				NSD							
G1	4	E42				NSD							
G1	5	F41				NSD							
G1	6	F42				NSD							
G2	7	F53				NSD							
G2	8	E52				NSD							
G2	9	G52				NSD							
G2	10	E43				NSD							
G2	11	C33				NSD							

Lab/Cor Sample No: S6
Client Sample No: 17050054
Description: AS15

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B34				NSD							
G1	2	C33				NSD							
G1	3	C34				NSD							
G1	4	B42				NSD							
G1	5	C41				NSD							
G1	6	C42				NSD							
G1	7	C43				NSD							
G1	8	C44				NSD							
G1	9	B52				NSD							
G1	10	C51				NSD							
G2	11	C31				NSD							
G2	12	C32				NSD							
G2	13	E41				NSD							
G2	14	F41				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-06

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No: S8
Client Sample No: 17050056
Description: PS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C43				NSD							
G1	2	C44				NSD							
G1	3	E43				NSD							
G1	4	E44				NSD							
G1	5	F43				NSD							
G1	6	F44				NSD							
G1	7	G43				NSD							
G1	8	G44				NSD							
G1	9	H43				NSD							
G1	10	B52				NSD							
G1	11	C51				NSD							
G1	12	C52	ADQ	1	1	MC 1-0	9	6.1	1.5	Actinolite		1-0	TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	F30705SP	KM 5/23/2017	
Diffraction	F30705DF	KM 5/23/2017	0.53nm ROW SPACING
Brightfield	F30705BF		

G1	13	E51				NSD							
G1	14	E52				NSD							
G1	15	F51				NSD							
G1	16	F52				NSD							
G1	17	G51				NSD							
G1	18	G52				NSD							
G1	19	H51				NSD							
G1	20	H52				NSD							
G2	21	B34				NSD							
G2	22	C33				NSD							
G2	23	C34				NSD							
G2	24	E33				NSD							
G2	25	E34				NSD							
G2	26	F33				NSD							
G2	27	G33				NSD							
G2	28	G34				NSD							
G2	29	H33				NSD							
G2	30	B44				NSD							
G2	31	C43				NSD							
G2	32	C44				NSD							
G2	33	E43				NSD							
G2	34	E44				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-06

Report Number: 172921R03
Date Received: 5/22/2017

Lab/Cor Sample No: S8
Client Sample No: 17050056
Description: PS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	35	F43				NSD							

Lab/Cor Sample No: S13
Client Sample No: 17050061
Description: PS07

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C34				NSD							
G1	2	E33				NSD							
G1	3	E34				NSD							
G1	4	F33				NSD							
G1	5	F34				NSD							
G1	6	G33				NSD							
G1	7	G34				NSD							
G1	8	H33				NSD							
G1	9	H34				NSD							
G1	10	B44				NSD							
G1	11	C43				NSD							
G1	12	C44				NSD							
G1	13	E43				NSD							
G1	14	E44				NSD							
G1	15	F43				NSD							
G1	16	F44				NSD							
G1	17	G43				NSD							
G1	18	G44				NSD							
G2	19	C34				NSD							
G2	20	E33				NSD							
G2	21	E34				NSD							
G2	22	F33				NSD							
G2	23	F34				NSD							
G2	24	G33				NSD							
G2	25	G34				NSD							
G2	26	H33				NSD							
G2	27	H34				NSD							
G2	28	H42				NSD							
G2	29	H41				NSD							
G2	30	G42				NSD							
G2	31	G41				NSD							

MW 4-2018

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Final Report

Phone: (503) 224-5055
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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172921 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-06

Report Number: 172921R03
Date Received: 5/22/2017

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

MW 4-20-18

172921

USEPA
DateShipped: 5/21/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-06
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050049	AS03	Asbestos PCM	Air	MCE Cassette	5/21/2017	2968.62	Liters	292	10.1665	L/min
	17050050	AS04	Asbestos PCM	Air	MCE Cassette	5/21/2017	3120.15	Liters	305	10.23	L/min
	17050051	AS12	Asbestos PCM	Air	MCE Cassette	5/21/2017	3335.14	Liters	326	10.2305	L/min
	17050052	AS13	Asbestos PCM	Air	MCE Cassette	5/21/2017	3403.77	Liters	340	10.0111	L/min
	17050053	AS14	Asbestos PCM	Air	MCE Cassette	5/21/2017	3204.65	Liters	315	10.1735	L/min
	17050054	AS15	Asbestos PCM	Air	MCE Cassette	5/21/2017	2609.18	Liters	262	9.9587	L/min
	17050055	PS01	Asbestos PCM	Air	MCE Cassette	5/21/2017	1062.65	Liters	352	3.0189	L/min
	17050056	PS02	Asbestos PCM	Air	MCE Cassette	5/21/2017	1024.2	Liters	348	2.9431	L/min
	17050057	PS03	Asbestos PCM	Air	MCE Cassette	5/21/2017	1244.39	Liters	410	3.0351	L/min
	17050058	PS04	Asbestos PCM	Air	MCE Cassette	5/21/2017	1384.42	Liters	467	2.9645	L/min
	17050059	PS05	Asbestos PCM	Air	MCE Cassette	5/21/2017	1323.63	Liters	437	3.0289	L/min
	17050060	PS06	Asbestos PCM	Air	MCE Cassette	5/21/2017	1103.7	Liters	363	3.0405	L/min
	17050061	PS07	Asbestos PCM	Air	MCE Cassette	5/21/2017	1180.68	Liters	388	3.043	L/min
	17050062	Blank	Asbestos PCM	Air	MCE Cassette	5/21/2017		Liters			L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/21/17 1845	[signature] LABCOR PORTLAND, INC	5/22/17 6:00 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of five air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050068 17050071 17050072 17050073 17050074

The samples were analyzed by May 25, 2017. No issues were noted in the case narrative.

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Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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Job Number: 172958 **PDX**

Report Number: 172958R05
Report Date: 6/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-07
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172958 - S6	17050068 - AS18	ISO 10312 - Direct		5/23/2017
172958 - S9	17050071 - ASB03	ISO 10312 - Direct		5/23/2017
172958 - S10	17050072 - ASB04	ISO 10312 - Direct		5/23/2017
172958 - S11	17050073 - PS01	ISO 10312 - Direct		5/23/2017
172958 - S12	17050074 - PS02	ISO 10312 - Direct		5/23/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Tracy Handrich
Analyst

MW 4-20-18

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Portland, OR 97239

Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No.: S6
Client Sample No.: 17050068
Description: AS18

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/24/2017	H-7000	20000

Volume (L) : 3538.88
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 11
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.1144
Analytical Sens. (struc/cc) : 0.00095
Detection Limit. (struc/cc) : 0.00284

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	17.5	0.002	0 - 0.007 - Poisson	2	
Total Asbestos Structures	17.5	0.002	0 - 0.007 - Poisson		2
rimary Asb and Libby-Other Amphibole Structure	17.5	0.002	0 - 0.007 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	17.5	0.002	0 - 0.007 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	8.7	0.001	0 - 0.005 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

JLW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
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Final Report

Phone: (503) 224-5055
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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No.: S9
Client Sample No.: 17050071
Description: ASB03

Volume (L) : 493.34
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 76
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.7904
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00295

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/23/2017	Philips CM12	15000
TH	5/24/2017	Philips CM12	15000
TH	5/25/2017	Philips CM12	15000

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	2.5	0.002	0 - 0.007 - Poisson	2	
Total Asbestos Structures	2.5	0.002	0 - 0.007 - Poisson		2
rimary Asb and Libby-Other Amphibole Structure	2.5	0.002	0 - 0.007 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	2.5	0.002	0 - 0.007 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	1.3	0.001	0 - 0.006 - Poisson		1
Asbestos Structures >5um and 3:1	2.5	0.002	0 - 0.007 - Poisson	2	
PCM Equivalent Fibers-ISO	1.3	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Fibers-NIOSH	1.3	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	1.3	0.001	0 - 0.006 - Poisson		1
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	1.3	0.001	0 - 0.006 - Poisson	1	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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ISO 10312 - Direct Summary Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No.: S10
Client Sample No.: 17050072
Description: ASB04

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/24/2017	Philips 410	18000

Volume (L) : 485.4
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 74
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.8066
Analytical Sens. (struc/cc) : 0.00098
Detection Limit. (struc/cc) : 0.00294

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172958 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No.: S11
Client Sample No.: 17050073
Description: PS01

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/24/2017	H7000FA	20000

Volume (L) : 1321.41
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 27
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.2943
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	13.6	0.004	0.001 - 0.01 - Poisson	4	
Total Asbestos Structures	23.8	0.007	0.003 - 0.014 - Poisson		7
rimary Asb and Libby-Other Amphibole Structure	13.6	0.004	0.001 - 0.01 - Poisson	4	
Total Asb & Libby-OtherAmph Structures	23.8	0.007	0.003 - 0.014 - Poisson		7
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	3.4	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No.: S12
Client Sample No.: 17050074
Description: PS02

Analyst(s)	Analysis Date	Microscope	Magnification
JH	5/25/2017	H7000FA	20000

Volume (L) : 1258.97
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 29
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.3161
Analytical Sens. (struc/cc) : 0.00097
Detection Limit. (struc/cc) : 0.00289

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.004 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.004 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x

Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S6
Client Sample No: 17050068
Description: AS18

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B43	NAM	1		MD 1-1	15	7	2.1	Non Asbestos Mineral			
G1	1	B43	NAM		1	MF	13	2	6.5	Non Asbestos Mineral			
G1	2	B44				NSD							
G1	3	C43	NAM	2	2	F	9	2.2	4.1	Non Asbestos Mineral			
G1	3	C43	NAM	3	3	F	8	1.1	7.3	Non Asbestos Mineral			
G1	3	C43	NAM	4	4	F	11	1.5	7.3	Non Asbestos Mineral		2X Grid Bar Rule, RB	
G1	4	C44	NAM	5	5	F	13	3	4.3	Non Asbestos Mineral			
G1	5	E43				NSD							
G1	6	E44	NAM	6	6	F	9	2	4.5	Non Asbestos Mineral	Na, Mg, Al, Si, K, Ca, Ti, Fe		

ItemType	ItemNum	Confirmed	Comment
Brightfield	H30709BF		

G1	6	E44	ADQ	7		MD 1-0	11.2	10.3	1.1	Actinolite			PAOS, AS>5, 3:1
G1	6	E44	ADQ		7	MF	1.5	0.33	4.5	Actinolite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30710SP	PK 5/24/2017	
Diffraction	H30710DF	PK 5/24/2017	0.53 nm ROW SPACING
Brightfield	H30710BF		

G2	7	C42				NSD							
G2	8	E41	AQ	8		MD 1-0	3.35	1.26	2.7	Actinolite			PAOS
G2	8	E41	AQ		8	MF	3.35	0.82	4.1	Actinolite	Na, Mg, Al, Si, K, Ca, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30711SP	PK 5/24/2017	
Brightfield	H30711BF		

G2	9	E42				NSD							
G2	10	F41				NSD							
G2	11	F42				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S9
Client Sample No: 17050071
Description: ASB03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C61				NSD							
G1	2	C62				NSD							
G1	3	E61	NAM	1		MD 1-1	16	10	1.6	Non Asbestos Mineral			
G1	3	E61	NAM		1	MF	10	2.2	4.5	Non Asbestos Mineral			
G1	4	E62				NSD							
G1	5	F61				NSD							
G1	6	F62				NSD							
G1	7	G61	NAM	2		MD 1-1	9.21	2.4	3.8	Non Asbestos Mineral			
G1	7	G61	NAM		2	MF	9.2	1.2	7.7	Non Asbestos Mineral			
G1	8	G62				NSD							
G1	9	B54				NSD							
G1	10	C53				NSD							
G1	11	C54	NAM	3		MD 1-1	12.53	6.12	2	Non Asbestos Mineral			
G1	11	C54	NAM		3	MF	7.73	1.23	6.3	Non Asbestos Mineral			
G1	12	E53	NAM	4		MD 1-1	11.19	4.54	2.5	Non Asbestos Mineral			
G1	12	E53	NAM		4	MF	7.04	1.74	4	Non Asbestos Mineral			
G1	13	E54				NSD							
G1	14	F53				NSD							
G1	15	F54	NAM	5		MD 1-1	10.96	7.15	1.5	Non Asbestos Mineral			
G1	15	F54	NAM		5	MF	8.25	1	8.2	Non Asbestos Mineral			
G1	16	G53	NAM	6		MD 1-1	7.37	5.47	1.3	Non Asbestos Mineral			
G1	16	G53	NAM		6	MF	6.96	1.88	3.7	Non Asbestos Mineral			

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Job Number: 172958 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S9
Client Sample No: 17050071
Description: ASB03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	16	G53	NAM	7		MD 1-1	32	8.3	3.9	Non Asbestos Mineral			
G1	16	G53	NAM		7	MF	30	5.7	5.3	Non Asbestos Mineral		2X GRID BAR RULE; RB	
G1	17	G54	NAM	8		MD 1-1	160	18	8.9	Non Asbestos Mineral		2X GRID BAR RULE; TB	
G1	17	G54	NAM		8	MF	5.5	1.2	4.6	Non Asbestos Mineral			
G1	18	B51				NSD							
G1	19	B52	ADQ	9		MD 1-0	15.18	7.29	2.1	Actinolite			PAOS, AS>5, 3:1
G1	19	B52	ADQ		9	MF	2.45	0.21	11.7	Actinolite	Mg, Al, Si, Ca, Ti, Cr, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30712SP	TH 5/24/2017	
Diffraction	Pc30712DF	TH 5/24/2017	0.53 nm ROW SPACING
Brightfield	Pc30712BF		

G1	20	C51				NSD							
G1	21	C52	NAM	10		MD 1-1	42	18.9	2.2	Non Asbestos Mineral			
G1	21	C52	NAM		10	MF	30	2.7	11.1	Non Asbestos Mineral			
G1	21	C52	CDQ	11		MD 2-1	28	7.96	3.5	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH
G1	21	C52	CDQ		11	MB	13.96	0.32	43.6	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30713SP	TH 5/24/2017	
Diffraction	Pc30713DF	TH 5/24/2017	0.53 nm ROW SPACING
Brightfield	Pc30713BF		

G1	21	C52	NAM		12	MF	3.81	0.1	38.1	Non Asbestos Mineral			
G1	22	E51	NAM	12		MD 1-1	16.32	6.5	2.5	Non Asbestos Mineral			
G1	22	E51	NAM		13	MF	16.32	2.67	6.1	Non Asbestos Mineral			

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S9
Client Sample No: 17050071
Description: ASB03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	23	E52	NAM	13	14	F	9.53	1.99	4.8	Non Asbestos Mineral			
G1	24	F51				NSD							
G1	25	F52				NSD							
G1	26	G51				NSD							
G1	27	G52				NSD							
G1	28	H51				NSD							
G1	29	H52				NSD							
G1	30	B43				NSD							
G1	31	B44	NAM	14		MD 1-1	13.96	6.94	2	Non Asbestos Mineral			
G1	31	B44	NAM		15	MF	13.67	1.29	10.6	Non Asbestos Mineral			
G1	32	C43	NAM	15		MD 1-1	8.2	6.6	1.2	Non Asbestos Mineral			
G1	32	C43	NAM		16	MF	6.09	2.06	3	Non Asbestos Mineral			
G1	32	C43	NAM	16		MD 1-1	9.7	9.2	1.1	Non Asbestos Mineral			
G1	32	C43	NAM		17	MF	8.76	2.72	3.2	Non Asbestos Mineral			
G1	33	C44				NSD							
G1	34	E43	NAM	17		MD 1-1	25.3	17.6	1.4	Non Asbestos Mineral			
G1	34	E43	NAM		18	MF	6.44	1.9	3.4	Non Asbestos Mineral			
G1	35	E44				NSD							
G1	36	F43				NSD							
G1	37	F44				NSD							
G1	38	G43	NAM	18		MD 1-1	13.64	9.26	1.5	Non Asbestos Mineral			
G1	38	G43	NAM		19	MF	12.76	3.37	3.8	Non Asbestos Mineral			

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S9
Client Sample No: 17050071
Description: ASB03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	38	G43	NAM	19	20	F	7.68	2.88	2.7	Non Asbestos Mineral			
G1	39	G44				NSD							
G1	40	B42	NAM	20		MD 1-1	11.53	7.43	1.6	Non Asbestos Mineral			
G1	40	B42	NAM		21	MF	6.5	1.4	4.6	Non Asbestos Mineral			
G1	41	C42	NAM	21	22	F	13	3	4.3	Non Asbestos Mineral			
G1	42	E41				NSD							
G1	43	E42	NAM	22		MD 1-1	11.8	4.8	2.5	Non Asbestos Mineral			
G1	43	E42	NAM		23	MF	9.8	2.4	4.1	Non Asbestos Mineral			
G2	44	B62	NAM	23	24	F	5.2	1.7	3.1	Non Asbestos Mineral			
G2	45	E61	NAM	24		MD 1-1	9.62	6.3	1.5	Non Asbestos Mineral			
G2	45	E61	NAM		25	MF	7.29	1.92	3.8	Non Asbestos Mineral			
G2	45	E62	NAM	25		MD 1-1	19.91	9.34	2.1	Non Asbestos Mineral			
G2	45	E62	NAM		26	MF	10.13	1.53	6.6	Non Asbestos Mineral			
G2	46	F61				NSD							
G2	47	G61				NSD							
G2	48	G62				NSD							
G2	49	H61				NSD							
G2	50	B53				NSD							
G2	51	B54				NSD							
G2	52	C53				NSD							
G2	53	C54				NSD							
G2	54	E53				NSD							

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Final Report

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S9
Client Sample No: 17050071
Description: ASB03

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	55	E54	NAM	26		MD 1-1	21.5	17.2	1.2	Non Asbestos Mineral			
G2	55	E54	NAM		27	MF	10	2.1	4.8	Non Asbestos Mineral			
G2	56	F53				NSD							
G2	57	F54				NSD							
G2	58	G53				NSD							
G2	59	G54				NSD							
G2	60	H53				NSD							
G2	61	C51				NSD							
G2	62	C52				NSD							
G2	63	E51				NSD							
G2	64	E52				NSD							
G2	65	G51	NAM	27	28	F	5.01	2.06	2.4	Non Asbestos Mineral			
G2	65	G51	NAM	28	29	F	5.3	1.4	3.8	Non Asbestos Mineral			
G2	66	F51				NSD							
G2	67	F52				NSD							
G2	68	G52				NSD							
G2	69	H51				NSD							
G2	70	H52				NSD							
G2	71	C44				NSD							
G2	72	E43				NSD							
G2	73	E44				NSD							
G2	74	F43				NSD							
G2	75	F44				NSD							
G2	76	G43				NSD							

MW 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S10
Client Sample No: 17050072
Description: ASB04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B31				NSD							
G1	2	B32	NAM	1	1	F	3.5	0.5	7	Non Asbestos Mineral	Mg, Al, Si, Ca Fe		
G1	3	C31				NSD							
G1	4	C32	NAM	2	2	F	15	2	7.5	Non Asbestos Mineral	Na, Al, Si, Ca		
G1	5	E31				NSD							
G1	6	E32	NAM	3	3	F	10	2	5	Non Asbestos Mineral	Na, Al, Si, Ca		
G1	7	F31				NSD							
G1	8	F32				NSD							
G1	9	G31				NSD							
G1	10	G32				NSD							
G1	11	H31	NAM	4	4	F	2.5	0.35	7.1	Non Asbestos Mineral	S, Ca		
G1	12	H32				NSD							
G1	13	B33				NSD							
G1	14	B34				NSD							
G1	15	C33				NSD							
G1	16	C34				NSD							
G1	17	E33				NSD							
G1	18	E34	NAM	5	5	F	11	2.5	4.4	Non Asbestos Mineral	Al, Si, K, Ca		
G1	19	F33				NSD							
G1	20	F34				NSD							
G1	21	G33				NSD							
G1	22	G34				NSD							
G1	23	H33				NSD							
G1	24	H34				NSD							
G1	25	B41				NSD							
G1	26	B42				NSD							
G1	27	C41				NSD							
G1	28	C42				NSD							
G1	29	E41				NSD							
G1	30	E42				NSD							
G1	31	F41				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S10
Client Sample No: 17050072
Description: ASB04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	32	F42				NSD							
G1	33	G41				NSD							
G1	34	G42				NSD							
G1	35	H41				NSD							
G1	36	H42				NSD							
G1	37	C43				NSD							
G1	38	C44				NSD							
G1	39	E43				NSD							
G1	40	E44				NSD							
G2	41	B31				NSD							
G2	42	B32				NSD							
G2	43	C31				NSD							
G2	44	C32				NSD							
G2	45	E31	NAM	6	6	F	11	2.5	4.4	Non Asbestos Mineral	Al, Si, Ca		
G2	46	E32				NSD							
G2	47	F31				NSD							
G2	48	F32	NAM	7	7	F	14	0.75	18.7	Non Asbestos Mineral	Al, Si, Ca		
G2	49	G31				NSD							
G2	50	G32				NSD							
G2	51	H31				NSD							
G2	52	H32				NSD							
G2	53	B33				NSD							
G2	54	B34				NSD							
G2	55	C33	NAM	8	8	F	2.5	0.35	7.1	Non Asbestos Mineral	Al, Si, Ca		
G2	56	C34				NSD							
G2	57	E33				NSD							
G2	58	E34				NSD							
G2	59	F33				NSD							
G2	60	F34				NSD							
G2	61	G33				NSD							
G2	62	G34				NSD							
G2	63	H33				NSD							
G2	64	H34				NSD							
G2	65	B41				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S10
Client Sample No: 17050072
Description: ASB04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	66	B42				NSD							
G2	67	C41	NAM	9	9	F	7.5	1	7.5	Non Asbestos Mineral	Al, Si, Ca		
G2	68	C42				NSD							
G2	69	E41				NSD							
G2	70	E42				NSD							
G2	71	F41	NAM	10	10	F	10	1.5	6.7	Non Asbestos Mineral	Al, Si, Ca		
G2	71	F41	NAM	11	11	F	11	1	11	Non Asbestos Mineral	Al, Si, Ca		
G2	72	F42				NSD							
G2	73	G41				NSD							
G2	74	G42				NSD							

MN 4-2018

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S11
Client Sample No: 17050073
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B34	CMQ	1		MD 1-0	1.8	1.5	1.2	Chrysotile			PAOS
G1	1	B34	CMQ		1	MB	0.7	0.05	14	Chrysotile	Mg, Si		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	F30715BF						
G1	1	B34	CMQ		2	MR	1.75	1.2	1.5	Chrysotile		1-0	TAOS
G1	2	C33	CMQ	2	3	B	1.2	0.2	6	Chrysotile	Mg, Si		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	F30716SP				KM 5/24/2017		
						Brightfield	F30716BF						
G1	2	C33	CMQ	3	4	B	1.82	0.17	10.7	Chrysotile	Mg, Si	See F30716BF	TAOS, PAOS
G1	2	C33	CDQ	4		MD 2-0	9.5	8	1.2	Chrysotile		See F30716BF; Visual Diffraction observed. The beam deteriorated the diffraction pattern before it could be captured.	PAOS, AS>5, 3:1
G1	2	C33	CDQ		5	MB	3.2	0.5	6.4	Chrysotile			TAOS
G1	2	C33	CMQ		6	MF	1.2	0.08	15	Chrysotile			TAOS
G1	2	C33	CDQ		7	MR	9.5	5.5	1.7	Chrysotile		20-0	TAOS
G1	3	E33	NAM	5	8	F	7.8	1.1	7.1	Non Asbestos Mineral	S, Ca	Possible Gypsum	
G1	4	E34				NSD							
G1	5	F33				NSD							
G1	6	F34				NSD							
G1	7	G33				NSD							
G1	8	G34	NAM	6	9	F	8.5	1.2	7.1	Non Asbestos Mineral	None	Possible Organic	
G1	9	H33				NSD							
G1	10	C43	NAM	7	10	F	8	0.8	10	Non Asbestos Mineral			
G1	10	C43	NAM	8	11	F	8	1.8	4.4	Non Asbestos Mineral			
G1	10	C43	NAM	9	12	F	9.5	2.8	3.4	Non Asbestos Mineral			

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Final Report

Asbestos and Environmental Analysis

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S11
Client Sample No: 17050073
Description: PS01

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	11	E43				NSD							
G1	12	E44				NSD							
G1	13	F43				NSD							
G1	14	F44	NAM	10	13	F	8.5	1.8	4.7	Non Asbestos Mineral			
G1	14	F44	NAM	11	14	F	6.8	0.5	13.6	Non Asbestos Mineral			
G1	14	F44	NAM	12	15	F	7.8	1.1	7.1	Non Asbestos Mineral			
G1	14	F44	NAM	13	16	F	9	1.1	8.2	Non Asbestos Mineral			
G1	15	G43				NSD							
G1	16	G44	NAM	14	17	F	5.2	1.74	3	Non Asbestos Mineral			
G2	17	C33	NAM	15	18	F	17.2	1.8	9.6	Non Asbestos Mineral	Si	2x GRID BAR	
G2	18	C34				NSD							
G2	19	E33	NAM	16	19	F	13	1.2	10.8	Non Asbestos Mineral			
G2	20	E34				NSD							
G2	21	F33				NSD							
G2	22	F34				NSD							
G2	23	G33				NSD							
G2	24	G34				NSD							
G2	25	E43				NSD							
G2	26	E44				NSD							
G2	27	F43	NAM	17	20	F	6.5	2	3.2	Non Asbestos Mineral			

MW 4-20-18

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ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Lab/Cor Sample No: S12
Client Sample No: 17050074
Description: PS02

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B32				NSD							
G1	2	E24				NSD							
G1	3	G33				NSD							
G1	4	H44				NSD							
G1	5	G51				NSD							
G1	6	F51				NSD							
G1	7	C51				NSD							
G1	8	C62				NSD							
G1	9	F61				NSD							
G1	10	F24				NSD							
G1	11	C32				NSD							
G1	12	B34				NSD							
G1	13	B41				NSD							
G1	14	F54				NSD							
G1	15	G43				NSD							
G2	16	E23				NSD							
G2	17	F21				NSD							
G2	18	G21				NSD							
G2	19	H32				NSD							
G2	20	H41				NSD							
G2	21	G43				NSD							
G2	22	F41				NSD							
G2	23	E43				NSD							
G2	24	B41				NSD							
G2	25	B52				NSD							
G2	26	E53				NSD							
G2	27	F61				NSD							
G2	28	F54				NSD							
G2	29	G53				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R05
Date Received: 5/23/2017

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

JMW 4-2018

172958

USEPA
DateShipped: 5/22/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-07
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
1	17050063	AS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	3752.18	Liters	369	10.1685	L/min
2	17050064	AS13	Asbestos PCM	Air	MCE Cassette	5/22/2017	3938.97	Liters	381	10.3385	L/min
3	17050065	AS15	Asbestos PCM	Air	MCE Cassette	5/22/2017	2696.64	Liters	265	10.176	L/min
4	17050066	AS16	Asbestos PCM	Air	MCE Cassette	5/22/2017	2821	Liters	280	10.075	L/min
5	17050067	AS17	Asbestos PCM	Air	MCE Cassette	5/22/2017	3444.41	Liters	343	10.042	L/min
6	17050068	AS18	Asbestos PCM	Air	MCE Cassette	5/22/2017	3538.88	Liters	347	10.1985	L/min
7	17050069	ASB01	Asbestos PCM	Air	MCE Cassette	5/22/2017	253.91	Liters	125	2.0313	L/min
8	17050070	ASB02	Asbestos PCM	Air	MCE Cassette	5/22/2017	248.94	Liters	124	2.0076	L/min
9	17050071	ASB03	Asbestos PCM	Air	MCE Cassette	5/22/2017	493.34	Liters	122	4.0438	L/min
10	17050072	ASB04	Asbestos PCM	Air	MCE Cassette	5/22/2017	485.4	Liters	121	4.0116	L/min
11	17050073	PS01	Asbestos PCM	Air	MCE Cassette	5/22/2017	1321.41	Liters	440	3.0032	L/min
12	17050074	PS02	Asbestos PCM	Air	MCE Cassette	5/22/2017	1258.97	Liters	419	3.0047	L/min
13	17050075	PS03	Asbestos PCM	Air	MCE Cassette	5/22/2017	1248.68	Liters	409	3.053	L/min
14	17050076	PS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	1113.15	Liters	370	3.0085	L/min
15	17050077	PS05	Asbestos PCM	Air	MCE Cassette	5/22/2017	1371.62	Liters	447	3.0685	L/min
16	17050078	PS06	Asbestos PCM	Air	MCE Cassette	5/22/2017	1202.12	Liters	397	3.028	L/min
17	17050079	PS07	Asbestos PCM	Air	MCE Cassette	5/22/2017	522.84	Liters	173	3.0222	L/min
18	17050080	Blank	Asbestos PCM	Air	MCE Cassette	5/22/2017		Liters			L/min

Special Instructions: Please process ASB03 and ASB04 for early PCM reads first, then refer to email from shall@ene.com for further analytical instructions
Please proceses all samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/22/17 1934	[signature] LABCOR PORTLAND INC, 5/23/17	5/23/17 10:10 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of one air filter/filter blank sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (ISO Method 13794) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The sample was numbered: 17050063

The sample was analyzed by July 3, 2017. No issues were noted in the case narrative.

LabCor Portland Inc
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Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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Job Number: 172958 **PDX**

Report Number: 172958R07
Report Date: 7/3/2017

Client: **Ecology & Environment, Inc.**
Address: **720 Third Ave**
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-07
PO Number:
Sub Project:
Reference No.:
Report Note:

REVISED FINAL REPORT: This report was revised after QC Checks determined the sensitivity was not reached in the original analysis. The NADES report shows enough GO's analyzed, there might be an error in the calculation used to alert the analyst to analysis completion.

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172958 - S1	17050063 - AS04	ISO 13794 - Indirect	REJECTED for PCM: Overloaded -	5/23/2017

ISO 13794 - Indirect: Preparation and analysis of the above samples was conducted in accordance with the ISO method 13794 (Indirect) for the identification of asbestos. Briefly, a portion of the original filter was ashed to isolate the material of interest and then suspended in laboratory reagent water. The suspension is then treated with acetic acid and briefly sonicated. The samples were then aliquoted onto lab filters which were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The redeposit samples were analyzed at 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Kate March
Analyst

MW 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 13794 - Indirect Summary Data

Job Number: 172958 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172958R07
Date Received: 5/23/2017

Lab/Cor Sample No.: S1
Client Sample No.: 17050063
Description: AS04
Filter Fraction: 0.5 **Aliquot Dilution:** 0.5
Residual Ash Vol: 20 ml **Final Dilution:** 0.5
Begin Volume: 20 ml
Volume Taken: 10 ml

Sample Area/Mass/Volume (L) : 3752.18
Lab Filter Area (mm2) : 193
Grid Openings Analyzed : 19
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.2071
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.003

Analyst(s)	Analysis Date	Microscope	Magnification
JH	5/24/2017	H7000FA	20000
JH	7/3/2017	H7000FA	20000

Structure Type	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim	Structure Count[1] Total
Primary Asbestos Structures	0.017	0.01 - 0.027 - Poisson	17	
Total Asbestos Structures	0.017	0.01 - 0.027 - Poisson		17
Primary Asb and Libby-Other Amphibole Structures	0.017	0.01 - 0.027 - Poisson	17	
Total Asb & Libby-OtherAmph Structures	0.017	0.01 - 0.027 - Poisson		17
Asbestos Fibers and Bundles > 5um and 3:1	0.003	0.001 - 0.009 - Poisson		3
Asbestos Structures >5um and 3:1	0.003	0.001 - 0.009 - Poisson	3	
PCM Equivalent Fibers-ISO	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0.002	0 - 0.007 - Poisson	2	
PCM Equivalent Structures-NIOSH	0.002	0 - 0.007 - Poisson	2	
EPA2 Asbestos Structures 0.5-5.0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0.003	0.001 - 0.009 - Poisson		3

x Kate March
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 13794 - Indirect Raw Data

Job Number: 172958 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R07
Date Received: 5/23/2017

Lab/Cor Sample No: S1
Client Sample No: 17050063
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G7	1	C33	CDQ	1		MD 1-0	4	3.5	1.1	Chrysotile			PAOS
G7	1	C33	CDQ		1	MF	1.2	0.06	20	Chrysotile	Mg, Si		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	F30740BF						
						Diffraction	F30740DF				JH 5/24/2017	0.53 NM ROW SPACING	
						Spectra	F30740SP						
G7	1	C33	CD	2		CD 1-1	6.5	2	3.2	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30741BF						
G7	1	C33	CD		2	CF	5.5	0.06	91.7	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
G7	1	C33	CD	3	3	F	0.9	0.1	9	Chrysotile	Mg, Si		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30742BF						
						Diffraction	H30742DF					0.53 nm row spacing	
G7	1	C33	CD	4	4	F	1.3	0.05	26	Chrysotile			TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30743BF						
G7	1	C33	CD	5	5	F	0.7	0.05	14	Chrysotile			TAOS, PAOS
G7	2	F41				NSD							
G7	3	G44	CD	6	6	F	1	0.05	20	Chrysotile			TAOS, PAOS
G7	4	E54	CD	7		MD 1-0	4	1	4	Chrysotile			PAOS
G7	4	E54	CD		7	MF	2.3	0.05	46	Chrysotile			TAOS
G7	4	E54	CDQ	8	8	F	1	0.05	20	Chrysotile			TAOS, PAOS
G8	5	C44	CD	9	9	F	1.5	0.05	30	Chrysotile			TAOS, PAOS
G8	6	C32				NSD							
G8	7	G31	CD	10	10	F	0.7	0.06	11.7	Chrysotile			TAOS, PAOS
G8	8	G33	CD	11	11	F	1.2	0.06	20	Chrysotile			TAOS, PAOS
G9	9	C31				NSD							
G9	10	G33				NSD							
G9	11	H31				NSD							
G9	12	G44	CD	12	12	F	1.5	0.05	30	Chrysotile	Mg, Si		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	F31253BF						
						Diffraction	F31253DF						
						Spectra	F31253SP						
G9	13	F51	CD	13		MD 1-0	1.4	0.6	2.3	Chrysotile			PAOS

MW 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 13794 - Indirect Raw Data

Job Number: 172958 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-07

Report Number: 172958R07
Date Received: 5/23/2017

Lab/Cor Sample No: S1
Client Sample No: 17050063
Description: AS04

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G9	13	F51	CD		13	MF	1.4	0.05	28	Chrysotile			TAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		F31254BF					
G9	14	E43	CD	14	14	B	1.7	0.1	17	Chrysotile			TAOS, PAOS
G9	15	C52	CD	15		MD 1-1	20	13	1.5	Chrysotile			PAOS, AS>5, 3:1
G9	15	C52	CD		15	MF	8	0.06	133.3	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
G9	16	B44	CD	16		MD 1-1	8	1.2	6.7	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
G9	16	B44	CD		16	MF	5.5	0.06	91.7	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		F31255BF					
G9	17	B34	CD	17	17	B	1.1	0.1	11	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		F31256BF					
G9	18	E34				NSD							
G9	19	F32				NSD							

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x Kate March
Kate March
Analyst

Mu 4-2018

172958

USEPA
DateShipped: 5/22/2017

CHAIN OF CUSTODY RECORD
Site #: xx
Contact Name: Brad Martin
Contact Phone: 206-419-9780

No: PDX-07
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
1	17050063	AS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	3752.18	Liters	369	10.1685	L/min
2	17050064	AS13	Asbestos PCM	Air	MCE Cassette	5/22/2017	3938.97	Liters	381	10.3385	L/min
3	17050065	AS15	Asbestos PCM	Air	MCE Cassette	5/22/2017	2696.64	Liters	265	10.176	L/min
4	17050066	AS16	Asbestos PCM	Air	MCE Cassette	5/22/2017	2821	Liters	280	10.075	L/min
5	17050067	AS17	Asbestos PCM	Air	MCE Cassette	5/22/2017	3444.41	Liters	343	10.042	L/min
6	17050068	AS18	Asbestos PCM	Air	MCE Cassette	5/22/2017	3538.88	Liters	347	10.1985	L/min
7	17050069	ASB01	Asbestos PCM	Air	MCE Cassette	5/22/2017	253.91	Liters	125	2.0313	L/min
8	17050070	ASB02	Asbestos PCM	Air	MCE Cassette	5/22/2017	248.94	Liters	124	2.0076	L/min
9	17050071	ASB03	Asbestos PCM	Air	MCE Cassette	5/22/2017	493.34	Liters	122	4.0438	L/min
10	17050072	ASB04	Asbestos PCM	Air	MCE Cassette	5/22/2017	485.4	Liters	121	4.0116	L/min
11	17050073	PS01	Asbestos PCM	Air	MCE Cassette	5/22/2017	1321.41	Liters	440	3.0032	L/min
12	17050074	PS02	Asbestos PCM	Air	MCE Cassette	5/22/2017	1258.97	Liters	419	3.0047	L/min
13	17050075	PS03	Asbestos PCM	Air	MCE Cassette	5/22/2017	1248.68	Liters	409	3.053	L/min
14	17050076	PS04	Asbestos PCM	Air	MCE Cassette	5/22/2017	1113.15	Liters	370	3.0085	L/min
15	17050077	PS05	Asbestos PCM	Air	MCE Cassette	5/22/2017	1371.62	Liters	447	3.0685	L/min
16	17050078	PS06	Asbestos PCM	Air	MCE Cassette	5/22/2017	1202.12	Liters	397	3.028	L/min
17	17050079	PS07	Asbestos PCM	Air	MCE Cassette	5/22/2017	522.84	Liters	173	3.0222	L/min
18	17050080	Blank	Asbestos PCM	Air	MCE Cassette	5/22/2017		Liters			L/min

Special Instructions: Please process ASB03 and ASB04 for early PCM reads first, then refer to email from shall@ene.com for further analytical instructions
Please proceses all samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/22/17 1934	[signature] LABCOR PORTLAND INC, 5/23/17	5/23/17 10:10 AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 air filter sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (ISO Method 13794) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The sample was numbered: 17050095

The sample was analyzed by May 25, 2017. No issues were noted in the case narrative.

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172985 **PDX**

Report Number: 172985R10
Report Date: 6/27/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-08
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172985 - S15	17050095 - ABS12	ISO 13794 - Indirect		5/24/2017

ISO 13794 - Indirect: Preparation and analysis of the above samples was conducted in accordance with the ISO method 13794 (Indirect) for the identification of asbestos. Briefly, a portion of the original filter was ashed to isolate the material of interest and then suspended in laboratory reagent water. The suspension is then treated with acetic acid and briefly sonicated. The samples were then aliquoted onto lab filters which were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The redeposit samples were analyzed at 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Tracy Handrich
Analyst

MW 4-2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 13794 - Indirect Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R10
Date Received: 5/24/2017

Lab/Cor Sample No.: S15
Client Sample No.: 17050095
Description: ABS12
Filter Fraction: 1 **Aliquot Dilution:** 0.5
Residual Ash Vol: 20 ml **Final Dilution:** 0.5
Begin Volume: 20 ml
Volume Taken: 10 ml

Sample Area/Mass/Volume (L) : 473.84
Lab Filter Area (mm2) : 193
Grid Openings Analyzed : 75
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.8175
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.003

Analyst(s)	Analysis Date	Microscope	Magnification
JH	5/24/2017	H7000FA	20000
JH	5/25/2017	H7000FA	20000

Structure Type	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	< 0.001	0 - 0.004 - Poisson	0	
Total Asbestos Structures	< 0.001	0 - 0.004 - Poisson		0
Primary Asb and Libby-Other Amphibole Structures	< 0.001	0 - 0.004 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	< 0.001	0 - 0.004 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	< 0.001	0 - 0.004 - Poisson		0
Asbestos Structures >5um and 3:1	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers-ISO	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Structures-NIOSH	< 0.001	0 - 0.004 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	< 0.001	0 - 0.004 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	< 0.001	0 - 0.004 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	< 0.001	0 - 0.004 - Poisson		0

x
Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

JMW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R10
Date Received: 5/24/2017

Lab/Cor Sample No: S15
Client Sample No: 17050095
Description: ABS12

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G7	1	C22				NSD							
G7	2	E21				NSD							
G7	3	E22				NSD							
G7	4	F21				NSD							
G7	5	F22				NSD							
G7	6	G21				NSD							
G7	7	G22				NSD							
G7	8	B31				NSD							
G7	9	B32				NSD							
G7	10	C31				NSD							
G7	11	C32				NSD							
G7	12	E31				NSD							
G7	13	E32				NSD							
G7	14	F31				NSD							
G7	15	F32				NSD							
G7	16	G31				NSD							
G7	17	G32				NSD							
G7	18	H31				NSD							
G7	19	H32				NSD							
G7	20	B41				NSD							
G7	21	B42				NSD							
G7	22	C41				NSD							
G7	23	C42				NSD							
G7	24	E41				NSD							
G7	25	F42				NSD							
G7	26	G42				NSD							
G7	27	H41				NSD							
G7	28	K41				NSD							
G7	29	C52				NSD							
G7	30	E51				NSD							
G7	31	E52				NSD							
G7	32	F51				NSD							
G7	33	F52				NSD							
G7	34	G51				NSD							
G7	35	G52				NSD							
G7	36	H51				NSD							
G7	37	H52				NSD							
G8	38	B24				NSD							

MW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R10
Date Received: 5/24/2017

Lab/Cor Sample No: S15
Client Sample No: 17050095
Description: ABS12

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G8	39	C23				NSD							
G8	40	C24				NSD							
G8	41	E23				NSD							
G8	42	E24				NSD							
G8	43	F23				NSD							
G8	44	F24				NSD							
G8	45	G23				NSD							
G8	46	C31				NSD							
G8	47	C32				NSD							
G8	48	F31				NSD							
G8	49	F32				NSD							
G8	50	G31				NSD							
G8	51	G32				NSD							
G8	52	H32				NSD							
G8	53	K31				NSD							
G8	54	B42				NSD							
G8	55	C41				NSD							
G8	56	C42				NSD							
G8	57	E41				NSD							
G8	58	E42				NSD							
G8	59	F41				NSD							
G8	60	F42				NSD							
G8	61	G41				NSD							
G8	62	G42				NSD							
G8	63	H41				NSD							
G8	64	H42				NSD							
G8	65	K41				NSD							
G8	66	B51				NSD							
G8	67	B52				NSD							
G8	68	C51				NSD							
G8	69	C52				NSD							
G8	70	E51				NSD							
G8	71	E52				NSD							
G8	72	G51				NSD							
G8	73	G52				NSD							
G8	74	H51				NSD							
G8	75	F62				NSD							

MW 42048

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R10
Date Received: 5/24/2017

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Tracy Handrich
Analyst

MW 4-2018

172985 pg 2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050100	PS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	782180	Liters	259	3.02	L/min
	17050101	PS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	1332.78	Liters	445	2.995	L/min
	17050102	PS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	339.9	Liters	165	2.06	L/min
	17050103	PS09	Asbestos PCM	Air	MCE Cassette	5/23/2017	294	Liters	150	1.96	L/min
	17050104	PS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	309	Liters	150	2.06	L/min
	17050105	BLANK	Asbestos PCM	Air	MCE Cassette	5/23/2017	BLANK	NOT SUBMITTED			

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] → LABCOR PORTLAND INC.	5/24/17 3:45pm SG	

172985 pv2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050081	AS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1721.03	Liters	176	9.7786	L/min
	17050082	AS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	2194.39	Liters	220	9.9745	L/min
	17050083	AS15	Asbestos PCM	Air	MCE Cassette	5/23/2017	2071.44	Liters	210	9.864	L/min
	17050084	AS19	Asbestos PCM	Air	MCE Cassette	5/23/2017	1868.28	Liters	181	10.322	L/min
	17050085	AS20	Asbestos PCM	Air	MCE Cassette	5/23/2017	1820.46	Liters	182	10.0025	L/min
	17050086	AS21	Asbestos PCM	Air	MCE Cassette	5/23/2017	1619.54	Liters	154	10.5165	L/min
	17050087	AS22	Asbestos PCM	Air	MCE Cassette	5/23/2017	1457.03	Liters	145	10.0485	L/min
	17050088	ABS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	254.55	Liters	126	2.0202	L/min
	17050089	ABS06	Asbestos PCM	Air	MCE Cassette	5/23/2017	499.2	Liters	122	4.0918	L/min
	17050090	ABS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	245.45	Liters	122	2.0119	L/min
	17050091	ABS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	486.59	Liters	120	4.0549	L/min
	17050092	ABS099	Asbestos PCM	Air	MCE Cassette	5/23/2017	253.94	Liters	122	2.0815	L/min
	17050093	ABS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	478.05	Liters	121	3.9508	L/min
	17050094	ABS11	Asbestos PCM	Air	MCE Cassette	5/23/2017	258.68	Liters	122	2.1203	L/min
	17050095	ABS12	Asbestos PCM	Air	MCE Cassette	5/23/2017	473.84	Liters	121	3.916	L/min
	17050096	PS01	Asbestos PCM	Air	MCE Cassette	5/23/2017	1581.36	Liters	528	2.995	L/min
	17050097	PS02	Asbestos PCM	Air	MCE Cassette	5/23/2017	621.29	Liters	209	2.9727	L/min
	17050098	PS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1302.6	Liters	445	2.9272	L/min
	17050099	PS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	1108.56	Liters	372	2.98	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] LABCOR PORTLAND INC.	5/24/17 3:45AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: April 20, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos, Portland, Oregon

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 11 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (modified ISO Method 10312) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2 Data Validation Manual Process (S2VM).

The samples were numbered:

17050084	17050085	17050086	17050087	17050089
17050091	17050092	17050093	17050102	17050103
17050104				

The samples were analyzed by June 27, 2017. No issues were noted in the case narrative.

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Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name:
Project No.: PDX-08
PO Number:
Sub Project:
Reference No.:

Report Number: 172985R12
Report Date: 6/29/2017

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
172985 - S4	17050084 - AS19	ISO 10312 - Direct		5/24/2017
172985 - S5	17050085 - AS20	ISO 10312 - Direct		5/24/2017
172985 - S6	17050086 - AS21	ISO 10312 - Direct		5/24/2017
172985 - S7	17050087 - AS22	ISO 10312 - Direct		5/24/2017
172985 - S9	17050089 - ABS06	ISO 10312 - Direct		5/24/2017
172985 - S11	17050091 - ABS08	ISO 10312 - Direct		5/24/2017
172985 - S12	17050092 - ABS09	ISO 10312 - Direct		5/24/2017
172985 - S13	17050093 - ABS10	ISO 10312 - Direct		5/24/2017
172985 - S22	17050102 - PS08	ISO 10312 - Direct		5/24/2017
172985 - S23	17050103 - PS09	ISO 10312 - Direct		5/24/2017
172985 - S24	17050104 - PS10	ISO 10312 - Direct		5/24/2017

ISO 10312 - Direct Preparation and analysis of the above samples was conducted in accordance with the ISO method 10312 (Direct) for the identification of asbestos. Briefly, the samples were collapsed with a solution of N,N-dimethylformamide and acetic acid, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in N,N-Dimethlyformamide / Acetone baths until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The air samples were analyzed at an approximate screen magnification of 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed using a calibrated digital imaging system at low magnification.

Disclaimer The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

x

Kate March
Analyst

MW 4-20-18

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Portland, OR 97239

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S4
Client Sample No.: 17050084
Description: AS19

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/26/2017	Philips CM12	15000

Volume (L) : 1868.28
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 21
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.2184
Analytical Sens. (struc/cc) : 0.00094
Detection Limit. (struc/cc) : 0.00282

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	4.6	0.0009	0 - 0.0053 - Poisson	1	
Total Asbestos Structures	4.6	0.0009	0 - 0.0053 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	4.6	0.0009	0 - 0.0053 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	4.6	0.0009	0 - 0.0053 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.0009	0 - 0.0035 - Poisson		0
Asbestos Structures >5um and 3:1	4.6	0.0009	0 - 0.0053 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.0009	0 - 0.0035 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.0009	0 - 0.0035 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.0009	0 - 0.0035 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.0009	0 - 0.0035 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.0009	0 - 0.0035 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.0009	0 - 0.0035 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.0009	0 - 0.0035 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.0009	0 - 0.0035 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S5
Client Sample No.: 17050085
Description: AS20

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/26/2017	Philips CM12	15000

Volume (L) : 1820.46
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 22
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.2288
Analytical Sens. (struc/cc) : 0.00092
Detection Limit. (struc/cc) : 0.00276

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.0009	0 - 0.0034 - Poisson	0	
Total Asbestos Structures	0	< 0.0009	0 - 0.0034 - Poisson		0
Primary Asb and Libby-Other Amphibole Structure	0	< 0.0009	0 - 0.0034 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.0009	0 - 0.0034 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.0009	0 - 0.0034 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.0009	0 - 0.0034 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.0009	0 - 0.0034 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.0009	0 - 0.0034 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.0009	0 - 0.0034 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.0009	0 - 0.0034 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.0009	0 - 0.0034 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.0009	0 - 0.0034 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.0009	0 - 0.0034 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.0009	0 - 0.0034 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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ISO 10312 - Direct Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S6
Client Sample No.: 17050086
Description: AS21

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/26/2017	H-7000	20000

Volume (L) : 1619.54
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 24
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.2496
Analytical Sens. (struc/cc) : 0.00095
Detection Limit. (struc/cc) : 0.00285

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	8	0.0019	0.0002 - 0.0069 - Poisson	2	
Total Asbestos Structures	8	0.0019	0.0002 - 0.0069 - Poisson		2
rimary Asb and Libby-Other Amphibole Structure	8	0.0019	0.0002 - 0.0069 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	8	0.0019	0.0002 - 0.0069 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	4	0.001	0 - 0.0053 - Poisson		1
Asbestos Structures >5um and 3:1	4	0.001	0 - 0.0053 - Poisson	1	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.0035 - Poisson		0
PCM Equivalent Fibers-NIOSH	4	0.001	0 - 0.0053 - Poisson		1
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.0035 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.0035 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.0035 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0035 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0035 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.0035 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S7
Client Sample No.: 17050087
Description: AS22

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/25/2017	H-7000	20000
PK	5/26/2017	H-7000	20000

Volume (L) : 1457.03
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 27
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 0.2808
Analytical Sens. (struc/cc) : 0.00094
Detection Limit. (struc/cc) : 0.00281

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	7.1	0.0019	0.0002 - 0.0068 - Poisson	2	
Total Asbestos Structures	7.1	0.0019	0.0002 - 0.0068 - Poisson		2
Primary Asb and Libby-Other Amphibole Structure	7.1	0.0019	0.0002 - 0.0068 - Poisson	2	
Total Asb & Libby-OtherAmph Structures	7.1	0.0019	0.0002 - 0.0068 - Poisson		2
Asbestos Fibers and Bundles > 5um and 3:1	3.6	0.0009	0 - 0.0052 - Poisson		1
Asbestos Structures >5um and 3:1	3.6	0.0009	0 - 0.0052 - Poisson	1	
PCM Equivalent Fibers-ISO	3.6	0.0009	0 - 0.0052 - Poisson		1
PCM Equivalent Fibers-NIOSH	3.6	0.0009	0 - 0.0052 - Poisson		1
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	3.6	0.0009	0 - 0.0052 - Poisson		1
PCM Equivalent Structures-ISO	0	< 0.0009	0 - 0.0035 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.0009	0 - 0.0035 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.0009	0 - 0.0035 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.0009	0 - 0.0035 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.0009	0 - 0.0035 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S9
Client Sample No.: 17050089
Description: ABS06

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/24/2017	Philips 410	18000

Volume (L) : 499.2
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 71
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.7739
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00298

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	14.2	0.011	0.0055 - 0.0196 - Poisson	11	
Total Asbestos Structures	14.2	0.011	0.0055 - 0.0196 - Poisson		11
rimary Asb and Libby-Other Amphibole Structure	14.2	0.011	0.0055 - 0.0196 - Poisson	11	
Total Asb & Libby-OtherAmph Structures	14.2	0.011	0.0055 - 0.0196 - Poisson		11
Asbestos Fibers and Bundles > 5um and 3:1	2.6	0.002	0.0002 - 0.0072 - Poisson		2
Asbestos Structures >5um and 3:1	5.2	0.004	0.0011 - 0.0102 - Poisson	4	
PCM Equivalent Fibers-ISO	2.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers-NIOSH	2.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	2.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Structures-ISO	2.6	0.002	0.0002 - 0.0072 - Poisson	2	
PCM Equivalent Structures-NIOSH	2.6	0.002	0.0002 - 0.0072 - Poisson	2	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S11
Client Sample No.: 17050091
Description: ABS08

Analyst(s)	Analysis Date	Microscope	Magnification
KM	5/24/2017	H7000FA	20000

Volume (L) : 486.59
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 73
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.7957
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00297

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	1.3	0.001	0 - 0.0055 - Poisson	1	
Total Asbestos Structures	1.3	0.001	0 - 0.0055 - Poisson		1
rimary Asb and Libby-Other Amphibole Structure	1.3	0.001	0 - 0.0055 - Poisson	1	
Total Asb & Libby-OtherAmph Structures	1.3	0.001	0 - 0.0055 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.0037 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.0037 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

Mn 4/20/18

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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

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ISO 10312 - Direct Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S12
Client Sample No.: 17050092
Description: ABS09

Analyst(s)	Analysis Date	Microscope	Magnification
JH	5/26/2017	H7000FA	20000

Volume (L) : 253.94
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 140
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 1.526
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00297

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0	< 0.001	0 - 0.0037 - Poisson	0	
Total Asbestos Structures	0	< 0.001	0 - 0.0037 - Poisson		0
rimary Asb and Libby-Other Amphibole Structure	0	< 0.001	0 - 0.0037 - Poisson	0	
Total Asb & Libby-OtherAmph Structures	0	< 0.001	0 - 0.0037 - Poisson		0
Asbestos Fibers and Bundles > 5um and 3:1	0	< 0.001	0 - 0.0037 - Poisson		0
Asbestos Structures >5um and 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Structures-ISO	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Structures-NIOSH	0	< 0.001	0 - 0.0037 - Poisson	0	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

May 2018

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S13
Client Sample No.: 17050093
Description: ABS10

Analyst(s)	Analysis Date	Microscope	Magnification
DW	5/24/2017	Philips 410	18000

Volume (L) : 478.05
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 74
Average Grid Opening Area : 0.0109
Area Analyzed (mm2) : 0.8066
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00299

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	13.6	0.011	0.0055 - 0.0197 - Poisson	11	
Total Asbestos Structures	14.9	0.012	0.0062 - 0.0209 - Poisson		12
Primary Asb and Libby-Other Amphibole Structure	13.6	0.011	0.0055 - 0.0197 - Poisson	11	
Total Asb & Libby-OtherAmph Structures	14.9	0.012	0.0062 - 0.0209 - Poisson		12
Asbestos Fibers and Bundles > 5um and 3:1	1.2	0.001	0 - 0.0056 - Poisson		1
Asbestos Structures >5um and 3:1	2.5	0.002	0.0002 - 0.0072 - Poisson	2	
PCM Equivalent Fibers-ISO	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers-NIOSH	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0
PCM Equivalent Structures-ISO	1.2	0.001	0 - 0.0056 - Poisson	1	
PCM Equivalent Structures-NIOSH	1.2	0.001	0 - 0.0056 - Poisson	1	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	1.2	0.001	0 - 0.0056 - Poisson		1

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

MW 4-20-18

LabCor Portland Inc
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Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

ISO 10312 - Direct Summary Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S22
Client Sample No.: 17050102
Description: PS08

Analyst(s)	Analysis Date	Microscope	Magnification
PK	5/30/2017	H-7000	20000
PK	5/31/2017	H-7000	20000

Volume (L) : 339.9
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 110
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 1.144
Analytical Sens. (struc/cc) : 0.00099
Detection Limit. (struc/cc) : 0.00296

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim	Structure Count[1] Total
Primary Asbestos Structures	9.6	0.0109	0.0054 - 0.0195 - Poisson	11	
Total Asbestos Structures	9.6	0.0109	0.0054 - 0.0195 - Poisson		11
rimary Asb and Libby-Other Amphibole Structure	10.5	0.0119	0.0061 - 0.0208 - Poisson	12	
Total Asb & Libby-OtherAmph Structures	10.5	0.0119	0.0061 - 0.0208 - Poisson		12
Asbestos Fibers and Bundles > 5um and 3:1	0.9	0.001	0 - 0.0055 - Poisson		1
Asbestos Structures >5um and 3:1	5.2	0.0059	0.0022 - 0.0129 - Poisson	6	
PCM Equivalent Fibers-ISO	1.7	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers-NIOSH	1.7	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	1.7	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Structures-ISO	0.9	0.001	0 - 0.0055 - Poisson	1	
PCM Equivalent Structures-NIOSH	0.9	0.001	0 - 0.0055 - Poisson	1	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0	< 0.001	0 - 0.0037 - Poisson		0

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

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Asbestos and Environmental Analysis

ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S23
Client Sample No.: 17050103
Description: PS09

Analyst(s)	Analysis Date	Microscope	Magnification
TH	5/30/2017	Philips CM12	15000
TH	5/31/2017	Philips CM12	15000
TH	6/1/2017	Philips CM12	15000

Volume (L) : 294
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 126
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 1.3104
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00299

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	14.5	0.019	0.0114 - 0.0297 - Poisson	19	
Total Asbestos Structures	16	0.021	0.013 - 0.0321 - Poisson		21
rimary Asb and Libby-Other Amphibole Structure	15.3	0.02	0.0122 - 0.0309 - Poisson	20	
Total Asb & Libby-OtherAmph Structures	16.8	0.022	0.0138 - 0.0333 - Poisson		22
Asbestos Fibers and Bundles > 5um and 3:1	8.4	0.011	0.0055 - 0.0197 - Poisson		11
Asbestos Structures >5um and 3:1	9.9	0.013	0.0069 - 0.0222 - Poisson	13	
PCM Equivalent Fibers-ISO	5.3	0.007	0.0028 - 0.0144 - Poisson		7
PCM Equivalent Fibers-NIOSH	5.3	0.007	0.0028 - 0.0144 - Poisson		7
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	4.6	0.006	0.0022 - 0.0131 - Poisson		6
PCM Equivalent Structures-ISO	0.8	0.001	0 - 0.0056 - Poisson	1	
PCM Equivalent Structures-NIOSH	1.5	0.002	0.0002 - 0.0072 - Poisson	2	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	3.1	0.004	0.0011 - 0.0102 - Poisson		4

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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ISO 10312 - Direct Summary Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No.: S24
Client Sample No.: 17050104
Description: PS10

Analyst(s)	Analysis Date	Microscope	Magnification
PK	6/1/2017	H-7000	20000
PK	6/2/2017	H-7000	20000
TH	6/5/2017	H-7000	20000
PK	6/5/2017	H-7000	20000
TH	6/6/2017	H-7000	20000
PK	6/6/2017	H-7000	20000
TH	6/27/2017	H-7000	20000

Volume (L) : 309
Lab Filter Area (mm2) : 385
Grid Openings Analyzed : 120
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 1.248
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.00299

Structure Type	Filter Density (s/mm2)	Concen-tration* (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim	Structure Count[1] Total
Primary Asbestos Structures	26.4	0.0329	0.0227 - 0.0463 - Poisson	33	
Total Asbestos Structures	26.4	0.0329	0.0227 - 0.0463 - Poisson		33
rimary Asb and Libby-Other Amphibole Structure	27.2	0.0339	0.0235 - 0.0474 - Poisson	34	
Total Asb & Libby-OtherAmph Structures	27.2	0.0339	0.0235 - 0.0474 - Poisson		34
Asbestos Fibers and Bundles > 5um and 3:1	2.4	0.003	0.0006 - 0.0088 - Poisson		3
Asbestos Structures >5um and 3:1	16	0.02	0.0122 - 0.0308 - Poisson	20	
PCM Equivalent Fibers-ISO	1.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers-NIOSH	1.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	1.6	0.002	0.0002 - 0.0072 - Poisson		2
PCM Equivalent Structures-ISO	2.4	0.003	0.0006 - 0.0088 - Poisson	3	
PCM Equivalent Structures-NIOSH	3.2	0.004	0.0011 - 0.0102 - Poisson	4	
EPA2 Asbestos Structures 0.5-5.0	0	< 0.001	0 - 0.0037 - Poisson	0	
Mod. AHERA >=0.5 to 5.0µm, 3:1	0	< 0.001	0 - 0.0037 - Poisson	0	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0.8	0.001	0 - 0.0056 - Poisson		1

[1] Concentration and 95% Confidence Level are calculated based upon the number showing under the Structure Count header.

Reviewed by:

x

Kate March
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S4
Client Sample No: 17050084
Description: AS19

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C61				NSD							
G1	2	C62				NSD							
G1	3	E61				NSD							
G1	4	E62				NSD							
G1	5	F61				NSD							
G1	6	F62				NSD							
G1	7	G61				NSD							
G1	8	G62				NSD							
G1	9	H61				NSD							
G1	10	B54				NSD							
G1	11	C53				NSD							
G1	12	C54				NSD							
G1	13	E53				NSD							
G2	14	E54				NSD							
G2	15	F53				NSD							
G2	16	F54				NSD							
G2	17	G53	CDQ	1		MD 1-0	5.1	4.5	1.1	Chrysotile			PAOS, AS>5, 3:1
G2	17	G53	CDQ		1	MB	2.43	0.57	4.3	Chrysotile			TAOS

ItemType	ItemNum	Confirmed		Comment
Spectra	Pc30802SP	TH	5/26/2017	
Diffraction	Pc30802DF	TH	5/26/2017	0.53 nm ROW SPACING
Brightfield	Pc30802BF			

G2	18	G54				NSD							
G2	19	F51				NSD							
G2	20	F52				NSD							
G2	21	G51				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S5
Client Sample No: 17050085
Description: AS20

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	F61				NSD							
G1	2	G61				NSD							
G1	3	G62				NSD							
G1	4	E54				NSD							
G1	5	F53				NSD							
G1	6	F54				NSD							
G1	7	G54				NSD							
G1	8	H53				NSD							
G1	9	H54				NSD							
G1	10	E51				NSD							
G1	11	E52				NSD							
G1	12	F51				NSD							
G1	13	F52				NSD							
G1	14	G51				NSD							
G1	15	G52				NSD							
G2	16	C52				NSD							
G2	17	E51				NSD							
G2	18	E52				NSD							
G2	19	F51				NSD							
G2	20	F52				NSD							
G2	21	B44				NSD							
G2	22	C41				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S6
Client Sample No: 17050086
Description: AS21

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C62				NSD							
G1	2	E61				NSD							
G1	3	E62	NAM	1		MD 1-1	11	8	1.4	Non Asbestos Mineral			
G1	3	E62	NAM		1	MF	7	0.8	8.8	Non Asbestos Mineral			
G1	4	E54				NSD							
G1	5	F53				NSD							
G1	6	F54	NAM	2		MD 1-1	5.5	1	5.5	Non Asbestos Mineral			
G1	6	F54	NAM		2	MF	5.5	0.8	6.9	Non Asbestos Mineral			
G1	7	G53				NSD							
G1	8	G54				NSD							
G1	9	E41				NSD							
G1	10	E42				NSD							
G1	11	F41				NSD							
G1	12	F42	NAM	3	3	NAM	17.21	9.4	1.8	Non Asbestos Mineral	Na, Mg, Al, Si, K, Ca, Ti, Mn, Fe	Fe-Actinolite (high Fe)	

ItemType	ItemNum	Confirmed	Comment
Spectra	H30804SP	PK 5/26/2017	
Diffraction	H30804DF	PK 5/26/2017	0.53 nm ROW SPACING
Brightfield	H30804BF		

G1	13	G41	NAM	4		MD 1-1	60	7	8.6	Non Asbestos Mineral			
G1	13	G41	NAM		3	MF	60	1.1	54.5	Non Asbestos Mineral			
G1	13	G41	NAM	5	4	F	5.5	1.5	3.7	Non Asbestos Mineral			
G1	14	G42	NAM	6	5	F	33	0.8	41.2	Non Asbestos Mineral			
G1	15	H41	ADQ	7		MD 1-0	5	2	2.5	Actinolite			PAOS

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S6
Client Sample No: 17050086
Description: AS21

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	15	H41	ADQ		6	MF	2.5	0.6	4.2	Actinolite	Mg, Al, Si, K, Ca, Ti, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30805SP	PK 5/26/2017	
Diffraction	H30805DF	PK 5/26/2017	0.53 nm ROW SPACING
Brightfield	H30805BF		

G2	16	C43	AQ	8		MD 1-1	40	20	2	Actinolite		2X Grid Bar Rule, RB	PAOS, AS>5, 3:1
G2	16	C43	AQ		7	MF	16.7	3.81	4.4	Actinolite	Na, Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-NIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	H30806SP	PK 5/26/2017	
Brightfield	H30806BF		

G2	17	C44	NSD
G2	18	E43	NSD
G2	19	E44	NSD
G2	20	F43	NSD
G2	21	B42	NSD
G2	22	C41	NSD
G2	23	C42	NSD
G2	24	E41	NSD

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S7
Client Sample No: 17050087
Description: AS22

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B44	NAM	1		MD 1-1	15	14	1.1	Non Asbestos Mineral			
G1	1	B44	NAM		1	MF	8	1.1	7.3	Non Asbestos Mineral			
G1	2	C43				NSD							
G1	3	C44				NSD							
G1	4	E43				NSD							
G1	5	E44				NSD							
G1	6	F43				NSD							
G1	7	F44				NSD							
G1	8	G43				NSD							
G1	9	G44				NSD							
G1	10	C42				NSD							
G1	11	E41				NSD							
G1	12	E42				NSD							
G2	13	E51				NSD							
G2	14	E52				NSD							
G2	15	F51				NSD							
G2	16	F52				NSD							
G2	17	G51	ADQ	2		MD 1-1	9.07	4.61	2	Actinolite			PAOS, AS>5, 3:1
G2	17	G51	ADQ		2	MF	7.82	1.9	4.1	Actinolite	Na, Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	H30801SP	PK 5/26/2017	
Diffraction	H30801DF	PK 5/26/2017	0.53 nm ROW SPACING
Brightfield	H30801BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	18	G52				NSD							
G2	19	F44				NSD							
G2	20	G43				NSD							
G2	21	G44	AQ	3		MD 1-0	2.2	1.35	1.6	Actinolite			PAOS
G2	21	G44	AQ		3	MF	0.91	0.24	3.8	Actinolite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30803SP	PK 5/26/2017	
Brightfield	H30803BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	22	H43				NSD							
G2	23	H44				NSD							
G2	24	G41				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S7
Client Sample No: 17050087
Description: AS22

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	25	G42				NSD							
G2	26	H41				NSD							
G2	27	H42				NSD							

MW 4-20-18

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Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S9
Client Sample No: 17050089
Description: ABS06

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B33	NAM	1		MD 2-1	7	7	1	Non Asbestos Mineral	Mg, Si		

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30718BF		
Diffraction	P30718DF		
Spectra	P30718SP	DW 5/24/2017	

G1	1	B33	NAM		1	MB	6	0.75	8	Non Asbestos Mineral			
G1	1	B33	NAM		2	MB	3	1	3	Non Asbestos Mineral			
G1	2	B34				NSD							
G1	3	C33				NSD							
G1	4	C34				NSD							
G1	5	E33				NSD							
G1	6	E34				NSD							
G1	7	F33				NSD							
G1	8	F34				NSD							
G1	9	G33				NSD							
G1	10	B41				NSD							
G1	11	B42				NSD							
G1	12	C41				NSD							
G1	13	C42	NAM	2	3	F	2.5	0.6	4.2	Non Asbestos Mineral	Al, Si, Ca		
G1	14	E41				NSD							
G1	15	E42				NSD							
G1	16	F41				NSD							
G1	17	F42				NSD							
G1	18	G41				NSD							
G1	19	G42				NSD							
G1	20	H41				NSD							
G1	21	H42				NSD							
G1	22	K41				NSD							
G1	23	K42				NSD							
G1	24	C43				NSD							
G1	25	C44				NSD							
G1	26	E43				NSD							

MW 4-20-18

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ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S9
Client Sample No: 17050089
Description: ABS06

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	27	E44				NSD							
G1	28	F43				NSD							
G1	29	F44				NSD							
G1	30	G43				NSD							
G1	31	G44				NSD							
G1	32	B51				NSD							
G1	33	B52				NSD							
G1	34	C51				NSD							
G1	35	C52				NSD							
G2	36	C42				NSD							
G2	37	E41				NSD							
G2	38	E42				NSD							
G2	39	F41				NSD							
G2	40	F42				NSD							
G2	41	G41				NSD							
G2	42	G42	NAM	3	4	CC 25-0	5	4	1.2	Non Asbestos Mineral	Mg, Si	Non-Asbestos	
G2	43	H41				NSD							
G2	44	H42				NSD							
G2	45	C43				NSD							
G2	46	C44				NSD							
G2	47	E43	CDQ	4	5	B	4	0.35	11.4	Chrysotile	Mg, Si		TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30719BF		
Diffraction	P30719DF	DW 5/24/2017	0.53nm Row Spacing
Spectra	P30719SP	DW 5/24/2017	

G2	47	E43	CMQ	5	6	B	1.5	0.15	10	Chrysotile			TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30720BF		

G2	47	E43	CMQ	6	7	B	2.5	0.15	16.7	Chrysotile			TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30721BF		

G2	47	E43	CMQ	7	8	F	0.5	0.1	5	Chrysotile			TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Brightfield	P30722BF		

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S9
Client Sample No: 17050089
Description: ABS06

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	47	E43	CMQ	8	9	B	1.5	0.15	10	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30723BF					
G2	47	E43	CMQ	9	10	F	0.5	0.1	5	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30724BF					
G2	47	E43	CMQ	10	11	B	2	0.15	13.3	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30725BF					
G2	47	E43	CMQ	11	12	B	19	1.5	12.7	Chrysotile			TAOS, PAOS, AS>5, 3:1, AFB>5, 3:1, PCMEF-NIOSH, PCMES-NIOSH, PCMEF-ISO, PCMES-ISO, PCMEFmodNIOSH
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30726BF					
G2	48	E44				NSD							
G2	49	F43				NSD							
G2	50	F44	ADQ	12	13	F	10	1.5	6.7	Actinolite	Mg, Si, Ca, Fe		TAOS, PAOS, AS>5, 3:1, AFB>5, 3:1, PCMEF-NIOSH, PCMES-NIOSH, PCMEF-ISO, PCMES-ISO, PCMEFmodNIOSH
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30727BF					
						Diffraction		P30727DF			DW 5/24/2017	0.53nm Row Spacing	
						Spectra		P30727SP			DW 5/24/2017		
G2	51	G43				NSD							
G2	52	G44				NSD							
G2	53	H43				NSD							
G2	54	H44				NSD							
G2	55	C51				NSD							
G2	56	C52				NSD							
G2	57	E51				NSD							
G2	58	E52				NSD							
G2	59	F51				NSD							
G2	60	F52				NSD							
G2	61	G51				NSD							
G2	62	G52				NSD							
G2	63	H51				NSD							
G2	64	H52				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S9
Client Sample No: 17050089
Description: ABS06

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	65	C53				NSD							
G2	66	C54				NSD							
G2	67	E53				NSD							
G2	68	E54	CMQ	13	14	MC 1-1	9	6	1.5	Chrysotile			TAOS, PAOS, AS>5, 3:1
G2	68	E54	CMQ	14	15	CC 5-2	7	2.5	2.8	Chrysotile			TAOS, PAOS, AS>5, 3:1
G2	69	F53				NSD							
G2	70	F54				NSD							
G2	71	G53				NSD							

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ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S11
Client Sample No: 17050091
Description: ABS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B33				NSD							
G1	2	B34				NSD							
G1	3	C33				NSD							
G1	4	C34	NAM	1	1	F	11	2.1	5.2	Non Asbestos Mineral			
G1	5	E33				NSD							
G1	6	E34				NSD							
G1	7	F33				NSD							
G1	8	F34				NSD							
G1	9	G33				NSD							
G1	10	G34				NSD							
G1	11	H33				NSD							
G1	12	H34				NSD							
G1	13	C41				NSD							
G1	14	C42				NSD							
G1	15	E41				NSD							
G1	16	E42				NSD							
G1	17	F41				NSD							
G1	18	F42	NAM	2	2	F	18	1.8	10	Non Asbestos Mineral			
G1	19	G41				NSD							
G1	20	G42				NSD							
G1	21	H41				NSD							
G1	22	H42				NSD							
G1	23	K41	ADQ	3	3	B	1.8	0.8	2.2	Tremolite	Mg, Si, Ca, Mn, Fe		TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	F30731SP	KM 5/24/2017	
Diffraction	F30731DF	KM 5/24/2017	0.53nm ROW SPACING
Brightfield	F30731BF		

G1	24	B43				NSD							
G1	25	B44				NSD							
G1	26	C43				NSD							
G1	27	C44				NSD							
G1	28	E43				NSD							
G1	29	E44				NSD							
G1	30	F44				NSD							

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Date Received: 5/24/2017

Lab/Cor Sample No: S11
Client Sample No: 17050091
Description: ABS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	31	G43				NSD							
G1	32	G44				NSD							
G1	33	H43				NSD							
G1	34	H44				NSD							
G1	35	C52				NSD							
G1	36	E51				NSD							
G1	37	E52				NSD							
G1	38	F51				NSD							
G1	39	F52				NSD							
G1	40	G51				NSD							
G1	41	G52				NSD							
G2	42	C31				NSD							
G2	43	C32				NSD							
G2	44	E31				NSD							
G2	45	E32				NSD							
G2	46	F31				NSD							
G2	47	F32				NSD							
G2	48	G32				NSD							
G2	49	H31				NSD							
G2	50	C33				NSD							
G2	51	C34				NSD							
G2	52	E33				NSD							
G2	53	E34				NSD							
G2	54	F33				NSD							
G2	55	F34				NSD							
G2	56	G33				NSD							
G2	57	G34				NSD							
G2	58	H33				NSD							
G2	59	C41				NSD							
G2	60	C42				NSD							
G2	61	E41				NSD							
G2	62	E42				NSD							
G2	63	F41				NSD							
G2	64	F42				NSD							
G2	65	G41				NSD							
G2	66	G42				NSD							
G2	67	H41				NSD							
G2	68	H42				NSD							

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Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S11
Client Sample No: 17050091
Description: ABS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	69	E43				NSD							
G2	70	E44				NSD							
G2	71	F43				NSD							
G2	72	F44				NSD							
G2	73	G43				NSD							

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Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S12
Client Sample No: 17050092
Description: ABS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	1	C22				NSD							
G4	2	E21				NSD							
G4	3	E22				NSD							
G4	4	F21				NSD							
G4	5	F22				NSD							
G4	6	G21				NSD							
G4	7	G22				NSD							
G4	8	B23				NSD							
G4	9	B24				NSD							
G4	10	C24				NSD							
G4	11	E23				NSD							
G4	12	E24				NSD							
G4	13	F23				NSD							
G4	14	F24				NSD							
G4	15	G23				NSD							
G4	16	G24				NSD							
G4	17	H23				NSD							
G4	18	H24				NSD							
G4	19	B31				NSD							
G4	20	B32				NSD							
G4	21	C31				NSD							
G4	22	C32				NSD							
G4	23	E31				NSD							
G4	24	E32				NSD							
G4	25	F31				NSD							
G4	26	F32				NSD							
G4	27	G31				NSD							
G4	28	G32				NSD							
G4	29	H31				NSD							
G4	30	H32				NSD							
G4	31	K31				NSD							
G4	32	B33				NSD							
G4	33	B34				NSD							
G4	34	C33				NSD							
G4	35	C34				NSD							
G4	36	E33				NSD							
G4	37	E34				NSD							
G4	38	F33				NSD							

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Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S12
Client Sample No: 17050092
Description: ABS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	39	F34				NSD							
G4	40	G33				NSD							
G4	41	G34				NSD							
G4	42	H33				NSD							
G4	43	H34				NSD							
G4	44	K33				NSD							
G4	45	B41				NSD							
G4	46	B42				NSD							
G4	47	C41				NSD							
G4	48	C42				NSD							
G4	49	E41				NSD							
G4	50	E42				NSD							
G4	51	F41				NSD							
G4	52	F42				NSD							
G4	53	G41				NSD							
G4	54	G42				NSD							
G4	55	H41				NSD							
G4	56	H42				NSD							
G4	57	K41				NSD							
G4	58	B43				NSD							
G4	59	B44				NSD							
G4	60	C43				NSD							
G4	61	C44				NSD							
G4	62	E43				NSD							
G4	63	E44				NSD							
G4	64	F43				NSD							
G4	65	F44				NSD							
G4	66	G43				NSD							
G4	67	G44				NSD							
G4	68	H43				NSD							
G4	69	H44				NSD							
G4	70	K43				NSD							
G4	71	B52				NSD							
G4	72	C51				NSD							
G4	73	C52				NSD							
G4	74	D51				NSD							
G4	75	D52				NSD							
G4	76	E51				NSD							

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Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S12
Client Sample No: 17050092
Description: ABS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	77	E52				NSD							
G4	78	F51				NSD							
G4	79	F52				NSD							
G4	80	G51				NSD							
G4	81	G52				NSD							
G4	82	H51				NSD							
G4	83	H52				NSD							
G4	84	K51				NSD							
G4	85	B54				NSD							
G4	86	C53				NSD							
G4	87	C54				NSD							
G4	88	E53				NSD							
G4	89	E54				NSD							
G4	90	F53				NSD							
G4	91	F54				NSD							
G4	92	G53				NSD							
G4	93	G54				NSD							
G4	94	H53				NSD							
G4	95	H54				NSD							
G4	96	C61				NSD							
G4	97	C62				NSD							
G4	98	E61				NSD							
G4	99	E62				NSD							
G4	100	F61				NSD							
G4	101	F62				NSD							
G4	102	G61				NSD							
G4	103	G62				NSD							
G4	104	H61				NSD							
G5	105	C22				NSD							
G5	106	E21				NSD							
G5	107	E22				NSD							
G5	108	F21				NSD							
G5	109	F22				NSD							
G5	110	G21				NSD							
G5	111	G22				NSD							
G5	112	H21				NSD							
G5	113	H22				NSD							
G5	114	B24				NSD							

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Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S12
Client Sample No: 17050092
Description: ABS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G5	115	C23				NSD							
G5	116	C24				NSD							
G5	117	E23				NSD							
G5	118	E24				NSD							
G5	119	F23				NSD							
G5	120	F24				NSD							
G5	121	G23				NSD							
G5	122	G24				NSD							
G5	123	B31				NSD							
G5	124	B32				NSD							
G5	125	C31				NSD							
G5	126	C32				NSD							
G5	127	E31				NSD							
G5	128	E32				NSD							
G5	129	F31				NSD							
G5	130	F32				NSD							
G5	131	G31				NSD							
G5	132	G32				NSD							
G5	133	B41				NSD							
G5	134	B42				NSD							
G5	135	C41				NSD							
G5	136	C42				NSD							
G5	137	E41				NSD							
G5	138	E42				NSD							
G5	139	F41				NSD							
G5	140	F42				NSD							

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Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S13
Client Sample No: 17050093
Description: ABS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	B32				NSD							
G1	2	C31	CD	1	1	B	1.25	0.15	8.3	Chrysotile		Bundle Tilts Behind Grid Bar	TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30728BF						
						Diffraction	P30728DF				DW 5/24/2017	0.53nm Row Spacing	
G1	3	C32	CMQ	2	2	F	0.5	0.1	5	Chrysotile			TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30729BF						
G1	4	E31				NSD							
G1	5	E32	ADQ	3	3	F	2	0.3	6.7	Anthophyllite	Mg, Si, Fe		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30730BF						
						Diffraction	P30730DF				DW 5/24/2017	0.53nm Row Spacing	
						Spectra	P30730SP				DW 5/24/2017		
G1	6	F31				NSD							
G1	7	F32				NSD							
G1	8	G31				NSD							
G1	9	G32				NSD							
G1	10	H31				NSD							
G1	11	H32				NSD							
G1	12	K31				NSD							
G1	13	B33				NSD							
G1	14	B34				NSD							
G1	15	C33				NSD							
G1	16	C34				NSD							
G1	17	E33				NSD							
G1	18	E34				NSD							
G1	19	F33	CMQ	4	4	MC 1-0	5	4	1.2	Chrysotile			TAOS, PAOS
G1	19	F33	CMQ	5	5	CC 40-0	4	2	2	Chrysotile			TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30732BF						
G1	20	F34				NSD							
G1	21	G33				NSD							
G1	22	G34				NSD							
G1	23	H33				NSD							
G1	24	H34				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S13
Client Sample No: 17050093
Description: ABS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	25	B41	CMQ	6		MD 1-0	10	10	1	Chrysotile			PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30733BF						
G1	25	B41	CMQ		6	MF	1.5	0.15	10	Chrysotile			TAOS
G1	26	B42				NSD							
G1	27	C41				NSD							
G1	28	C42				NSD							
G1	29	E41				NSD							
G1	30	E42				NSD							
G1	31	F41				NSD							
G1	32	F42				NSD							
G1	33	G41				NSD							
G1	34	G42				NSD							
G1	35	H41				NSD							
G1	36	H42				NSD							
G1	37	B43				NSD							
G1	38	B44				NSD							
G1	39	C43				NSD							
G1	40	C44				NSD							
G2	41	B41	AMQ	7	7	F	2.5	0.65	3.8	Anthophyllite	Mg, Si, Fe		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30734BF						
G2	41	B41	NAM	8	8	F	2	0.35	5.7	Non Asbestos Mineral	Mg, Al, Si, Ca, Fe		
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	P30735BF						
						Diffraction	P30735DF				DW 5/24/2017		
						Spectra	P30735SP				DW 5/24/2017		
G2	42	B42				NSD							
G2	43	C41				NSD							
G2	44	C42				NSD							
G2	45	E41				NSD							
G2	46	E42				NSD							
G2	47	F41				NSD							
G2	48	F42				NSD							
G2	49	G41				NSD							
G2	50	G42				NSD							

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S13
Client Sample No: 17050093
Description: ABS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	51	H41				NSD							
G2	52	H42				NSD							
G2	53	B43				NSD							
G2	54	B44				NSD							
G2	55	C43				NSD							
G2	56	C44				NSD							
G2	57	E43	CMQ	9	9	B	1.5	0.15	10	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30736BF					
G2	57	E43	CMQ	10	10	CC 8-0	2.5	0.75	3.3	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30737BF					
G2	57	E43	CMQ	11		MD 1-1	8	1	8	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30738BF					
G2	57	E43	CMQ		11	MF	8	0.15	53.3	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30738BF					
G2	57	E43	CMQ		12	MR	2	0.08	25	Chrysotile		1-0	TAOS
G2	58	E44				NSD							
G2	59	F43	CMQ	12	13	F	0.75	0.1	7.5	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		P30739BF					
G2	60	F44				NSD							
G2	61	G43				NSD							
G2	62	G44				NSD							
G2	63	H43				NSD							
G2	64	H44				NSD							
G2	65	C51				NSD							
G2	66	C52				NSD							
G2	67	E51				NSD							
G2	68	E52				NSD							
G2	69	F51				NSD							
G2	70	F52				NSD							
G2	71	G51				NSD							
G2	72	G52				NSD							

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Date Received: 5/24/2017

Lab/Cor Sample No: S13
Client Sample No: 17050093
Description: ABS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	73	H51				NSD							
G2	74	H52				NSD							

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Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C62				NSD							
G1	2	F61				NSD							
G1	3	F62				NSD							
G1	4	G62				NSD							
G1	5	C53				NSD							
G1	6	C54	ADQ	1		MD 1-0	3.5	2.6	1.3	Actinolite			PAOS
G1	6	C54	ADQ		1	MF	2.17	0.54	4	Actinolite	Na, Mg, Al, Si, Ca, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30813SP	PK 5/30/2017	
Diffraction	H30813DF	PK 5/30/2017	0.53 nm ROW SPACING
Brightfield	H30813BF		

G1	6	C54	AQ	2		MD 1-0	2.3	2.15	1.1	Actinolite			PAOS
G1	6	C54	AQ		2	MF	1.22	0.15	8.1	Actinolite	Na, Mg, Al, Si, Ca, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30814SP	PK 5/30/2017	
Brightfield	H30814BF		

G1	7	E54				NSD							
G1	8	G53				NSD							
G1	9	E51				NSD							
G1	10	E52				NSD							
G1	11	F52				NSD							
G1	12	G52				NSD							
G1	13	H51				NSD							
G1	14	H52				NSD							
G1	15	B44				NSD							
G1	16	E43				NSD							
G1	17	E44				NSD							
G1	18	G43				NSD							
G1	19	H43				NSD							
G1	20	H44				NSD							
G1	21	B41				NSD							
G1	22	C42				NSD							
G1	23	G41				NSD							
G1	24	H42				NSD							
G1	25	B33				NSD							

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Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	26	E33				NSD							
G1	27	E34				NSD							
G1	28	F33				NSD							
G1	29	G33				NSD							
G1	30	G34				NSD							
G1	31	H33				NSD							
G1	32	B32				NSD							
G1	33	C31				NSD							
G1	34	C32				NSD							
G1	35	E31				NSD							
G1	36	F32				NSD							
G1	37	G31				NSD							
G1	38	G32	NAM	3	3	B	120	8.5	14.1	Non Asbestos Mineral		2X Grid Bar Rule, RB	
G1	39	C24				NSD							
G1	40	E23				NSD							
G1	41	F24				NSD							
G2	42	F62				NSD							
G2	43	G61				NSD							
G2	44	E54				NSD							
G2	45	F53	NAM	4		MD 1-1	8	3.4	2.4	Non Asbestos Mineral			
G2	45	F53	NAM		4	MF	8	2.65	3	Non Asbestos Mineral	Na, Mg, Al, Si, Ca, Ti, Mn, Fe		
G2	46	F54				NSD							
G2	47	G53				NSD							
G2	48	F51				NSD							
G2	49	F52	NAM	5		MD 1-1	14	8	1.8	Non Asbestos Mineral			
G2	49	F52	NAM		5	MF	10	0.8	12.5	Non Asbestos Mineral			
G2	50	G52				NSD							
G2	51	H51				NSD							
G2	52	B44	NAM	6	6	F	60	8	7.5	Non Asbestos Mineral		2X Grid Bar Rule, RB	
G2	53	F44				NSD							

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Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	54	G43				NSD							
G2	55	H43				NSD							
G2	56	H44				NSD							
G2	57	F41				NSD							
G2	58	F42				NSD							
G2	59	G41	NAM	7	7	F	8	2	4	Non Asbestos Mineral			
G2	60	G42	NAM	8	8	F	22	2	11	Non Asbestos Mineral			
G2	61	H41				NSD							
G2	62	H42				NSD							
G2	63	E34				NSD							
G2	64	F33				NSD							
G2	65	F34				NSD							
G2	66	G33				NSD							
G2	67	G34				NSD							
G2	68	H33				NSD							
G2	69	H34				NSD							
G2	70	F32				NSD							
G2	71	G31				NSD							
G2	72	G32				NSD							
G2	73	H31				NSD							
G3	74	G52				NSD							
G3	75	H52				NSD							
G3	76	G43				NSD							
G3	77	G44				NSD							
G3	78	H43				NSD							
G3	79	H44				NSD							
G3	80	F41				NSD							
G3	81	F42	ADQ	9		MD 1-0	3.314	1.522	2.2	Actinolite			PAOS
G3	81	F42	ADQ		9	MF	2.91	0.67	4.3	Actinolite	Na, Mg, Al, Si, K, Ca, Ti, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30824SP	PK 5/31/2017	
Diffraction	H30824DF	PK 5/31/2017	0.53 nm ROW SPACING
Brightfield	H30824BF		

G3	81	F42	AQ	10		MD 1-0	3.46	1.65	2.1	Actinolite			PAOS

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Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G3	81	F42	AQ		10	MF	3.46	1.17	3	Actinolite	Mg, Al, Si, Ca, Ti, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30825SP				PK 5/31/2017		
						Brightfield	H30825BF						
G3	82	G41	CDQ	11		MD 1-0	8.89	6.69	1.3	Chrysotile			PAOS, AS>5, 3:1
G3	82	G41	CDQ		11	MB	2.76	0.16	17.2	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30826SP				PK 5/31/2017		
						Diffraction	H30826DF				PK 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	H30826BF						
G3	83	G42				NSD							
G3	84	H41				NSD							
G3	85	H42				NSD							
G3	86	F33				NSD							
G3	87	F34				NSD							
G3	88	G33				NSD							
G3	89	G34				NSD							
G3	90	H33				NSD							
G3	91	E32	AQ	12	12	F	1.27	0.4	3.2	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30827SP				PK 5/31/2017		
						Brightfield	H30827BF						
G3	92	F32				NSD							
G3	93	G31				NSD							
G3	94	G32				NSD							
G4	95	B43	ADQ	13		MD 1-1	7.18	2.37	3	Winchite			PAOS, PCMES-NIOSH, PCMES-ISO
G4	95	B43	ADQ		13	MF	7.18	1.61	4.5	Winchite			TAOS, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30831SP				PK 5/31/2017		
						Diffraction	H30831DF				PK 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	H30831BF						
G4	95	B43	NAM	14		MD 1-1	7	3	2.3	Non Asbestos Mineral			
G4	95	B43	NAM		14	MF	7	1.5	4.7	Non Asbestos Mineral			

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Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	96	B44	CD	15	15	MC 1-1	10.58	9.61	1.1	Chrysotile			TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30833DF				PK 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	H30833BF						
G4	96	B44	CM	16		MD 1-0	8.06	4.01	2	Chrysotile			PAOS, AS>5, 3:1
G4	96	B44	CM		16	MF	1.56	0.09	17.3	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30834BF						
G4	96	B44	AQ	17		MD 1-0	5.86	3.94	1.5	Actinolite			PAOS, AS>5, 3:1
G4	96	B44	AQ		17	MF	2.41	0.7	3.4	Actinolite	Na, Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30836SP				PK 5/31/2017		
						Brightfield	H30836BF						
G4	97	C43				NSD							
G4	98	C44	NAM	18		MD 1-1	8.5	3	2.8	Non Asbestos Mineral			
G4	98	C44	NAM		18	MF	8.1	2.3	3.5	Non Asbestos Mineral			
G4	99	E43	AQ	19	19	MC 1-0	6.14	2.92	2.1	Actinolite	Mg, Al, Si, Ca, Ti, Fe		TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30838SP				PK 5/31/2017		
						Brightfield	H30838BF						
G4	100	E44				NSD							
G4	101	F43				NSD							
G4	102	F44				NSD							
G4	103	G43				NSD							
G4	104	G44	CD	20		MD 1-1	7.86	5.58	1.4	Chrysotile			PAOS, AS>5, 3:1
G4	104	G44	CD		20	MB	5.44	1.67	3.3	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-NIOSH, PCMEF-ISO, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30841DF				PK 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	H30841BF						
G4	105	B42				NSD							
G4	106	C41				NSD							
G4	107	C42				NSD							

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Lab/Cor Sample No: S22
Client Sample No: 17050102
Description: PS08

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	108	E41				NSD							
G4	109	E42				NSD							
G4	110	F41				NSD							

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Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S23
Client Sample No: 17050103
Description: PS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	E62				NSD							
G1	2	F62				NSD							
G1	3	G61				NSD							
G1	4	G62				NSD							
G1	5	H61				NSD							
G1	6	H62				NSD							
G1	7	C53				NSD							
G1	8	F54				NSD							
G1	9	G53				NSD							
G1	10	G54				NSD							
G1	11	H54				NSD							
G1	12	B52				NSD							
G1	13	E51				NSD							
G1	14	F51				NSD							
G1	15	F52				NSD							
G1	16	G51				NSD							
G1	17	F43				NSD							
G1	18	F44				NSD							
G1	19	B42				NSD							
G1	20	C41				NSD							
G1	21	E41				NSD							
G1	22	F41				NSD							
G1	23	F42				NSD							
G1	24	G41				NSD							
G1	25	G42				NSD							
G1	26	H41				NSD							
G1	27	H42				NSD							
G1	28	C33	ADQ	1		MD 1-0	4.44	1.61	2.8	Actinolite			PAOS
G1	28	C33	ADQ		1	MF	4.44	1.14	3.9	Actinolite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30815SP	TH 5/30/2017	
Diffraction	Pc30815DF	TH 5/30/2017	0.53 nm ROW SPACING
Brightfield	Pc30815BF		

G1	28	C33	CDQ	2		MD 1-1	26.84	8.36	3.2	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH

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Lab/Cor Sample No: S23
Client Sample No: 17050103
Description: PS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	28	C33	CDQ		2	MB	6.03	0.18	33.5	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30816SP				TH 5/30/2017		
						Diffraction	Pc30816DF				TH 5/30/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30816BF						
G1	29	C34				NSD							
G1	30	E33				NSD							
G1	31	F34				NSD							
G1	32	G33				NSD							
G1	33	G34	ADQ	3	3	MC 2-0	15.88	11.08	1.4	Winchite			TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30817SP				TH 5/31/2017		
						Diffraction	Pc30817DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30817BF						
G1	34	H33				NSD							
G1	35	C31	ADQ	4		MD 1-1	32.62	28.94	1.1	Actinolite		2X GRID BAR RULE; TB, RB	PAOS, AS>5, 3:1
G1	35	C31	ADQ		4	MF	9.79	3.03	3.2	Actinolite			TAOS, AFB>5, 3:1, PCMEF-NIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30818SP				TH 5/31/2017		
						Diffraction	Pc30818DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30818BF						
G1	36	C32				NSD							
G1	37	E31	ADQ	5	5	F	0.65	0.1	6.5	Actinolite	Mg, Al, Si, Ca, Fe		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30819SP				TH 5/31/2017		
						Diffraction	Pc30819DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30819BF						
G1	38	E32				NSD							
G1	39	G31				NSD							
G1	40	G32				NSD							
G1	41	C24				NSD							
G1	42	E23				NSD							
G1	43	E24				NSD							
G2	44	E53				NSD							
G2	45	E54				NSD							
G2	46	F53				NSD							

MW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S23
Client Sample No: 17050103
Description: PS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	47	F54				NSD							
G2	48	B51	AQ	6		MD 1-0	2.19	1.61	1.4	Actinolite			PAOS
G2	48	B51	AQ		6	MF	0.81	0.18	4.5	Actinolite			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30820SP				TH 5/31/2017		
						Brightfield	Pc30820BF						
G2	48	B51	CD	7		MD 1-1	9.52	8.16	1.2	Chrysotile			PAOS, AS>5, 3:1
G2	48	B51	CD		7	MF	5.87	0.11	53.4	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	Pc30821DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30821BF						
G2	49	H51				NSD							
G2	50	F43				NSD							
G2	51	G44				NSD							
G2	52	B41	AQ	8		MD 1-1	7.49	4.64	1.6	Actinolite			PAOS, AS>5, 3:1
G2	52	B41	AQ		8	MF	5.72	1.54	3.7	Actinolite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30822SP				TH 5/31/2017		
						Brightfield	Pc30822BF						
G2	52	B41	AQ	9		MD 1-1	10.77	6.17	1.7	Actinolite			PAOS, AS>5, 3:1
G2	52	B41	AQ		9	MF	8.94	1.44	6.2	Actinolite			TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30823SP				TH 5/31/2017		
						Brightfield	Pc30823BF						
G2	53	B42	ADQ	10	10	MC 1-0	3.83	3.76	1	Anthophyllite	Mg, Al, Si, Ca, Mn, Fe		TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30828SP				TH 5/31/2017		
						Diffraction	Pc30828DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30828BF						
G2	53	B42	AQ	11		MD 1-1	7.39	5.56	1.3	Anthophyllite			PAOS, AS>5, 3:1

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Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	53	B42	AQ		11	MF	7.04	2.1	3.4	Anthophyllite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30829SP				TH 5/31/2017		
						Brightfield	Pc30829BF						
G2	54	F34				NSD							
G2	55	G33	AQ	12		MD 1-0	3.12	1.74	1.8	Actinolite			PAOS
G2	55	G33	AQ		12	MF	3.7	0.3	12.3	Actinolite	Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30830SP				TH 5/31/2017		
						Brightfield	Pc30830BF						
G2	56	F31				NSD							
G2	57	F32				NSD							
G2	58	H31				NSD							
G2	59	B23	AQ	13		MD 1-0	5.39	4.06	1.3	Actinolite			PAOS, AS>5, 3:1
G2	59	B23	AQ		13	MF	1.45	0.35	4.1	Actinolite	Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30832SP				TH 5/31/2017		
						Brightfield	Pc30832BF						
G2	60	E24	AQ	14		MD 1-1	18.51	2.63	7	Actinolite			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
G2	60	E24	AQ		14	MF	12.43	1.3	9.6	Actinolite			TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	Pc30835SP				TH 5/31/2017		
						Brightfield	Pc30835BF						
G3	61	C54				NSD							
G3	62	F54	CD	15		MD 1-1	6.2	4.06	1.5	Chrysotile			PAOS, AS>5, 3:1
G3	62	F54	CD		15	MB	6.2	0.22	28.2	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF_thin
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	Pc30837DF				TH 5/31/2017	0.53 nm ROW SPACING	
						Brightfield	Pc30837BF						
G3	63	B51	NAM	16	16	F	5.5	0.5	11	Non Asbestos Mineral			

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Client Sample No: 17050103
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Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G3	64	C51	ADQ	17		MD 1-1	4.33	2	2.2	Amosite			PAOS
G3	64	C51	ADQ		17	MF	4.33	1.18	3.7	Amosite	Mg, Al, Si, Ca, Ti, Mn, Fe	High Fe	TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30839SP	TH 5/31/2017	
Diffraction	Pc30839DF	TH 5/31/2017	0.53 nm ROW SPACING
Brightfield	Pc30839BF		

G3	65	C43				NSD							
G3	66	E44				NSD							
G3	67	C41				NSD							
G3	68	F41	AQ	18	18	MC 2-0	6.49	5	1.3	Actinolite	Mg, Al, Si, K, Ca, Mn, Fe		TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30840SP	TH 5/31/2017	
Brightfield	Pc30840BF		

G3	69	C34	NSD
G3	70	E34	NSD
G3	71	H34	NSD
G3	72	H31	NSD
G3	73	F23	NSD
G4	74	E61	NSD
G4	75	G62	NSD
G4	76	E54	NSD
G4	77	F53	NSD
G4	78	F54	NSD
G4	79	G54	NSD
G4	80	C51	NSD
G4	81	C52	NSD
G4	82	E51	NSD
G4	83	E52	NSD
G4	84	F52	NSD
G4	85	G51	NSD
G4	86	B44	NSD
G4	87	C43	NSD
G4	88	C44	NSD
G4	89	E43	NSD
G4	90	E44	NSD

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Client Sample No: 17050103
Description: PS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	91	F43	CD	19		MD 1-1	5.09	3.42	1.5	Chrysotile			PAOS, AS>5, 3:1
G4	91	F43	CD		19	MF	4.81	0.19	25.3	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc30847DF	TH 6/1/2017	0.53 nm ROW SPACING
Brightfield	Pc30847BF		

G4	92	F44				NSD							
G4	93	G44				NSD							
G4	94	B41				NSD							
G4	95	B42				NSD							
G4	96	C41				NSD							
G4	97	C42				NSD							
G4	98	E41				NSD							
G4	99	E42				NSD							
G4	100	F41				NSD							
G4	101	F42	AQ	20		MD 1-1	5.07	3.42	1.5	Actinolite			PAOS, AS>5, 3:1
G4	101	F42	AQ		20	MF	1.72	0.48	3.6	Actinolite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30849SP	TH 6/1/2017	
Brightfield	Pc30849BF		

G4	102	B34				NSD							
G4	103	C33				NSD							
G4	104	C34				NSD							
G4	105	E33				NSD							
G4	106	E34				NSD							
G4	107	F33				NSD							
G4	108	B32				NSD							
G4	109	C31				NSD							
G4	110	C32				NSD							
G4	111	E31				NSD							
G4	112	E32				NSD							
G4	113	B23				NSD							
G4	114	B24				NSD							
G4	115	C23				NSD							
G4	116	C24				NSD							
G4	117	E23	ADQ	21		MD 1-1	7.65	2.63	2.9	Anthophyllite			PAOS, AS>5, 3:1

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Client Sample No: 17050103
Description: PS09

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G4	117	E23	ADQ		21	MF	7.65	2.25	3.4	Anthophyllite	Mg, Al, Si, Ca, Ti, Mn, Fe		TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc30850SP	TH 6/1/2017	
Diffraction	Pc30850DF	TH 6/1/2017	0.53 nm ROW SPACING
Brightfield	Pc30850BF		

G4	118	E24				NSD							
G5	119	C61				NSD							
G5	120	E62				NSD							
G5	121	G53				NSD							
G5	122	C51	CD		22	CB	10.72	1.44	7.4	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
G5	122	C51	CD		23	MF	10.7	0.07	152.9	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc30853DF	TH 6/1/2017	0.53 nm ROW SPACING
Brightfield	Pc30853BF		

G5	123	E52				NSD							
G5	124	H52				NSD							
G5	125	B44				NSD							
G5	126	F43				NSD							

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Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	1	C62	ADQ	1		MD 1-0	7.6	6.5	1.2	Anthophyllite			PAOS, AS>5, 3:1
G1	1	C62	ADQ		1	MB	1.71	0.31	5.5	Anthophyllite			TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30846SP	PK 6/1/2017	
Diffraction	H30846DF	PK 6/1/2017	0.53 nm ROW SPACING
Brightfield	H30846BF		

G1	2	E61				NSD							
G1	3	E62	ADQ	2		MD 1-0	2.55	0.989	2.6	Actinolite			PAOS
G1	3	E62	ADQ		2	MF	2.55	0.5	5.1	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30848SP	PK 6/1/2017	
Diffraction	H30848DF	PK 6/1/2017	0.53 nm ROW SPACING
Brightfield	H30848BF		

G1	3	E62	NAM	3	3	MC 1-1	15	9	1.7	Non Asbestos Mineral			
G1	4	F62	NAM	4	4	MC 1-1	12	7	1.7	Non Asbestos Mineral			
G1	4	F62	NAM	5		MD 1-1	5.5	2.5	2.2	Non Asbestos Mineral			
G1	4	F62	NAM		5	MF	5.5	1.3	4.2	Non Asbestos Mineral			
G1	5	G62	CDQ	6	6	MC 1-0	14.7	9.96	1.5	Chrysotile		Poor Diffraction	TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Spectra	H30851SP		
Diffraction	H30851DF	PK 6/1/2017	0.53 nm ROW SPACING
Brightfield	H30851BF		

G1	6	C53				NSD							
G1	7	C54				NSD							
G1	8	E53	AQ	7		MD 1-0	3.11	2.54	1.2	Actinolite			PAOS
G1	8	E53	AQ		7	MF	2.02	0.66	3.1	Actinolite	Na, Mg, Al, Si, Ca, Ti, Fe		TAOS

ItemType	ItemNum	Confirmed	Comment
Spectra	H30852SP	PK 6/1/2017	
Brightfield	H30852BF		

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Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	8	E53	AQ	8	8	MC 1-0	7	5.5	1.3	Actinolite	Na, Mg, Al, Si, Ca, Fe	2X Grid Bar Rule, RB	TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30854SP				PK 6/1/2017		
						Brightfield	H30854BF						
G1	9	E54	ADQ	9		MD 1-0	2.43	1.1	2.2	Richterite	Na, Mg, Si, K, Ca, Fe		PAOS
G1	9	E54	ADQ		9	MF	2.43	0.54	4.5	Richterite			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30855SP				PK 6/1/2017		
						Diffraction	H30855DF				PK 6/1/2017	0.53 nm ROW SPACING	
						Brightfield	H30855BF						
G1	9	E54	AQ	10		MD 1-0	4.34	2.16	2	Actinolite			PAOS
G1	9	E54	AQ		10	MF	1.3	0.24	5.4	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30856SP				PK 6/1/2017		
						Brightfield	H30856BF						
G1	10	F53				NSD							
G1	11	G53	NAM	11	11	MC 1-1	11	5	2.2	Non Asbestos Mineral			
G1	12	C51				NSD							
G1	13	C52				NSD							
G1	14	E51				NSD							
G1	15	E52	CDQ	12	12	MC 1-1	11	6	1.8	Chrysotile			TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30857SP				PK 6/1/2017		
						Diffraction	H30857DF				PK 6/1/2017	0.53 nm ROW SPACING	
						Brightfield	H30857BF						
G1	16	F51				NSD							
G1	17	F52	AQ	13		MD 1-0	4.17	2.68	1.6	Actinolite			PAOS
G1	17	F52	AQ		13	MF	3.55	0.3	11.8	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30858SP				PK 6/1/2017		
						Brightfield	H30858BF						
G1	17	F52	CD	14		MD 1-1	5.67	0.42	13.5	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO

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G1	17	F52	CD		14	MF	5.22	0.09	58	Chrysotile			TAOS, AFB>5, 3:1, PCMEF_thin
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30859DF				PK 6/1/2017	0.53 nm ROW SPACING	
						Brightfield	H30859BF						
G1	18	G51	CM	15	15	MC 8-0	13.8	9.39	1.5	Chrysotile			TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30860BF						
G1	18	G51	NAM	16		MD 1-1	28.6	11.9	2.4	Non Asbestos Mineral			
G1	18	G51	NAM		16	MB	18.2	5.99	3	Non Asbestos Mineral		Possbile Altered Chrysotile	
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30861SP				PK 6/1/2017		
						Diffraction	H30861DF				PK 6/1/2017	Random Row Spacing	
						Brightfield	H30861BF						
G1	19	G52				NSD							
G1	20	B43				NSD							
G1	21	C43	NAM	17		MD 1-1	20	3.5	5.7	Non Asbestos Mineral			
G1	21	C43	NAM		17	MF	20	0.3	66.7	Non Asbestos Mineral			
G1	22	C44	CM	18		MD 1-0	2.88	2.78	1	Chrysotile			PAOS
G1	22	C44	CM		18	MF	1.03	0.06	17.2	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30862BF						
G1	22	C44	NAM	19		MD 1-0	6.9	5.84	1.2	Non Asbestos Mineral			
G1	22	C44	NAM		19	MF	3.6	0.43	8.4	Non Asbestos Mineral	Mg, Al, Si, Ca, Ti, Mn, Fe	Fe-Actinolite (high Fe)	
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30863SP				PK 6/1/2017		
						Diffraction	H30863DF				PK 6/1/2017	0.53 nm ROW SPACING	
						Brightfield	H30863BF						
G1	23	E43				NSD							

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Description: PS10

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G1	24	E44	NAM	20	20	F	5.5	0.6	9.2	Non Asbestos Mineral			
G1	25	F43	NAM	21	21	MC 1-1	8.45	6.53	1.3	Non Asbestos Mineral			
G1	25	F43	NAM	22	22	MC 1-1	20	11.2	1.8	Non Asbestos Mineral		2X Grid Bar Rule RB, Possible Altered Chrysotile	

ItemType	ItemNum	Confirmed	Comment
Spectra	H30864SP	PK 6/2/2017	
Diffraction	H30864DF	PK 6/2/2017	Random Row Spacing
Brightfield	H30864BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	26	F44				NSD							
G1	27	G44	NAM	23		MD 1-1	7	5.5	1.3	Non Asbestos Mineral			
G1	27	G44	NAM		23	MF	6	1.5	4	Non Asbestos Mineral			
G1	27	G44	CD	24	24	B	1.28	0.32	4	Chrysotile			TAOS, PAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30866DF	PK 6/2/2017	0.53 nm ROW SPACING
Brightfield	H30866BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	27	G44	NAM	25		MD 1-1	13	5	2.6	Non Asbestos Mineral			
G1	27	G44	NAM		25	MF	13	2.2	5.9	Non Asbestos Mineral			
G1	28	H43	CM	26		MD 1-0	10.11	8.82	1.1	Chrysotile			PAOS, AS>5, 3:1
G1	28	H43	CM		26	MB	1.29	0.2	6.4	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Brightfield	H30867BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	28	H43	CM	27	27	MC 3-2	13.6	6.48	2.1	Chrysotile			TAOS, PAOS, AS>5, 3:1

ItemType	ItemNum	Confirmed	Comment
Brightfield	H30868BF		

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	29	H44				NSD							
G1	30	B42				NSD							
G1	31	C41				NSD							

JMW 4-20-18

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	32	C42	NAM	28		MD 1-1	12.16	6	2	Non Asbestos Mineral			
G1	32	C42	NAM		28	MF	9.83	2.74	3.6	Non Asbestos Mineral			
G1	32	C42	AQ	29		MD 1-0	2.15	1.14	1.9	Actinolite			PAOS
G1	32	C42	AQ		29	MF	2.15	0.57	3.8	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30869SP				PK 6/2/2017		
						Brightfield	H30869BF						
G1	33	E41	CM	30	30	MC 1-1	29	10.6	2.7	Chrysotile		2X Grid Bar Rule RB	TAOS, PAOS, AS>5, 3:1
G1	33	E41	CM	31	31	F	0.89	0.1	8.9	Chrysotile			TAOS, PAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30870BF						
G1	34	E42	AQ	32	32	MC 1-0	13.28	9.45	1.4	Actinolite	Mg, Al, Si, K, Ca, Fe		TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30871SP				PK 6/2/2017		
						Brightfield	H30871BF						
G1	35	G41	CM	33		MD 1-0	5.5	4.3	1.3	Chrysotile			PAOS, AS>5, 3:1
G1	35	G41	CM		33	MF	1.18	0.1	11.8	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30872BF						
G1	36	G42	NAM	34		MD 1-1	5.5	4	1.4	Non Asbestos Mineral			
G1	36	G42	NAM		34	MF	5.5	0.1	55	Non Asbestos Mineral			
G1	37	H42				NSD							
G1	38	C34				NSD							
G1	39	E33				NSD							
G1	40	E34				NSD							
G1	41	G33				NSD							
G1	42	G34				NSD							
G1	43	H33				NSD							
G1	44	F31				NSD							
G1	45	F32				NSD							

MW 4-2018

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Portland, OR 97239

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
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ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G1	46	G31				NSD							
G1	47	G32	AQ	35		MD 1-0	7.96	5.77	1.4	Actinolite			PAOS, AS>5, 3:1
G1	47	G32	AQ		35	MF	4.06	1.24	3.3	Actinolite			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30876SP				TH 6/5/2017		
						Brightfield	H30876BF						
G1	47	G32	NAM		36	MR	7.96	4.06	2	Non Asbestos Mineral		3-0	
G1	48	H31				NSD							
G1	49	F23				NSD							
G1	50	F24				NSD							
G1	51	G23				NSD							
G1	52	G24				NSD							
G2	53	C62				NSD							
G2	54	E61				NSD							
G2	55	E62	CD	36	37	MC 2-2	7	6.06	1.2	Chrysotile			TAOS, PAOS, AS>5, 3:1
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30877DF				PK 6/5/2017	0.53 nm ROW SPACING	
						Brightfield	H30877BF				PK 6/5/2017		
G2	56	F61	CD	37		MD 1-0	1.24	0.23	5.4	Chrysotile			PAOS
G2	56	F61	CD		38	MF	1.14	0.08	14.2	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30878DF				TH 6/5/2017	0.53 nm ROW SPACING	
						Brightfield	H30878BF						
G2	57	F62				NSD							
G2	58	C53				NSD							
G2	59	C54				NSD							
G2	60	E53				NSD							
G2	61	E54				NSD							
G2	62	F53				NSD							
G2	63	F54	AQ	38		MD 1-0	1.43	1.13	1.3	Actinolite			PAOS
G2	63	F54	AQ		39	MF	0.99	0.21	4.7	Actinolite	Na, Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30879SP				TH 6/5/2017		
						Brightfield	H30879BF						
G2	64	G53				NSD							
G2	65	G54	CD	39		MD 1-0	4.79	2.28	2.1	Chrysotile			PAOS

MW 4-20-18

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	65	G54	CD		40	MF	0.95	0.12	7.9	Chrysotile			TAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		H30880BF					
						Diffraction		H30880DF			TH 6/5/2017	0.53 nm ROW SPACING	
G2	66	H53				NSD							
G2	67	H54				NSD							
G2	68	B51				NSD							
G2	69	B52	CD	40	41	MC 1-0	5.91	4.28	1.4	Chrysotile			TAOS, PAOS, AS>5, 3:1
						ItemType		ItemNum			Confirmed	Comment	
						Diffraction		H30881DF			TH 6/5/2017	0.53 nm ROW SPACING	
						Brightfield		H30881BF					
G2	70	C51				NSD							
G2	71	C52				NSD							
G2	72	E51				NSD							
G2	73	E52				NSD							
G2	74	F51				NSD							
G2	75	F52				NSD							
G2	76	G51				NSD							
G2	77	G52				NSD							
G2	78	E43	CM	41	42	MC 1-0	2.75	1.09	2.5	Chrysotile			TAOS, PAOS
						ItemType		ItemNum			Confirmed	Comment	
						Brightfield		H30883BF					
G2	79	E44				NSD							
G2	80	F43				NSD							
G2	81	F44				NSD							
G2	82	G43	NAM	42	43	F	13	0.5	26	Non Asbestos Mineral			
G2	83	G44				NSD							
G2	84	H43				NSD							
G2	85	H44				NSD							
G2	86	B42				NSD							
G2	87	C41				NSD							
G2	88	C42				NSD							
G2	89	E41				NSD							
G2	90	E42				NSD							
G2	91	F41				NSD							
G2	92	F42	ADQ	43		MD 1-0	2.33	1.35	1.7	Anthophyllite			PAOS

MW 4-2018

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G2	92	F42	ADQ		44	MF	1.09	0.33	3.3	Anthophyllite	Na, Mg, Al, Si, Ca, Mn, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30884SP				PK 6/6/2017		
						Diffraction	H30884DF				PK 6/6/2017	0.53 nm ROW SPACING	
						Brightfield	H30884BF						
G2	93	G41	CM	44		MD 1-0	5.43	1.62	3.4	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
G2	93	G41	CM		45	MF	4.16	0.08	52	Chrysotile			TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Brightfield	H30885BF						
G2	94	G42				NSD							
G2	95	H41				NSD							
G2	96	B34				NSD							
G2	97	C34	CD	45		MD 1-1	11.3	1.71	6.6	Chrysotile			PAOS, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
G2	97	C34	CD		46	MB	11.3	0.47	24	Chrysotile			TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH
						ItemType	ItemNum				Confirmed	Comment	
						Diffraction	H30886DF				TH 6/6/2017	0.53 nm ROW SPACING	
						Brightfield	H30886BF						
G2	98	E33				NSD							
G2	99	E34				NSD							
G2	100	F33				NSD							
G2	101	F34				NSD							
G2	102	G33				NSD							
G2	103	G34				NSD							
G2	104	H33				NSD							
G2	105	B32	ADQ	46		MD 1-0	11.01	8.96	1.2	Tremolite			PAOS, AS>5, 3:1
G2	105	B32	ADQ		47	MF	1.51	0.17	8.9	Tremolite	Na, Mg, Al, Si, Ca, Fe		TAOS
						ItemType	ItemNum				Confirmed	Comment	
						Spectra	H30887SP				TH 6/6/2017		
						Brightfield	H30887BF						
						Diffraction	H30887DF				TH 6/6/2017	0.53 nm ROW SPACING	
G2	106	F31				NSD							
G2	107	G32				NSD							

MW 4/20/18

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 PDX
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Lab/Cor Sample No: S24
Client Sample No: 17050104
Description: PS10

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G3	108	E51				NSD							
G3	109	E52				NSD							
G3	110	F51				NSD							
G3	111	F52				NSD							
G3	112	G51	CD	47		MD 1-0	6.96	6.08	1.1	Chrysotile			PAOS, AS>5, 3:1
G3	112	G51	CD		48	MF	3.03	0.05	60.6	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30888DF	TH 6/6/2017	0.53 nm ROW SPACING
Brightfield	H30888BF		

G3	113	G52				NSD							
G3	114	H51				NSD							
G3	115	C43	ADQ	48		MD 1-1	11.9	3.4	3.5	Anthophyllite			PAOS, AS>5, 3:1, PCMES-NIOSH
G3	115	C43	ADQ		49	MF	11.9	2.54	4.7	Anthophyllite	Na, Mg, Si, Ca, Fe		TAOS, AFB>5, 3:1, PCMEF-ISO, PCMEF-NIOSH, PCMEFmodNIOSH

ItemType	ItemNum	Confirmed	Comment
Spectra	H30889SP	TH 6/6/2017	
Diffraction	H30889DF	TH 6/6/2017	0.53 nm ROW SPACING
Brightfield	H30889BF		

G3	116	C44				NSD							
G3	117	E43				NSD							
G3	118	E44				NSD							
G3	119	F43				NSD							
G3	120	F44	CD	49		MD 1-0	7.78	6.56	1.2	Chrysotile			PAOS, AS>5, 3:1
G3	120	F44	CD		50	MB	1.92	0.333	5.8	Chrysotile			TAOS

ItemType	ItemNum	Confirmed	Comment
Diffraction	H30890DF	TH 6/6/2017	0.53 nm ROW SPACING
Brightfield	H30890BF		

G3	120	F44	NAM		51	MR	7.76	6	1.3	Non Asbestos Mineral		4-0	

MW 4-2018

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Final Report

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Asbestos and Environmental Analysis

ISO 10312 - Direct Raw Data

Job Number: 172985 **PDX**
Client: Ecology & Environment, Inc.
Project Name:
Project No.: PDX-08

Report Number: 172985R12
Date Received: 5/24/2017

Count Categories

AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5, 3:1	Asbestos Structures >5um and 3:1	EPA2_0.5-5	EPA2 Asbestos Structures 0.5-5.0
mdAHERA_0.5-	Mod. AHERA >=0.5 to 5.0µm, 3:1	PAOS	Primary Asb and Libby-Other Amphibole Structures	PAS	Primary Asbestos Structures
PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1	PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1
PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH	PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH
TAOS	Total Asb & Libby-OtherAmph Structures	TAS	Total Asbestos Structures		

Reviewed by:

x

Kate March
Analyst

JUN 4 2017

172985 pg 2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050100	PS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	782180	Liters	259	3.02	L/min
	17050101	PS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	1332.78	Liters	445	2.995	L/min
	17050102	PS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	339.9	Liters	165	2.06	L/min
	17050103	PS09	Asbestos PCM	Air	MCE Cassette	5/23/2017	294	Liters	150	1.96	L/min
	17050104	PS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	309	Liters	150	2.06	L/min
	17050105	BLANK	Asbestos PCM	Air	MCE Cassette	5/23/2017	BLANK	NOT SUBMITTED			

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] → LABCOR PORTLAND INC.	5/24/17 3:45pm SG	

172985 pv2

USEPA

DateShipped: 5/23/2017

CHAIN OF CUSTODY RECORD

Site #: xx

Contact Name: Brad Martin

Contact Phone: 206-419-9780

No: PDX-08

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050081	AS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1721.03	Liters	176	9.7786	L/min
	17050082	AS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	2194.39	Liters	220	9.9745	L/min
	17050083	AS15	Asbestos PCM	Air	MCE Cassette	5/23/2017	2071.44	Liters	210	9.864	L/min
	17050084	AS19	Asbestos PCM	Air	MCE Cassette	5/23/2017	1868.28	Liters	181	10.322	L/min
	17050085	AS20	Asbestos PCM	Air	MCE Cassette	5/23/2017	1820.46	Liters	182	10.0025	L/min
	17050086	AS21	Asbestos PCM	Air	MCE Cassette	5/23/2017	1619.54	Liters	154	10.5165	L/min
	17050087	AS22	Asbestos PCM	Air	MCE Cassette	5/23/2017	1457.03	Liters	145	10.0485	L/min
	17050088	ABS05	Asbestos PCM	Air	MCE Cassette	5/23/2017	254.55	Liters	126	2.0202	L/min
	17050089	ABS06	Asbestos PCM	Air	MCE Cassette	5/23/2017	499.2	Liters	122	4.0918	L/min
	17050090	ABS07	Asbestos PCM	Air	MCE Cassette	5/23/2017	245.45	Liters	122	2.0119	L/min
	17050091	ABS08	Asbestos PCM	Air	MCE Cassette	5/23/2017	486.59	Liters	120	4.0549	L/min
	17050092	ABS099	Asbestos PCM	Air	MCE Cassette	5/23/2017	253.94	Liters	122	2.0815	L/min
	17050093	ABS10	Asbestos PCM	Air	MCE Cassette	5/23/2017	478.05	Liters	121	3.9508	L/min
	17050094	ABS11	Asbestos PCM	Air	MCE Cassette	5/23/2017	258.68	Liters	122	2.1203	L/min
	17050095	ABS12	Asbestos PCM	Air	MCE Cassette	5/23/2017	473.84	Liters	121	3.916	L/min
	17050096	PS01	Asbestos PCM	Air	MCE Cassette	5/23/2017	1581.36	Liters	528	2.995	L/min
	17050097	PS02	Asbestos PCM	Air	MCE Cassette	5/23/2017	621.29	Liters	209	2.9727	L/min
	17050098	PS03	Asbestos PCM	Air	MCE Cassette	5/23/2017	1302.6	Liters	445	2.9272	L/min
	17050099	PS04	Asbestos PCM	Air	MCE Cassette	5/23/2017	1108.56	Liters	372	2.98	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature]	5/23/17 2003	[signature] LABCOR PORTLAND INC.	5/24/17 3:45AM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 3, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 1 air filter sample collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (ISO Method 13794- Indirect) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The sample was numbered: 17050181

Data Qualifications:

The sample was collected on June 2, 2017, and was analyzed by July 1, 2017. No issues were noted in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 13794 - Indirect Summary Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No.: S7
Client Sample No.: 17050181
Description: AS05
Filter Fraction: 1
Residual Ash Vol: 20 ml
Begin Volume: 20 ml
Volume Taken: 0.3 ml

Aliquot Dilution: 0.015
Final Dilution: 0.015

Sample Area/Mass/Volume (L) : 5049.03
Lab Filter Area (mm2) : 193
Grid Openings Analyzed : 241
Average Grid Opening Area : 0.0104
Area Analyzed (mm2) : 2.5064
Analytical Sens. (struc/cc) : 0.001
Detection Limit. (struc/cc) : 0.003

Analyst(s)	Analysis Date	Microscope	Magnification
TH	6/23/2017	H-7000	20000
TH	6/24/2017	H-7000	20000
TH	6/26/2017	H-7000	20000
TH	6/29/2017	H-7000	20000
TH	6/30/2017	Philips CM12	15000
TH	7/1/2017	Philips CM12	15000

Structure Type	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Structure Count[1] Prim/Total	
Primary Asbestos Structures	0.007	0.003 - 0.015 - Poisson	7	
Total Asbestos Structures	0.007	0.003 - 0.014 - Poisson		7
Asbestos Structures > 5um and 5:1	0.001	0 - 0.006 - Poisson	1	
Asbestos Fibers and Bundles > 5um and 5:1	0.001	0 - 0.006 - Poisson		1
Asbestos Fibers and Bundles > 5um and 3:1	0.001	0 - 0.006 - Poisson		1
Asbestos Structures >5um and 3:1	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Fibers-ISO	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers-NIOSH	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	< 0.001	0 - 0.004 - Poisson		0
PCM Equivalent Structures-ISO	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Structures-NIOSH	0.001	0 - 0.006 - Poisson	1	
PCM Equivalent Fibers - <0.25, >5 & 3:1	0.001	0 - 0.006 - Poisson		1

x
Tracy Handrich
Analyst

* One-sided upper 95% Poisson confidence limits may be used to calculate sample concentrations ([Struc count] * [Analytical Sensitivity]) when the structure count is below 4. The limits are: 0 str - 0, 1 str - 1, 2 str - 2, 3 str - 3

7-3-17

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Prelim Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G7	1	C61				NSD							
G7	2	C62				NSD							
G7	3	E61				NSD							
G7	4	E62				NSD							
G7	5	F61				NSD							
G7	6	B54				NSD							
G7	7	C53				NSD							
G7	8	C54				NSD							
G7	9	E53				NSD							
G7	10	E54				NSD							
G7	11	B51				NSD							
G7	12	B52				NSD							
G7	13	C51				NSD							
G7	14	C52				NSD							
G7	15	E51				NSD							
G7	16	E52				NSD							
G7	17	F51				NSD							
G7	18	F52				NSD							
G7	19	G51				NSD							
G7	20	E43				NSD							
G7	21	E44				NSD							
G7	22	F43	CDQ	1		MD 1-1	6.18	0.83	7.4	Chrysotile			AS>5, AS>5, 3:1, PCMES-NIOSH, PCMES-ISO
G7	22	F43	CDQ		1	MF	6.18	0.05	123.6	Chrysotile			AFB>5, AFB>5, 3:1, PCMEF_thin

ItemType	ItemNum	Confirmed	Comment
Spectra	H31118SP	TH 6/24/2017	
Diffraction	H31118DF	TH 6/24/2017	0.53 nm ROW SPACING
Brightfield	H31118BF		

G7	23	F44				NSD							
G7	24	G43				NSD							
G7	25	B41				NSD							
G7	26	B42				NSD							
G7	27	C41				NSD							
G7	28	C42				NSD							
G7	29	E41				NSD							
G7	30	E42				NSD							
G7	31	B34				NSD							
G7	32	C33				NSD							

MW 73-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G7	33	C34				NSD							
G7	34	E33				NSD							
G7	35	E34				NSD							
G7	36	F33				NSD							
G7	37	F34				NSD							
G7	38	H33				NSD							
G7	39	C32				NSD							
G7	40	E31				NSD							
G7	41	E32	CD	2		MD 1-0	1.61	0.2	8.1	Chrysotile			
G7	41	E32	CD		2	MF	1.61	0.05	32.2	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Diffraction	H31119DF	TH 6/24/2017	0.53 nm ROW SPACING
Brightfield	H31119BF		

G7	42	E24	ADQ	3		MD 1-0	2.65	0.41	6.5	Actinolite			
G7	42	E24	CM		3	MF	2.65	0.26	10.2	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Spectra	H31120SP	TH 6/24/2017	
Diffraction	H31120DF	TH 6/24/2017	0.53 nm ROW SPACING
Brightfield	H31120BF		

G7	43	F24				NSD							
G7	44	G24				NSD							
G8	45	C61				NSD							
G8	46	C62				NSD							
G8	47	E61				NSD							
G8	48	F61				NSD							
G8	49	G61				NSD							
G8	50	G62				NSD							
G8	51	H61				NSD							
G8	52	C53				NSD							
G8	53	C54				NSD							
G8	54	E53				NSD							
G8	55	E54				NSD							
G8	56	F53				NSD							
G8	57	F54				NSD							
G8	58	G54				NSD							
G8	59	H53				NSD							
G8	60	B51				NSD							
G8	61	B52				NSD							

MW 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G8	62	C51				NSD							
G8	63	E52				NSD							
G8	64	F51				NSD							
G8	65	F52				NSD							
G8	66	H51				NSD							
G8	67	E44				NSD							
G8	68	F43				NSD							
G8	69	F44				NSD							
G8	70	G43				NSD							
G8	71	H44				NSD							
G8	72	E41				NSD							
G8	73	E42				NSD							
G8	74	F41				NSD							
G8	75	F42				NSD							
G8	76	G41				NSD							
G8	77	G42				NSD							
G8	78	H41				NSD							
G8	79	B34				NSD							
G8	80	C34				NSD							
G8	81	E33				NSD							
G8	82	E34				NSD							
G8	83	F34				NSD							
G8	84	G33				NSD							
G8	85	G34				NSD							
G8	86	H33				NSD							
G8	87	B32				NSD							
G8	88	C31				NSD							
G8	89	E31				NSD							
G8	90	E32				NSD							
G8	91	F31				NSD							
G8	92	F32				NSD							
G8	93	B24				NSD							
G8	94	C23				NSD							
G8	95	C24				NSD							
G8	96	E23				NSD							
G8	97	E24				NSD							
G8	98	H24				NSD							
G9	99	C64				NSD							

MW 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G9	100	E64				NSD							
G9	101	F63				NSD							
G9	102	F64				NSD							
G9	103	B62				NSD							
G9	104	G61				NSD							
G9	105	G62				NSD							
G9	106	H61				NSD							
G9	107	B53				NSD							
G9	108	F54				NSD							
G9	109	H54				NSD							
G9	110	B41				NSD							
G9	111	B42				NSD							
G9	112	E42	CD	4		MD 1-0	1.89	0.63	3	Chrysotile			
G9	112	E42	CD		4	MF	1.89	0.1	18.9	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc31243DF	TH 6/30/2017	0.53 nm ROW SPACING
Brightfield	Pc31243BF		

G9	113	F41				NSD							
G9	114	H41				NSD							
G9	115	H42				NSD							
G9	116	C33				NSD							
G9	117	F33				NSD							
G9	118	G33				NSD							
G9	119	H34				NSD							
G9	120	C32				NSD							
G9	121	E31				NSD							
G9	122	E32				NSD							
G9	123	F32				NSD							
G9	124	G32				NSD							
G9	125	H31				NSD							
G9	126	E23				NSD							
G9	127	E24				NSD							
G9	128	F23				NSD							
G9	129	G24				NSD							
G9	130	H23				NSD							
G10	131	C64				NSD							
G10	132	E64				NSD							
G10	133	F63				NSD							

MW 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G10	134	G63				NSD							
G10	135	G64				NSD							
G10	136	H63				NSD							
G10	137	B62				NSD							
G10	138	C61				NSD							
G10	139	C62				NSD							
G10	140	E61				NSD							
G10	141	B53				NSD							
G10	142	B54				NSD							
G10	143	C53				NSD							
G10	144	C54				NSD							
G10	145	B51				NSD							
G10	146	C52				NSD							
G10	147	H51				NSD							
G10	148	H52				NSD							
G10	149	C44				NSD							
G10	150	G43				NSD							
G10	151	G44				NSD							
G10	152	H43				NSD							
G10	153	H44				NSD							
G10	154	C41				NSD							
G10	155	C42				NSD							
G10	156	F42				NSD							
G10	157	G41				NSD							
G10	158	G42				NSD							
G10	159	H41				NSD							
G10	160	H42				NSD							
G10	161	C33				NSD							
G10	162	C34				NSD							
G10	163	E33	CDQ	5	5	F	4.05	0.13	31.2	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Spectra	Pc31244SP	TH 6/30/2017	
Diffraction	Pc31244DF	TH 6/30/2017	0.53 nm ROW SPACING
Brightfield	Pc31244BF		

G10	164	E34				NSD
G10	165	F33				NSD
G10	166	F34				NSD
G10	167	G33				NSD

MW 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G10	168	G34				NSD							
G10	169	H33				NSD							
G10	170	H34				NSD							
G10	171	B32				NSD							
G10	172	C31				NSD							
G10	173	C32				NSD							
G10	174	E31				NSD							
G10	175	E32				NSD							
G10	176	G32				NSD							
G10	177	H31				NSD							
G10	178	C23				NSD							
G10	179	C24				NSD							
G10	180	E24				NSD							
G11	181	B62				NSD							
G11	182	C61				NSD							
G11	183	C62				NSD							
G11	184	B54				NSD							
G11	185	C53				NSD							
G11	186	E53				NSD							
G11	187	E54				NSD							
G11	188	F54				NSD							
G11	189	G53				NSD							
G11	190	B52				NSD							
G11	191	C51				NSD							
G11	192	C52				NSD							
G11	193	E52				NSD							
G11	194	F51				NSD							
G11	195	H51				NSD							
G11	196	B43				NSD							
G11	197	B44				NSD							
G11	198	C43				NSD							
G11	199	C44				NSD							
G11	200	E43				NSD							
G11	201	E44				NSD							
G11	202	F43				NSD							
G11	203	F44				NSD							
G11	204	G44				NSD							
G11	205	H43				NSD							

Mu 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G11	206	H44				NSD							
G11	207	B41				NSD							
G11	208	B42				NSD							
G11	209	C42	CD	6	6	F	1.4	0.1	14	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc31246DF	TH 7/1/2017	0.53 nm ROW SPACING
Brightfield	Pc31246BF		

G11	210	E41				NSD							
G11	211	E42				NSD							
G11	212	F41				NSD							
G11	213	G41				NSD							
G11	214	G42	CD	7	7	B	2.85	0.33	8.6	Chrysotile			

ItemType	ItemNum	Confirmed	Comment
Diffraction	Pc31247DF	TH 7/1/2017	0.53 nm ROW SPACING
Brightfield	Pc31247BF		

G11	215	H42				NSD							
G11	216	B33				NSD							
G11	217	B34				NSD							
G11	218	C33				NSD							
G11	219	C34				NSD							
G11	220	E33				NSD							
G11	221	E34				NSD							
G11	222	F33				NSD							
G11	223	F34				NSD							
G11	224	H33				NSD							
G11	225	B31				NSD							
G11	226	B32				NSD							
G11	227	C31				NSD							
G11	228	C32				NSD							
G11	229	E31				NSD							
G11	230	E32				NSD							
G11	231	F31				NSD							
G11	232	F32				NSD							
G11	233	B24				NSD							
G11	234	C24				NSD							
G11	235	E23				NSD							
G11	236	E24				NSD							
G11	237	F23				NSD							

MW 7-3-17

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Asbestos and Environmental Analysis

ISO 13794 - Indirect Raw Data

Job Number: 173201 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD
Project No.: PDX-20

Report Number: 173201R03
Date Received: 6/2/2017

Lab/Cor Sample No: S7
Client Sample No: 17050181
Description: AS05

Gr	No.	Loc.	ID	Prim	Tot	Class	Length	Width	Aspect	Analyte	Elements	Comment	Count Categories
G11	238	F24				NSD							
G11	239	G23				NSD							
G11	240	G24				NSD							
G11	241	F21				NSD							

Count Categories

AFB>5	Asbestos Fibers and Bundles > 5um and 5:1	AFB>5, 3:1	Asbestos Fibers and Bundles > 5um and 3:1	AS>5	Asbestos Structures > 5um and 5:1
AS>5, 3:1	Asbestos Structures >5um and 3:1	PAS	Primary Asbestos Structures	PCMEF_thin	PCM Equivalent Fibers - <0.25, >5 & 3:1
PCMEF-ISO	PCM Equivalent Fibers-ISO	PCMEFmodNIO	PCM Equivalent Fibers - 0.25-3.0, > 5 & 3:1	PCMEF-NIOSH	PCM Equivalent Fibers-NIOSH
PCMES-ISO	PCM Equivalent Structures-ISO	PCMES-NIOSH	PCM Equivalent Structures-NIOSH	TAS	Total Asbestos Structures

Reviewed by:

x

Tracy Handrich
Analyst

MW 7317

173201

USEPA

DateShipped: 6/1/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-20

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050175	PS01		Air	MCE Cassette	6/1/2017	1133.09	Liters	381	2.974	L/min
	17050176	PS02		Air	MCE Cassette	6/1/2017	710.43	Liters	239	2.9725	L/min
	17050177	PS03		Air	MCE Cassette	6/1/2017	1113.4	Liters	372	2.993	L/min
	17050178	PS04		Air	MCE Cassette	6/1/2017	826.09	Liters	271	3.0483	L/min
	17050179	PS05		Air	MCE Cassette	6/1/2017	164.61	Liters	56	2.9395	L/min
	17050180	AS03		Air	MCE Cassette	6/1/2017	4719.36	Liters	473	9.9775	L/min
	17050181	AS05		Air	MCE Cassette	6/1/2017	5049.03	Liters	496	10.1795	L/min
	17050182	AS15		Air	MCE Cassette	6/1/2017	5182.11	Liters	510	10.161	L/min
	17050183	Blank		Air	MCE Cassette	6/1/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	[signature] START	6/1/17 1816	[signature] LABCOR PORTLAND, INC	6/2/17 8:00AM	

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H Analytical Data – Interim Air Sampling

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ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 3, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contract microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050260 17050261 17050262 17050263

Data Qualifications:

The samples were received at the laboratory on June 3, 2017, and were analyzed by July 3, 2017. Sample 17050261 was overloaded with particulate matter and was not analyzed. No other issues were noted in the case narrative. There were no detections in the filter blank or in the laboratory blank.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
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Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 173961 **PDX**
Client: Ecology & Environment, Inc.
Project Name: Site# 10QD

Report Number: 173961R01
Date Received: 7/3/2017

Analyst: TH 7/3/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050260	AS25 Asbestos PCM	13837	16	100	20.806	0.001	0 - 0.001	0
S3	17050262	AS24 Asbestos PCM	15307	14	100	18.205	< 0.001 U	0 - 0.001	0
S4	17050263	Blank	0	0	100	< 7.0 U			
B1	Blank		0	0	100	< 7.0 U			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	6/1/2017

Reviewed by:

x

Tracy Handrich
Analyst

MW
7-3-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 174100 PDX
Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-40
PO Number:
Sub Project:
Reference No.:

Report Number: 174100R01
Report Date: 7/10/2017

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
174100 - S1	17050264 - AS25	NIOSH 7400 - PCM		7/10/2017
174100 - S2	17050265 - AS24	NIOSH 7400 - PCM		7/10/2017
174100 - S3	17050266 - Blank	NIOSH 7400 - PCM		7/10/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Hillarie Sales
Analyst

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 174100 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 174100R01
Date Received: 7/10/2017

Analyst: HS 7/10/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050264	AS25	2588.3	3	100	< 7.0	< 0.001	0 - 0.002	0.001
S2	17050265	AS24	2562.3	3	100	< 7.0	< 0.001	0 - 0.002	0.001
S3	17050266	Blank	0	4	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	**Low Fibs = 5-20 Flds = 100**	**Med Fibs=>20-50 Flds = 100**	**High Fibs=>50 Flds = 100**
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	**Date Meas.**
0.00769	6/1/2017

Reviewed by:

X

Hillarie Sales
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

174100

USEPA

DateShipped: 7/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-40

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050264	AS25	Asbestos PCM	Air	MCE Cassette	7/7/2017	2588.25	Liters	250	10.353	L/min
	17050265	AS24	Asbestos PCM	Air	MCE Cassette	7/7/2017	2562.25	Liters	247	10.3735	L/min
	17050266	Blank	Asbestos PCM	Air	MCE Cassette	7/7/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , and shall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipment		7/7/17 18:09		7/10/17 8:00AM	

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 174264 **PDX**

Report Number: 174264R01
Report Date: 7/14/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-41
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
174264 - S1	17050267 - AS24	NIOSH 7400 - PCM		7/14/2017
174264 - S2	17050268 - AS25	NIOSH 7400 - PCM		7/14/2017
174264 - S3	17050269 - Blank	NIOSH 7400 - PCM		7/14/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Paulina Kho
Analyst

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 174264 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 174264R01
Date Received: 7/14/2017

Analyst: PK 7/14/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050267	AS24	3362.6	4	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050268	AS25	3365.1	3	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050269	Blank	0	4	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.55	0.39	0.63
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00785	7/10/2017

Reviewed by:

X

Paulina Kho
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

174264

USEPA

DateShipped: 7/13/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-41

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050267	AS24	Asbestos PCM	Air	MCE Cassette	7/13/2017	3362.55	Liters	334	10.0675	L/min
	17050268	AS25	Asbestos PCM	Air	MCE Cassette	7/13/2017	3365.11	Liters	331	10.1665	L/min
	17050269	Blank	Asbestos PCM	Air	MCE Cassette	7/13/2017					

Special Instructions: Please processes these samples ASAP or within 24hrs

Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , shall@ene.com , & erinc@ehsintl.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
SHIPMENT	S Cutter	7/13/17 1833			

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 27, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contract microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050270 17050271 17050272

Data Qualifications:

The samples were received at the laboratory on July 21, 2017, and were analyzed by July 24, 2017. No issues were noted in the case narrative. There were no detections in the filter blank or in the laboratory blank.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 174473 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 174473R01
Date Received: 7/21/2017

Analyst: PK 7/24/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050270	AS24	2686.9	3	100	< 7.0	< 0.001	0 - 0.002	0.001
S2	17050271	AS25	2982.5	1	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050272	Blank	0	4	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.39	0.65
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00785	7/6/2017

Reviewed by:

x Paulina Kho

Paulina Kho
Analyst

MW 7-27-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

174473

USEPA

DateShipped: 7/21/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-42

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050270	AS24	Asbestos PCM	Air	MCE Cassette	7/21/2017	2686.87	Liters	266	10.101	L/min
	17050271	AS25	Asbestos PCM	Air	MCE Cassette	7/21/2017	2982.49	Liters	292	10.214	L/min
	17050272	Blank	Asbestos PCM	Air	MCE Cassette	7/21/2017					

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , shall@ene.com , & erinc@ehsintl.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	Bryan Cieck	7/21/17 1658	William Cranbert Labcor PDX	7-21-17 4:58PM	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: July 31, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contract microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050273 17050274 17050275

Data Qualifications:

The samples were received at the laboratory on July 28, 2017, and were analyzed by July 31, 2017. No issues were noted in the case narrative. There were no detections in the filter blank or in the laboratory blank.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 174641 PDX
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 174641R01
Date Received: 7/28/2017

Analyst: PK 7/31/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concentration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050275	Blank	0	5	100	< 7.0 U			
S2	17050273	AS24	3058.2	3.5	100	< 7.0	< 0.001 U	0 - 0.002	0.001
S3	17050274	AS25	3114.7	1.5	100	< 7.0	< 0.001 U	0 - 0.001	0.001
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.39	0.65
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00785	7/6/2017

Reviewed by:

x Paulina Kho
Paulina Kho
Analyst

PKN 7-31-17

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

174641

USEPA
DateShipped:

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-43
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units.	Total_Time	Avg_Flow	Flow_Units
	17050275	Blank	Asbestos PCM	Air	MCE Cassette	7/28/2017					
	17050273	AS24	Asbestos PCM	Air	MCE Cassette	7/28/2017	3058.24	Liters	304	10.06	L/min
	17050274	AS25	Asbestos PCM	Air	MCE Cassette	7/28/2017	3114.72	Liters	309	10.08	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
drop-off at lab	START	7/28/17 14:38	LabCor PDX	7-28-17 2:54PM	

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 174769 **PDX**

Report Number: 174769R01
Report Date: 8/7/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-44
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
174769 - S1	17050276 - AS25	NIOSH 7400 - PCM		8/4/2017
174769 - S2	17050277 - AS24	NIOSH 7400 - PCM	Not Analyzed REJECTED: Overloaded - Rejected during prep due to overloading on filter	8/4/2017
174769 - S3	17050278 - Blank	NIOSH 7400 - PCM		8/4/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Paulina Kho
Analyst

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 174769 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 174769R01
Date Received: 8/4/2017

Analyst: PK 8/7/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050276	AS25	2664.5	5	100	< 7.0	< 0.001	0 - 0.002	0.001
S3	17050278	Blank	0	3	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.39	0.65
PK	0.53	0.48	0.79
HS	0.57	0.38	0.9
LAB	**0.58**	**0.45**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	8/7/2017

Reviewed by:

x

Paulina Kho
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

USEPA
DateShipped: 8/4/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-44
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050276	AS25	Asbestos PCM	Air	MCE Cassette	8/3/2017	2664.48	Liters	273	9.76	L/min
	17050277	AS24	Asbestos PCM	Air	MCE Cassette	8/3/2017	2701.64	Liters	267	10.1185	L/min
	17050278	Blank	Asbestos PCM	Blank	MCE Cassette	8/3/2017	0	Liters	311	0	L/min

Special Instructions: Please proceses these samples ASAP or within 24hrs
Please provide perliminary and full data package and email to bmartin@ene.com , mwoodke@ene.com , shall@ene.com , & erinc@ehsintl.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY # PDX-44

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/LAB	Ryan Whitchurch EKE/START	8/4/2017 13:17	Allison Gambert LabCor-PDX	8-4-17 1:17PM	

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 175097 **PDX**

Report Number: 175097R01
Report Date: 8/21/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-46
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
175097 - S1	17050282 - AS24	NIOSH 7400 - PCM		8/21/2017
175097 - S2	17050283 - AS25	NIOSH 7400 - PCM		8/21/2017
175097 - S3	17050284 - Blank	NIOSH 7400 - PCM		8/21/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Paulina Kho
Analyst

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 175097 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 175097R01
Date Received: 8/21/2017

Analyst: PK 8/21/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050282	AS24	3607.7	4.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050283	AS25	3063	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050284	Blank	0	3	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	**Low Fibs = 5-20 Flds = 100**	**Med Fibs=>20-50 Flds = 100**	**High Fibs=>50 Flds = 100**
TH	0.67	0.54	0.76
SG	0.54	0.38	0.66
PK	0.54	0.47	0.77
HS	0.57	0.38	0.9
LAB	**0.58**	**0.44**	**0.77**

Graticule Area	
Graticule Area	**Date Meas.**
0.00769	8/7/2017

Reviewed by:

X

Paulina Kho
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

175057

USEPA
DateShipped: 8/18/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-46
Lab: Labcor
Lab Phone: 503-224-5055
Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050282	AS24	Asbestos PCM	Air	MCE Cassette	8/18/2017	3607.7	Liters	360	10.0214	L/min
	17050283	AS25	Asbestos PCM	Air	MCE Cassette	8/18/2017	3063	Liters	300	10.21	L/min
	17050284	Blank	Asbestos PCM	Blank	MCE Cassette	8/18/2017		Liters			L/min

Special Instructions: Please proceses these samples within 24hrs. Please send results to sghall@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Rachel Locke (START)	17:43 8/18/17		8/21/17 0815	OK

Reviewed by: HS
Results Released on: 8/21/17
Invoice Released on: 8/21/17
Verbal Email Physical

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 175234 **PDX**

Report Number: 175234R01
Report Date: 8/28/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-47
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
175234 - S1	17050285 - AS24	NIOSH 7400 - PCM		8/28/2017
175234 - S2	17050286 - AS24	NIOSH 7400 - PCM		8/28/2017
175234 - S3	17050287 - Blank	NIOSH 7400 - PCM		8/28/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Hillarie Sales
Analyst

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 175234 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 175234R01
Date Received: 8/28/2017

Analyst: HS 8/28/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050285	AS24	3412.7	0	100	< 7.0	< 0.001	0 - 0.001	0.001
S2	17050286	AS24	3239.6	2	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050287	Blank	0	4	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	**Low Fibs = 5-20 Flds = 100**	**Med Fibs=>20-50 Flds = 100**	**High Fibs=>50 Flds = 100**
TH	0.67	0.54	0.76
SG	0.54	0.38	0.66
PK	0.54	0.47	0.77
HS	0.57	0.38	0.9
LAB	**0.58**	**0.44**	**0.77**

Graticule Area	
Graticule Area	**Date Meas.**
0.00769	8/7/2017

Reviewed by:

X

Hillarie Sales
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

175234

USEPA

DateShipped: 8/25/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-47

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050285	AS24	Asbestos PCM	Air	MCE Cassette	8/25/2017	3412.7	Liters	346	9.8633	L/min
	17050286	AS25	Asbestos PCM	Air	MCE Cassette	8/25/2017	3239.56	Liters	327	9.9069	L/min
	17050287	Blank	Asbestos PCM	Blank	MCE Cassette	8/25/2017		Liters			L/min

Special Instructions: Please proceses these samples within 24hrs. Please send results to sghall@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples	START	16:53 8/25/17	8:00AM 8-28-17		

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 175404 **PDX**

Report Number: 175404R01
Report Date: 9/5/2017

Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-48
PO Number:
Sub Project:
Reference No.:

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
175404 - S1	17050288 - AS24	NIOSH 7400 - PCM		9/5/2017
175404 - S2	17050289 - AS25	NIOSH 7400 - PCM		9/5/2017
175404 - S3	17050290 - Blank	NIOSH 7400 - PCM		9/5/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Hillarie Sales
Analyst

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 175404 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 175404R01
Date Received: 9/5/2017

Analyst: HS 9/5/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050288	AS24	2757.8	4.5	100	< 7.0	< 0.001	0 - 0.002	0.001
S2	17050289	AS25	2803.0	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050290	Blank	0	3	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values

Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.38	0.66
PK	0.54	0.47	0.76
HS	0.56	0.37	0.9
LAB	**0.58**	**0.44**	**0.77**

Graticule Area

Graticule Area	Date Meas.
0.00769	9/1/2017

Reviewed by:

X

Hillarie Sales
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

175404

USEPA

DateShipped: 9/1/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-48

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050288	AS24	Asbestos PCM	Air	MCE Cassette	9/1/2017	2757.75	Liters	272	10.1388	L/min
	17050289	AS25	Asbestos PCM	Air	MCE Cassette	9/1/2017	2803.03	Liters	279	10.0467	L/min
	17050290	Blank	Asbestos PCM	Blank	MCE Cassette	9/1/2017		Liters			L/min

Special Instructions: Please proceses these samples within 24hrs. Please send results to sghall@ene.com

rlocke@ene.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	9/1/17	Labcor PDX	9/5/17 8:00am	GOOD.

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Analysis Report Cover

Final Report

Asbestos and Environmental Analysis

Phone: (503) 224-5055
http://www.labcorpdx.net

Job Number: 175540 PDX
Client: Ecology & Environment, Inc.
Address: 720 Third Ave
Suite 1700
Seattle, WA 98104
Project Name: 10QD
Project No.: PDX-49
PO Number:
Sub Project:
Reference No.:

Report Number: 175540R01
Report Date: 9/11/2017

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Sample #	Client Sample # and Description	Analysis	Analysis Notes	Date Received:
175540 - S1	17050293 - Blank	NIOSH 7400 - PCM		9/8/2017
175540 - S2	17050291 - AS24	NIOSH 7400 - PCM		9/8/2017
175540 - S3	17050292 - AS25	NIOSH 7400 - PCM		9/8/2017

NIOSH 7400 - PCM: Preparation and analysis of the above samples was conducted in accordance with the NIOSH 7400 method dated August 15th, 1994. Phase contrast microscopy (PCM) analysis was conducted on air samples collected on mixed cellulose ester (MCE) filters. Samples are placed on a glass slide and exposed to hot acetone vapor until the filter material is completely collapsed. Approximately 0.02ml of Triacetin is placed on the collapsed filter and sealed with a 22mm cover slip. PCM analysis is then performed using a calibrated Olympus BHTU BH-2 phase contrast microscope with a Walton Beckett Graticule.

Disclaimer: The results reported relate only to the samples tested or analyzed; the laboratory is not responsible for data collected by personnel who are not affiliated with the laboratory. Results reported in both structures/cm3 and structures/mm2 are dependent on the sample volume and area. These parameters are measured and recorded by non-laboratory personnel and are not covered by the laboratory's accreditation. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor Portland, Inc. the opportunity to provide you with the analytical services.

Sincerely,

X

Paulina Kho
Analyst

LabCor Portland Inc

Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 175540 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 175540R01
Date Received: 9/8/2017

Analyst: PK 9/11/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050293	Blank	0	3	100	< 7.0			
S2	17050291	AS24	2524.7	2.5	100	< 7.0	< 0.001	0 - 0.001	0.001
S3	17050292	AS25	3004.7	1.5	100	< 7.0	< 0.001	0 - 0.001	0.001
B1	Blank		0	0	100	< 7.0			

IntraLab R Values

Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.38	0.66
PK	0.54	0.47	0.76
HS	0.56	0.37	0.88
LAB	**0.58**	**0.44**	**0.77**

Graticule Area

Graticule Area	Date Meas.
0.00769	9/1/2017

Reviewed by:

X

Paulina Kho
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

175540

USEPA

DateShipped: 9/8/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone:

No: PDX-49

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050293	Blank	Asbestos PCM	Blank	MCE Cassette	9/8/2017		Liters			L/min
	17050291	AS24	Asbestos PCM	Air	MCE Cassette	9/8/2017	2524.73	Liters	254	9.9399	L/min
	17050292	AS25	Asbestos PCM	Air	MCE Cassette	9/8/2017	3004.75	Liters	297	10.117	L/min

Special Instructions: Please proceses these samples within 24hrs. Please send results to sghall@ene.com	
rlocke@ene.com	SAMPLES TRANSFERRED FROM
	CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sample drop-off	[signature] E&E/START	9-8-17 15:15	[signature] LabCor, PDX	9/8/17 3:11pm	good

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 15, 2017

TO: Brad Martin, START-IV Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Asbestos Data Quality Assurance Review, River Street Warehouse Fire Site, Portland, Oregon**

REF: TDD: 17-05-0003 PAN: 1004530.0004.188.02

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Fire site in Portland, Oregon, has been completed. Phase contract microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by Lab/Cor, Inc., Portland, Oregon. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050294 17050295 17050296

Data Qualifications:

The samples were collected on September 14, 2017, and were analyzed by September 15, 2017. There were no detections in the filter blank or in the laboratory blank.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

LabCor Portland Inc
Lab/Cor Portland, Inc.
4321 SW Corbett Ave., Ste A
Portland, OR 97239

Final Report

Phone: (503) 224-5055
http://www.labcorpdx.net

Asbestos and Environmental Analysis

NIOSH 7400 - PCM

Job Number: 175677 **PDX**
Client: Ecology & Environment, Inc.
Project Name: 10QD

Report Number: 175677R01
Date Received: 9/14/2017

Analyst: PK 9/15/2017

Lab/Cor Sample No.	Client Sample No.	Description	Volume (L)	[1]Total Adj. Fibers	Total Fields	[3]Density (Fibers/mm2)	Concen-tration (Fibers/cc)	95% Confidence Interval (LCL – UCL)	[2]LOD (Fibers/cc)
S1	17050294	AS24	3085.4	9	100	11.704	0.001	0.001 - 0.003	0.001
S2	17050295	AS25	2971.3	4	100	< 7.0 U	< 0.001 U	0 - 0.002	0.001
S3	17050296	Blank	0	4	100	< 7.0			
B1	Blank		0	0	100	< 7.0			

IntraLab R Values			
Analyst	Low Fibs = 5-20 Flds = 100	Med Fibs=>20-50 Flds = 100	High Fibs=>50 Flds = 100
TH	0.67	0.54	0.76
SG	0.54	0.38	0.66
PK	0.54	0.47	0.76
HS	0.56	0.37	0.88
LAB	**0.58**	**0.44**	**0.77**

Graticule Area	
Graticule Area	Date Meas.
0.00769	9/1/2017

Reviewed by:

x Paulina Kho

Paulina Kho
Analyst

Concentration = (((Total Adj Fibers) * (Filter Area))/ (Number of Fields * Field Area * Volume * 1000))
[1] Net fiber counts after average blank count reduction.
[2] LOD is calculated based on 5.5 fib/ 100 fields as referenced in NIOSH 7402 Method.
[3] Density is reported as <7.0 fib/mm2 when the Total Fiber Cnt. - Avg. Blank Fiber Cnt. is <5.5 fibers

JMW 9-15-17

175677

USEPA

DateShipped: 9/14/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone:

No: PDX-50

Lab: Labcor

Lab Phone: 503-224-5055

Lab Address: 4321 SW Corbett Ave

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050294	AS24	Asbestos PCM	Air	MCE Cassette	9/14/2017	3085.38	Liters	305	10.116	L/min
	17050295	AS25	Asbestos PCM	Air	MCE Cassette	9/14/2017	2971.25	Liters	296	10.038	L/min
	17050296	Blank	Asbestos PCM	Blank	MCE Cassette	9/14/2017		Liters			L/min

Special Instructions: Please proceses these samples within 24hrs. Please send results to sghall@ene.com	
rlocke@ene.com	SAMPLES TRANSFERRED FROM
	CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
3/ to lab	[illegible] E&E	9/14/17/1600	[illegible]	4:21pm 9/14/17	good

I Analytical Data – TCRA Air Sampling

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ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 24, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17090018 17090019 17090020

Data Qualifications:

The samples were collected on September 21, 2017, and were analyzed by September 22, 2017. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041727906
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Mark Woodke Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	**Phone:**	(206) 624-9537
		Fax:	(206) 621-9832
		Received Date:	09/22/2017 9:15 AM
		Analysis Date:	09/22/2017
		Collected Date:	09/21/2017
Project:	Site #: 10QD (BOA)		

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

Sample	*Location*	*Sample Date*	*Volume (liters)*	*Fibers*	*Fields*	*LOD (fib/cc)*	*Fibers/ mm²*	*Fibers/ cc*	*Notes*
17090018	AS26	9/21/2017	3467.25	<5.5	100	0.001	<7.01	<0.001	
041727906-0001									
17090019	AS24	9/21/2017	3483.39	<5.5	100	0.001	<7.01	<0.001	
041727906-0002									
17090020	Blank	9/21/2017	0.00	<5.5	100		<7.01		Field Blank
041727906-0003									

The results reported have been blank corrected as applicable.

Analyst(s):
William Nguyen PCM (3)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

9-24-17

Limit of detection is 7 fibers/mm². Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/22/2017 14:48:25

USEPA
DateShipped: 9/21/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone 206-920-1739

No: PDX-52
Lab. EMSL Analytical Inc
Lab Phone: 856-303-2556
Lab Address. 200 Route 130 North

041727906

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090018	AS26	Asbestos PCM	Air	MCE Cassette	9/21/2017	3467 25	Liters	349	9.9348	L/min
	17090019	AS24	Asbestos PCM	Air	MCE Cassette	9/21/2017	3483.39	Liters	351	9 9242	L/min
	17090020	Blank	Asbestos PCM	Blank	MCE Cassette	9/21/2017		Liters			L/min

RECEIVED SEP 22 2017

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene com, mwoodke@ene.com, rlocke@ene com.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	[signature] START E&E	9/21/17 15:30	Shewlett EMSL	9/22/17 0915	Acceptable

OrderID: 041727906

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: October 9, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17090021 17090022 17090023

Data Qualifications:

The samples were collected on September 22, 2017, and were analyzed by September 25, 2017. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041728009
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Steven Hall Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	**Phone:**	(206) 920-1739
		Fax:	(206) 621-9832
		Received Date:	09/23/2017 10:00 AM
		Analysis Date:	09/25/2017
		Collected Date:	09/22/2017
Project:	Site #10QD - PDX-53 (BOA)		

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

Sample	*Location*	*Sample Date*	*Volume (liters)*	*Fibers*	*Fields*	*LOD (fib/cc)*	*Fibers/ mm²*	*Fibers/ cc*	*Notes*
17090022	AS24	9/22/2017	3691.62	<5.5 U	100	0.001	<7.01 U	<0.001	
041728009-0001									
17090023	Blank	9/22/2017	0.00	<5.5 U	100		<7.01 U		Field Blank
041728009-0002									
17090021	AS26	9/22/2017	3777.61	6	100	0.001	7.64	0.001	
041728009-0003									

The results reported have been blank corrected as applicable.

Analyst(s):

Dave Poltras PCM (3)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

MW 10-9-17

Limit of detection is 7 fibers/mm². Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/25/2017 10:53:13

041728009

USEPA

DateShipped: 9/22/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-53

Lab: EMSL Analytical Inc.

Lab Phone: 856-303-2556

Lab Address: 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090022	AS24	Asbestos PCM	Air	MCE Cassette	9/22/2017	3691.62	Liters	378	9.7662	L/min
	17090023	Blank	Asbestos PCM	Blank	MCE Cassette	9/22/2017		Liters			L/min
	17090021	AS26	Asbestos PCM	Air	MCE Cassette	9/22/2017	3777.61	Liters	379	9.9673	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	[illegible] E & E START	9/22/17 15:30	[illegible] -10A	10A 9-23-17	

OrderID: 041728009

3

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 27, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050303 17090304 17090305

Data Qualifications:

The samples were collected on September 25, 2017, and were analyzed by September 26, 2017. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041728187
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Steven Hall Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	Phone:	(206) 920-1739
		Fax:	(206) 621-9832
		Received Date:	09/26/2017 9:15 AM
		Analysis Date:	09/26/2017
		Collected Date:	09/25/2017
Project:	Site #10QD (BOA)		

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

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm²	Fibers/ cc	Notes
17050303	AS26	9/25/2017	4105.46	6	100	0.001	7.64	0.001	
041728187-0001									
17050304	AS24	9/25/2017	3892.64	8	100	0.001	10.2	0.001	
041728187-0002									
17050305	Blank	9/25/2017	0.00	<5.5 U	100		<7.01 U		Field Blank
041728187-0003									

The results reported have been blank corrected as applicable.

Analyst(s):

Dave Poitras PCM (3)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

MW 9-27-17

Limit of detection is 7 fibers/mm². Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/26/2017 14:30:19

USEPA
DateShipped. 9/25/2017

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

041728187

No: PDX-54
Lab: EMSL Analytical Inc.
Lab Phone 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050303	AS26	Asbestos PCM	Air	MCE Cassette	9/25/2017	4105.46	Liters	409	10.0378	L/min
	17050304	AS24	Asbestos PCM	Air	MCE Cassette	9/25/2017	3892 64	Liters	392	9 9302	L/min
	17050305	Blank	Asbestos PCM	Blank	MCE Cassette	9/25/2017		Liters			L/min

RECEIVED
SEP 26 2017
EMSL INC.

Special Instructions Please process air samples within 24 hrs Please send results to sghall@ene com, mwoodke@ene.com, rlocke@ene.com

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Sampling	E&E (START)	15:09 9/25/17	EMSL	9-26-17 9:15am	Acceptable

(3) AR

OrderID: 041728187

Page 1 Of 1

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 28, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17090024 17090025 17090026 17090027

Data Qualifications:

The samples were collected on September 26, 2017, and were analyzed by September 27, 2017. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

recycled paper

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order: 041728315
Customer ID: ECOL44
Customer PO:
Project ID: BOA

Attention: Steven Hall
Ecology & Environment, Inc.
720 3rd Ave
Suite 1700
Seattle, WA 98104
Project: Site #: 10QD (BOA)

Phone: (206) 920-1739
Fax: (206) 621-9832
Received Date: 09/27/2017 9:11 AM
Analysis Date: 09/27/2017
Collected Date: 09/26/2017

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

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm²	Fibers/ cc	Notes
17090024	AS24	9/26/2017	3913.76	<5.5	100	0.001	<7.01	<0.001	
041728315-0001									
17090025	AS26	9/26/2017	3823.35	<5.5	100	0.001	<7.01	<0.001	
041728315-0002									
17090026	AS15	9/26/2017	3171.80	7	100	0.001	8.92	0.001	
041728315-0003									
17090027	Blank	9/26/2017	0.00	<5.5	100		<7.01		Field Blank
041728315-0004									

The results reported have been blank corrected as applicable.

Analyst(s):
Susan Muir PCM (4)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

MW 9-28-17

Limit of detection is 7 fibers/mm². Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/28/2017 08:41:34

USEPA

DateShipped: 9/26/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-55

Lab EMSL Analytical Inc

Lab Phone: 856-303-2556

Lab Address 200 Route 130 North

041728315

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090024	AS24	Asbestos PCM	Air	MCE Cassette	9/26/2017	3913.76	Liters	388	10 087	L/min
	17090025	AS26	Asbestos PCM	Air	MCE Cassette	9/26/2017	3823.35	Liters	379	10 088	L/min
	17090026	AS15	Asbestos PCM	Air	MCE Cassette	9/26/2017	3171.8	Liters	318	9.9742	L/min
	17090027	Blank	Asbestos PCM	Blank	MCE Cassette	9/26/2017		Liters			L/min

RECEIVED SEP 27 2017 EMSL INC.

Special Instructions Please process air samples within 24 hrs Please send results to sghall@ene com, mwoodke@ene.com, rlocke@ene com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Shipped Samples	[illegible] START E&E	9/26/17 15:00	Shewlett EMSL	09/27/17 0911	Acceptable

OrderID: 041728315

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 28, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 4 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17050310 17050311 17050312 17050313

Data Qualifications:

The samples were collected on September 27, 2017, and were analyzed by September 28, 2017. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041728402
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Steven Hall Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	**Phone:**	(206) 920-1739
		Fax:	(206) 621-9832
		Received Date:	09/28/2017 9:11 AM
		Analysis Date:	09/28/2017
		Collected Date:	09/27/2017
Project:	Site: 10QD (BOA)		

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

Sample	*Location*	*Sample Date*	*Volume (liters)*	*Fibers*	*Fields*	*LOD (fib/cc)*	*Fibers/ mm²*	*Fibers/ cc*	*Notes*
17050310	AS26	9/27/2017	5266.32	<5.5 U	100	0.001	<7.01 U	<0.001	
041728402-0001									
17050311	AS24	9/27/2017	5074.98	<5.5 U	100	0.001	<7.01 U	<0.001	
041728402-0002									
17050312	AS15	9/27/2017	5150.38	7	100	0.001	8.92	0.001	
041728402-0003									
17050313	Blank	9/27/2017	0.00	<5.5 U	100		<7.01 U		Field Blank
041728402-0004									

The results reported have been blank corrected as applicable.

Analyst(s):
William Nguyen PCM (4)

Daniel John McDaid for
Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

MW 9-28-17

Limit of detection is 7 fibers/mm². Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/28/2017 14:49:45

USEPA
DateShipped:

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

041728402

No: PDX-56
Lab EMSL Analytical Inc.
Lab Phone: 856-303-2556
Lab Address 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17050310	AS26	Asbestos PCM	Air	MCE Cassette	9/27/2017	5266.32	Liters	532	9.8991	L/min
	17050311	AS24	Asbestos PCM	Air	MCE Cassette	9/27/2017	5074 98	Liters	514	9.8735	L/min
	17050312	AS15	Asbestos PCM	Air	MCE Cassette	9/27/2017	5150 38	Liters	514	10.0202	L/min
	17050313	Blank	Asbestos PCM	Blank	MCE Cassette	9/27/2017		Liters			L/min

RECEIVED
SEP 28 2017
EMSL INC.

Special Instructions: Please process air samples within 24 hrs Please send results to sghall@ene.com, mwoodke@ene.com, rlocke@ene.com.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature]	9/27/17	[signature] EMSL	9/28/17 0911	Acceptable

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: September 29, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 3 air filter/filter blank samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Phase contrast microscopy (PCM) (NIOSH Method 7400) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2B Data Validation Manual Process (S2BVM).

The samples were numbered:

17090028 17090029 17090030 17090031

Data Qualifications:

The samples were collected on September 28, 2017, and were analyzed by September 29, 2017. Samples 17090028 and 17090029 were not analyzed as they had greater than 50% particulate loading. One field blank was submitted. There were no detections in the field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	041728519
Customer ID:	ECOL44
Customer PO:	
Project ID:	BOA

Attention:	Steven Hall Ecology & Environment, Inc. 720 3rd Ave Suite 1700 Seattle, WA 98104	Phone:	(206) 920-1739
		Fax:	(206) 621-9832
		Received Date:	09/29/2017 9:15 AM
		Analysis Date:	09/29/2017
		Collected Date:	09/28/2017
Project:	Site #: 10QD (BOA)		

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

Sample	Location	Sample Date	Volume (liters)	Fibers	Fields	LOD (fib/cc)	Fibers/ mm²	Fibers/ cc	Notes
17090028 *041728519-0001*	AS26	9/28/2017							Overloaded >50% particulate loading
17090029 *041728519-0002*	AS24	9/28/2017							Overloaded >50% particulate loading
17090030 *041728519-0003*	AS15	9/28/2017	4020.40	<5.5 U	100	0.001	<7.01 U	<0.001 U	
17090031 *041728519-0004*	Blank	9/28/2017	0.00	<5.5 U	100		<7.01 U		Field Blank

The results reported have been blank corrected as applicable.

Analyst(s):
William Nguyen PCM (4)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

9-29-17

Limit of detection is 7 fibers/mm², Intra-laboratory Sr values: 5-20 fibers = 0.36, 21-50 fibers = 0.39, 51-100 fibers = 0.22. Inter-laboratory Sr values (Average of EMSL round robin data) = 0.30. 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: 09/29/2017 15:53:10

USEPA

DateShipped: 9/28/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-57

Lab: EMSL Analytical Inc.

Lab Phone: 856-303-2556

Lab Address: 200 Route 130 North

-041728519

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090028	AS26	Asbestos PCM	Air	MCE Cassette	9/28/2017	4047.93	Liters	405	9.9949	L/min
	17090029	AS24	Asbestos PCM	Air	MCE Cassette	9/28/2017	3661.38	Liters	368	9.9494	L/min
	17090030	AS15	Asbestos PCM	Air	MCE Cassette	9/28/2017	4020.4	Liters	400	10.051	L/min
	17090031	Blank	Asbestos PCM	Blank	MCE Cassette	9/28/2017		Liters			L/min

RECEIVED SEP 29 2017 EMSL INC

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, rlocke@ene.com.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples Shipped	[signature] E&E START	9/28/17 15:10	B Beatty emsl 04	9/29/17 915A	acceptable

OrderID: 041728519

ADVANTAGE Environmental INC.

Clean your world.

October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 9/29/2017 START- Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 9/29/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day, was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225A
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 9/29/2017
DATE RECEIVED 9/30/2017
DATE ANALYZED 9/30/2017
DATE REPORTED 10/2/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17090032	9301715	0	100	0/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
170900033	9301716	Air	AS15	8:01 AM	4:30 PM	10.0595	10.0595
170900034	9301717	Air	AS24	7:43 AM	4:16 PM	9.9325	9.9325
170900035	9301718	Air	AS26	7:49 AM	4:23 PM	9.9035	9.9035

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
170900033	9301716	509	10.0595	5120.29	7	100	0	0.0700	8.917	0.0007	1.785	<0.0012	N/A
170900034	9301717	513	9.9325	5095.37	6.5	100	0	0.0650	8.280	0.0006	1.810	<0.0011	N/A
170900035	9301718	514	9.9035	5090.40	8	100	0	0.0800	10.191	0.0008	1.741	<0.0013	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 9/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-58

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	170900033	AS15	Asbestos PCM	Air	MCE Cassette	9/29/2017	5120.29	Liters	509	10.0595	L/min
	170900034	AS24	Asbestos PCM	Air	MCE Cassette	9/29/2017	5095.37	Liters	513	9.9325	L/min
	170900035	AS26	Asbestos PCM	Air	MCE Cassette	9/29/2017	5090.4	Liters	514	9.9035	L/min
	17090032	Blank	Asbestos PCM	Blank	MCE Cassette	9/29/2017		Liters			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature] START	9/30/17	Sidney Carter AEI	9/30/17 8:14	Good/Sealed

ADVANTAGE Environmental INC.

Clean your world.

October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 9/30/2017 START- Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 9/30/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 9/30/2017
DATE RECEIVED 9/30/2017
DATE ANALYZED 9/30/2017
DATE REPORTED 9/30/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17090039	9301711	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17090036	9301712	Air	AS26	7:46 AM	4:47 PM	9.757	9.757
17090037	9301713	Air	AS24	7:55 AM	3:55 PM	9.8792	9.8792
17090038	9301714	Air	AS15	8:08 AM	4:33 PM	9.9502	9.9502

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17090036	9301712	541	9.757	5278.537	7.5	100	0.005	0.0700	8.917	0.0007	1.775	<0.0012	N/A
17090037	9301713	480	9.8792	4742.016	15	100	0.005	0.1450	18.471	0.0015	1.575	<0.0024	N/A
17090038	9301714	505	9.9502	5024.851	8	100	0.005	0.0750	9.554	0.0007	1.741	<0.0013	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 9/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-60

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090036	AS26	Asbestos PCM	Air	MCE Cassette	9/30/2017	5278.54	Liters	541	9.757	L/min
	17090037	AS24	Asbestos PCM	Air	MCE Cassette	9/30/2017	4742.02	Liters	480	9.8792	L/min
	17090038	AS15	Asbestos PCM	Air	MCE Cassette	9/30/2017		Liters			L/min
	17090039	Blank	Asbestos PCM	Air	MCE Cassette	9/30/2017		Liters			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	9/30/17			
		10/2/17			

USEPA

DateShipped: 9/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-60

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090036	AS26	Asbestos PCM	Air	MCE Cassette	9/30/2017	5278.54	Liters	541	9.757	L/min
	17090037	AS24	Asbestos PCM	Air	MCE Cassette	9/30/2017	4742.02	Liters	480	9.8792	L/min
	17090038	AS15	Asbestos PCM	Air	MCE Cassette	9/30/2017		Liters			L/min
	17090039	Blank	Asbestos PCM	Air	MCE Cassette	9/30/2017		Liters			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	9/30/17			
		10/2/17			

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: November 2, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 air filter samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) asbestos analyses were performed by EMSL, Inc., Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 1 Data Validation Manual Process (S1VM).

The samples were numbered: 17090028 17090029

Data Qualifications:

The samples were collected on September 28, 2017, and were analyzed by October 6, 2017. There were no detections in the ashing blank, filtration blank, or field blank analyses.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

version
AirDustTEM_v1
5i-DRAFT

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_17090028_10-06-17_041728519_Air__TEM_IA.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	Air	**Lab Sample Number**	041728519-0001	**Effective filter area (mm2)**	365
Sample Type	Field Sample	**Client Sample Number**	17090028	**F-factor**	1.00E+00
Air Volume (L)	4047.93	**Preparation**	Indirect - Ashed	**Grid opening area (mm2)**	0.0128
QA Sample Type	Not QC	**Analysis Date**	10/6/2017	**# GOs counted High Magnification**	8
Sample Status	Analyzed	**Method SOP**	Modified ISO 13794	**# GOs counted Low Magnification**	0
Maximum Area Examined				**# GOs counted High + Low Magnification**	8
High Magnification	1.0E-01				
Low Magnification	0.0E+00				
				Sensitivity (1/cc)	
Stopping Rule(s):	Max Area = N/A, Structures = n/a, Sensitivity = 1.00E-03			**Total Asbestos**	0.0008803
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			**PCME/User Defined**	0.0008803

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	0	0.0E+00	0.0E+00	< 2.6E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	< 2.6E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.6E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.6E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.6E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.6E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.6E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.6E-03
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	0.0E+00	< 2.6E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	< 2.6E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.6E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.6E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.6E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.6E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.6E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.6E-03

Binning Rule Description:

Apply to fibers (F) only:

L ≥ 0.5µm, AR ≥ 3:1

No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	1.0E+00

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0

L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	–

[redacted]

(a) Based on countable structures only.

(b) Loading on Filter (s/mm^2) = 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).

(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.

(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

MW 11-2-17

version
AirDustTEM_v1
5i-DRAFT

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_17090029_10-06-17_041728519_Air__TEM_IA.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	Air	**Lab Sample Number**	041728519-0002	**Effective filter area (mm2)**	365
Sample Type	Field Sample	**Client Sample Number**	17090029	**F-factor**	1.00E+00
Air Volume (L)	3661.38	**Preparation**	Indirect - Ashed	**Grid opening area (mm2)**	0.0128
QA Sample Type	Not QC	**Analysis Date**	10/6/2017	**# GOs counted High Magnification**	8
Sample Status	Analyzed	**Method SOP**	Modified ISO 13794	**# GOs counted Low Magnification**	0
Maximum Area Examined				**# GOs counted High + Low Magnification**	8
High Magnification	1.0E-01				
Low Magnification	0.0E+00			**Sensitivity (1/cc)**	
Stopping Rule(s):	Max Area = N/A, Structures = n/a, Sensitivity = 1.00E-03			**Total Asbestos**	0.0009733
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			**PCME/User Defined**	0.0009733

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	3	2.9E+01	2.9E-03	< 7.5E-03
Total Chrysotile (CH)	3	2.9E+01	2.9E-03	< 7.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.9E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.9E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.9E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.9E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.9E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.9E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.9E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.9E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.9E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.9E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.9E-03
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	0.0E+00	< 2.9E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	< 2.9E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.9E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.9E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.9E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.9E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.9E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.9E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.9E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.9E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.9E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.9E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.9E-03

Binning Rule Description:

Apply to fibers (F) only:

L ≥ 0.5µm, AR ≥ 3:1

No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	6.6E-01

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0

L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	--

[redacted]

(a) Based on countable structures only.

(b) Loading on Filter (s/mm^2) = 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).

(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.

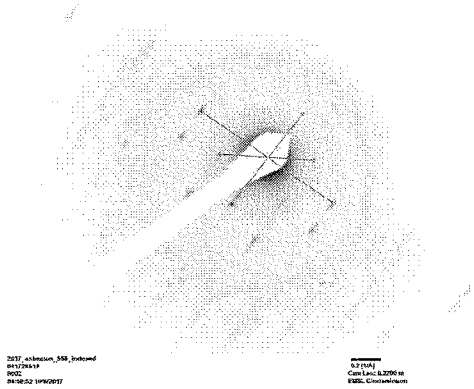
(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

JMW 11-2-17

SAED INDEXING FORM

EMSL Order Number: 041728519 **Date:** 10/6/2017
Image Number: 2017_asbestos_555
Reference/Sample Number: 0002
Preliminary ID: Chrysotile
Camera Constant: 796 **Å Pixels**
Calibration Reference: Au Ring

	Measured	Reference	-5%	+5%
Inter-row Spacing:	5.46	5.3	5.04	5.57
d2 or hk0 (Camera K/zero row dist.):	7.50	7.32	6.95	7.69
d1 or hkl (Camera K/slant vector dist.):	4.56	4.58	4.35	4.81
Ratio of hk0/hkl:	1.64			
Vector Angle:	58.6	60	57.0	63.0



From SAED Reference Book, 'unknown' diffraction
pattern was found to be that of: Chrysotile
With a Zone Axis of: 1 1 0
Indexed by: W. Nguyen
Preliminary Identification was: _X__ CORRECT
____ INCORRECT

EMSL Analytical 200 Rt 130 North, Cinnaminson, NJ 08077
TEL: (800) 220-3675 FAX: (856) 786-5974
www.EMSL.com

MW 11-2-17

Morphology Report

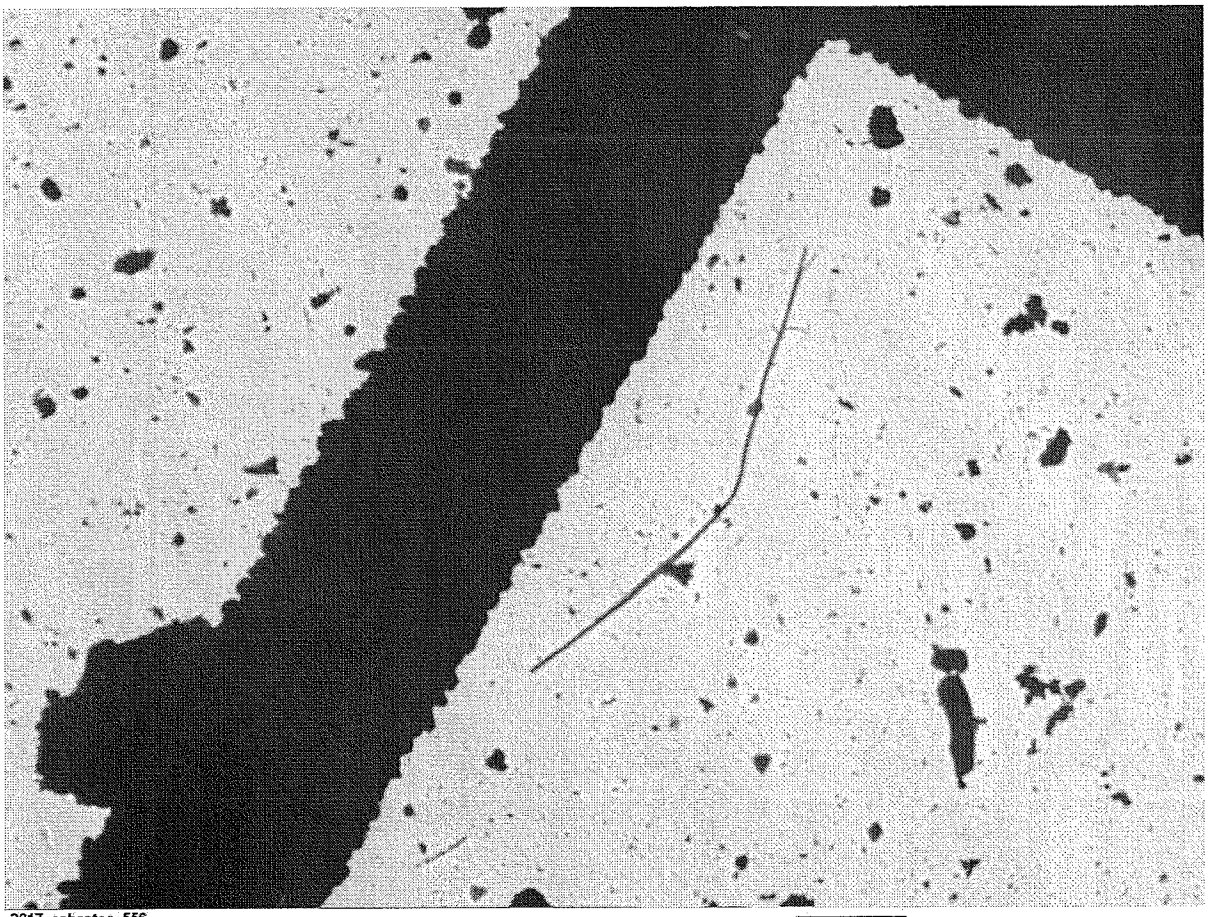
EMSL ANALYTICAL, INC.

EMSL Order Number: 041728519 **Date:** 10-6-17

Reference/Sample Number: 0002

Image Number: 2017_04-05_041728519-0002_STR_1_ASBESTOS_2017_MG_556

Fiber Type: Chrysotile **Magnification:** 0.36 k



MW 11-2-17

version
AirDustTEM_v1
5i-DRAFT

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_Ashing Blank_10-06-17_041728519_TEM_IA_LB.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	N/A	**Lab Sample Number**	041728519 AB	**Effective filter area (mm2)**	365
Sample Type	Lab QC	**Client Sample Number**	Ashing Blank	**F-factor**	1.00E+00
		Preparation	Indirect - Ashed	**Grid opening area (mm2)**	0.0128
QA Sample Type	LB	**Analysis Date**	10/6/2017	**# GOs counted High Magnification**	8
Sample Status	Analyzed	**Method SOP**	Modified ISO 13794	**# GOs counted Low Magnification**	0
Maximum Area Examined				**# GOs counted High + Low Magnification**	8
High Magnification	1.0E-01				
Low Magnification	0.0E+00				
				Sensitivity (1/cc)	
Stopping Rule(s):	Max Area = N/A, Structures = n/a, Sensitivity = 1.00E-03			**Total Asbestos**	blank
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			**PCME/User Defined**	blank

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5µm, AR ≥ 3:1
No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	1.0E+00

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0
L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	–

[redacted]

(a) Based on countable structures only.
(b) Loading on Filter (s/mm^2) = 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).
(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.
(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

JMW 11-2-17

version
AirDustTEM_v1
5i-DRAFT

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_Filtration Blank_10-06-17_041728519_TEM_D_LB.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	N/A	**Lab Sample Number**	041728519 FB	**Effective filter area (mm2)**	385
Sample Type	Lab QC	**Client Sample Number**	Filtration Blank	**F-factor**	1.00E+00
		Preparation	Direct	**Grid opening area (mm2)**	0.0128
QA Sample Type	LB	**Analysis Date**	10/6/2017	**# GOs counted High Magnification**	8
Sample Status	Analyzed	**Method SOP**	Modified ISO 13794	**# GOs counted Low Magnification**	0
Maximum Area Examined				**# GOs counted High + Low Magnification**	8
High Magnification	1.0E-01				
Low Magnification	0.0E+00				
				Sensitivity (1/cc)	
Stopping Rule(s):	Max Area = N/A, Structures = n/a, Sensitivity = 1.00E-03			**Total Asbestos**	blank
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			**PCME/User Defined**	blank

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5µm, AR ≥ 3:1
No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	1.0E+00

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0
L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	–

[redacted]

(a) Based on countable structures only.
(b) Loading on Filter (s/mm^2) = 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).
(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.
(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

11-2-17

Date Printed: 11/2/2017
Time Printed: 11:57 AM

version
AirDustTEM_v1
5i-DRAFT

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_Hood Blank_10-06-17_041728519_TEM_D_LB.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	N/A	Lab Sample Number	041728519 HB	Effective filter area (mm2)	385
Sample Type	Lab QC	Client Sample Number	Hood Blank	F-factor	1.00E+00
		Preparation	Direct	Grid opening area (mm2)	0.0128
QA Sample Type	LB	Analysis Date	10/6/2017	# GOs counted High Magnification	8
Sample Status	Analyzed	Method SOP	Modified ISO 13794	# GOs counted Low Magnification	0
Maximum Area Examined				# GOs counted High + Low Magnification	8
High Magnification	1.0E-01				
Low Magnification	0.0E+00				
				Sensitivity (1/cc)	
Stopping Rule(s):	Max Area = N/A, Structures = n/a, Sensitivity = 1.00E-03			Total Asbestos	blank
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			PCME/User Defined	blank

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	blank	blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank
Total Amphibole	0	0.0E+00	blank	blank
actinolite (AC)	0	0.0E+00	blank	blank
amosite (AM)	0	0.0E+00	blank	blank
anthophyllite (AN)	0	0.0E+00	blank	blank
crocidolite (CR)	0	0.0E+00	blank	blank
tremolite (TR)	0	0.0E+00	blank	blank
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	blank	blank
other amphibole (OA)	0	0.0E+00	blank	blank
Solid Soln: Amosite	0	0.0E+00	blank	blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank
other mineral class (OM)	0	0.0E+00	blank	blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5µm, AR ≥ 3:1
No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	1.0E+00

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0
L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	–

(a) Based on countable structures only.
(b) Loading on Filter (s/mm^2) = 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).
(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.
(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

11-2-17

USEPA

DateShipped: 9/28/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-57

Lab: EMSL Analytical Inc.

Lab Phone: 856-303-2556

Lab Address: 200 Route 130 North

-041728519

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17090028	AS26	Asbestos PCM	Air	MCE Cassette	9/28/2017	4047.93	Liters	405	9.9949	L/min
	17090029	AS24	Asbestos PCM	Air	MCE Cassette	9/28/2017	3661.38	Liters	368	9.9494	L/min
	17090030	AS15	Asbestos PCM	Air	MCE Cassette	9/28/2017	4020.4	Liters	400	10.051	L/min
	17090031	Blank	Asbestos PCM	Blank	MCE Cassette	9/28/2017		Liters			L/min

RECEIVED SEP 29 2017 EMSL INC

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, rlocke@ene.com.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples Shipped	[signature] E&E START	9/28/17 15:10	B Beatty emsl 04	9/29/17 915A	acceptable

OrderID: 041728519

ADVANTAGE Environmental INC.

Clean your world.

October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/02/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/02/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/2/2017
DATE RECEIVED 10/2/2017
DATE ANALYZED 10/2/2017
DATE REPORTED 10/3/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100004	10021715	0	100	0/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100001	10021716	Air	AS24	8:49 AM	3:46 PM	9.9312	9.9312
17100002	10021717	Air	AS26	9:06 AM	3:55 PM	9.8698	9.8698
17100003	10021718	Air	AS15	9:22 AM	4:22 PM	9.8821	9.8821

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100001	10021716	417	9.9312	4141.31	11	100	0	0.1100	14.013	0.0013	1.655	<0.0022	N/A
17100002	10021717	409	9.8698	4036.75	8.5	100	0	0.0850	10.828	0.0010	1.720	<0.0018	N/A
17100003	10021718	420	9.8821	4150.48	6.5	100	0	0.0650	8.280	0.0008	1.810	<0.0014	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/2/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-61

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17100001	AS24	Asbestos PCM	Air	MCE Cassette	10/2/2017	4141.31	Liters	417	9.9312	L/min
	17100002	AS26	Asbestos PCM	Air	MCE Cassette	10/2/2017	4036.75	Liters	409	9.8698	L/min
	17100003	AS15	Asbestos PCM	Air	MCE Cassette	10/2/2017	4150.48	Liters	420	9.8821	L/min
	17100004	Blank	Asbestos PCM	Air	MCE Cassette	10/2/2017		Liters			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
drop-off Samples	[illegible] E&E START	10/2/17 17:00			
	[illegible]	10/3/17			

ADVANTAGE Environmental INC.

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October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/03/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/03/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/3/2017
DATE RECEIVED 10/3/2017
DATE ANALYZED 10/3/2017
DATE REPORTED 10/6/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100008	10031713	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100005	10031714	Air	AS24	8:16 AM	11:45 AM	10.0581	10.0581
17100006	10031715	Air	AS26	8:23 AM	3:51 PM	10.0815	10.0815
17100007	10031716	Air	AS15	8:34 AM	3:39 PM	10.2365	10.2365

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100005	10031714	209	10.0581	2102.143	8	100	0.01	0.0700	8.917	0.0016	1.741	<0.0028	N/A
17100006	10031715	448	10.0815	4516.512	9.5	100	0.01	0.0850	10.828	0.0009	1.690	<0.0016	N/A
17100007	10031716	425	10.2365	4350.513	6.5	100	0.01	0.0550	7.006	0.0006	1.810	<0.0011	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/3/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-62

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17100005	AS24	Asbestos PCM	Air	MCE Cassette	10/3/2017	4314.92	Liters	429	10.0581	L/min
	17100006	AS26	Asbestos PCM	Air	MCE Cassette	10/3/2017	4314.88	Liters	428	10.0815	L/min
	17100007	AS15	Asbestos PCM	Air	MCE Cassette	10/3/2017	4350.51	Liters	425	10.2365	L/min
	17100008	Blank	Asbestos PCM	Air	MCE Cassette	10/3/2017		Liters			L/min

Special Instructions: Please process air samples within 24-48 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
drop-off samples	[illegible] E&E/START	10/3/17 17:00			

ADVANTAGE Environmental INC.

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October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/04/2017 START- Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/04/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/4/2017
DATE RECEIVED 10/4/2017
DATE ANALYZED 10/4/2017
DATE REPORTED 10/6/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100013	10041711	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100009	10041712	Air	AS24a	8:46 AM	11:45 AM	10.2185	10.218
17100010	10041713	Air	AS26	8:57 AM	3:44 PM	10.0727	10.0727
17100011	10041714	Air	AS15	9:11 AM	3:56 PM	10.148	10.148
17100012	10041715	Air	AS24b	11:48 AM	3:39 PM	10.0159	10.0159

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100009	10041712	179	10.21825	1829.067	8	100	0.005	0.0750	9.554	0.0020	1.741	<0.0035	N/A
17100010	10041713	407	10.0727	4099.589	14	100	0.005	0.1350	17.197	0.0016	1.590	<0.0026	N/A
17100011	10041714	405	10.148	4109.94	16	100	0.005	0.1550	19.745	0.0018	1.550	<0.0029	N/A
17100012	10041715	231	10.0159	2313.673	7.5	100	0.005	0.0700	8.917	0.0015	1.775	<0.0026	NA

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/4/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-63

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17100009	AS24a	Asbestos PCM	Air	MCE Cassette	10/4/2017	1829.11	Liters	179	10.2185	L/min
	17100010	AS26	Asbestos PCM	Air	MCE Cassette	10/4/2017	4099.59	Liters	407	10.0727	L/min
	17100011	AS15	Asbestos PCM	Air	MCE Cassette	10/4/2017	4109.94	Liters	405	10.148	L/min
	17100012	Blank	Asbestos PCM	Air	MCE Cassette	10/4/2017		Liters			L/min
	17100013	AS24b	Asbestos PCM	Air	MCE Cassette	10/4/2017	2313.67	Liters	231	10.0159	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
drop-off Samples	[illegible] E&E START	10/4/17 17:00			

ADVANTAGE Environmental INC.

Clean your world.

October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/05/2017 Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/05/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
One blank submitted with this set of samples. Per NIOSH 7400 method, minimum of 2 Blanks or 10% whichever is greater are to be submitted with each sample set.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/5/2017
DATE RECEIVED 10/5/2017
DATE ANALYZED 10/5/2017
DATE REPORTED 10/9/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100018	10051709	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100014	10051710	Air	AS24a	8:08 AM	12:30 PM	10.0595	10.595
17100015	10051711	Air	AS26	8:33 AM	3:58 PM	10.1065	10.1065
17100016	10051712	Air	AS15	8:54 AM	4:04 PM	10.2255	10.2255
17100017	10051713	Air	AS24b	12:32 PM	3:59 PM	10.0895	10.895

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100014	10051710	262	10.32725	2705.74	9.5	100	0.0075	0.0875	11.146	0.0016	1.690	<0.0027	N/A
17100015	10051711	445	10.1065	4497.393	10	100	0.0075	0.0925	11.783	0.0010	1.670	<0.0017	N/A
17100016	10051712	430	10.2255	4396.965	10.5	100	0.0075	0.0975	12.420	0.0011	1.660	<0.0018	N/A
17100017	10051713	207	10.49225	2171.896	13	100	0.0075	0.1225	15.605	0.0028	1.610	<0.0045	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/5/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-64

Lab: Advanced Environmental

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17100014	AS24a	Asbestos PCM	Air	MCE Cassette	10/5/2017	2635.59	Liters	262	10.0595	L/min
	17100015	AS26	Asbestos PCM	Air	MCE Cassette	10/5/2017	4497.39	Liters	445	10.1065	L/min
	17100016	AS15	Asbestos PCM	Air	MCE Cassette	10/5/2017	4396.97	Liters	430	10.2255	L/min
	17100017	AS24b	Asbestos PCM	Air	MCE Cassette	10/5/2017	1886.74	Liters	187	10.0895	L/min
	17100018	Blank	Asbestos PCM	Air	MCE Cassette	10/5/2017		Liters			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[illegible] E&E START	10/5/17 17:00			

ADVANTAGE Environmental INC.

Clean your world.

October 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/06/2017 Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal & Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below PELs and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/6/2017
DATE RECEIVED 10/6/2017
DATE ANALYZED 10/6/2017
DATE REPORTED 10/9/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100023	10061716	1	100	1/100
17100024	10061717	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100019	10061718	Air	AS24a	8:11 AM	12:09 PM	10.0435	10.0435
17100020	10061719	Air	AS26	8:23 AM	3:31 PM	10.2245	10.2245
17100021	10061720	Air	AS15	8:33 AM	3:38 PM	10.2135	10.2135
17100022	10061721	Air	AS24b	12:13 PM	3:20 PM	10.149	10.149

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100019	10061718	238	10.0435	2390.35	9.5	100	0.0075	0.0875	11.146	0.0018	1.690	<0.0030	N/A
17100020	10061719	428	10.2245	4376.09	10	100	0.0075	0.0925	11.783	0.0010	1.670	<0.0017	N/A
17100021	10061720	425	10.2135	4340.74	10.5	100	0.0075	0.0975	12.420	0.0011	1.660	<0.0018	N/A
17100022	10061721	187	10.149	1897.86	13	100	0.0075	0.1225	15.605	0.0032	1.610	<0.0051	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/6/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-65

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Volume	Vol Units	Total_Time	Avg_Flow	Flow_Units
	17100019	AS24a	Asbestos PCM	Air	MCE Cassette	10/6/2017	2390.35	Liters	238	10.0435	L/min
	17100020	AS26	Asbestos PCM	Air	MCE Cassette	10/6/2017	4376.09	Liters	428	10.2245	L/min
	17100021	AS15	Asbestos PCM	Air	MCE Cassette	10/6/2017	4340.74	Liters	425	10.2135	L/min
	17100022	AS24b	Asbestos PCM	Air	MCE Cassette	10/6/2017	1897.86	Liters	187	10.149	L/min
	17100023	Blank1	Asbestos PCM	Air	MCE Cassette	10/6/2017		Liters			L/min
	17100024	Blank2	Asbestos PCM	Air	MCE Cassette	10/6/2017		Liters			L/min

Start / Stop Times

17100019 : 08:11 - 12:09

17100020 : 08:23 - 15:31

17100021 : 08:33 - 15:38

17100022 : 12:13 - 15:20

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature] E&E START	10/6/17 17:00			

ADVANTAGE Environmental INC.

Clean your world.

October 12, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/07/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/7/2017
DATE RECEIVED 10/10/2017
DATE ANALYZED 10/10/2017
DATE REPORTED 10/11/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100029	10101711	1	100	1/100
17100030	10101712	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100025	10101713	Air	AS24a	8:07 AM	12:12 PM	10.028	10.098
17100026	10101714	Air	AS26	8:23 AM	3:07 PM	10.044	10.242
17100027	10101715	Air	AS15	8:38 AM	3:11 PM	10.018	10.146
17100028	10101716	Air	AS24b	12:14 PM	3:00 PM	10.089	10.236

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100025	10101713	245	10.063	2465.44	8	100	0.01	0.0700	8.917	**0.0014**	1.741	<0.0024	N/A
17100026	10101714	404	10.143	4097.77	11	100	0.01	0.1000	12.739	**0.0012**	1.655	<0.0020	N/A
17100027	10101715	393	10.082	3962.23	9.5	100	0.01	0.0850	10.828	**0.0011**	1.690	<0.0018	N/A
17100028	10101716	166	10.1625	1686.98	10	100	0.01	0.0900	11.465	**0.0026**	1.670	<0.0044	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-66

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100025	AS24a	Asbestos PCM	Air	MCE Cassette	10/7/2017	10.028	10.098	2465.44	Liters	8:07:00 AM	12:12:00 PM	245	10.063	L/min
	17100026	AS26	Asbestos PCM	Air	MCE Cassette	10/7/2017	10.044	10.242	4097.77	Liters	8:23:00 AM	3:07:00 PM	404	10.143	L/min
	17100027	AS15	Asbestos PCM	Air	MCE Cassette	10/7/2017	10.018	10.146	3962.23	Liters	8:38:00 AM	3:11:00 PM	393	10.082	L/min
	17100028	AS24b	Asbestos PCM	Air	MCE Cassette	10/7/2017	10.089	10.236	1686.98	Liters	12:14:00 PM	3:00:00 PM	166	10.1625	L/min
	17100029	Blank1	Asbestos PCM	Air	MCE Cassette	10/7/2017				Liters					L/min
	17100030	Blank2	Asbestos PCM	Air	MCE Cassette	10/7/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[illegible] E&E START	10/7/17 17:00			

ADVANTAGE Environmental INC.

Clean your world.

October 12, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/10/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/10/2017
DATE RECEIVED 10/11/2017
DATE ANALYZED 10/11/2017
DATE REPORTED 10/12/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100034	10111701	0	100	0/100
17100035	10111702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Sidney Carter

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100031	10111703	Air	AS24	7:39 AM	3:56 PM	10.104	10.163
17100032	10111704	Air	AS26	7:45 AM	3:50 PM	9.927	10.226
17100033	10111705	Air	AS15	7:53 AM	4:09 PM	9.945	10.1

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100031	10111703	497	10.1335	5036.35	9	100	0.0025	0.0875	11.146	0.0009	1.705	<0.0015	N/A
17100032	10111704	485	10.0765	4887.103	11.5	100	0.0025	0.1125	14.331	0.0011	1.635	<0.0018	N/A
17100033	10111705	496	10.0225	4971.16	9.5	100	0.0025	0.0925	11.783	0.0009	1.690	<0.0015	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/10/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone:

No: PDX-67

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100035	Blank 2	Asbestos PCM	Air	MCE Cassette	10/10/2017				Liters					L/min
	17100031	AS24	Asbestos PCM	Air	MCE Cassette	10/10/2017	10.104	10.163	5036.35	Liters	7:39:00 AM	3:56:00 PM	497	10.1335	L/min
	17100032	AS26	Asbestos PCM	Air	MCE Cassette	10/10/2017	9.927	10.226	4887.1	Liters	7:45:00 AM	3:50:00 PM	485	10.0765	L/min
	17100033	AS15	Asbestos PCM	Air	MCE Cassette	10/10/2017	9.945	10.1	4971.16	Liters	7:53:00 AM	4:09:00 PM	496	10.0225	L/min
	17100034	Blank 1	Asbestos PCM	Air	MCE Cassette	10/10/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	10:13 10/11/17		10/11/17 8:40am	Good

ADVANTAGE Environmental INC.

Clean your world.

October 12, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/11/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/11/2017
DATE RECEIVED 10/12/2017
DATE ANALYZED 10/12/2017
DATE REPORTED 10/13/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100036	10121701	1	100	1/100
17100038	10121702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100037	10121703	Air	AS24	7:30 AM	4:00 PM	10.13	10.348
17100039	10121704	Air	AS15	7:44 AM	4:08 PM	10.038	10.288
17100040	10121705	Air	AS26	7:37 AM	3:56 PM	9.988	10.268

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100037	10121703	510	10.239	5221.89	11	100	0.0075	0.1025	13.057	0.0010	1.655	<0.0016	N/A
17100039	10121704	504	10.163	5122.152	9.5	100	0.0075	0.0875	11.146	0.0008	1.690	<0.0014	N/A
17100040	10121705	499	10.128	5053.872	15	100	0.0075	0.1425	18.153	0.0014	1.575	<0.0022	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/12/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-68

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100036	Blank 1	Asbestos PCM	Air	MCE Cassette	10/11/2017				Liters					L/min
	17100037	AS24	Asbestos PCM	Air	MCE Cassette	10/11/2017	10.13	10.348	5221.89	Liters	7:30:00 AM	4:00:00 PM	510	10.239	L/min
	17100038	Blank 2	Asbestos PCM	Air	MCE Cassette	10/11/2017									L/min
	17100039	AS15	Asbestos PCM	Air	MCE Cassette	10/11/2017	10.038	10.288	5122.15	Liters	7:44:00 AM	4:08:00 PM	504	10.163	L/min
	17100040	AS26	Asbestos PCM	Air	MCE Cassette	10/11/2017	9.988	10.268	5053.87	Liters	7:37:00 AM	3:56:00 PM	499	10.128	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	16:37 10/11/17			
				10/12/17 2:10pm	

ADVANTAGE Environmental INC.

Clean your world.

October 16, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/12/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/12/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Sample #17100043, not analyzed per START rep request

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/12/2017
DATE RECEIVED 10/13/2017
DATE ANALYZED 10/13/2017
DATE REPORTED 10/13/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100044	10131701	0.5	100	0.5/100
17100045	10131702	0	100	0/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100041	10131703	Air	AS24	7:47 AM	3:55 PM	10.073	9.978
17100042	10131704	Air	AS26	7:58 AM	3:58 PM	10.065	10.065
17100043	10131705	Air	AS15- Per Start Rep-This Sample Not Analyzed	8:07 AM	4:06 PM	9.917	10.17

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100041	10131703	488	10.0255	4892.444	7.5	100	0.0025	0.0725	9.236	0.0007	1.775	<0.0013	N/A
17100042	10131704	480	10.065	4831.2	8	100	0.0025	0.0775	9.873	0.0008	1.741	<0.0014	N/A
17100043	10131705	479	10.0435	4810.837	Sample	Not	Analyzed	N/A	N/A	N/A	N/A	N/A	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/13/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-69

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100041	AS24	Asbestos PCM	Air	MCE Cassette	10/12/2017	10.073	9.978	4892.44	Liters	7:47:00 AM	3:55:00 PM	488	10.0255	L/min
	17100042	AS26	Asbestos PCM	Air	MCE Cassette	10/12/2017	10.065	10.065	4831.2	Liters	7:58:00 AM	3:58:00 PM	480	10.065	L/min
	17100043	AS15	Asbestos PCM	Air	MCE Cassette	10/12/2017	9.917	10.17	4810.84	Liters	8:07:00 AM	4:06:00 PM	479	10.0435	L/min
	17100044	Blank 1	Asbestos PCM	Air	MCE Cassette	10/12/2017				Liters					L/min
	17100045	Blank 2	Asbestos PCM	Air	MCE Cassette	10/12/2017				Liters					L/min

Do not Analyze

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	E3E START	10/12/17 1640		10/13/17 7:30	Good
				10/13/17	

ADVANTAGE Environmental INC.

Clean your world.

October 16, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/13/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/13/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/13/2017
DATE RECEIVED 10/16/2017
DATE ANALYZED 10/16/2017
DATE REPORTED 10/17/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100049	10161701	0.5	100	0.5/100
17100050	10161702	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100046	10161703	Air	AS24	7:42 AM	3:32 PM	10.062	10.309
17100047	10161704	Air	AS26	7:53 AM	3:39 PM	9.953	10.296
17100048	10161705	Air	AS15	8:04 AM	3:46 PM	10.06	10.575

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100046	10161703	470	10.1855	4787.19	9.5	100	0.0075	0.0875	11.146	0.0009	1.690	<0.0015	N/A
17100047	10161704	466	10.1245	4718.02	7.5	100	0.0075	0.0675	8.599	0.0007	1.775	<0.0012	N/A
17100048	10161705	462	10.3175	4766.69	6.5	100	0.0075	0.0575	7.325	0.0006	1.810	<0.0011	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 10/16/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-70

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100046	AS24	Asbestos PCM	Air	MCE Cassette	10/13/2017	10.062	10.309	4787.19	Liters	7:42:00 AM	3:32:00 PM	470	10.1855	L/min
	17100047	AS26	Asbestos PCM	Air	MCE Cassette	10/13/2017	9.953	10.296	4718.02	Liters	7:53:00 AM	3:39:00 PM	466	10.1245	L/min
	17100048	AS15	Asbestos PCM	Air	MCE Cassette	10/13/2017	10.06	10.575	4766.69	Liters	8:04:00 AM	3:46:00 PM	462	10.3175	L/min
	17100049	Blank 1	Asbestos PCM	Air	MCE Cassette	10/13/2017				Liters					L/min
	17100050	Blank 2	Asbestos PCM	Air	MCE Cassette	10/13/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	B2 E3E/START	10-13-17 /1620	[illegible]	10/16/17	

ADVANTAGE Environmental INC.

Clean your world.

October 18, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/16/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area sample were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/16/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Unable to analyze sample 17100053, from Location AS15A-The filter media inside the cassette is damaged/broken.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/16/2017
DATE RECEIVED 10/17/2017
DATE ANALYZED 10/17/2017
DATE REPORTED 10/18/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100054	10171701	0.5	100	0.5/100
17100055	10171702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100057	10171703	Air	AS15b	12:31 PM	4:51 PM	9.35	9.354
17100056	10171704	Air	AS24b	12:07 PM	5:00 PM	9.978	9.966
17100053	10171705	Air	AS15a-Cassette filter damaged-not analyzed	8:03 AM	12:26 PM	10.118	10.663
17100052	10171706	Air	AS26	7:47 AM	5:04 PM	10.067	10.428
17100051	10171707	Air	AS24a	7:34 AM	12:00 PM	10.051	10.196

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100057	10171703	260	9.352	2431.52	11.5	100	0.005	0.1100	14.013	0.0022	1.635	<0.0036	N/A
17100056	10171704	293	9.972	2921.80	6	100	0.005	0.0550	7.006	0.0009	1.839	<0.0017	N/A
17100053	10171705	Sample	Not	Analyzed	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17100052	10171706	557	10.2475	5707.86	9	100	0.005	0.0850	10.828	0.0007	1.705	<0.0012	N/A
17100051	10171707	266	10.1235	2692.85	10	100	0.005	0.0950	12.102	0.0017	1.670	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-71

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100057	AS15b	Asbestos PCM	Air	MCE Cassette	10/16/2017	9.35	9.354	2431.52	Liters	12:31:00 PM	4:51:00 PM	260	9.352	L/min
	17100056	AS24b	Asbestos PCM	Air	MCE Cassette	10/16/2017	9.978	9.966	2921.8	Liters	12:07:00 PM	5:00:00 PM	293	9.972	L/min
	17100055	Blank 2	Asbestos PCM	Air	MCE Cassette	10/16/2017									
	17100054	Blank 1	Asbestos PCM	Air	MCE Cassette	10/16/2017									
	17100053	AS15a	Asbestos PCM	Air	MCE Cassette	10/16/2017	10.118	10.663	2732.7	Liters	8:03:00 AM	12:26:00 PM	263	10.3905	L/min
	17100052	AS26	Asbestos PCM	Air	MCE Cassette	10/16/2017	10.067	10.428	5707.86	Liters	7:47:00 AM	5:04:00 PM	557	10.2475	L/min
	17100051	AS24a	Asbestos PCM	Air	MCE Cassette	10/16/2017	10.051	10.196	2692.85	Liters	7:34:00 AM	12:00:00 PM	266	10.1235	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples		10/16/17		10/17/20	
				10/17/17	

ADVANTAGE Environmental INC.

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October 19, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/17/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/17/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/17/2017
DATE RECEIVED 10/18/2017
DATE ANALYZED 10/18/2017
DATE REPORTED 10/19/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100061	10181704	1	100	1/100
17100062	10181705	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100058	10181706	Area	AS15	7:35 AM	3:25 PM	9.959	10.146
17100059	10181707	Area	AS26	8:01 AM	3:35 PM	10.021	10.264
17100060	10181708	Area	AS24	8:23 AM	3:44 PM	10.054	10.163

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100058	10181706	470	10.0525	4724.68	15	100	0.01	0.1400	17.834	0.0015	1.575	<0.0023	N/A
17100059	10181707	454	10.1425	4604.70	9	100	0.01	0.0800	10.191	0.0009	1.705	<0.0015	N/A
17100060	10181708	441	10.1085	4457.85	10.5	100	0.01	0.0950	12.102	0.0010	1.705	<0.0017	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 10/17/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-72

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100058	AS15	Asbestos PCM	Air	MCE Cassette	10/17/2017	9.959	10.146	4724.68	Liters	7:35:00 AM	3:25:00 PM	470	10.0525	L/min
	17100059	AS26	Asbestos PCM	Air	MCE Cassette	10/17/2017	10.021	10.264	4604.7	Liters	8:01:00 AM	3:35:00 PM	454	10.1425	L/min
	17100060	AS24	Asbestos PCM	Air	MCE Cassette	10/17/2017	10.054	10.163	4457.85	Liters	8:23:00 AM	3:44:00 PM	441	10.1085	L/min
	17100061	Blank 1	Asbestos PCM	Air	MCE Cassette	10/17/2017									
	17100062	Blank 2	Asbestos PCM	Air	MCE Cassette	10/17/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples		10/17/17		10/18 200	Good
		10/18/17			

ADVANTAGE Environmental INC.

Clean your world.

October 20, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/18/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/18/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/18/2017
DATE RECEIVED 10/19/2017
DATE ANALYZED 10/19/2017
DATE REPORTED 10/20/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100066	10191701	0.5	100	0.5/100
17100067	10191702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100063	10191703	Air	AS15	7:55 AM	4:07 PM	10.028	10.142
17100064	10191704	Air	AS24	8:30 AM	3:25 PM	9.959	10.213
17100065	10191705	Air	AS26	8:09 AM	3:55 PM	10.089	10.251

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100063	10191703	492	10.085	4961.82	9.5	100	0.005	0.0900	11.465	0.0009	1.690	<0.0015	N/A
17100064	10191704	415	10.086	4185.69	11	100	0.005	0.1050	13.376	0.0012	1.655	<0.0020	N/A
17100065	10191705	466	10.17	4739.22	10.5	100	0.005	0.1000	12.739	0.0012	1.655	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-73

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100063	AS15	Asbestos PCM	Air	MCE Cassette	10/18/2017	10.028	10.142	4961.82	Liters	7:55:00 AM	4:07:00 PM	492	10.085	L/min
	17100064	AS24	Asbestos PCM	Air	MCE Cassette	10/18/2017	9.959	10.213	4185.69	Liters	8:30:00 AM	3:25:00 PM	415	10.086	L/min
	17100065	AS26	Asbestos PCM	Air	MCE Cassette	10/18/2017	10.089	10.251	4739.22	Liters	8:09:00 AM	3:55:00 PM	466	10.17	L/min
	17100066	Blank 1	Asbestos PCM	Air	MCE Cassette	10/18/2017									
	17100067	Blank 2	Asbestos PCM	Air	MCE Cassette	10/18/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	[illegible], E&B	10/19/17	[illegible]	10/19/17 7:00 10/19/17	Good

ADVANTAGE Environmental INC.

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October 23, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/19/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/19/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/19/2017
DATE RECEIVED 10/20/2017
DATE ANALYZED 10/20/2017
DATE REPORTED 10/23/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100071	10201701	0.5	100	0.5/100
17100072	10201702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100068	10201703	Area	AS15	7:50 AM	3:28 PM	9.969	10.154
17100069	10201704	Area	AS24	9:50 AM	3:44 PM	10.111	10.587
17100070	10201705	Area	AS26	8:03 AM	3:37 PM	10.059	10.257

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100068	10201703	458	10.0615	4608.17	6	100	0.005	0.0550	7.006	0.0006	1.839	<0.0011	N/A
17100069	10201704	354	10.349	3663.55	7.5	100	0.005	0.0700	8.917	0.0009	1.775	<0.0017	N/A
17100070	10201705	454	10.158	4611.73	6	100	0.005	0.0550	7.006	0.0007	1.775	<0.0013	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920–1739

No: PDX-75

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100073	AS15	Asbestos PCM	Air	MCE Cassette	10/20/2017	10.056	10.304	4692.98	Liters	7:42:00 AM	3:23:00 PM	461	10.18	L/min
	17100074	AS24	Asbestos PCM	Air	MCE Cassette	10/20/2017	10.073	10.307	4626.26	Liters	8:07:00 AM	3:41:00 PM	454	10.19	L/min
	17100075	AS26	Asbestos PCM	Air	MCE Cassette	10/20/2017	9.996	10.272	4661.64	Liters	7:53:00 AM	3:33:00 PM	460	10.134	L/min
	17100076	Blank 1	Asbestos PCM	Blank	MCE Cassette	10/20/2017									
	17100077	Blank 2	Asbestos PCM	Air	MCE Cassette	10/20/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	[illegible], E+E	10/21/17	[illegible]	10/21/17 7AM	Good
			[illegible]	10/21/17	

ADVANTAGE Environmental INC.

Clean your world.

October 23, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/20/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/20/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/20/2017
DATE RECEIVED 10/21/2017
DATE ANALYZED 10/21/2017
DATE REPORTED 10/23/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100076	10211701	1	100	1/100
17100077	10211702	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100073	10211703	Area	AS15	7:42 AM	3:23 PM	10.056	10.304
17100074	10211704	Area	AS24	8:07 AM	3:41 PM	10.073	10.307
17100075	10211705	Area	AS26	7:53 AM	3:33 PM	9.996	10.272

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100073	10211703	461	10.18	4692.98	7	100	0.01	0.0600	7.643	0.0006	1.785	<0.0011	N/A
17100074	10211704	454	10.19	4626.26	6	100	0.01	0.0500	6.369	< LOD	1.839	<1.8390	N/A
17100075	10211705	460	10.134	4661.64	5.5	100	0.01	0.0450	5.732	< LOD	1.839	<1.8390	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920–1739

No: PDX-75

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100073	AS15	Asbestos PCM	Air	MCE Cassette	10/20/2017	10.056	10.304	4692.98	Liters	7:42:00 AM	3:23:00 PM	461	10.18	L/min
	17100074	AS24	Asbestos PCM	Air	MCE Cassette	10/20/2017	10.073	10.307	4626.26	Liters	8:07:00 AM	3:41:00 PM	454	10.19	L/min
	17100075	AS26	Asbestos PCM	Air	MCE Cassette	10/20/2017	9.996	10.272	4661.64	Liters	7:53:00 AM	3:33:00 PM	460	10.134	L/min
	17100076	Blank 1	Asbestos PCM	Blank	MCE Cassette	10/20/2017									
	17100077	Blank 2	Asbestos PCM	Air	MCE Cassette	10/20/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	[illegible], E+E	10/21/17	[illegible]	10/21/17 7AM	Good
			[illegible]	10/21/17	

ADVANTAGE Environmental INC.

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October 24, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/21/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/21/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/21/2017
DATE RECEIVED 10/23/2017
DATE ANALYZED 10/23/2017
DATE REPORTED 10/24/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100081	10231701	0.5	100	0.5/100
17100082	10231702	0.5	100	0.5/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100078	10231703	Area	AS15	7:47 AM	2:08 PM	10.066	10.241
17100079	10231704	Area	AS24	8:14 AM	2:24 PM	9.914	10.07
17100080	10231705	Area	AS26	8:00 AM	2:16 PM	9.969	10.144

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100078	10231703	381	10.1535	3868.48	7.5	100	0.005	0.0700	8.917	0.0009	1.775	<0.0016	N/A
17100079	10231704	370	9.992	3697.04	6.5	100	0.005	0.0600	7.643	0.0008	1.810	<0.0014	N/A
17100080	10231705	376	10.0565	3781.24	6.5	100	0.005	0.0600	7.643	0.0008	1.810	<0.0014	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-76

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100078	AS15	Asbestos PCM	Air	MCE Cassette	10/21/2017	10.066	10.241	3868.48	Liters	7:47:00 AM	2:08:00 PM	381	10.1535	L/min
	17100079	AS24	Asbestos PCM	Air	MCE Cassette	10/21/2017	9.914	10.07	3697.04	Liters	8:14:00 AM	2:24:00 PM	370	9.992	L/min
	17100080	AS26	Asbestos PCM	Air	MCE Cassette	10/21/2017	9.969	10.144	3781.24	Liters	8:00:00 AM	2:16:00 PM	376	10.0565	L/min
	17100081	Blank 1	Asbestos PCM	Blank	MCE Cassette	10/21/2017									
	17100082	Blank 2	Asbestos PCM	Blank	MCE Cassette	10/21/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	PJE	10/23/17		10/23/17	

ADVANTAGE Environmental INC.

Clean your world.

October 25, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/23/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/23/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/23/2017
DATE RECEIVED 10/24/2017
DATE ANALYZED 10/24/2017
DATE REPORTED 10/25/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100086	10241701	1	100	1/100
17100087	10241702	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100083	10241703	Area	AS15	7:30 AM	3:35 PM	10.051	10.233
17100084	10241704	Area	AS24	7:47 AM	3:43 PM	9.929	10.209
17100085	10247105	Area	AS26	8:00 AM	3:49 PM	10.038	10.298

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100083	10241703	485	10.142	4918.87	9.5	100	0.01	0.0850	10.828	0.0008	1.690	<0.0014	N/A
17100084	10241704	476	10.069	4792.84	8.5	100	0.01	0.0750	9.554	0.0008	1.720	<0.0013	N/A
17100085	10247105	469	10.168	4768.79	11.5	100	0.01	0.1050	13.376	0.0011	1.635	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/24/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-77

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100083	AS24	Asbestos PCM	Air	MCE Cassette	10/23/2017	10.051	10.233	4918.87	Liters	7:30:00 AM	3:35:00 PM	485	10.142	L/min
	17100084	AS26	Asbestos PCM	Air	MCE Cassette	10/23/2017	9.929	10.209	4792.84	Liters	7:47:00 AM	3:43:00 PM	476	10.069	L/min
	17100085	AS15	Asbestos PCM	Air	MCE Cassette	10/23/2017	10.038	10.298	4768.79	Liters	8:00:00 AM	3:49:00 PM	469	10.168	L/min
	17100086	Blank 1	Asbestos PCM	Blank	MCE Cassette	10/23/2017									
	17100087	Blank 2	Asbestos PCM	Blank	MCE Cassette	10/23/2017									

Special Instructions:

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	E+E/START	10/23/17 1617		10/24/17	

ADVANTAGE Environmental INC.

Clean your world.

October 26, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/24/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/24/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Samples 1700088 & 1710089 were over loaded, and analysis could not be completed.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/24/2017
DATE RECEIVED 10/25/2017
DATE ANALYZED 10/25/2017
DATE REPORTED 10/26/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
1710091	10251701	1	100	1/100
1710092	10251702	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100093	10251703	Area	AS24b	11:16 AM	3:24 PM	10.069	10.209
17100094	10251704	Area	AS26b	11:27 AM	3:32 PM	10.043	10.189
17100088	10251705	Area	AS24a- Unable to complete analyze-sample over loaded	7:43 AM	11:13 AM	10.045	10.187
1710089	10251706	Area	AS15a Unable to complete analyze-sample over loaded	7:53 AM	11:26 AM	9.9774	10.011
1710090	10251707	Area	AS24a	8:14 AM	11:35 AM	9.942	10.111

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100093	10251703	248	10.139	2514.47	12.5	100	0.01	0.1150	14.650	0.0022	1.620	<0.0036	N/A
17100094	10251704	245	10.116	2478.42	11.5	100	0.01	0.1050	13.376	0.0021	1.635	<0.0034	N/A
17100088	10251705	210	10.116	2124.36	Sample	Over	Loaded	N/A	N/A	N/A	N/A	N/A	N/A
1710089	10251706	213	9.9942	2128.76	Sample	Over	Loaded	N/A	N/A	N/A	N/A	N/A	N/A
1710090	10251707	201	10.0265	2015.33	10.5	100	0.01	0.0950	12.102	0.0023	1.660	<0.0038	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/25/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-78

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100093	AS24b	Asbestos PCM	Air	MCE Cassette	10/24/2017	10.069	10.209	2514.47	Liters	11:16:00 AM	3:24:00 PM	248	10.139	L/min
	17100094	AS26b	Asbestos PCM	Air	MCE Cassette	10/24/2017	10.043	10.189	2478.42	Liters	11:27:00 AM	3:32:00 PM	245	10.116	L/min
	17100088	AS24a	Asbestos PCM	Air	MCE Cassette	10/24/2017	10.045	10.187	2124.36	Liters	7:43:00 AM	11:13:00 AM	210	10.116	L/min
	1710089	AS26a	Asbestos PCM	Air	MCE Cassette	10/24/2017	9.9774	10.011	2128.76	Liters	7:53:00 AM	11:26:00 AM	213	9.9942	L/min
	1710090	AS15a	Asbestos PCM	Air	MCE Cassette	10/24/2017	9.942	10.111	2015.33	Liters	8:14:00 AM	11:35:00 AM	201	10.0265	L/min
	1710091	Blank 1	Asbestos PCM	Air	MCE Cassette	10/24/2017									
	1710092	Blank 2	Asbestos PCM	Air	MCE Cassette	10/24/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples		16:13 10/24/17			
				10/25/17	

ADVANTAGE Environmental INC.

Clean your world.

October 27, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/25/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/25/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Samples 1710093 & 1710094 were over loaded, and analysis could not be completed.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/25/2017
DATE RECEIVED 10/26/2017
DATE ANALYZED 10/26/2017
DATE REPORTED 10/27/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
1710096	10261701	0.5	100	0.5/100
1710097	10261702	1	100	1/100

SAMPLES COLLECTED BY: Brittany Train

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
1710093	10261703	Area	AS24 Unable to complete analysis-sample over loaded	7:57 AM	3:42 PM	10.005	10.213
1710094	10261704	Area	AS26 Unable to complete analysis-sample over loaded	8:06 AM	3:47 PM	9.959	10.144
1710095	10261705	Area	AS15	10:00 AM	3:56 PM	9.978	10.287

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
1710093	10261703	465	10.109	4700.69	Sample	Over	Loaded	N/A	N/A	N/A	N/A	N/A	N/A
1710094	10261704	461	10.0515	4633.74	Sample	Over	Loaded	N/A	N/A	N/A	N/A	N/A	N/A
1710095	10261705	356	10.1325	3607.17	8.5	100	0.0075	0.9925	126.433	0.0135	1.720	<0.0232	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 10/26/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-79

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	1710093	AS24	Asbestos PCM	Air	MCE Cassette	10/25/2017	10.005	10.213	4700.69	Liters	7:57:00 AM	3:42:00 PM	465	10.109	L/min
	1710094	AS26	Asbestos PCM	Air	MCE Cassette	10/25/2017	9.959	10.144	4633.74	Liters	8:06:00 AM	3:47:00 PM	461	10.0515	L/min
	1710095	AS15	Asbestos PCM	Air	MCE Cassette	10/25/2017	9.978	10.287	3607.17	Liters	10:00:00 AM	3:56:00 PM	356	10.1325	L/min
	1710096	Blank 1	Asbestos PCM	Air	MCE Cassette	10/25/2017									
	1710097	Blank 2	Asbestos PCM	Air	MCE Cassette	10/25/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	E+E START	10/25/17 1618			
				10/26/7	

ADVANTAGE Environmental INC.

Clean your world.

October 30, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/26/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Anomalies
Chain of custody - missing the following data:
10/26/2017 Sample 17100098-no start time, no stop time, no start LPM, no stop LPM
10/26/2017 Sample 17100099-no start time, no stop time, no start LPM, no stop LPM
10/26/2017 Sample 17100100 no start time, no stop time, no start LPM, no stop LPM

Mixed dates on chain of custody- Blank samples 17100101 & 17100102-dated 10/25

Air Data Results
Due to incomplete chain of custody, laboratory report could not be fully completed.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/26/2017
DATE RECEIVED 10/26/2017
DATE ANALYZED 10/27/2017
DATE REPORTED 10/30/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100101	10271701	0.5	100	0.5/100
17100102	10271702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100098	1027103	Area	AS24	N/A	N/A	N/A	N/A
17100099	1027104	Area	AS26	N/A	N/A	N/A	N/A
17100100	1027105	Area	AS15	N/A	N/A	N/A	N/A

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100098	1027103	N/A	N/A	N/A	16.5	100	0.0075	0.1575	20.064	N/A	N/A	N/A	N/A
17100099	1027104	N/A	N/A	N/A	8.5	100	0.0075	0.0775	9.873	N/A	N/A	N/A	N/A
17100100	1027105	N/A	N/A	N/A	9	100	0.0075	0.0825	10.510	N/A	N/A	N/A	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/27/2017

CHAIN OF CUSTODY RECORD

R10 PDX Combined/OR

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-80

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	17100098	AS24	Asbestos PCM	Air	10/26/2017	1			
	17100099	AS26	Asbestos PCM	Air	10/26/2017	1			
	17100100	AS15	Asbestos PCM	Air	10/26/2017	1			
	17100101	Blank 1	Asbestos PCM	Air	10/25/2017	1	MCE Cassette	None	N
	17100102	Blank 1	Asbestos PCM	Air	10/25/2017	1	MCE Cassette	None	N

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples/analysis	[signature] ETE START	10-26-17/1620			
			[signature]	10/27/17	

ADVANTAGE Environmental INC.

Clean your world.

October 30, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/27/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Anomalies
Chain of custody - missing the following data:
10/27/2017 Sample 17100105-no start time, no stop time, no start LPM, no stop LPM
10/27/2017 Sample 17100106-no start time, no stop time, no start LPM, no stop LPM
10/27/2017 Sample 17100107 no start time, no stop time, no start LPM, no stop LPM
10/27/2017 Sample 17100108-no start time, no stop time, no start LPM, no stop LPM
10/27/2017 Sample 17100109-no start time, no stop time, no start LPM, no stop LPM
10/27/2017 Sample 17100110 no start time, no stop time, no start LPM, no stop LPM

Air Data Results
Due to incomplete chain of custody, laboratory report could not be fully completed.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/27/2017
DATE RECEIVED 10/28/2017
DATE ANALYZED 10/28/2017
DATE REPORTED 10/30/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100111	10281701	0.5	100	0.5/100
17100112	10281702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Pete Coleman

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100105	10281703	Area	AS24a	N/A	N/A	N/A	N/A
17100106	10281704	Area	AS26a	N/A	N/A	N/A	N/A
17100107	10281705	Area	AS15a	N/A	N/A	N/A	N/A
17100108	10281706	Area	AS24b	N/A	N/A	N/A	N/A
17100109	10281707	Area	AS26b	N/A	N/A	N/A	N/A
17100110	10281708	Area	AS15b	N/A	N/A	N/A	N/A

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100105	10281703	N/A	N/A	N/A	10	100	0.005	0.095	12.102	N/A	N/A	N/A	N/A
17100106	10281704	N/A	N/A	N/A	8.5	100	0.005	0.080	10.191	N/A	N/A	N/A	N/A
17100107	10281705	N/A	N/A	N/A	6.5	100	0.005	0.060	7.643	N/A	N/A	N/A	N/A
17100108	10281706	N/A	N/A	N/A	11	100	0.005	0.105	13.376	N/A	N/A	N/A	N/A
17100109	10281707	N/A	N/A	N/A	8	100	0.005	0.075	9.554	N/A	N/A	N/A	N/A
17100110	10281708	N/A	N/A	N/A	7	100	0.005	0.065	8.280	N/A	N/A	N/A	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/28/2017

CHAIN OF CUSTODY RECORD

R10 PDX Combined/OR

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-81

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	17100105	AS24a	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100106	AS26a	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100107	AS15a	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100108	AS24b	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100109	AS26b	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100110	AS15b	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100111	Blank 1	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N
	17100112	Blank 2	Asbestos PCM	Air	10/27/2017	1	MCE Cassette	None	N

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	[illegible] ENE. START	10/27/17 1620	[illegible]	10/28/17 08:25	

ADVANTAGE Environmental INC.

Clean your world.

October 31, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/28/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/28/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/28/2017
DATE RECEIVED 10/30/2017
DATE ANALYZED 10/30/2017
DATE REPORTED 10/31/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100116	10301704	0.5	100	0.5/100
17100117	10301705	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100113	10301706	Area	AS24	7:51 AM	12:06 PM	10	10.003
17100114	10301707	Area	AS26	8:01 AM	12:00 PM	10.123	10.169
17100115	10301708	Area	AS15	8:20 AM	11:49 AM	10.125	10.186

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100113	10301706	255	10.0015	2550.38	9.5	100	0.0075	0.0875	11.146	0.0017	1.690	<0.0028	N/A
17100114	10301707	239	10.146	2424.89	8.5	100	0.0075	0.0775	9.873	0.0016	1.720	<0.0027	N/A
17100115	10301708	209	10.1555	2122.50	7.5	100	0.0075	0.0675	8.599	0.0016	1.775	<0.0028	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

ADVANTAGE Environmental INC.

Clean your world.

November 1, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/30/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/30/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/30/2017
DATE RECEIVED 10/31/2017
DATE ANALYZED 10/31/2017
DATE REPORTED 11/1/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100122	10311708	0.5	100	0.5/100
17100123	10311709	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100120	10311710	Area	AS24b	11:49 AM	3:07 PM	10.02	9.8786
17100121	10311711	Area	AS26b	11:52 AM	3:16 PM	10.018	10.182
17100118	10311712	Area	AS24a	7:30 AM	11:42 AM	10.003	10.219
17100119	10311713	Area	AS26a	7:42 AM	11:49 AM	10.091	10.608

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100120	10311710	198	9.9493	1969.96	7	100	0.005	0.0650	8.280	0.0016	1.785	<0.0029	N/A
17100121	10311711	204	10.1	2060.40	8.5	100	0.005	0.0800	10.191	0.0019	1.720	<0.0033	N/A
17100118	10311712	252	10.111	2547.97	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0022	N/A
17100119	10311713	247	10.3495	2556.33	7.5	100	0.005	0.0700	8.917	0.0013	1.775	<0.0024	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 10/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-83

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100120	AS24b	Asbestos PCM	Air	MCE Cassette	10/30/2017	10.02	9.8786	1969.96	Liters *	11:49:00 AM	3:07:00 PM	198	9.9493	L/min
	17100121	AS26b	Asbestos PCM	Air	MCE Cassette	10/30/2017	10.018	10.182	2060.4	Liters	11:52:00 AM	3:16:00 PM	204	10.1	L/min
	17100118	AS24a	Asbestos PCM	Air	MCE Cassette	10/23/2017	10.003	10.219	2547.97	Liters	7:30:00 AM	11:42:00 AM	252	10.111	L/min
	17100119	AS26a	Asbestos PCM	Air	MCE Cassette	10/30/2017	10.091	10.608	2556.33	Liters	7:42:00 AM	11:49:00 AM	247	10.3495	L/min
	17100122	Blank 1		Air	MCE Cassette	10/30/2017									
	17100123	Blank 2		Air	MCE Cassette	10/30/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	(START)	10/30/17 1552		10/31/17	

ADVANTAGE Environmental INC.

Clean your world.

November 2, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 10/31/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 10/31/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Sample 17100125, collected from location AS26a was damaged (filter media-torn) and could not be analyzed.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 10/31/2017
DATE RECEIVED 11/1/2017
DATE ANALYZED 11/1/2017
DATE REPORTED 11/2/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17100129	11011701	0.5	100	0.5/100
17100130	11011702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17100124	11011703	Area	AS24a	7:48 AM	12:00 PM	10.104	10.011
17100125	11011704	Area	AS26a - Filter media inside cassette damaged	7:59 AM	12:07 PM	10.012	10.048
17100126	11011705	Area	AS15a	8:28 AM	12:17 PM	10.031	10.136
17100127	1101706	Area	AS24b	12:04 PM	3:12 PM	10.041	10.106
17100128	10241707	Area	AS26b	12:10 PM	3:19 PM	10.035	10.137

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17100124	11011703	252	10.0575	2534.49	6.5	100	0.0025	0.0625	7.962	0.0012	1.810	<0.0022	N/A
17100125	11011704	248	10.03	2487.44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17100126	11011705	229	10.0835	2309.12	6	100	0.0025	0.0575	7.325	0.0012	1.839	<0.0022	N/A
17100127	1101706	188	10.0735	1893.82	6.5	100	0.0025	0.0625	7.962	0.0016	1.810	<0.0029	N/A
17100128	10241707	189	10.086	1906.25	7	100	0.0025	0.0675	8.599	0.0017	1.785	<0.0031	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 10/31/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-84

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100124	AS24a	Asbestos PCM	Air	MCE Cassette	10/31/2017	10.104	10.011	2534.49	Liters	7:48:00 AM	12:00:00 PM	252	10.0575	L/min
	17100125	AS26a	Asbestos PCM	Air	MCE Cassette	10/31/2017	10.012	10.048	2487.44	Liters	7:59:00 AM	12:07:00 PM	248	10.03	L/min
	17100126	AS15a	Asbestos PCM	Air	MCE Cassette	10/31/2017	10.031	10.136	2309.12	Liters	8:28:00 AM	12:17:00 PM	229	10.0835	L/min
	17100127	AS24b	Asbestos PCM	Air	MCE Cassette	10/31/2017	10.041	10.106	1893.82	Liters	12:04:00 PM	3:12:00 PM	188	10.0735	L/min
	17100128	AS26b	Asbestos PCM	Air	MCE Cassette	10/31/2017	10.035	10.137	1906.25	Liters	12:10:00 PM	3:19:00 PM	189	10.086	L/min
	17100129	Blank 1			MCE Cassette	10/31/2017									
	17100130	Blank 2			MCE Cassette	10/31/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	(START)	10/31/17		11-1-17	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 4, 2017

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Asbestos Data Quality Assurance Review,**
River Street Warehouse Asbestos Site, Portland, Oregon

REF: TDD: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 air filter sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Transmission electron microscopy (TEM) (ISO Method 10312) asbestos analyses were performed by EMSL Analytical, Inc, Cinnaminson, New Jersey. All sample analyses were evaluated following EPA's Stage 2A Data Validation Manual Process (S2AVM).

The sample was numbered: 17100097

Data Qualifications:

The sample was collected on October 10, 2017, and was analyzed by November 10, 2017. There were no detections in the laboratory blank. All provided instrument sensitivity and calibration information was acceptable. No issues were noted in the case narrative.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result. The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), and the analytical method(s). Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

version
AirDustTEM_v1
5i-DRAFT

10QD [10QD]

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

ANALYTICAL REPORT

FILE NAME: 10QD_EMSL04_17100097_11-10-17_041732497_Air__TEM_D.xlsm

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Media	Air	**Lab Sample Number**	041732497-0001	**Effective filter area (mm2)**	385
Sample Type	Field Sample	**Client Sample Number**	17100097	**F-factor**	1.00E+00
Air Volume (L)	3607.17	**Preparation**	Direct	**Grid opening area (mm2)**	0.0129
QA Sample Type	Not QC	**Analysis Date**	11/10/2017	**# GOs counted High Magnification**	9
Sample Status	Analyzed	**Method SOP**	Modified ISO 10312	**# GOs counted Low Magnification**	0
Maximum Area Examined				**# GOs counted High + Low Magnification**	9
High Magnification	1.2E-01				
Low Magnification	0.0E+00				
				Sensitivity (1/cc)	
Stopping Rule(s):	Max Area = n/a, Structures = n/a, Sensitivity = 1.00E-03			**Total Asbestos**	0.0009193
Recording Rule(s):	Min Aspect Ratio = >= 3:1, Min Length = 0.5µm, Min Width = 0µm			**PCME/User Defined**	0.0009193

Number of Structures with Fatal Data Entry Errors 0 *(Structures with fatal errors are excluded from calculations below)*

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Poisson Confidence Interval for this Sample (d)
Total TEM Structures - based on High Magnification GOs Only				
Total Asbestos	0	0.0E+00	0.0E+00	< 2.8E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	< 2.8E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.8E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.8E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.8E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.8E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.8E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.8E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.8E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.8E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.8E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.8E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.8E-03
PCM Equivalent Structures (PCME) - based on PCME fibers in either High or Low Magnification GOs				
Total Asbestos	0	0.0E+00	0.0E+00	< 2.8E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	< 2.8E-03
Total Amphibole	0	0.0E+00	0.0E+00	< 2.8E-03
actinolite (AC)	0	0.0E+00	0.0E+00	< 2.8E-03
amosite (AM)	0	0.0E+00	0.0E+00	< 2.8E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	< 2.8E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	< 2.8E-03
tremolite (TR)	0	0.0E+00	0.0E+00	< 2.8E-03
winchite/richterite/tremolite/actinolite (WRTA)	0	0.0E+00	0.0E+00	< 2.8E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	< 2.8E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	< 2.8E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	< 2.8E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	< 2.8E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5µm, AR ≥ 3:1
No restrictions for other structure types.

ChiSq test for even filter loading for Total TEM Structures (see Annex F2 in ISO 10312)

p value:	1.0E+00

Filter loading is OK

Binning Rule Description:

Apply to all structures where Total column > 0
L > 5µm, W ≥ 0.25µm and W ≤ 3µm, AR ≥ 3:1

ChiSq test for even filter loading for PCMe Structures (see Annex F2 in ISO 10312)

p value:	--

(a) Based on countable structures only.
(b) Loading on Filter (s/mm^2) = 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).
(d) If the result is shown as '<', the value shown is the one-sided upper 95% confidence limit of the Poisson distribution. For structure counts>30, ISO recommends calculating both Gaussian and Poisson distributions for comparison. NADES calculates only the Poisson.
(e) It is assumed that low magnification analysis is capable of detecting all user-defined structures. If not, the results for user-defined concentrations could be biased low.

FILE NAME: 10QD_EMSL04_17100097_11-10-17_041732497_Air__TEM_D.xlsm

FILE TYPE: Original

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

Site or Project Name:	10QD
State/Federal Site or Project Identifier:	10QD

Site/Project Identifier Code:	10QD

9	Estimated number of GOs required to reach a stopping rule

Laboratory name:	EMSL04
Instrument ID:	JEOL-1200EX (04-03)
Voltage (kV):	100
Magnification: [Enter one or both here (a)]	20000
Grid opening area (mm^2):	0.0129

	High Mag:	Low Mag:
Scale: 1L =	1	1
Scale: 1D =	1	1

Filter Size (mm):	25
Filter Pore Size (um):	0.8
Method:	Modified ISO 10312
Grid Storage Location:	0417-Special Projects-63
Archive filter(s) storage location:	EMSL04

Client Sample Number:	17100097
Date received by lab:	11/9/2017
Lab Job Number:	041732497
Lab Sample Number:	041732497-0001
Chain of Custody Number:	PDX-89

Sample Type:	Field Sample
QC Sample Type:	Not QC
Media:	Air
Air volume (L) or dust area (cm^2):	3607

Number of grids prepared:	4
Prepared by:	J. Barner
Preparation date:	11/10/2017
Preparation Type:	Direct
If sample type = air, is there loose material or debris in the cowl?	No

Primary filter area (mm^2):	385
Secondary Filter Area (mm^2):	
F- factor: [proposed value shown, cell formula can be over-written if neccessary]	1.000
Filter Status:	Analyzed
Analyzed by:	W. Nguyen
Analysis date:	11/10/2017

F-factor Input Parameters:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep o *[For dust, enter 1.0]*
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used 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

V	Grid opening traverse direction

COMMENTS (do not use commas)

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20000x OR 5000x OR 20000/5000x (do not use commas)

☐ Check box if this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates

10QD

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by TEM

FILE NAME: 10QD_EMSL04_17100097_11-10-17_041732497_Air__TEM_D.xlsm

CLIENT SAMPLE NUMBER: 17100097
LAB SAMPLE NUMBER: 041732497-0001

Media: Air
Sample Prep: Direct

Sample Type: Field Sample
QC Sample Type: Not QC
Sample Status: Analyzed
Analysis Date: 11/10/2017

Data Entry by: W. Nguyen
Data Entry Date: 11/10/2017

QA by: M. Smollock
QA Date: 11/15/2017

[illegible]

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification Code (b)	Mineral Type (c)	Other Mineral Description (d)	1 = yes, blank = no			Low Mag (f)	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS		
S1	H6	ND												
S1	D6	ND												
S1	B5	ND												
S2	I6	ND												
S2	D6	ND												
S2	A5	ND												
S3	I6	ND												
S3	E7	ND												
S3	B5	ND												

Structure Sketch Sheet for Direct Data Entry

EMSL Sample ID: 041732497-0001 **Client:** Ecology & Environment

Client Sample: 17100097 Page 1 of 1

Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
ND			
Primary Structure #	Primary Structure #	PrimaryStructure #	Primary Structure #
PrimaryStructure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #

Analyst: WW Date: 11/16/17 Scope: 04/03

200 Route 130 North Cinnaminson, NJ 08077
www.emsl.com

0417324197

USEPA

DateShipped: 11/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-89

Lab: EMSL Analytical Inc.

Lab Phone: 856-303-2556

Lab Address: 200 Route 130 North

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17100097	AS15	Asbestos TEM (TAT 48 hours)	Air	MCE Cassette	10/25/2017	9.978	10.287	3607.17	Liters	10:00:00 AM	3:56:00 PM	356	10.1325	L/min

RECEIVED EMSL CINNAMINSON, NJ 17 NOV -9 AM 9:51

Special Instructions: Please process within 48 hours, or contact us to discuss best possible TAT. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
17100097 TO LAB	Ryan Whitchurch Via FEDEX Region 10 START	11/7/2017 15:50	[illegible]	11-9-17 9am	

10W

OrderID: 041732497

ADVANTAGE Environmental INC.

Clean your world.

November 3, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/01/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/01/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (Start)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/1/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/2/2017
CONTRACTOR	Ecology and Environmental, Inc. (Start)	**REPORT #**	1	**DATE ANALYZED**	11/2/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/3/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110006	11021701	0.5	100	0.5/100
17110007	11021702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110001	11021703	Area	AS24a	7:43 AM	11:18 AM	10.065	9.915
17110002	11021704	Area	AS26a	7:53 AM	11:24 AM	10.033	10.027
17110003	11021705	Area	AS15b	11:35 AM	3:34 PM	10.036	10.064
17110004	11021706	Area	AS24b	11:20 AM	3:22 PM	10.087	10.102
17110005	11021707	Area	AS26b	11:25 AM	3:28 PM	10.054	10.152

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110001	11021703	215	9.99	2147.85	6.5	100	0.005	0.0600	7.643	0.0014	1.810	<0.0025	N/A
17110002	11021704	211	10.03	2116.33	7	100	0.005	0.0650	8.280	0.0015	1.785	<0.0027	N/A
17110003	11021705	239	10.05	2401.95	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A
17110004	11021706	242	10.0945	2442.87	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0022	N/A
17110005	11021707	243	10.103	2455.03	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/1/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steven Hall

Contact Phone: 206-920-1739

No: PDX-85

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110001	AS24a	Asbestos PCM	Air	MCE Cassette	11/1/2017	10.065	9.915	2147.85	Liters	7:43:00 AM	11:18:00 AM	215	9.99	L/min
	17110002	AS26a	Asbestos PCM	Air	MCE Cassette	11/1/2017	10.033	10.027	2116.33	Liters	7:53:00 AM	11:24:00 AM	211	10.03	L/min
	17110003	AS15b	Asbestos PCM	Air	MCE Cassette	11/1/2017	10.036	10.064	2401.95	Liters	11:35:00 AM	3:34:00 PM	239	10.05	L/min
	17110004	AS24b	Asbestos PCM	Air	MCE Cassette	11/1/2017	10.087	10.102	2442.87	Liters	11:20:00 AM	3:22:00 PM	242	10.0945	L/min
	17110005	AS26b	Asbestos PCM	Air	MCE Cassette	11/1/2017	10.054	10.152	2455.03	Liters	11:25:00 AM	3:28:00 PM	243	10.103	L/min
	17110006	Blank 1		Blank	MCE Cassette	11/1/2017									
	17110007	Blank 2		Blank	MCE Cassette	11/1/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	(START)	11/1/17		11-2-17	

ADVANTAGE Environmental INC.

Clean your world.

November 6, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/02/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/02/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
Sample 17110009, collected from location AS26a was damaged (filter media-torn) and could not be analyzed.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/2/2017
DATE RECEIVED 11/3/2017
DATE ANALYZED 11/3/2017
DATE REPORTED 11/6/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110014	11031701	0.5	100	0.5/100
17110015	11031702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection		Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110011	11031703	Area	AS24b		11:59 AM	4:04 PM	9.92	9.96
17110012	11031704	Area	AS26b		12:06 PM	4:22 PM	10.33	10.390
17110013	11031705	Area	AS15b		12:21 PM	4:39 PM	10.09	10.15
17110008	11031706	Area	AS24a		7:31 AM	11:58 AM	10.018	9.91
17110009	11031707	Area	AS26a-Filter media inside cassette damaged		8:02 AM	12:05 PM	10.137	10.16
17110010	11031708	Area	AS15a		7:45 AM	12:19 PM	10.009	9.96

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110011	11031703	245	9.94	2435.30	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0022	N/A
17110012	11031704	256	10.36	2652.16	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0020	N/A
17110013	11031705	258	10.12	2610.96	7	100	0.005	0.0650	8.280	0.0012	1.785	<0.0022	N/A
17110008	11031706	267	9.964	2660.39	7.5	100	0.005	0.0700	8.917	0.0013	1.775	<0.0023	N/A
17110009	11031707	243	10.1485	2466.09	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17110010	11031708	274	9.9845	2735.753	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0019	NA

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/2/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steven Hall

Contact Phone: 206-920-1739

No: PDX-86

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110011	AS24b	Asbestos PCM	Air	MCE Cassette	11/2/2017	9.92	9.96	2435.3	Liters	11:59:00 AM	4:04:00 PM	245	9.94	L/min
	17110012	AS26b	Asbestos PCM	Air	MCE Cassette	11/2/2017	10.33	10.39	2652.16	Liters	12:06:00 PM	4:22:00 PM	256	10.36	L/min
	17110013	AS15b	Asbestos PCM	Air	MCE Cassette	11/2/2017	10.09	10.15	2610.96	Liters	12:21:00 PM	4:39:00 PM	258	10.12	L/min
	17110014	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/2/2017	0	0	0	Liters	7:40:00 AM	4:50:00 PM	550	0	L/min
	17110015	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/2/2017	0	0	0	Liters	7:35:00 AM	4:45:00 PM	550	0	L/min
	17110008	AS24a	Asbestos PCM	Air	MCE Cassette	11/2/2017	10.018	9.91	2660.39	Liters	7:31:00 AM	11:58:00 AM	267	9.964	L/min
	17110009	AS26a	Asbestos PCM	Air	MCE Cassette	11/2/2017	10.137	10.16	2466.09	Liters	8:02:00 AM	12:05:00 PM	243	10.1485	L/min
	17110010	AS15a	Asbestos PCM	Air	MCE Cassette	11/2/2017	10.009	9.96	2735.75	Liters	7:45:00 AM	12:19:00 PM	274	9.9845	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All / overnight storage	Ryan Whitcomb START (samples custody sealed in job trailer)	11/2/2017 1727		11/3/17	

AB26b - blow out

ADVANTAGE Environmental INC.

Clean your world.

November 7, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/03/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/03/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/3/2017
DATE RECEIVED 11/6/2017
DATE ANALYZED 11/6/2017
DATE REPORTED 11/7/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110022	11061701	0.5	100	0.5/100
17110023	11061702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection		Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110016	11061703	Area	AS24a		7:30 AM	11:45 AM	9.9938	9.8437
17110017	11061704	Area	AS26a		7:41 AM	11:50 AM	10.053	9.863
17110018	11061705	Area	AS15a		7:56 AM	11:58 AM	10.053	9.9733
17110019	11061706	Area	AS24b		11:48 AM	3:08 PM	10.081	10.216
17110020	11061707	Area	AS26b		11:53 AM	3:02 PM	10.115	10.367
17110021	11061708	Area	AS15b		12:01 PM	3:22 PM	10.039	10.287

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110016	11061703	255	9.9188	2529.28	8	100	0.005	0.0750	9.554	0.0015	1.741	<0.0025	N/A
17110017	11061704	249	9.958	2479.54	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A
17110018	11061705	242	10.0132	2423.18	8	100	0.005	0.0750	9.554	0.0015	1.741	<0.0026	N/A
17110019	11061706	200	10.1485	2029.70	9.5	100	0.005	0.0900	11.465	0.0022	1.690	<0.0037	N/A
17110020	11061707	189	10.241	1935.55	7.5	100	0.005	0.0700	8.917	0.0018	1.775	<0.0031	N/A
17110021	11061708	201	10.163	2042.763	8.5	100	0.005	0.0800	10.191	0.0019	1.720	<0.0033	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/3/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steven Hall

Contact Phone: 206-920-1739

No: PDX-87

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110016	AS24a	Asbestos PCM	Air	MCE Cassette	11/3/2017	9.9938	9.8437	2529.29	Liters	7:30:00 AM	11:45:00 AM	255	9.9188	L/min
	17110017	AS26a	Asbestos PCM	Air	MCE Cassette	11/3/2017	10.053	9.863	2479.54	Liters	7:41:00 AM	11:50:00 AM	249	9.958	L/min
	17110018	AS15a	Asbestos PCM	Air	MCE Cassette	11/3/2017	10.053	9.9733	2423.19	Liters	7:56:00 AM	11:58:00 AM	242	10.0132	L/min
	17110019	AS24b	Asbestos PCM	Air	MCE Cassette	11/3/2017	10.081	10.216	2029.7	Liters	11:48:00 AM	3:08:00 PM	200	10.1485	L/min
	17110020	AS26b	Asbestos PCM	Air	MCE Cassette	11/3/2017	10.115	10.367	1935.55	Liters	11:53:00 AM	3:02:00 PM	189	10.241	L/min
	17110021	AS15b	Asbestos PCM	Air	MCE Cassette	11/3/2017	10.039	10.287	2042.76	Liters	12:01:00 PM	3:22:00 PM	201	10.163	L/min
	17110022	Blank 1		Blank	MCE Cassette	11/3/2017									
	17110023	Blank 2		Blank	MCE Cassette	11/3/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	(START)	11/3/17		11/6/17	

ADVANTAGE Environmental INC.

Clean your world.

November 10, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/06/2017 START-Asbestos Air Sampling Results 1300 North River St, Portland, OR.

Personal & (or) Area samples were collected utilizing 25mm mixed cellulose -ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 192, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8-hour time weighted average TWA.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and (or) Area samples collected on 11/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and health 192.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully

Sidney Carter
Senior Project Manager/AHERA Project Designer

[Type here]

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (Start)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (Start)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/6/2017
DATE RECEIVED 11/7/2017
DATE ANALYZED 11/7/2017
DATE REPORTED 11/8/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110027	11071701	0.5	100	0.5/100
17110028	11071702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection		Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110024	11071703	Area	AS24a		7:49 AM	11:47 AM	10.141	10.166
17110025	11071704	Area	AS26a		8:15 AM	12:03 PM	10.043	10.313
17110026	11071705	Area	AS15a		8:44 AM	12:18 PM	10.076	10.27
17110029	11071706	Area	AS24b		11:49 AM	4:16 PM	10.258	10.243
17110030	11071707	Area	AS26b		12:05 PM	4:08 PM	10.23	10.129
17110031	11071708	Area	AS15b		12:20 PM	4:20 PM	10.152	10.084

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110024	11071703	238	10.1535	2416.53	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0024	N/A
17110025	11071704	228	10.178	2320.58	7	100	0.005	0.0650	8.280	0.0014	1.785	<0.0025	N/A
17110026	11071705	214	10.1730	2177.02	7	100	0.005	0.0650	8.280	0.0015	1.785	<0.0026	N/A
17110029	11071706	267	10.2505	2736.88	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0019	N/A
17110030	11071707	243	10.1795	2473.62	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0022	N/A
17110031	11071708	240	10.118	2428.32	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-88

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110024	AS24a	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.141	10.166	2416.53	Liters *	7:49:00 AM	11:47:00 AM	238	10.1535	L/min
	17110025	AS26a	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.043	10.313	2320.58	Liters	8:15:00 AM	12:03:00 PM	228	10.178	L/min
	17110026	AS15a	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.076	10.27	2177.02	Liters	8:44:00 AM	12:18:00 PM	214	10.173	L/min
	17110027	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/6/2017	0	0	0	Liters	7:30:00 AM	4:30:00 PM	540	0	L/min
	17110028	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/6/2017	0	0	0	Liters	7:35:00 AM	4:35:00 PM	540	0	L/min
	17110029	AS24b	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.258	10.243	2736.88	Liters	11:49:00 AM	4:16:00 PM	267	10.2505	L/min
	17110030	AS26b	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.23	10.129	2473.62	Liters	12:05:00 PM	4:08:00 PM	243	10.1795	L/min
	17110031	AS15b	Asbestos PCM	Air	MCE Cassette	11/6/2017	10.152	10.084	2428.32	Liters	12:20:00 PM	4:20:00 PM	240	10.118	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	16:57 11/6/17		11/7/17	

ADVANTAGE Environmental INC.

Clean your world.

November 9, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/07/2017 START-Asbestos Air Sampling Results 1300 North River St, Portland, OR.

Personal & (or) Area samples were collected utilizing 25mm mixed cellulose -ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 192, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8-hour time weighted average TWA.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and (or) Area samples collected on 11/07/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and health 192.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully

Sidney Carter
Senior Project Manager/AHERA Project Designer

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ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/7/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/8/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/8/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/9/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110032	11081701	1	100	1/100
17110036	11081702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110033	11081703	Area	AS24a	8:07 AM	11:49 AM	10.282	10.172
17110034	11081704	Area	AS26a	8:23 AM	12:03 PM	10.078	10.136
17110035	11081705	Area	AS15a	8:53 AM	12:19 PM	9.9306	10.66
17110037	11081706	Area	AS24b	11:52 AM	4:11 PM	10.1	10.101
17110038	11081707	Area	AS26b	12:05 PM	4:27 PM	10.048	10.048
17110039	11081708	Area	AS15b	12:20 PM	4:41 PM	9.8931	9.8931

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110033	11081703	222	10.227	2270.39	9.5	100	0.01	0.0850	10.828	0.0018	1.690	<0.0031	NA
17110034	11081704	220	10.107	2223.54	8.5	100	0.01	0.075	9.554	0.0017	1.720	<0.0028	NA
17110035	11081705	206	10.2953	2120.83	8	100	0.01	0.070	8.917	0.0016	1.741	<0.0028	NA
17110037	11081706	259	10.1005	2616.03	9	100	0.01	0.08	10.191	0.0015	1.705	<0.0026	NA
17110038	11081707	262	10.048	2632.58	9	100	0.01	0.080	10.191	0.0015	1.705	<0.0025	NA
17110039	11081708	261	9.8931	2582.10	8	100	0.01	0.070	8.917	0.0013	1.741	<0.0023	NA

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/8/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-90

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110032	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/7/2017	0	0	0	Liters	7:20:00 AM	12:30:00 PM	310	0	L/min
	17110033	AS24a	Asbestos PCM	Air	MCE Cassette	11/7/2017	10.282	10.172	2270.39	Liters	8:07:00 AM	11:49:00 AM	222	10.227	L/min
	17110034	AS26a	Asbestos PCM	Air	MCE Cassette	11/7/2017	10.078	10.136	2223.54	Liters	8:23:00 AM	12:03:00 PM	220	10.107	L/min
	17110035	AS15a	Asbestos PCM	Air	MCE Cassette	11/7/2017	9.9306	10.066	2059.65	Liters	8:53:00 AM	12:19:00 PM	206	9.9983	L/min
	17110036	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/7/2017	0	0	0	Liters	11:30:00 AM	5:00:00 PM	330	0	L/min
	17110037	AS24b	Asbestos PCM	Air	MCE Cassette	11/7/2017	10.1	10.101	2616.03	Liters	11:52:00 AM	4:11:00 PM	259	10.1005	L/min
	17110038	AS26b	Asbestos PCM	Air	MCE Cassette	11/7/2017	10.048	10.048	2632.58	Liters	12:05:00 PM	4:27:00 PM	262	10.048	L/min
	17110039	AS15b	Asbestos PCM	Air	MCE Cassette	11/7/2017	9.8931	9.8931	2582.1	Liters	12:20:00 PM	4:41:00 PM	261	9.8931	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All/Analysis	Ryan Whitlock - START	11/8/2017 0934		11/8/17	

ADVANTAGE Environmental INC.

Clean your world.

November 10, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/08/2017 START-Asbestos Air Sampling Results 1300 North River St, Portland, OR.

Personal & (or) Area samples were collected utilizing 25mm mixed cellulose -ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 192, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8-hour time weighted average TWA.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and (or) Area samples collected on 11/08/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and health 192.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully

Sidney Carter
Senior Project Manager/AHERA Project Designer

[Type here]

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/8/2017
DATE RECEIVED 11/9/2017
DATE ANALYZED 11/9/2017
DATE REPORTED 11/10/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110043	11091701	1	100	1/100
17110047	11091702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110040	11091703	Area	AS24a	7:46 AM	11:28 AM	10.284	10.445
17110041	11091704	Area	AS26a	7:59 AM	11:40 AM	9.8965	10.123
17110042	11091705	Area	AS15a	8:25 AM	12:07 PM	9.9967	10.119
17110044	11091706	Area	AS24b	11:31 AM	3:45 PM	10.321	10.177
17110045	11091707	Area	AS26b	11:43 AM	3:59 PM	10.142	10.034
17110046	11091708	Area	AS15b	12:10 PM	4:19 PM	10.262	10.216

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110040	11091703	222	10.3645	2300.92	8	100	0.0075	0.0725	9.236	0.0015	1.741	<0.0027	N/A
17110041	11091704	221	10.00975	2212.15	8	100	0.0075	0.0725	9.236	0.0016	1.741	<0.0028	N/A
17110042	11091705	222	10.05785	2232.84	7.5	100	0.0075	0.0675	8.599	0.0015	1.775	<0.0026	N/A
17110044	11091706	254	10.249	2603.25	8.5	100	0.0075	0.0775	9.873	0.0015	1.720	<0.0025	N/A
17110045	11091707	256	10.088	2582.53	8.5	100	0.0075	0.0775	9.873	0.0015	1.720	<0.0025	N/A
17110046	11091708	249	10.239	2549.51	7.5	100	0.0075	0.0675	8.599	0.0013	1.775	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Copy of Original

USEPA

DateShipped: 11/9/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-91

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110040	AS24a	Asbestos PCM	Air	MCE Cassette	11/8/2017	10.284	10.445	2300.92	Liters	7:46:00 AM	11:28:00 AM	222	10.3645	L/min
	17110041	AS26a	Asbestos PCM	Air	MCE Cassette	11/8/2017	9.8965	10.123	2212.17	Liters	7:59:00 AM	11:40:00 AM	221	10.0098	L/min
	17110042	AS15a	Asbestos PCM	Air	MCE Cassette	11/8/2017	9.9967	10.119	2232.85	Liters	8:25:00 AM	12:07:00 PM	222	10.0579	L/min
	17110043	Blank 1	Asbestos PCM	Air	MCE Cassette	11/8/2017	0	0	0	Liters	7:30:00 AM	12:30:00 PM	300	0	L/min
	17110044	AS24b	Asbestos PCM	Air	MCE Cassette	11/8/2017	10.321	10.177	2603.25	Liters	11:31:00 AM	3:45:00 PM	254	10.249	L/min
	17110045	AS26b	Asbestos PCM	Air	MCE Cassette	11/8/2017	10.142	10.034	2582.53	Liters	11:43:00 AM	3:59:00 PM	256	10.088	L/min
	17110046	AS15b	Asbestos PCM	Air	MCE Cassette	11/8/2017	10.262	10.216	2549.51	Liters	12:10:00 PM	4:19:00 PM	249	10.239	L/min
	17110047	Blank 2	Asbestos PCM	Air	MCE Cassette	11/8/2017	0	0	0	Liters	11:15:00 AM	4:30:00 PM	315	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All Analysis	R. Whitchurch START	11/9/2017 0700		11/9/17	

ADVANTAGE Environmental INC.

Clean your world.

November 13, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/09/2017 START-Asbestos Air Sampling Results 1300 North River St, Portland, OR.

Personal & (or) Area samples were collected utilizing 25mm mixed cellulose -ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 192, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8-hour time weighted average TWA.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and (or) Area samples collected on 11/09/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and health 192.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully

Sidney Carter
Senior Project Manager/AHERA Project Designer

[Type here]

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/9/2017
DATE RECEIVED 11/10/2017
DATE ANALYZED 11/10/2017
DATE REPORTED 11/13/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110048	11101701	1	100	1/100
17110052	11101702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110049	11101703	Area	AS24a	7:44 AM	11:54 AM	10.429	10.358
17110050	11101704	Area	AS26a	7:57 AM	12:06 PM	10.191	10.137
17110051	11101705	Area	AS15a	8:15 AM	12:20 PM	10.338	10.326
17110053	11101706	Area	AS24b	11:56 AM	4:10 PM	10.252	10.299
17110054	11101707	Area	AS26b	12:07 PM	4:17 PM	10.032	10.271
17110055	11101708	Area	AS15b	12:21 PM	4:33 PM	10.145	10.126

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110049	11101703	250	10.3935	2598.38	7.5	100	0.01	0.0650	8.280	0.0012	1.775	<0.0022	N/A
17110050	11101704	249	10.164	2530.84	7	100	0.01	0.060	7.643	0.0012	1.785	<0.0021	N/A
17110051	11101705	245	10.332	2531.34	8	100	0.01	0.070	8.917	0.0014	1.741	<0.0024	N/A
17110053	11101706	254	10.2755	2609.98	7	100	0.01	0.06	7.643	0.0011	1.785	<0.0020	N/A
17110054	11101707	250	10.1515	2537.88	7.5	100	0.01	0.065	8.280	0.0013	1.775	<0.0022	N/A
17110055	11101708	252	10.1355	2554.15	7.5	100	0.01	0.065	8.280	0.0012	1.775	<0.0022	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/10/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-92

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110048	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/9/2017	0	0	0	Liters	7:30:00 AM	12:30:00 PM	300	0	L/min
	17110049	AS24a	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.429	10.358	2598.38	Liters	7:44:00 AM	11:54:00 AM	250	10.3935	L/min
	17110050	AS26a	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.191	10.137	2530.84	Liters	7:57:00 AM	12:06:00 PM	249	10.164	L/min
	17110051	AS15a	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.338	10.326	2531.34	Liters	8:15:00 AM	12:20:00 PM	245	10.332	L/min
	17110052	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/9/2017	0	0	0	Liters	11:30:00 AM	4:45:00 PM	315	0	L/min
	17110053	AS24b	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.252	10.299	2609.98	Liters	11:56:00 AM	4:10:00 PM	254	10.2755	L/min
	17110054	AS26b	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.032	10.271	2537.88	Liters	12:07:00 PM	4:17:00 PM	250	10.1515	L/min
	17110055	AS15b	Asbestos PCM	Air	MCE Cassette	11/9/2017	10.145	10.126	2554.15	Liters	12:21:00 PM	4:33:00 PM	252	10.1355	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/Analysis	Ryan Whitchurch/START	11/10/2017 0657	[signature]	11/10/17	

ADVANTAGE Environmental INC.

Clean your world.

November 15, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/13/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/13/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/13/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/14/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/14/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/15/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110060	11141701	1	100	1/100
17110061	11141702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110056	11141703	Area	AS26a	7:22 AM	11:39 AM	9.976	10.255
17110057	11141704	Area	AS26b	11:42 AM	3:22 PM	9.95	10
17110058	11141705	Area	AS24b	12:00 PM	3:14 PM	10.034	10.347
17110059	11141706	Area	AS24b	11:50 AM	3:29 PM	10.060	10.104

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110056	11141703	257	10.1155	2599.68	7.5	100	0.0075	0.0675	8.599	0.0013	1.775	<0.0023	N/A
17110057	11141704	220	9.975	2194.50	8	100	0.0075	0.0725	9.236	0.0016	1.741	<0.0028	N/A
17110058	11141705	194	10.1905	1976.96	9	100	0.0075	0.0825	10.510	0.0020	1.705	<0.0035	N/A
17110059	11141706	219	10.082	2207.96	9.5	100	0.0075	0.0875	11.146	0.0019	1.690	<0.0033	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/14/2017

CHAIN OF CUSTODY RECORD

R10 PDX Combined/OR

Contact Name: Steve Hall

Contact Phone: (206) 920-1739

No: PDX-93

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110056	AS26a	Asbestos PCM	Air	MCE Cassette	11/13/2017	9.976	10.255	2599.68	Liters	7:22:00 AM	11:39:00 AM	257	10.1155	L/min
	17110057	AS26b	Asbestos PCM	Air	MCE Cassette	11/13/2017	9.95	10	2194.5	Liters	11:42:00 AM	3:22:00 PM	220	9.975	L/min
	17110058	AS24b	Asbestos PCM	Air	MCE Cassette	11/13/2017	10.034	10.347	1976.96	Liters	12:00:00 PM	3:14:00 PM	194	10.1905	L/min
	17110059	AS24b	Asbestos PCM	Air	MCE Cassette	11/13/2017	10.06	10.104	2207.96	Liters	11:50:00 AM	3:29:00 PM	219	10.082	L/min
	17110060	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/13/2017	0		0	Liters	7:30:00 AM		300	0	L/min
	17110061	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/13/2017	0		0	Liters	7:30:00 AM		300	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	E3E/START			11/14/17	
			Vinson White		

ADVANTAGE Environmental INC.

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November 16, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/14/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/14/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/14/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/15/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/15/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/16/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110065	11151701	0.5	100	0.5/100
17110069	11151702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110062	11151703	Area	AS24a	7:05 AM	11:43 AM	10.022	10.231
17110063	11151704	Area	AS15a	7:23 AM	11:55 AM	10.103	10.219
17110064	11151705	Area	AS26a	7:39 AM	12:10 PM	10.052	10.213
17110066	11151706	Area	AS24b	11:47 AM	3:36 PM	10.163	10.206
17110067	11151707	Area	AS15b	11:57 AM	3:51 PM	10.374	10.332
17110068	11151708	Area	AS26b	12:13 PM	4:05 PM	10.177	10.154

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110062	11151703	278	10.1265	2815.17	7	100	0.0025	0.0675	8.599	0.0012	1.785	<0.0021	N/A
17110063	11151704	272	10.161	2763.79	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0020	N/A
17110064	11151705	271	10.1325	2745.91	7.5	100	0.0025	0.0725	9.236	0.0013	1.775	<0.0023	N/A
17110066	11151706	229	10.1845	2332.25	7	100	0.0025	0.0675	8.599	0.0014	1.785	<0.0025	N/A
17110067	11151707	234	10.353	2422.60	6.5	100	0.0025	0.063	7.962	0.0013	1.810	<0.0023	N/A
17110068	11151708	232	10.1655	2358.40	6	100	0.0025	0.058	7.325	0.0012	1.839	<0.0022	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name:

Contact Phone:

No: PDX-94

Lab:

Lab Phone:

Lab Address:

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110062	AS24a	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.022	10.231	2815.17	Liters *	7:05:00 AM	11:43:00 AM	278	10.1265	L/min
	17110063	AS15a	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.103	10.219	2763.79	Liters	7:23:00 AM	11:55:00 AM	272	10.161	L/min
	17110064	AS26a	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.052	10.213	2745.91	Liters	7:39:00 AM	12:10:00 PM	271	10.1325	L/min
	17110065	Blank1	Asbestos PCM	Blank	MCE Cassette	11/14/2017	0	0	0	Liters	7:06:00 AM		-426	0	L/min
	17110066	AS24b	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.163	10.206	2332.25	Liters	11:47:00 AM	3:36:00 PM	229	10.1845	L/min
	17110067	AS15b	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.374	10.332	2422.6	Liters	11:57:00 AM	3:51:00 PM	234	10.353	L/min
	17110068	AS26b	Asbestos PCM	Air	MCE Cassette	11/14/2017	10.177	10.154	2358.4	Liters	12:13:00 PM	4:05:00 PM	232	10.1655	L/min
	17110069	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/14/2017	0	0		Liters	11:47:00 AM				L/min

Special Instructions:

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	START	11/14/17 16:38		11/15/17	

ADVANTAGE Environmental INC.

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November 17, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/15/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/15/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/15/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/16/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/16/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/17/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110073	11161701	0	100	0/100
17110074	11161702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110070	11161703	Area	AS24a	7:13 AM	11:43 AM	9.9696	10.068
17110071	11161704	Area	AS26a	7:23 AM	11:48 AM	10.065	10.147
17110072	11161705	Area	AS15a	7:35 AM	11:54 AM	10.033	10.082
17110075	11161706	Area	AS24b	11:45 AM	3:18 PM	10.025	9.938
17110076	11161707	Area	AS26b	11:50 AM	3:23 PM	10.018	9.9848
17110077	11161708	Area	AS15b	11:58 AM	3:30 PM	10.079	10.073

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110070	11161703	270	10.0188	2705.08	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0021	N/A
17110071	11161704	265	10.106	2678.09	7.5	100	0.0025	0.0725	9.236	0.0013	1.775	<0.0024	N/A
17110072	11161705	259	10.0575	2604.89	7.5	100	0.0025	0.0725	9.236	0.0014	1.775	<0.0024	N/A
17110075	11161706	213	9.9815	2126.06	8.5	100	0.0025	0.0825	10.510	0.0019	1.720	<0.0033	N/A
17110076	11161707	213	10.0014	2130.30	6.5	100	0.0025	0.0625	7.962	0.0014	1.810	<0.0026	N/A
17110077	11161708	212	10.076	2136.11	9.5	100	0.0025	0.0925	11.783	0.0021	1.690	<0.0036	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/16/2017

CHAIN OF CUSTODY RECORD

R10 PDX Combined/OR

Contact Name: Steve Hall

Contact Phone:

No: PDX-95

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110070	AS24a	Asbestos PCM	Air	MCE Cassette	11/15/2017	9.9696	10.068	2705.08	Liters	7:13:00 AM	11:43:00 AM	270	10.0188	L/min
	17110071	AS26a	Asbestos PCM	Air	MCE Cassette	11/15/2017	10.065	10.147	2678.09	Liters	7:23:00 AM	11:48:00 AM	265	10.106	L/min
	17110072	AS15a	Asbestos PCM	Air	MCE Cassette	11/15/2017	10.033	10.082	2604.89	Liters	7:35:00 AM	11:54:00 AM	259	10.0575	L/min
	17110073	Blank1	Asbestos PCM	Blank	MCE Cassette	11/15/2017	0		0	Liters	7:06:00 AM		-426	0	L/min
	17110074	Blank2	Asbestos PCM	Blank	MCE Cassette	11/15/2017	0		0	Liters	7:07:00 AM		-426	0	L/min
	17110075	AS24b	Asbestos PCM	Air	MCE Cassette	11/15/2017	10.025	9.938	2126.06	Liters	11:45:00 AM	3:18:00 PM	213	9.9815	L/min
	17110076	AS26b	Asbestos PCM	Air	MCE Cassette	11/15/2017	10.018	9.9848	2130.3	Liters	11:50:00 AM	3:23:00 PM	213	10.0014	L/min
	17110077	AS15b	Asbestos PCM	Air	MCE Cassette	11/15/2017	10.079	10.073	2136.11	Liters	11:58:00 AM	3:30:00 PM	212	10.076	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	B2 [illegible] EHE START	11-15-17/1602			

ADVANTAGE Environmental INC.

Clean your world.

November 20, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/16/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/16/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/16/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/17/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/17/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/20/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110084	11171701	0.5	100	0.5/100
17110085	11171702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110078	11171703	Area	AS24a	7:08 AM	11:14 AM	9.9438	10.143
17110079	11171704	Area	AS26a	7:16 AM	11:21 AM	9.9034	10.194
17110080	11171705	Area	AS15a	7:42 AM	11:27 AM	9.9386	10.188
17110081	11171706	Area	AS24b	11:19 AM	3:21 PM	10.037	10.116
17110082	11171707	Area	AS26b	11:24 AM	3:29 PM	9.9443	9.9821
17110083	11171708	Area	AS15b	11:30 AM	3:35 PM	10.068	10.039

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110078	11171703	246	10.0434	2470.68	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A
17110079	11171704	245	10.0487	2461.93	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A
17110080	11171705	225	10.0633	2264.24	7	100	0.005	0.0650	8.280	0.0014	1.785	<0.0025	N/A
17110081	11171706	242	10.0765	2438.51	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A
17110082	11171707	245	9.9632	2440.98	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A
17110083	11171708	245	10.0535	2463.11	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/17/2017

CHAIN OF CUSTODY RECORD

R10 PDX Combined/OR

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-96

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110078	AS24a	Asbestos PCM	Air	MCE Cassette	11/16/2017	9.9438	10.143	2470.68	Liters	7:08:00 AM	11:14:00 AM	246	10.0434	L/min
	17110079	AS26a	Asbestos PCM	Air	MCE Cassette	11/16/2017	9.9034	10.194	2461.93	Liters	7:16:00 AM	11:21:00 AM	245	10.0487	L/min
	17110080	AS15a	Asbestos PCM	Air	MCE Cassette	11/16/2017	9.9386	10.188	2264.24	Liters	7:42:00 AM	11:27:00 AM	225	10.0633	L/min
	17110081	AS24b	Asbestos PCM	Air	MCE Cassette	11/16/2017	10.037	10.116	2438.51	Liters	11:19:00 AM	3:21:00 PM	242	10.0765	L/min
	17110082	AS26b	Asbestos PCM	Air	MCE Cassette	11/16/2017	9.9443	9.9821	2440.98	Liters	11:24:00 AM	3:29:00 PM	245	9.9632	L/min
	17110083	AS15b	Asbestos PCM	Air	MCE Cassette	11/16/2017	10.068	10.039	2463.11	Liters	11:30:00 AM	3:35:00 PM	245	10.0535	L/min
	17110084	Blank1	Asbestos PCM	Blank	MCE Cassette	11/16/2017	0		0	Liters	7:00:00 AM		-426	0	L/min
	17110085	Blank2	Asbestos PCM	Blank	MCE Cassette	11/16/2017	0		0	Liters	7:00:00 AM		-426	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	Brian Clarke EHE START	11/16/17 1558	Vincent White	11/17/17	

ADVANTAGE Environmental INC.

Clean your world.

November 21, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/17/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/17/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/17/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/20/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/20/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/21/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110092	11201701	1	100	1/100
17110093	11201702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110086	11201703	Area	AS24a	7:20 AM	10:53 AM	9.9917	10.075
17110087	11201704	Area	AS26a	7:27 AM	11:00 AM	9.9532	10.142
17110088	11201705	Area	AS15a	7:39 AM	11:06 AM	9.8874	10.001
17110089	11201706	Area	AS24b	10:57 AM	3:18 PM	10.062	9.98958
17110090	11201707	Area	AS26b	11:02 AM	3:23 PM	10.091	9.9642
17110091	11201708	Area	AS15b	11:09 AM	3:28 PM	9.9306	9.98243

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110086	11201703	213	10.0334	2137.10	7.5	100	0.0075	0.0675	8.599	0.0015	1.775	<0.0027	N/A
17110087	11201704	213	10.0476	2140.14	7.5	100	0.0075	0.0675	8.599	0.0015	1.775	<0.0027	N/A
17110088	11201705	207	9.9442	2058.45	8	100	0.0075	0.0725	9.236	0.0017	1.741	<0.0030	N/A
17110089	11201706	261	10.0258	2616.73	8	100	0.0075	0.0725	9.236	0.0014	1.741	<0.0024	N/A
17110090	11201707	261	10.0276	2617.20	7.5	100	0.0075	0.0675	8.599	0.0013	1.775	<0.0022	N/A
17110091	11201708	259	9.9565	2578.74	7	100	0.0075	0.0625	7.962	0.0012	1.785	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/20/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-97

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110086	AS24a	Asbestos PCM	Air	MCE Cassette	11/17/2017	9.9917	10.075	2137.11	Liters *	7:20:00 AM	10:53:00 AM	213	10.0334	L/min
	17110087	AS26a	Asbestos PCM	Air	MCE Cassette	11/17/2017	9.9532	10.142	2140.14	Liters	7:27:00 AM	11:00:00 AM	213	10.0476	L/min
	17110088	AS15a	Asbestos PCM	Air	MCE Cassette	11/17/2017	9.8874	10.001	2058.45	Liters	7:39:00 AM	11:06:00 AM	207	9.9442	L/min
	17110089	AS24b	Asbestos PCM	Air	MCE Cassette	11/17/2017	10.062	9.98958	2616.73	Liters	10:57:00 AM	3:18:00 PM	261	10.0258	L/min
	17110090	AS26b	Asbestos PCM	Air	MCE Cassette	11/17/2017	10.091	9.9642	2617.2	Liters	11:02:00 AM	3:23:00 PM	261	10.0276	L/min
	17110091	AS15b	Asbestos PCM	Air	MCE Cassette	11/17/2017	9.9306	9.98243	2578.73	Liters	11:09:00 AM	3:28:00 PM	259	9.9565	L/min
	17110092	Blank1	Asbestos PCM	Blank	MCE Cassette	11/17/2017	0		0	Liters	7:00:00 AM		-426	0	L/min
	17110093	Blank2	Asbestos PCM	Blank	MCE Cassette	11/17/2017	0		0	Liters	7:00:00 AM		-426	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
samples	START	9:53 11/20/17		11/20/17	

ADVANTAGE Environmental INC.

Clean your world.

November 22, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/20/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/20/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/20/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/21/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/21/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/22/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110100	11211701	0.5	100	0.5/100
17110101	11211702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Vinson White

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110094	11211703	Area	AS24a	7:22 AM	12:39 PM	9.9725	10.083
17110095	11211704	Area	AS26a	7:35 AM	12:54 PM	10.039	10.307
17110096	11211705	Area	AS15a	7:59 AM	1:07 PM	10.051	10.373
17110097	11211706	Area	AS24b	12:40 PM	3:45 PM	10.130	10.04
17110098	11211707	Area	AS26b	12:56 PM	3:58 PM	10.288	10.262
17110099	11211708	Area	AS15b	1:10 PM	4:07 PM	9.9306	9.98243

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110094	11211703	317	10.0278	3178.80	7.5	100	0.0075	0.0675	8.599	0.0010	1.775	<0.0018	N/A
17110095	11211704	319	10.1730	3245.19	8	100	0.0075	0.0725	9.236	0.0011	1.741	<0.0019	N/A
17110096	11211705	308	10.2120	3145.30	7.5	100	0.0075	0.0675	8.599	0.0011	1.775	<0.0019	N/A
17110097	11211706	185	10.0850	1865.73	7.5	100	0.0075	0.0675	8.599	0.0018	1.775	<0.0031	N/A
17110098	11211707	182	10.2750	1870.05	8	100	0.0075	0.0725	9.236	0.0019	1.741	<0.0033	N/A
17110099	11211708	177	9.9565	1762.30	7.5	100	0.0075	0.0675	8.599	0.0019	1.775	<0.0033	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/20/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-98

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110094	AS24a	Asbestos PCM	Blank	MCE Cassette	11/20/2017	9.9725	10.083	3178.81	Liters	7:22:00 AM	12:39:00 PM	317	10.0278	L/min
	17110095	AS26a	Asbestos PCM	Blank	MCE Cassette	11/20/2017	10.039	10.307	3245.19	Liters	7:35:00 AM	12:54:00 PM	319	10.173	L/min
	17110096	AS15a	Asbestos PCM	Blank	MCE Cassette	11/20/2017	10.051	10.373	3145.3	Liters	7:59:00 AM	1:07:00 PM	308	10.212	L/min
	17110097	AS24b	Asbestos PCM	Blank	MCE Cassette	11/20/2017	10.13	10.04	1865.73	Liters	12:40:00 PM	3:45:00 PM	185	10.085	L/min
	17110098	AS26b	Asbestos PCM	Blank	MCE Cassette	11/20/2017	10.288	10.262	1870.05	Liters	12:56:00 PM	3:58:00 PM	182	10.275	L/min
	17110099	AS15b	Asbestos PCM	Blank	MCE Cassette	11/20/2017	10.177	10.109	1795.31	Liters	1:10:00 PM	4:07:00 PM	177	10.143	L/min
	17110100	Blank1	Asbestos PCM	Blank	MCE Cassette	11/20/2017	0		0	Liters	7:00:00 AM		-426	0	L/min
	17110101	Blank2	Asbestos PCM	Blank	MCE Cassette	11/20/2017	0		0	Liters	7:00:00 AM		-426	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Maren Fritz / START	11/20/17 16:45	White	11/21/17	

ADVANTAGE Environmental INC.

Clean your world.

November 28, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/21/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/21/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/21/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/22/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/22/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/22/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110102	11221701	0.5	100	0.5/100
17110106	11221702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110103	11221703	Area	AS24a	7:41 AM	11:41 AM	9.8849	9.7241
17110104	11221704	Area	AS26a	7:59 AM	11:55 AM	10.383	10.242
17110105	11221705	Area	AS15a	8:18 AM	12:24 PM	10.047	10.011
17110107	11221706	Area	AS24b	11:44 AM	3:56 PM	9.594	9.52
17110108	11221707	Area	AS26b	11:57 AM	4:06 PM	10.289	10.214
17110109	11221708	Area	AS15b	12:26 PM	4:20 PM	10.989	10.773

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110103	11221703	240	9.8045	2353.08	9	100	0.005	0.0850	10.828	0.0018	1.705	<0.0030	N/A
17110104	11221704	236	10.3125	2433.75	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A
17110105	11221705	246	10.0290	2467.13	7.5	100	0.005	0.0700	8.917	0.0014	1.775	<0.0025	N/A
17110107	11221706	252	9.5585	2408.74	8	100	0.005	0.0750	9.554	0.0015	1.741	<0.0027	N/A
17110108	11221707	249	10.2515	2552.62	9.5	100	0.005	0.0900	11.465	0.0017	1.690	<0.0029	N/A
17110109	11221708	234	10.8810	2546.15	6	100	0.005	0.0550	7.006	0.0011	1.839	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/21/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-99

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110102	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/21/2017	0	0	0	Liters	7:25:00 AM	12:25:00 PM	300	0	L/min
	17110103	AS24a	Asbestos PCM	Air	MCE Cassette	11/21/2017	9.8849	9.7241	2353.08	Liters	7:41:00 AM	11:41:00 AM	240	9.8045	L/min
	17110104	AS26a	Asbestos PCM	Air	MCE Cassette	11/21/2017	10.383	10.242	2433.75	Liters	7:59:00 AM	11:55:00 AM	236	10.3125	L/min
	17110105	AS15a	Asbestos PCM	Air	MCE Cassette	11/21/2017	10.047	10.011	2467.13	Liters	8:18:00 AM	12:24:00 PM	246	10.029	L/min
	17110106	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/21/2017	0	0	0	Liters	10:46:00 AM	4:46:00 PM	360	0	L/min
	17110107	AS24b	Asbestos PCM	Air	MCE Cassette	11/21/2017	9.5936	9.5234	2408.74	Liters	11:44:00 AM	3:56:00 PM	252	9.5585	L/min
	17110108	AS26b	Asbestos PCM	Air	MCE Cassette	11/21/2017	10.289	10.214	2552.62	Liters	11:57:00 AM	4:06:00 PM	249	10.2515	L/min
	17110109	AS15b	Asbestos PCM	Air	MCE Cassette	11/21/2017	10.989	10.773	2546.15	Liters	12:26:00 PM	4:20:00 PM	234	10.881	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL - hold overnight under custody seal.	Ryan Whitchurch START-R10	11/21/2017 16:58	Ryan Whitchurch START R-10	11/22/2017 0636	As left last night/seal intact.
ALL to Analysis	Ryan Whitchurch START - R10	11/22/2017 0636	Vinson White	11/22/17	

ADVANTAGE Environmental INC.

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November 28, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/22/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/22/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	11/22/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	11/27/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	11/27/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	11/27/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110110	11271701	0.5	100	0.5/100
17110114	11271702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110111	11271703	Area	AS24a	7:24 AM	11:24 AM	9.8364	9.7607
17110112	11271704	Area	AS26a	7:39 AM	11:42 AM	10.256	10.206
17110113	11271705	Area	AS15a	8:08 AM	12:08 PM	9.9107	9.9676

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110111	11271703	240	9.7986	2351.65	7.5	100	0.005	0.0700	8.917	0.0015	1.775	<0.0026	N/A
17110112	11271704	243	10.231	2486.13	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A
17110113	11271705	240	9.9392	2385.40	9.5	100	0.005	0.0900	11.465	0.0019	1.690	<0.0031	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/22/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-100

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110110	Blank 1	Asbestos PCM	Blank	MCE Cassette	11/22/2017	0	0	0	Liters	6:55:00 AM	12:25:00 PM	330	0	L/min
	17110111	AS24a	Asbestos PCM	Air	MCE Cassette	11/22/2017	9.8364	9.7607	2351.66	Liters	7:24:00 AM	11:24:00 AM	240	9.7986	L/min
	17110112	AS26a	Asbestos PCM	Air	MCE Cassette	11/22/2017	10.256	10.206	2486.13	Liters	7:39:00 AM	11:42:00 AM	243	10.231	L/min
	17110113	AS15a	Asbestos PCM	Air	MCE Cassette	11/22/2017	9.9107	9.9676	2385.41	Liters	8:08:00 AM	12:08:00 PM	240	9.9392	L/min
	17110114	Blank 2	Asbestos PCM	Blank	MCE Cassette	11/27/2017	0	0		Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com,

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Maren Fulton / START	11-27-2017 0700	AEI Sidney Carter	11/27/17 10Am	good

ADVANTAGE Environmental INC.

Clean your world.

November 29, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/27/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/27/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/27/2017
DATE RECEIVED 11/28/2017
DATE ANALYZED 11/28/2017
DATE REPORTED 11/29/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110118	11281701	1	100	1/100
17110122	11281702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110115	11281703	Area	AS24a	7:48 AM	11:47 AM	10	10.077
17110116	11281704	Area	AS26a	8:13 AM	11:54 AM	9.999	10.208
17110117	11281705	Area	AS15a	8:32 AM	12:06 PM	9.924	10.146
17110119	11281706	Area	AS24b	11:48 AM	3:55 PM	9.973	9.99
17110120	11281707	Area	AS26b	11:55 AM	4:07 PM	10.106	10.125
17110121	11281708	Area	AS15b	12:08 PM	4:15 PM	10.085	10.114

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110115	11281703	239	10.0385	2399.20	7	100	0.0075	0.0625	7.962	0.0013	1.785	<0.0023	N/A
17110116	11281704	221	10.104	2232.87	8	100	0.0075	0.0725	9.236	0.0016	1.741	<0.0028	N/A
17110117	11281705	214	10.0350	2147.49	7	100	0.0075	0.0625	7.962	0.0014	1.785	<0.0025	N/A
17110119	11281706	247	9.9820	2465.55	10	100	0.0075	0.0925	11.783	0.0018	1.670	<0.0031	N/A
17110120	11281707	252	10.1155	2549.11	7	100	0.0075	0.0625	7.962	0.0012	1.785	<0.0021	N/A
17110121	11281708	247	10.0995	2494.58	9	100	0.0075	0.0825	10.510	0.0016	1.705	<0.0028	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/27/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-101

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110115	AS24a	Asbestos PCM	Air	MCE Cassette	11/27/2017	10	10.077	2399.2	Liters	7:48:00 AM	11:47:00 AM	239	10.0385	L/min
	17110116	AS26a	Asbestos PCM	Air	MCE Cassette	11/27/2017	9.999	10.208	2232.87	Liters	8:13:00 AM	11:54:00 AM	221	10.1035	L/min
	17110117	AS15a	Asbestos PCM	Air	MCE Cassette	11/27/2017	9.924	10.146	2147.49	Liters	8:32:00 AM	12:06:00 PM	214	10.035	L/min
	17110118	Blank1	Asbestos PCM	Blank	MCE Cassette	11/27/2017	0			Liters					L/min
	17110119	AS24b	Asbestos PCM	Air	MCE Cassette	11/27/2017	9.973	9.991	2465.55	Liters	11:48:00 AM	3:55:00 PM	247	9.982	L/min
	17110120	AS26b	Asbestos PCM	Air	MCE Cassette	11/27/2017	10.106	10.125	2549.11	Liters	11:55:00 AM	4:07:00 PM	252	10.1155	L/min
	17110121	AS15b	Asbestos PCM	Air	MCE Cassette	11/27/2017	10.085	10.114	2494.58	Liters	12:08:00 PM	4:15:00 PM	247	10.0995	L/min
	17110122	Blank2	Asbestos PCM	Blank	MCE Cassette	11/27/2017	0			Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Maren Fulton START	16:37 11/27/17	[signature] AEI Sidney Carter	11/28/17 8:20	Good

ADVANTAGE Environmental INC.

Clean your world.

November 30, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/28/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/28/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/28/2017
DATE RECEIVED 11/29/2017
DATE ANALYZED 11/29/2017
DATE REPORTED 11/30/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110126	11291701	0.5	100	0.5/100
17110130	11291702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110123	11291703	Area	AS24a	7:12 AM	12:20 PM	9.943	9.926
17110124	11291704	Area	AS26a	7:23 AM	12:40 PM	10.003	10.074
17110125	11291705	Area	AS15a	7:38 AM	12:31 PM	9.994	10.148
17110127	11291706	Area	AS24b	12:23 PM	4:04 PM	10.012	9.99
17110128	11291707	Area	AS26b	12:42 PM	4:17 PM	9.961	10.105
17110129	11291708	Area	AS15b	12:34 PM	4:25 PM	10.099	9.999

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110123	11291703	308	9.9345	3059.83	8	100	0.005	0.0750	9.554	0.0012	1.741	<0.0021	N/A
17110124	11291704	317	10.039	3182.2	9	100	0.005	0.0850	10.828	0.0013	1.705	<0.0022	N/A
17110125	11291705	293	10.0710	2950.8	12	100	0.005	0.1150	14.650	0.0019	1.620	<0.0031	N/A
17110127	11291706	221	10.0005	2210.11	6.5	100	0.005	0.0600	7.643	0.0013	1.810	<0.0024	N/A
17110128	11291707	215	10.0330	2157.1	11	100	0.005	0.1050	13.376	0.0024	1.655	<0.0040	N/A
17110129	11291708	231	10.0490	2321.32	9	100	0.005	0.0850	10.828	0.0018	1.705	<0.0031	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/28/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-102

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110123	AS24a	Asbestos PCM	Air	MCE Cassette	11/28/2017	9.943	9.926	3059.83	Liters	7:12:00 AM	12:20:00 PM	308	9.9345	L/min
	17110124	AS26a	Asbestos PCM	Air	MCE Cassette	11/28/2017	10.003	10.074	3182.2	Liters	7:23:00 AM	12:40:00 PM	317	10.0385	L/min
	17110125	AS15a	Asbestos PCM	Air	MCE Cassette	11/28/2017	9.994	10.148	2950.8	Liters	7:38:00 AM	12:31:00 PM	293	10.071	L/min
	17110126	Blank 1	Asbestos PCM	Air	MCE Cassette	11/28/2017				Liters					L/min
	17110127	AS24b	Asbestos PCM	Air	MCE Cassette	11/28/2017	10.012	9.989	2210.11	Liters	12:23:00 PM	4:04:00 PM	221	10.0005	L/min
	17110128	AS26b	Asbestos PCM	Air	MCE Cassette	11/28/2017	9.961	10.105	2157.1	Liters	12:42:00 PM	4:17:00 PM	215	10.033	L/min
	17110129	AS15b	Asbestos PCM	Air	MCE Cassette	11/28/2017	10.099	9.999	2321.32	Liters	12:34:00 PM	4:25:00 PM	231	10.049	L/min
	17110130	Blank 2	Asbestos PCM	Air	MCE Cassette	11/28/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Maren Fulton START	16:43 11/28/17	Sidney Carte	11/29/17 640	Good

ADVANTAGE Environmental INC.

Clean your world.

December 1, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/29/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/29/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/29/2017
DATE RECEIVED 11/30/2017
DATE ANALYZED 11/30/2017
DATE REPORTED 12/1/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110134	11301701	1	100	1/100
17110138	11301702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110131	11301703	Area	AS24a	7:14 AM	11:17 AM	10.043	10.232
17110132	11301704	Area	AS26b	7:43 AM	11:43 AM	9.905	10.216
17110133	11301705	Area	AS15a	7:31 AM	11:32 AM	9.995	10.216
17110135	11301706	Area	AS24b	11:21 AM	3:47 PM	10.125	9.96
17110136	11301707	Area	AS26b	11:44 AM	4:07 PM	10.035	9.967
17110137	11301708	Area	AS15b	11:37 AM	3:58 PM	10.088	9.984

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110131	11301703	243	10.1375	2463.41	9	100	0.005	0.0850	10.828	0.0017	1.705	<0.0029	N/A
17110132	11301704	240	10.061	2414.52	10	100	0.005	0.0950	12.102	0.0019	1.670	<0.0032	N/A
17110133	11301705	241	10.1055	2435.43	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0022	N/A
17110135	11301706	266	10.0425	2671.31	7	100	0.005	0.0650	8.280	0.0012	1.785	<0.0021	N/A
17110136	11301707	263	10.0010	2630.26	11	100	0.005	0.1050	13.376	0.0020	1.655	<0.0032	N/A
17110137	11301708	261	10.0360	2619.40	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-103

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110131	AS24a	Asbestos PCM	Air	MCE Cassette	11/29/2017	10.043	10.232	2463.41	Liters	7:14:00 AM	11:17:00 AM	243	10.1375	L/min
	17110132	AS26a	Asbestos PCM	Air	MCE Cassette	11/29/2017	9.905	10.216	2414.52	Liters	7:43:00 AM	11:43:00 AM	240	10.0605	L/min
	17110133	AS15a	Asbestos PCM	Air	MCE Cassette	11/29/2017	9.995	10.216	2435.43	Liters	7:31:00 AM	11:32:00 AM	241	10.1055	L/min
	17110134	Blank 1	Asbestos PCM	Air	MCE Cassette	11/29/2017				Liters					L/min
	17110135	AS24b	Asbestos PCM	Air	MCE Cassette	11/29/2017	10.125	9.96	2671.31	Liters	11:21:00 AM	3:47:00 PM	266	10.0425	L/min
	17110136	AS26b	Asbestos PCM	Air	MCE Cassette	11/29/2017	10.035	9.967	2630.26	Liters	11:44:00 AM	4:07:00 PM	263	10.001	L/min
	17110137	AS15b	Asbestos PCM	Air	MCE Cassette	11/29/2017	10.088	9.984	2619.4	Liters	11:37:00 AM	3:58:00 PM	261	10.036	L/min
	17110138	Blank 2	Asbestos PCM	Air	MCE Cassette	11/29/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all / to lab	Maren Fulton START	11/29/17 16:37	Sidney Carter	11/30/17 6:40	Good

ADVANTAGE Environmental INC.

Clean your world.

December 4, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 11/30/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 11/30/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 11/30/2017
DATE RECEIVED 12/1/2017
DATE ANALYZED 12/1/2017
DATE REPORTED 12/4/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110142	12011712	0	100	0/100
17110146	12011713	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110139	12011714	Area	AS24a	7:24 AM	11:40 AM	9.912	10.261
17110140	12011715	Area	AS26a	7:43 AM	11:59 AM	10.029	10.340
17110141	12011716	Area	AS15a	7:30 AM	11:50 AM	9.884	10.257
17110143	12011717	Area	AS24b	11:41 AM	3:49 PM	10.279	10.06
17110144	12011718	Area	AS26b	12:00 PM	4:10 PM	10.08	9.055
17110145	12011719	Area	AS15b	11:52 AM	4:00 PM	10.178	10.004

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110139	12011714	256	10.0865	2582.14	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A
17110140	12011715	256	10.185	2607.23	13	100	0.0025	0.1275	16.242	0.0024	1.610	<0.0039	N/A
17110141	12011716	260	10.0705	2618.33	7	100	0.0025	0.0675	8.599	0.0013	1.785	<0.0023	N/A
17110143	12011717	248	10.1690	2521.91	5.5	100	0.0025	0.0525	6.688	< LOD	NA	NA	N/A
17110144	12011718	250	9.5675	2391.88	12	100	0.0025	0.1175	14.968	0.0024	1.620	<0.0039	N/A
17110145	12011719	248	10.0910	2502.57	9	100	0.0025	0.0875	11.146	0.0017	1.705	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 11/30/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-104

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110139	AS24a	Asbestos PCM	Air	MCE Cassette	11/30/2017	9.912	10.261	2582.14	Liters	7:24:00 AM	11:40:00 AM	256	10.0865	L/min
	17110140	AS26a	Asbestos PCM	Air	MCE Cassette	11/30/2017	10.029	10.34	2607.23	Liters	7:43:00 AM	11:59:00 AM	256	10.1845	L/min
	17110141	AS15a	Asbestos PCM	Air	MCE Cassette	11/30/2017	9.884	10.257	2618.33	Liters	7:30:00 AM	11:50:00 AM	260	10.0705	L/min
	17110142	Blank 1	Asbestos PCM	Air	MCE Cassette	11/30/2017				Liters					L/min
	17110143	AS24b	Asbestos PCM	Air	MCE Cassette	11/30/2017	10.279	10.059	2521.91	Liters	11:41:00 AM	3:49:00 PM	248	10.169	L/min
	17110144	AS26b	Asbestos PCM	Air	MCE Cassette	11/30/2017	10.08	9.055	2391.88	Liters	12:00:00 PM	4:10:00 PM	250	9.5675	L/min
	17110145	AS15b	Asbestos PCM	Air	MCE Cassette	11/30/2017	10.178	10.004	2502.57	Liters	11:52:00 AM	4:00:00 PM	248	10.091	L/min
	17110146	Blank 2	Asbestos PCM	Air	MCE Cassette	11/30/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all / to lab	Marion Fulton START	11/30/17 16:35	[illegible]	12/01/17 6:44am	Good

ADVANTAGE Environmental INC.

Clean your world.

December 4, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/01/2017 Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal & Area sample/s collected utilized 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected by AEI on 12/01/2017 are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in of the air samples that were collected and analyzed for this day by AEI.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Field technician did not note any fiber release or and anomalies in the field.

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/1/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/4/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/4/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/4/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110150	12041701	1	100	1/100
17110154	12041702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110147	12041703	Area	AS24a	7:07 AM	11:05 AM	9.995	10.03
17110148	12041704	Area	AS26a	7:37 AM	11:39 AM	10.004	9.965
17110149	12041705	Area	AS15a	7:15 AM	11:52 AM	9.929	10.065
17110151	12041706	Area	AS24b	11:33 AM	3:24 PM	10.023	10.04
17110152	12047107	Area	AS26ab	11:53 AM	3:44 PM	10.022	10.053
17110153	12041708	Area	AS15b	11:42 AM	3:33 PM	10.007	10.022

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110147	12041703	238	10.0125	2382.98	11	100	0.005	0.1050	13.376	0.0022	1.655	<0.0036	N/A
17110148	12041704	242	9.985	2416.25	14	100	0.005	0.1350	17.197	0.0027	1.590	<0.0044	N/A
17110149	12041705	277	9.9970	2769.17	16	100	0.005	0.1550	19.745	0.0027	1.550	<0.0043	N/A
17110151	12041706	231	10.0310	2317.16	10	100	0.005	0.0950	12.102	0.0020	1.670	<0.0034	N/A
17110152	12047107	231	10.0375	2318.66	6	100	0.005	0.0550	7.006	0.0012	1.839	<0.0021	N/A
17110153	12041708	231	10.0145	2313.35	7	100	0.005	0.0650	8.280	0.0014	1.785	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/4/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-105

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110147	AS24a	Asbestos PCM	Air	MCE Cassette	12/1/2017	9.995	10.03	2382.98	Liters	7:07:00 AM	11:05:00 AM	238	10.0125	L/min
	17110148	AS26a	Asbestos PCM	Air	MCE Cassette	12/1/2017	10.004	9.965	2416.25	Liters	7:37:00 AM	11:39:00 AM	242	9.9845	L/min
	17110149	AS15a	Asbestos PCM	Air	MCE Cassette	12/1/2017	9.929	10.065	2769.17	Liters	7:15:00 AM	11:52:00 AM	277	9.997	L/min
	17110150	Blank 1	Asbestos PCM	Air	MCE Cassette	12/1/2017				Liters					L/min
	17110151	AS24b	Asbestos PCM	Air	MCE Cassette	12/1/2017	10.023	10.039	2317.16	Liters	11:33:00 AM	3:24:00 PM	231	10.031	L/min
	17110152	AS26b	Asbestos PCM	Air	MCE Cassette	12/1/2017	10.022	10.053	2318.66	Liters	11:53:00 AM	3:44:00 PM	231	10.0375	L/min
	17110153	AS15b	Asbestos PCM	Air	MCE Cassette	12/1/2017	10.007	10.022	2313.35	Liters	11:42:00 AM	3:33:00 PM	231	10.0145	L/min
	17110154	Blank 2	Asbestos PCM	Air	MCE Cassette	12/1/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	Marcus Fulton START	12/1/17 17:00	Ryan Whitehurst START	12/4/2017 0638	Seal intact, 8 cassettes.
ALL/To Advantage	Ryan Whitehurst START	12/4/17 0640	Sidney Carter AEA	12/4/17 0640	Good

ADVANTAGE Environmental INC.

Clean your world.

December 6, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/04/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/04/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/4/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/5/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/5/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/6/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110155	12051701	1	100	1/100
17110159	12051702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110156	12051703	Area	AS24a	7:50 AM	11:52 AM	10.056	9.9207
17110157	12051704	Area	AS26a	8:06 AM	12:01 PM	9.8306	9.8476
17110158	12051705	Area	AS15a	8:31 AM	12:22 PM	9.9362	10.038
17110160	12051706	Area	AS24b	11:55 AM	2:58 PM	9.8728	10.026
17110161	12051707	Area	AS26b	12:03 PM	3:07 PM	10.04	10.178
17110162	12051708	Area	AS15b	12:24 PM	3:28 PM	10.015	10.07

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110156	12051703	242	9.9884	2417.19	8	100	0.01	0.0700	8.917	0.0014	1.741	<0.0025	N/A
17110157	12051704	235	9.839	2312.19	8	100	0.01	0.0700	8.917	0.0015	1.741	<0.0026	N/A
17110158	12051705	231	9.9871	2307.02	13	100	0.01	0.1200	15.287	0.0026	1.610	<0.0041	N/A
17110160	12051706	183	9.9494	1820.74	8	100	0.01	0.0700	8.917	0.0019	1.741	<0.0033	N/A
17110161	12051707	184	10.1090	1860.06	10	100	0.01	0.0900	11.465	0.0024	1.670	<0.0040	N/A
17110162	12051708	184	10.0425	1847.82	9	100	0.01	0.0800	10.191	0.0021	1.705	<0.0036	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/4/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-106

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	✓17110155	Blank 1	Asbestos PCM	Blank	MCE Cassette	12/4/2017	0	0	0	Liters	7:18:00 AM	12:24:00 PM	306	0	L/min
	✓17110156	AS24a	Asbestos PCM	Air	MCE Cassette	12/4/2017	10.056	9.9207	2417.19	Liters	7:50:00 AM	11:52:00 AM	242	9.9884	L/min
	✓17110157	AS26a	Asbestos PCM	Air	MCE Cassette	12/4/2017	9.8306	9.8476	2312.19	Liters	8:06:00 AM	12:01:00 PM	235	9.8391	L/min
	✓17110158	AS15a	Asbestos PCM	Air	MCE Cassette	12/4/2017	9.9362	10.038	2307.02	Liters	8:31:00 AM	12:22:00 PM	231	9.9871	L/min
	✓17110159	Blank 2	Asbestos PCM	Blank	MCE Cassette	12/4/2017	0	0	0	Liters	9:30:00 AM	3:50:00 PM	380	0	L/min
	✓17110160	AS24b	Asbestos PCM	Air	MCE Cassette	12/4/2017	9.8728	10.026	1820.74	Liters	11:55:00 AM	2:58:00 PM	183	9.9494	L/min
	✓17110161	AS26b	Asbestos PCM	Air	MCE Cassette	12/4/2017	10.04	10.178	1860.06	Liters	12:03:00 PM	3:07:00 PM	184	10.109	L/min
	✓17110162	AS15b	Asbestos PCM	Air	MCE Cassette	12/4/2017	10.015	10.07	1847.82	Liters	12:24:00 PM	3:28:00 PM	184	10.0425	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All/overnight storage under seal	Ryan Whitchurch/START	12/4/2017 1559	Ryan Whitchurch START	12-5-17 10:46	Custody seal intact, 8 cassettes good
All to Advantage	Ryan Whitchurch/START	12/5/2017 10:46	[signature]	10:48 12/5/17	8 cassettes good

ADVANTAGE Environmental INC.

Clean your world.

December 7, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/05/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/05/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/5/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/6/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/6/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/7/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17110163	12071701	0.5	100	0.5/100
17110167	12071702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17110164	12071703	Area	AS24a	7:23 AM	11:22 AM	9.9734	9.7154
17110165	12071704	Area	AS26a	7:48 AM	11:33 AM	9.971	9.9837
17110166	12071705	Area	AS15a	8:03 AM	11:52 AM	9.8267	9.9185
17110168	12071706	Area	AS24b	11:24 AM	3:22 PM	9.8765	10.106
17110169	12071707	Area	AS26b	11:35 AM	3:28 PM	9.8199	10.008
17110170	12071708	Area	AS15b	11:54 AM	3:43 PM	9.8682	10.093

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17110164	12071703	239	9.8444	2352.81	6.5	100	0.005	0.0600	7.643	0.0013	1.810	<0.0023	N/A
17110165	12071704	225	9.9774	2244.92	7	100	0.005	0.0650	8.280	0.0014	1.785	<0.0025	N/A
17110166	12071705	229	9.8726	2260.83	9	100	0.005	0.0850	10.828	0.0018	1.705	<0.0031	N/A
17110168	12071706	238	9.9913	2377.93	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0024	N/A
17110169	12071707	233	9.9140	2309.96	7.5	100	0.005	0.0700	8.917	0.0015	1.775	<0.0026	N/A
17110170	12071708	229	9.9806	2285.56	9	100	0.005	0.0850	10.828	0.0018	1.705	<0.0031	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/5/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-107

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17110163	Blank 1	Asbestos PCM	Blank	MCE Cassette	12/5/2017	0	0	0	Liters	7:00:00 AM	11:55:00 AM	295	0	L/min
	17110164	AS24a	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.9734	9.7154	2352.81	Liters	7:23:00 AM	11:22:00 AM	239	9.8444	L/min
	17110165	AS26a	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.971	9.9837	2244.92	Liters	7:48:00 AM	11:33:00 AM	225	9.9774	L/min
	17110166	AS15a	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.8267	9.9185	2260.83	Liters	8:03:00 AM	11:52:00 AM	229	9.8726	L/min
	17110167	Blank 2	Asbestos PCM	Blank	MCE Cassette	12/5/2017	0	0	0	Liters	11:00:00 AM	4:00:00 PM	300	0	L/min
	17110168	AS24b	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.8765	10.106	2377.93	Liters	11:24:00 AM	3:22:00 PM	238	9.9913	L/min
	17110169	AS26b	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.8199	10.008	2309.96	Liters	11:35:00 AM	3:28:00 PM	233	9.914	L/min
	17110170	AS15b	Asbestos PCM	Air	MCE Cassette	12/5/2017	9.8682	10.093	2285.56	Liters	11:54:00 AM	3:43:00 PM	229	9.9806	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All / overnight storage w/custody seal.	Ryan Whitehurst 12/5/2017 START	12/5/2017 1639	Sydney Cartay AEI	12/6/17 6:44	Good

ADVANTAGE Environmental INC.

Clean your world.

December 8, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/06/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/06/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/6/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/7/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/7/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/8/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120004	12071701	1	100	1/100
17120008	12071702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120001	12071703	Area	AS24a	7:24 AM	11:32 AM	9.838	9.857
17120002	12071704	Area	AS26a	7:48 AM	11:59 AM	9.949	9.995
17120003	12071705	Area	AS15a	7:38 AM	11:47 AM	9.956	10.032
17120005	12071706	Area	AS24b	11:36 AM	4:45 PM	10.064	10.177
17120006	12071707	Area	AS26b	12:00 PM	4:29 PM	10.023	10.061
17120007	12071708	Area	AS15b	11:49 AM	4:15 PM	9.951	10.058

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120001	12071703	248	9.8475	2442.18	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A
17120002	12071704	251	9.9720	2502.97	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0021	N/A
17120003	12071705	249	9.9940	2488.51	8	100	0.005	0.0750	9.554	0.0015	1.741	<0.0026	N/A
17120005	12071706	309	10.1205	3127.23	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0017	N/A
17120006	12071707	269	10.0420	2701.3	7.5	100	0.005	0.0700	8.917	0.0013	1.775	<0.0023	N/A
17120007	12071708	266	10.0045	2661.2	10	100	0.005	0.0950	12.102	0.0018	1.670	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/7/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-108

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120001	AS24a	Asbestos PCM	Air	MCE Cassette	12/6/2017	9.838	9.857	2442.18	Liters	7:24:00 AM	11:32:00 AM	248	9.8475	L/min
	17120002	AS26a	Asbestos PCM	Air	MCE Cassette	12/6/2017	9.949	9.995	2502.97	Liters	7:48:00 AM	11:59:00 AM	251	9.972	L/min
	17120003	AS15a	Asbestos PCM	Air	MCE Cassette	12/6/2017	9.956	10.032	2488.51	Liters	7:38:00 AM	11:47:00 AM	249	9.994	L/min
	17120004	Blank 1	Asbestos PCM	Blank	MCE Cassette	12/6/2017	0		0	Liters	7:00:00 AM			0	L/min
	17120005	AS24b	Asbestos PCM	Air	MCE Cassette	12/6/2017	10.064	10.177	3127.23	Liters	11:36:00 AM	4:45:00 PM	309	10.1205	L/min
	17120006	AS26b	Asbestos PCM	Air	MCE Cassette	12/6/2017	10.023	10.061	2701.3	Liters	12:00:00 PM	4:29:00 PM	269	10.042	L/min
	17120007	AS15b	Asbestos PCM	Air	MCE Cassette	12/6/2017	9.951	10.058	2661.2	Liters	11:49:00 AM	4:15:00 PM	266	10.0045	L/min
	17120008	Blank 2	Asbestos PCM	Blank	MCE Cassette	12/6/2017	0		0	Liters	11:00:00 AM			0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	[illegible] START	12/6/17 17:30	Sidney Carter AEI	12/8/17 6:40	Good
Samples	[illegible] START	12/7/17			

ADVANTAGE Environmental INC.

Clean your world.

December 11, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/07/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/07/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/7/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/8/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/8/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/11/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120012	12081701	0.5	100	0.5/100
17120016	12081702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120009	12081703	Area	AS24a	7:32 AM	11:21 AM	9.9842	9.952
17120010	12081704	Area	AS15a	7:56 AM	11:38 AM	9.9361	10.062
17120011	12081705	Area	AS26a	7:21 AM	11:14 AM	9.9469	9.9744
17120012	12081706	Area	AS24b	11:29 AM	3:41 PM	9.9129	9.8694
17120013	12081707	Area	AS26b	11:16 AM	3:34 PM	10.064	10.087
17120014	12081708	Area	AS15b	11:45 AM	3:55 PM	10.187	10.234

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120009	12081703	229	9.9681	2282.69	9	100	0.0025	0.0875	11.146	0.0019	1.705	<0.0032	N/A
17120010	12081704	222	9.9991	2219.8	6.5	100	0.0025	0.0625	7.962	0.0014	1.810	<0.0025	N/A
17120011	12081705	233	9.9607	2320.84	6	100	0.0025	0.0575	7.325	0.0012	1.839	<0.0022	N/A
17120012	12081706	252	9.8912	2492.58	8	100	0.0025	0.0775	9.873	0.0015	1.741	<0.0027	N/A
17120013	12081707	258	10.0755	2599.48	10	100	0.0025	0.0975	12.420	0.0018	1.670	<0.0031	N/A
17120014	12081708	250	10.2105	2552.63	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/8/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-110

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120009	AS24a	Asbestos PCM	Air	MCE Cassette	12/7/2017	9.9842	9.952	2282.69	Liters	7:32:00 AM	11:21:00 AM	229	9.9681	L/min
	17120010	AS15a	Asbestos PCM	Air	MCE Cassette	12/7/2017	9.9361	10.062	2219.8	Liters	7:56:00 AM	11:38:00 AM	222	9.9991	L/min
	17120011	AS26a	Asbestos PCM	Air	MCE Cassette	12/7/2017	9.9469	9.9744	2320.84	Liters	7:21:00 AM	11:14:00 AM	233	9.9607	L/min
	17120012	Blank 1	Asbestos PCM	Air	MCE Cassette	12/7/2017				Liters	7:00:00 AM				L/min
	17120013	AS24b	Asbestos PCM	Air	MCE Cassette	12/7/2017	9.9129	9.8694	2492.58	Liters	11:29:00 AM	3:41:00 PM	252	9.8912	L/min
	17120014	AS26b	Asbestos PCM	Air	MCE Cassette	12/7/2017	10.064	10.087	2599.48	Liters	11:16:00 AM	3:34:00 PM	258	10.0755	L/min
	17120015	AS15b	Asbestos PCM	Air	MCE Cassette	12/7/2017	10.187	10.234	2552.63	Liters	11:45:00 AM	3:55:00 PM	250	10.2105	L/min
	17120016	Blank 2	Asbestos PCM	Air	MCE Cassette	12/7/2017				Liters	11:00:00 AM				L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	16:25 12/7/17	AEI	12/8/17 10:46	good

ADVANTAGE Environmental INC.

Clean your world.

December 11, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/08/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/08/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/8/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/9/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/9/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/11/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120020	12091701	1	100	1/100
17120024	12091702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Pete Coleman

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120017	12091703	Area	AS24a	7:13 AM	11:29 AM	9.948	10.16
17120018	12091704	Area	AS26a	7:38 AM	11:58 AM	9.977	10.161
17120019	12091705	Area	AS15a	7:25 AM	11:48 AM	10.114	10.364
121720021	12091706	Area	AS24b	11:30 AM	3:13 PM	10.155	10.12
17120022	12091707	Area	AS26b	11:59 AM	3:31 PM	10.188	10.12
17120023	12091708	Area	AS15b	11:50 AM	3:23 PM	10.242	10.149

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120017	12091703	256	10.0540	2573.82	7	100	0.0075	0.0625	7.962	0.0012	1.785	<0.0021	N/A
17120018	12091704	260	10.0690	2617.94	8	100	0.0075	0.0725	9.236	0.0014	1.741	<0.0024	N/A
17120019	12091705	263	10.2390	2692.86	9.5	100	0.0075	0.0875	11.146	0.0016	1.690	<0.0027	N/A
121720021	12091706	223	10.1375	2260.66	7.5	100	0.0075	0.0675	8.599	0.0015	1.775	<0.0026	N/A
17120022	12091707	212	10.1540	2152.65	8	100	0.0075	0.0725	9.236	0.0017	1.741	<0.0029	N/A
17120023	12091708	213	10.1955	2171.64	7	100	0.0075	0.0625	7.962	0.0014	1.785	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/8/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-111

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120017	AS24a	Asbestos PCM	Air	MCE Cassette	12/8/2017	9.948	10.16	2573.82	Liters	7:13:00 AM	11:29:00 AM	256	10.054	L/min
	17120018	AS26a	Asbestos PCM	Air	MCE Cassette	12/8/2017	9.977	10.161	2617.94	Liters	7:38:00 AM	11:58:00 AM	260	10.069	L/min
	17120019	AS15a	Asbestos PCM	Air	MCE Cassette	12/8/2017	10.114	10.364	2692.86	Liters	7:25:00 AM	11:48:00 AM	263	10.239	L/min
	17120020	Blank 1	Asbestos PCM	Air	MCE Cassette	12/8/2017				Liters	7:00:00 AM				L/min
	17120021	AS24b	Asbestos PCM	Air	MCE Cassette	12/8/2017	10.155	10.12	2260.66	Liters	11:30:00 AM	3:13:00 PM	223	10.1375	L/min
	17120022	AS26b	Asbestos PCM	Air	MCE Cassette	12/8/2017	10.188	10.12	2152.65	Liters	11:59:00 AM	3:31:00 PM	212	10.154	L/min
	17120023	AS15b	Asbestos PCM	Air	MCE Cassette	12/8/2017	10.242	10.149	2171.64	Liters	11:50:00 AM	3:23:00 PM	213	10.1955	L/min
	17120024	Blank 2	Asbestos PCM	Air	MCE Cassette	12/8/2017				Liters	11:00:00 AM				L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Maria Fulton START	16:10 12/8/17	Sidney Carter AEI	12/8/17 1040	Good

ADVANTAGE Environmental INC.

Clean your world.

December 12, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/09/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/09/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 12/9/2017
DATE RECEIVED 12/11/2017
DATE ANALYZED 12/11/2017
DATE REPORTED 12/12/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120028	12111701	0.5	100	0.5/100
117120029	12111702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Pete Coleman

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120025	12111703	Area	AS24	8:05 AM	12:14 PM	10.081	9.94
17120026	12111704	Area	AS26	8:25 AM	12:31 PM	10.188	10.266
17120027	12111705	Area	AS15	8:15 AM	12:23 PM	10.081	10.118

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120025	12111703	249	10.0125	2493.11	9	100	0.005	0.0850	10.828	0.0017	1.705	<0.0029	N/A
17120026	12111704	246	10.2270	2515.84	6.5	100	0.005	0.0600	7.643	0.0012	1.810	<0.0021	N/A
17120027	12111705	248	10.0995	2504.68	7	100	0.005	0.0650	8.280	0.0013	1.785	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/11/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-112

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120025	AS24	Asbestos PCM	Air	MCE Cassette	12/9/2017	10.081	9.944	2493.11	Liters	8:05:00 AM	12:14:00 PM	249	10.0125	L/min
	17120026	AS26	Asbestos PCM	Air	MCE Cassette	12/9/2017	10.188	10.266	2515.84	Liters	8:25:00 AM	12:31:00 PM	246	10.227	L/min
	17120027	AS15	Asbestos PCM	Air	MCE Cassette	12/9/2017	10.081	10.118	2504.68	Liters	8:15:00 AM	12:23:00 PM	248	10.0995	L/min
	17120028	Blank 1	Asbestos PCM	Air	MCE Cassette	12/9/2017				Liters	7:00:00 AM				L/min
	17120029	Blank 2	Asbestos PCM	Air	MCE Cassette	12/9/2017				Liters	7:05:00 AM				L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all / to lab	Maureen Felton START	12:45 12/9/17			
	[illegible] START	12/11/17	Sidney Carter AEI	12/11/17 640	Good

ADVANTAGE Environmental INC.

Clean your world.

December 13, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/11/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/11/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/11/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/12/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/12/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/13/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120033	12121701	0.5	100	0.5/100
17120034	12121702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120030	12121703	Area	AS15	8:43 AM	1:40 PM	10.105	10.241
17120031	12121704	Area	AS24	8:21 AM	1:31 PM	9.998	9.8946
17120032	12121705	Area	AS26	8:10 AM	1:22 PM	10.126	10.048

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120030	12121703	297	10.1730	3021.38	7.5	100	0.0025	0.0725	9.236	0.0012	1.775	<0.0021	N/A
17120031	12121704	310	9.9463	3083.35	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0017	N/A
17120032	12121705	312	10.0870	3147.14	6.5	100	0.0025	0.0625	7.962	0.0010	1.810	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 12/12/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-113

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120030	AS15	Asbestos PCM	Air	MCE Cassette	12/11/2017	10.105	10.241	3021.38	Liters	8:43:00 AM	1:40:00 PM	297	10.173	L/min
	17120031	AS24	Asbestos PCM	Air	MCE Cassette	12/11/2017	9.998	9.8946	3083.35	Liters	8:21:00 AM	1:31:00 PM	310	9.9463	L/min
	17120032	AS26	Asbestos PCM	Air	MCE Cassette	12/11/2017	10.126	10.048	3147.14	Liters	8:10:00 AM	1:22:00 PM	312	10.087	L/min
	17120033	Blank 1	Asbestos PCM	Air	MCE Cassette	12/11/2017				Liters					L/min
	17120034	Blank 2	Asbestos PCM	Air	MCE Cassette	12/11/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples		15:07 12/11/17			
Samples		11:08 am 12/12/17	11:09 AEI	11:09 12/12/17	good

ADVANTAGE Environmental INC.

Clean your world.

December 14, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/12/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/12/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/12/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/13/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/13/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/14/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120038	12131701	0.5	100	0.5/100
17120039	12131702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120035	12131703	Area	AS24	8:11 AM	3:21 PM	9.9652	9.8471
17120036	12131704	Area	AS15	8:57 AM	3:32 PM	9.9407	10.128
17120037	12131705	Area	AS26	8:21 AM	3:18 PM	10.022	10.189

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120035	12131703	430	9.9062	4259.67	6.5	100	0.005	0.0600	7.643	0.0007	1.810	<0.0013	N/A
17120036	12131704	395	10.0344	3963.59	7	100	0.005	0.0650	8.280	0.0008	1.785	<0.0014	N/A
17120037	12131705	417	10.1055	4213.99	6.5	100	0.005	0.0600	7.643	0.0007	1.810	<0.0013	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 12/13/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-114

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120035	AS24	Asbestos PCM	Air	MCE Cassette	12/12/2017	9.9652	9.8471	4259.67	Liters	8:11:00 AM	3:21:00 PM	430	9.9062	L/min
	17120036	AS15	Asbestos PCM	Air	MCE Cassette	12/12/2017	9.9407	10.128	3963.59	Liters	8:57:00 AM	3:32:00 PM	395	10.0344	L/min
	17120037	AS26	Asbestos PCM	Air	MCE Cassette	12/12/2017	10.022	10.189	4213.99	Liters	8:21:00 AM	3:18:00 PM	417	10.1055	L/min
	17120038	Blank 1	Asbestos PCM	Air	MCE Cassette	12/12/2017				Liters					L/min
	17120039	Blank 2	Asbestos PCM	Air	MCE Cassette	12/12/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM [redacted]

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature] START	15:53 12/12/17	Sidney Carter AEI	12/13 0850	Good

ADVANTAGE Environmental INC.

Clean your world.

December 15, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/13/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/13/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 12/13/2017
DATE RECEIVED 12/14/2017
DATE ANALYZED 12/14/2017
DATE REPORTED 12/14/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120043	12141701	0.5	100	0.5/100
17120044	12141702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Sidney Carter

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120041	12141703	Area	AS26	8:33 AM	1:51 PM	10.06	10.064
17120042	12141704	Area	AS15	8:20 AM	1:38 PM	9.975	10.01

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120041	12141703	318	10.062	3199.72	11	100	0.0075	0.1025	13.057	0.0016	1.655	<0.0026	N/A
17120042	12141704	318	9.9925	3177.62	12.5	100	0.0075	0.1175	14.968	0.0018	1.620	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/14/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-115

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120041	AS26	Asbestos PCM	Air	MCE Cassette	12/13/2017	10.06	10.064	3199.72	Liters	8:33:00 AM	1:51:00 PM	318	10.062	L/min
	17120042	AS15	Asbestos PCM	Air	MCE Cassette	12/13/2017	9.975	10.01	3177.62	Liters	8:20:00 AM	1:38:00 PM	318	9.9925	L/min
	17120043	Blank 1	Asbestos PCM	Air	MCE Cassette	12/13/2017				Liters					L/min
	17120044	Blank 2	Asbestos PCM	Air	MCE Cassette	12/13/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	Maureen Fulton START	14:58 12/13/17	Sidney Carter AEI	12/14 7:15	Good
Samples	[illegible] START	7:07 12/14/17			

ADVANTAGE Environmental INC.

Clean your world.

December 18, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/14/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/14/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/14/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/15/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/15/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/18/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120048	12151701	0.5	100	0.5/100
17120049	12151702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120045	12151703	Area	AS24	8:20 AM	2:53 PM	10.056	9.857
17120046	12151704	Area	AS26	8:35 AM	2:59 PM	9.9967	9.9682
17120047	12151705	Area	AS15	9:06 AM	2:43 PM	9.9713	10.09

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120045	12151703	393	9.957	3912.90	6	100	0.0025	0.0575	7.325	0.0007	1.839	<0.0013	N/A
17120046	12151704	384	9.9825	3833.28	6	100	0.0025	0.0575	7.325	0.0007	1.839	<0.0014	N/A
17120047	12151705	337	10.0307	3380.35	7.5	100	0.0025	0.0725	9.236	0.0011	1.775	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 12/15/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-116

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120045	AS24	Asbestos PCM	Air	MCE Cassette	12/14/2017	10.056	9.857	3912.9	Liters	8:20:00 AM	2:53:00 PM	393	9.9565	L/min
	17120046	AS26	Asbestos PCM	Air	MCE Cassette	12/14/2017	9.9967	9.9682	3833.28	Liters	8:35:00 AM	2:59:00 PM	384	9.9825	L/min
	17120047	AS15	Asbestos PCM	Air	MCE Cassette	12/14/2017	9.9713	10.09	3380.35	Liters	9:06:00 AM	2:43:00 PM	337	10.0307	L/min
	17120048	Blank 1	Asbestos PCM	Air	MCE Cassette	12/14/2017									
	17120049	Blank 2	Asbestos PCM	Air	MCE Cassette	12/14/2017									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	15:30 12/14/17			
Samples	START	7:08 12/15/17	AEI	12/15/17 7:08	good

ADVANTAGE Environmental INC.

Clean your world.

December 18, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/15/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/15/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/15/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/18/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/18/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/18/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120053	12161701	0	100	0/100
17120054	12161702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120050	12161703	Area	AS15	9:45 AM	2:45 PM	10.022	10.065
17120051	12161704	Area	AS26	8:42 AM	2:20 PM	10.054	9.8587
17120052	12161705	Area	AS24	8:59 AM	2:13 PM	10.071	9.9204

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120050	12161703	300	10.0435	3013.05	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0020	N/A
17120051	12161704	338	9.9564	3365.26	6	100	0.0025	0.0575	7.325	0.0008	1.839	<0.0015	N/A
17120052	12161705	314	9.9957	3138.65	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0017	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/16/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-117

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120050	AS15	Asbestos PCM	Air	MCE Cassette	12/15/2017	10.022	10.065	3013.05	Liters	9:45:00 AM	2:45:00 PM	300	10.0435	L/min
	17120051	AS26	Asbestos PCM	Air	MCE Cassette	12/15/2017	10.054	9.8587	3365.26	Liters	8:42:00 AM	2:20:00 PM	338	9.9564	L/min
	17120052	AS24	Asbestos PCM	Air	MCE Cassette	12/15/2017	10.071	9.9204	3138.65	Liters	8:59:00 AM	2:13:00 PM	314	9.9957	L/min
	17120053	Blank 1	Asbestos PCM	Air	MCE Cassette	12/15/2017				Liters					L/min
	17120054	Blank 2	Asbestos PCM	Air	MCE Cassette	12/15/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	15:40 12/15/17			
Samples	START	7:02 12/16/17	ACI	12/16/17 7:03	good

ADVANTAGE Environmental INC.

Clean your world.

December 19, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/16/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/16/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/16/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/18/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/18/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/19/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120058	12181701	0.5	100	0.5/100
17120059	12181702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120055	12181703	Area	AS15	8:38 AM	3:20 PM	10.105	10.291
17120056	12181704	Area	AS24	8:09 AM	1:32 PM	10.08	10.03
17120057	12181705	Area	AS26	7:59 AM	1:25 PM	10.153	10.193

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120055	12181703	402	10.198	4099.6	8	100	0.005	0.0750	9.554	0.0009	1.741	<0.0016	N/A
17120056	12181704	323	10.055	3247.77	6	100	0.005	0.0550	7.006	0.0008	1.839	<0.0015	N/A
17120057	12181705	326	10.173	3316.4	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/18/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-118

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120055	AS15	Asbestos PCM	Air	MCE Cassette	12/16/2017	10.105	10.291	4099.6	Liters •	8:38:00 AM	3:20:00 PM	402	10.198	L/min
	17120056	AS24	Asbestos PCM	Air	MCE Cassette	12/16/2017	10.08	10.03	3247.77	Liters	8:09:00 AM	1:32:00 PM	323	10.055	L/min
	17120057	AS26	Asbestos PCM	Air	MCE Cassette	12/16/2017	10.153	10.193	3316.4	Liters	7:59:00 AM	1:25:00 PM	326	10.173	L/min
	17120058	Blank 1	Asbestos PCM	Air	MCE Cassette	12/16/2017				Liters					L/min
	17120059	Blank 2	Asbestos PCM	Air	MCE Cassette	12/16/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature] START	15:57 12/16/17	Sidney Carter AEI	12/18/17 8:14	Good

ADVANTAGE Environmental INC.

Clean your world.

December 21, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/18/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/18/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/18/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/19/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/19/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/21/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120060	12181701	0.5	100	0.5/100
17120061	12181702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120062	12181703	Area	AS24	7:56 AM	2:51 PM	10.053	10.156
17120063	12181704	Area	AS26	8:12 AM	2:59 PM	9.8782	10.086
17120064	12181705	Area	AS15	8:29 AM	3:19 PM	10.268	10.422

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120062	12181703	415	10.1045	4193.4	9	100	0.005	0.0850	10.828	0.0010	1.705	<0.0017	N/A
17120063	12181704	407	9.9821	4062.71	7.5	100	0.005	0.0700	8.917	0.0008	1.775	<0.0015	N/A
17120064	12181705	410	10.345	4241.5	8	100	0.005	0.0750	9.554	0.0009	1.741	<0.0015	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 12/18/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-119

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120060	Blank 1	Asbestos PCM	Blank	MCE Cassette	12/18/2017	0	0	0	Liters	7:25:00 AM	3:45:00 PM	500	0	L/min
	17120061	Blank 2	Asbestos PCM	Blank	MCE Cassette	12/18/2017	0	0	0	Liters	7:30:00 AM	3:50:00 PM	500	0	L/min
	17120062	AS24	Asbestos PCM	Air	MCE Cassette	12/18/2017	10.053	10.156	4193.37	Liters	7:56:00 AM	2:51:00 PM	415	10.1045	L/min
	17120063	AS26	Asbestos PCM	Air	MCE Cassette	12/18/2017	9.8782	10.086	4062.71	Liters	8:12:00 AM	2:59:00 PM	407	9.9821	L/min
	17120064	AS15	Asbestos PCM	Air	MCE Cassette	12/18/2017	10.268	10.422	4241.45	Liters	8:29:00 AM	3:19:00 PM	410	10.345	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All 5	Ryan Whitchurch START for overnight storage at CP.	12/18/2017 15:54			
Samples	START	7:06 12/19/17	AGI	12/19/17 7:07	

ADVANTAGE Environmental INC.

Clean your world.

December 21, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/19/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/19/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 12/19/2017
DATE RECEIVED 12/20/2017
DATE ANALYZED 12/20/2017
DATE REPORTED 12/21/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120068	12201701	1	100	1/100
17120069	12201702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120065	12201703	Area	AS24	8:10 AM	1:25 PM	10.043	9.904
17120066	12201704	Area	AS26	7:55 AM	1:19 PM	10.031	9.866
17120067	12201705	Area	AS15	8:36 AM	1:40 PM	9.926	9.959

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120065	12201703	315	9.9735	3141.65	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0018	N/A
17120066	12201704	324	9.9485	3223.31	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0017	N/A
17120067	12201705	304	9.9425	3022.52	6.5	100	0.005	0.0600	7.643	0.0010	1.810	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/20/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-120

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120065	AS24	Asbestos PCM	Air	MCE Cassette	12/19/2017	10.043	9.904	3141.65	Liters	8:10:00 AM	1:25:00 PM	315	9.9735	L/min
	17120066	AS26	Asbestos PCM	Air	MCE Cassette	12/19/2017	10.031	9.866	3223.31	Liters	7:55:00 AM	1:19:00 PM	324	9.9485	L/min
	17120067	AS15	Asbestos PCM	Air	MCE Cassette	12/19/2017	9.926	9.959	3022.52	Liters	8:36:00 AM	1:40:00 PM	304	9.9425	L/min
	17120068	Blank 1	Asbestos PCM	Air	MCE Cassette	12/19/2017				Liters	8:00:00 AM				L/min
	17120069	Blank 2	Asbestos PCM	Air	MCE Cassette	12/19/2017				Liters	8:00:00 AM				L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	[signature] START	12/19/17 14:48	Sidney Caider AEI	12/20/17 7:10	Good

ADVANTAGE Environmental INC.

Clean your world.

December 22, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/20/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/20/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/20/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/21/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/21/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/22/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120073	12211701	0	100	0/100
17120074	12211702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120070	12211703	Area	AS24	8:15 AM	1:44 PM	0:37	10.108
17120071	12211704	Area	AS26	8:40 AM	1:47 PM	10.025	10.061
17120072	12211705	Area	AS15	8:28 AM	1:26 PM	10.008	10.108

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120070	12211703	329	10.067	3312.04	7	100	0.0025	0.0675	8.599	0.0010	1.785	<0.0018	N/A
17120071	12211704	307	10.043	3083.2	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0017	N/A
17120072	12211705	298	10.058	2997.28	7.5	100	0.0025	0.0725	9.236	0.0012	1.775	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/21/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-121

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120070	AS24	Asbestos PCM	Air	MCE Cassette	12/20/2017	10.026	10.108	3312.04	Liters	8:15:00 AM	1:44:00 PM	329	10.067	L/min
	17120071	AS26	Asbestos PCM	Air	MCE Cassette	12/20/2017	10.025	10.061	3083.2	Liters	8:40:00 AM	1:47:00 PM	307	10.043	L/min
	17120072	AS15	Asbestos PCM	Air	MCE Cassette	12/20/2017	10.008	10.108	2997.28	Liters	8:28:00 AM	1:26:00 PM	298	10.058	L/min
	17120073	Blank 1	Asbestos PCM	Air	MCE Cassette	12/20/2017				Liters	8:00:00 AM				L/min
	17120074	Blank 2	Asbestos PCM	Air	MCE Cassette	12/20/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Nurun Fulfr START	12/20/17 15:00	Sidney Carter AEI	12/21/17 905	Good

ADVANTAGE Environmental INC.

Clean your world.

December 26, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/21/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/21/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/21/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/22/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/22/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/26/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120078	12221701	0	100	0/100
17120079	12221702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120075	12221703	Area	AS24	8:05 AM	1:39 PM	10.028	10.014
17120076	12221704	Area	AS26	8:16 AM	1:52 PM	10.017	10.153
17120077	12221705	Area	AS15	8:29 AM	1:45 PM	10.025	10.282

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120075	12221703	334	10.021	3347.01	7	100	0.0025	0.0675	8.599	0.0010	1.785	<0.0018	N/A
17120076	12221704	336	10.085	3388.56	10	100	0.0025	0.0975	12.420	0.0014	1.670	<0.0024	N/A
17120077	12221705	316	10.1535	3208.51	8	100	0.0025	0.0775	9.873	0.0012	1.741	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 12/22/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-122

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120075	AS24	Asbestos PCM	Air	MCE Cassette	12/21/2017	10.028	10.014	3347.01	Liters	8:05:00 AM	1:39:00 PM	334	10.021	L/min
	17120076	AS26	Asbestos PCM	Air	MCE Cassette	12/21/2017	10.017	10.153	3388.56	Liters	8:16:00 AM	1:52:00 PM	336	10.085	L/min
	17120077	AS15	Asbestos PCM	Air	MCE Cassette	12/21/2017	10.025	10.282	3208.51	Liters	8:29:00 AM	1:45:00 PM	316	10.1535	L/min
	17120078	Blank 1	Asbestos PCM	Air	MCE Cassette	12/21/2017				Liters					L/min
	17120079	Blank 2	Asbestos PCM	Air	MCE Cassette	12/21/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	Maren Fulton START	15:30/12/21/17	[signature] ACL	12/22/17 2:00	good

ADVANTAGE Environmental INC.

Clean your world.

December 26, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/22/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/22/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/22/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/26/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/26/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/26/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120083	12261701	0.5	100	0.5/100
17120084	12261702	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120080	12261703	Area	AS24	8:08 AM	1:10 PM	9.94	9.957
17120081	12261704	Area	AS26	8:15 AM	1:30 PM	9.969	10.015
17120082	12261705	Area	AS15	8:27 AM	1:21 PM	9.952	10.134

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120080	12261703	302	9.9485	3004.45	7.5	100	0.0025	0.0725	9.236	0.0012	1.775	<0.0021	N/A
17120081	12261704	315	9.992	3147.48	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A
17120082	12261705	294	10.043	2952.64	6	100	0.0025	0.0575	7.325	0.0010	1.839	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/26/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-123

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120080	AS24	Asbestos PCM	Air	MCE Cassette	12/22/2017	9.94	9.957	3004.45	Liters	8:08:00 AM	1:10:00 PM	302	9.9485	L/min
	17120081	AS26	Asbestos PCM	Air	MCE Cassette	12/22/2017	9.969	10.015	3147.48	Liters	8:15:00 AM	1:30:00 PM	315	9.992	L/min
	17120082	AS15	Asbestos PCM	Air	MCE Cassette	12/22/2017	9.952	10.134	2952.64	Liters	8:27:00 AM	1:21:00 PM	294	10.043	L/min
	17120083	Blank 1	Asbestos PCM	Air	MCE Cassette	12/22/2017				Liters					L/min
	17120084	Blank 2	Asbestos PCM	Air	MCE Cassette	12/22/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	[illegible] START	12/22/17 15:30	[illegible]	12/26/17	good

ADVANTAGE Environmental INC.

Clean your world.

December 28, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/26/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/26/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT Ecology and Environmental, Inc. (START)
ATTENTION Erin Lynch
CONTRACTOR Ecology and Environmental, Inc. (START)
PROJECT River Street Water Front Portland, OR

ADVANTAGE PROJECT # 17-225a
CLIENT PROJECT # 10QD
REPORT # 1
PAGE 1 **OF** 1

DATE COLLECTED 12/26/2017
DATE RECEIVED 12/27/2017
DATE ANALYZED 12/27/2017
DATE REPORTED 12/28/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120088	12271701	0.5	100	0.5/100
17120089	12271702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120085	12271703	Area	AS24	8:25 AM	1:01 PM	9.804	9.917
17120086	12271704	Area	AS26	8:31 AM	1:08 PM	9.831	10.052
17120087	12271705	Area	AS15	8:50 AM	1:12 PM	9.791	10.079

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120085	12271703	276	9.8605	2721.50	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0020	N/A
17120086	12271704	277	9.9415	2753.80	7	100	0.005	0.0650	8.280	0.0012	1.785	<0.0021	N/A
17120087	12271705	262	9.935	2602.97	6.5	100	0.005	0.0600	7.643	0.0011	1.810	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 12/27/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-124

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120085	AS24	Asbestos PCM	Air	MCE Cassette	12/26/2017	9.804	9.917	2721.5	Liters	8:25:00 AM	1:01:00 PM	276	9.8605	L/min
	17120086	AS26	Asbestos PCM	Air	MCE Cassette	12/26/2017	9.831	10.052	2753.8	Liters	8:31:00 AM	1:08:00 PM	277	9.9415	L/min
	17120087	AS15	Asbestos PCM	Air	MCE Cassette	12/26/2017	9.791	10.079	2602.97	Liters	8:50:00 AM	1:12:00 PM	262	9.935	L/min
	17120088	Blank 1	Asbestos PCM	Air	MCE Cassette	12/26/2017				Liters					L/min
	17120089	Blank 2	Asbestos PCM	Air	MCE Cassette	12/26/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	Michele Fulton/STARS	15:00 12/26/17	Sidney Carter AEI	12/27/17 7:10	Good

ADVANTAGE Environmental INC.

Clean your world.

December 29, 2017

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/27/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/27/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/27/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/28/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/28/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	12/29/2017

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120093	12281701	0	100	0/100
17120094	12281702	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120090	12281703	Area	AS24	8:09 AM	2:42 PM	10.091	9.975
17120091	12281704	Area	AS26	8:55 AM	2:50 PM	9.892	10.192
17120092	12281705	Area	AS15	8:30 AM	2:46 PM	9.97	10.134

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120090	12281703	393	10.033	3942.97	8	100	0.005	0.0750	9.554	0.0009	1.741	<0.0016	N/A
17120091	12281704	355	10.042	3564.91	6.5	100	0.005	0.0600	7.643	0.0008	1.810	<0.0015	N/A
17120092	12281705	376	10.052	3779.55	7	100	0.005	0.0650	8.280	0.0008	1.785	<0.0015	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/28/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-125

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120090	AS24	Asbestos PCM	Air	MCE Cassette	12/27/2017	10.091	9.975	3942.97	Liters	8:09:00 AM	2:42:00 PM	393	10.033	L/min
	17120091	AS26	Asbestos PCM	Air	MCE Cassette	12/27/2017	9.892	10.192	3564.91	Liters	8:55:00 AM	2:50:00 PM	355	10.042	L/min
	17120092	AS15	Asbestos PCM	Air	MCE Cassette	12/27/2017	9.97	10.134	3779.55	Liters	8:30:00 AM	2:46:00 PM	376	10.052	L/min
	17120093	Blank 1	Asbestos PCM	Air	MCE Cassette	12/27/2017				Liters					L/min
	17120094	Blank 2	Asbestos PCM	Air	MCE Cassette	12/27/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all / to lab	Noreen Fulton / START	15:00 12/27/17	Sidney Carter AEI	12/28/17 7:15	Good

Fibers	COV	Fibers	COV	Fibers	COV
5.5	1.8705	30.5	1.385	55.5	1.275
6	1.839	31	1.382	56	1.274
6.5	1.81	31.5	1.38	56.5	1.272
7	1.785	32	1.375	57	1.27
7.5	1.775	32.5	1.372	57.5	1.269
8	1.7406	33	1.37	58	1.268
8.5	1.72	33.5	1.368	58.5	1.267
9	1.705	34	1.365	59	1.265
9.5	1.69	34.5	1.36	59.5	1.264
10	1.67	35	1.358	60	1.263
10.5	1.66	35.5	1.355	60.5	1.262
11	1.655	36	1.353	61	1.26
11.5	1.635	36.5	1.35	61.5	1.259
12	1.62	37	1.348	62	1.258
12.5	1.62	37.5	1.345	62.5	1.257
13	1.61	38	1.343	63	1.255
13.5	1.6	38.5	1.34	63.5	1.254
14	1.59	39	1.338	64	1.253
14.5	1.58	39.5	1.335	64.5	1.252
15	1.575	40	1.333	65	1.25
15.5	1.56	40.5	1.33	65.5	1.249
16	1.55	41	1.329	66	1.247
16.5	1.54	41.5	1.327	66.5	1.246
17	1.53	42	1.325	67	1.245
17.5	1.52	42.5	1.32	67.5	1.243
18	1.515	43	1.318	68	1.242
18.5	1.505	43.5	1.317	68.5	1.241
19	1.495	44	1.315	69	1.24
19.5	1.49	44.5	1.314	69.5	1.239
20	1.4813	45	1.311	70	1.238
20.5	1.475	45.5	1.31	70.5	1.237
21	1.47	46	1.308	71	1.236
21.5	1.46	46.5	1.305	71.5	1.235
22	1.457	47	1.303	72	1.234
22.5	1.45	47.5	1.302	72.5	1.233
23	1.445	48	1.3	73	1.232
23.5	1.44	48.5	1.298	73.5	1.231
24	1.435	49	1.297	74	1.23
24.5	1.43	49.5	1.295	74.5	1.229
25	1.428	50	1.292	75	1.227
25.5	1.425	50.5	1.29	75.5	1.226
26	1.42	51	1.289	76	1.225
26.5	1.415	51.5	1.287	76.5	1.224
27	1.41	52	1.285	77	1.223
27.5	1.408	52.5	1.283	77.5	1.222
28	1.405	53	1.281	78	1.221
28.5	1.4	53.5	1.28	78.5	1.22
29	1.3995	54	1.279	79	1.2195
29.5	1.395	54.5	1.278	79.5	1.219
30	1.39	55	1.276	80	1.218

ADVANTAGE Environmental INC.

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January 2, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/28/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/28/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/28/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	12/29/2017
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	12/29/2017
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/2/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120098	12291701	0	100	0/100
17120099	12291702	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120095	12291703	Area	AS24	8:23 AM	1:44 PM	9.969	9.787
17120096	12291704	Area	AS26	8:46 AM	2:04 PM	10.01	10.082
17120097	12291705	Area	AS15	8:35 AM	1:55 PM	10.093	10.053

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120095	12291703	321	9.878	3170.84	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A
17120096	12291704	318	10.046	3194.63	11	100	0.0025	0.1075	13.694	0.0017	1.655	<0.0027	N/A
17120097	12291705	320	10.073	3223.36	7	100	0.0025	0.0675	8.599	0.0010	1.785	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 12/29/2017

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-126

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120095	AS24	Asbestos PCM	Air	MCE Cassette	12/28/2017	9.969	9.787	3170.84	Liters	8:23:00 AM	1:44:00 PM	321	9.878	L/min
	17120096	AS26	Asbestos PCM	Air	MCE Cassette	12/28/2017	10.01	10.082	3194.63	Liters	8:46:00 AM	2:04:00 PM	318	10.046	L/min
	17120097	AS15	Asbestos PCM	Air	MCE Cassette	12/28/2017	10.093	10.053	3223.36	Liters	8:35:00 AM	1:55:00 PM	320	10.073	L/min
	17120098	Blank 1	Asbestos PCM	Air	MCE Cassette	12/28/2017				Liters					L/min
	17120099	Blank 2	Asbestos PCM	Air	MCE Cassette	12/28/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	[illegible] Fulton START	1500 12/28/17	[illegible] AEI	10:47 12/29/17	good

ADVANTAGE Environmental INC.

Clean your world.

January 3, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 12/29/2017 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 12/29/2017 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	12/29/2017
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/2/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/2/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/3/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
17120103	1021801	0.5	100	0.5/100
17120104	1021802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
17120100	1021803	Area	AS24	8:00 AM	1:35 PM	9.9492	9.8123
17120101	1021804	Area	AS26	8:38 AM	1:38 PM	9.8943	9.8216
17120102	1021805	Area	AS15	8:46 AM	1:43 PM	9.878	9.8699

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
17120100	1021803	335	9.88075	3310.05	8	100	0.005	0.0750	9.554	0.0011	1.741	<0.0019	N/A
17120101	1021804	300	9.85795	2957.39	15	100	0.005	0.1450	18.471	0.0024	1.575	<0.0038	N/A
17120102	1021805	297	9.87395	2932.56	6.5	100	0.005	0.0600	7.643	0.0010	1.810	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/2/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-127

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	17120100	AS24	Asbestos PCM	Air	MCE Cassette	12/29/2017	9.9492	9.8123	3310.07	Liters	8:00:00 AM	1:35:00 PM	335	9.8808	L/min
	17120101	AS26	Asbestos PCM	Air	MCE Cassette	12/29/2017	9.8943	9.8216	2957.4	Liters	8:38:00 AM	1:38:00 PM	300	9.858	L/min
	17120102	AS15	Asbestos PCM	Air	MCE Cassette	12/29/2017	9.878	9.8699	2932.58	Liters	8:46:00 AM	1:43:00 PM	297	9.874	L/min
	17120103	Blank 1	Asbestos PCM	Air	MCE Cassette	12/29/2017				Liters					L/min
	17120104	Blank 2	Asbestos PCM	Air	MCE Cassette	12/29/2017				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	By [signature] ENE, START	12/29/17 1435	[signature] A&T	1/2/18 7:11	good

ADVANTAGE Environmental INC.

Clean your world.

January 5, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 01/02/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 01/02/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/2/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/3/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/3/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/5/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010004	1031801	0.5	100	0.5/100
18010005	1031802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010001	1031803	Area	AS24	7:37 AM	1:09 PM	10.065	10.441
18010002	1031804	Area	AS26	7:47 AM	1:16 PM	10.034	10.397
18010003	1031805	Area	AS15	7:59 AM	1:23 PM	10.087	10.39

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010001	1031803	332	10.253	3404	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0016	N/A
18010002	1031804	329	10.2155	3360.9	13	100	0.005	0.1250	15.924	0.0018	1.610	<0.0029	N/A
18010003	1031805	324	10.2385	3317.27	8	100	0.005	0.0750	9.554	0.0011	1.741	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/2/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-128

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010001	AS24	Asbestos PCM	Air	MCE Cassette	1/2/2018	10.065	10.441	3404	Liters	7:37:00 AM	1:09:00 PM	332	10.253	L/min
	18010002	AS26	Asbestos PCM	Air	MCE Cassette	1/2/2018	10.034	10.397	3360.9	Liters	7:47:00 AM	1:16:00 PM	329	10.2155	L/min
	18010003	AS15	Asbestos PCM	Air	MCE Cassette	1/2/2018	10.087	10.39	3317.27	Liters	7:59:00 AM	1:23:00 PM	324	10.2385	L/min
	18010004	Blank 1	Asbestos PCM	Air	MCE Cassette	1/2/2018				Liters					L/min
	18010005	Blank 2	Asbestos PCM	Air	MCE Cassette	1/2/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	E+E START	1/2/18 13:49	Sidney Carter AEI	1/3/18 650	Good

ADVANTAGE Environmental INC.

Clean your world.

January 5, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/03/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/03/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/3/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/4/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/4/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/5/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010009	1041801	0	100	0/100
18010010	1041802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Sidney Carter

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010006	1041803	Area	AS24	7:54 AM	1:20 PM	10.036	10.003
18010007	1041804	Area	AS26	8:03 AM	1:25 PM	10.017	10.18
18010008	1041805	Area	AS15	8:19 AM	1:34 PM	10.093	10.358

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010006	1041803	326	10.0195	3266.36	11	100	0.0025	0.1075	13.694	0.0016	1.655	<0.0027	N/A
18010007	1041804	322	10.0985	3251.72	9	100	0.0025	0.0875	11.146	0.0013	1.705	<0.0023	N/A
18010008	1041805	315	10.2255	3221.03	12	100	0.0025	0.1175	14.968	0.0018	1.620	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/3/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-129

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010009	Blank 1	Asbestos PCM	Air	MCE Cassette	1/3/2018				Liters					L/min
	18010010	Blank 2	Asbestos PCM	Air	MCE Cassette	1/3/2018				Liters					L/min
	18010006	AS24	Asbestos PCM	Air	MCE Cassette	1/3/2018	10.036	10.003	3266.36	Liters	7:54:00 AM	1:20:00 PM	326	10.0195	L/min
	18010007	AS26	Asbestos PCM	Air	MCE Cassette	1/3/2018	10.017	10.18	3251.72	Liters	8:03:00 AM	1:25:00 PM	322	10.0985	L/min
	18010008	AS15	Asbestos PCM	Air	MCE Cassette	1/3/2018	10.093	10.358	3221.03	Liters	8:19:00 AM	1:34:00 PM	315	10.2255	L/min

Special Instructions: Please proces air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	(START E+E)	1/3/18 1354	Sidney Carter AEI	1/4/18 710	Good

ADVANTAGE Environmental INC.

Clean your world.

January 8, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/04/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/04/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/4/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/5/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/5/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/8/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010014	1051801	0.5	100	0.5/100
18010015	1051802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010011	1051803	Area	AS24	7:50 AM	1:19 PM	10.02	10.073
18010012	1051804	Area	AS26	8:00 AM	1:26 PM	10.014	10.183
18010013	1051805	Area	AS15	8:13 AM	1:33 PM	12:23 AM	10.234

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010011	1051803	329	10.0465	3305.3	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A
18010012	1051804	326	10.0985	3292.11	7.5	100	0.0025	0.0725	9.236	0.0011	1.775	<0.0019	N/A
18010013	1051805	320	10.125	3240	9	100	0.0025	0.0875	11.146	0.0013	1.705	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 1/4/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-130

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010011	AS24	Asbestos PCM	Air	MCE Cassette	1/4/2018	10.02	10.073	3305.3	Liters	7:50:00 AM	1:19:00 PM	329	10.0465	L/min
	18010012	AS26	Asbestos PCM	Air	MCE Cassette	1/4/2018	10.014	10.183	3292.11	Liters	8:00:00 AM	1:26:00 PM	326	10.0985	L/min
	18010013	AS15	Asbestos PCM	Air	MCE Cassette	1/4/2018	10.016	10.234	3240	Liters	8:13:00 AM	1:33:00 PM	320	10.125	L/min
	18010014	Blank1	Asbestos PCM	Air	MCE Cassette	1/4/2018									
	18010015	Blank 2	Asbestos PCM	Air	MCE Cassette	1/4/2018									

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	(E+E START)	1/4/18 1347	AEI	12:00 1/5/18	good

ADVANTAGE Environmental INC.

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January 8, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/05/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/05/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/5/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/6/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/6/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/8/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010019	1061801	0	100	0/100
18010020	1061802	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010016	1061803	Area	AS24	7:55 AM	1:21 PM	10.092	9.9735
18010017	1061804	Area	AS26	8:02 AM	1:27 PM	10.078	10.148
18010018	1061805	Area	AS15	8:18 AM	1:34 PM	12:46 AM	10.147

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010016	1061803	326	10.0328	3270.68	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0016	N/A
18010017	1061804	325	10.113	3286.73	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0017	N/A
18010018	1061805	316	10.0895	3188.28	7.5	100	0.005	0.0700	8.917	0.0011	1.775	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped:

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone:

No: PDX-131

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010016	AS24	Asbestos PCM	Air	MCE Cassette	1/5/2018	10.092	9.9735	3270.69	Liters	7:55:00 AM	1:21:00 PM	326	10.0328	L/min
	18010017	AS26	Asbestos PCM	Air	MCE Cassette	1/5/2018	10.078	10.148	3286.73	Liters	8:02:00 AM	1:27:00 PM	325	10.113	L/min
	18010018	AS15	Asbestos PCM	Air	MCE Cassette	1/5/2018	10.032	10.147	3188.28	Liters	8:18:00 AM	1:34:00 PM	316	10.0895	L/min
	18010019	Blank 1	Asbestos PCM	Air	MCE Cassette	1/5/2018				Liters					L/min
	18010020	Blank 2	Asbestos PCM	Air	MCE Cassette	1/5/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	(START E&E)	1/5/18 13:50	AEI	1/6/18 12:24	good

ADVANTAGE Environmental INC.

Clean your world.

January 9, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/06/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/06/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/6/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/8/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/8/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/9/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010024	1081801	0.5	100	0.5/100
18010025	1081802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010021	1061803	Area	AS24	7:45 AM	1:19 PM	10.005	9.9682
18010022	1061804	Area	AS26	7:56 AM	1:24 PM	10.037	10.225
18010023	1061805	Area	AS15	8:11 AM	1:30 PM	12:36 AM	10.238

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010021	1061803	334	9.9866	3335.52	13	100	0.0025	0.1275	16.242	0.0019	1.610	<0.0030	N/A
18010022	1061804	328	10.131	3322.97	7	100	0.0025	0.0675	8.599	0.0010	1.785	<0.0018	N/A
18010023	1061805	319	10.1315	3231.95	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/6/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-132

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010021	AS24	Asbestos PCM	Air	MCE Cassette	1/6/2018	10.005	9.9682	3335.52	Liters	7:45:00 AM	1:19:00 PM	334	9.9866	L/min
	18010022	AS26	Asbestos PCM	Air	MCE Cassette	1/6/2018	10.037	10.225	3322.97	Liters	7:56:00 AM	1:24:00 PM	328	10.131	L/min
	18010023	AS15	Asbestos PCM	Air	MCE Cassette	1/6/2018	10.025	10.238	3231.95	Liters	8:11:00 AM	1:30:00 PM	319	10.1315	L/min
	18010024	Blank 1	Asbestos PCM	Air	MCE Cassette	1/6/2018				Liters					L/min
	18010025	Blank 2	Asbestos PCM	Air	MCE Cassette	1/6/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	(START EE)	1/6/18 1344			
Samples	START	1/8/18	Sidney Carter AEI	1/8/18 6:50	Good

ADVANTAGE Environmental INC.

Clean your world.

January 11, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/08/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/08/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/8/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/9/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/9/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/11/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010029	1091801	0.5	100	0.5/100
18010030	1091802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010026	1091803	Area	AS24	8:05 AM	12:48 PM	10.075	10.015
18010027	1091804	Area	AS26	7:49 AM	1:00 PM	9.975	9.972
18010028	1091805	Area	AS15	8:35 AM	1:15 PM	9.934	10.065

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010026	1091803	283	10.045	2842.74	6.5	100	0.005	0.0600	7.643	0.0010	1.810	<0.0019	N/A
18010027	1091804	311	9.9735	3101.76	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0018	N/A
18010028	1091805	280	9.9995	2799.86	6	100	0.005	0.0550	7.006	0.0010	1.839	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/9/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-136

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010026	AS24	Asbestos PCM	Air	MCE Cassette	1/8/2018	10.075	10.015	2842.74	Liters	8:05:00 AM	12:48:00 PM	283	10.045	L/min
	18010027	AS26	Asbestos PCM	Air	MCE Cassette	1/8/2018	9.975	9.972	3101.76	Liters	7:49:00 AM	1:00:00 PM	311	9.9735	L/min
	18010028	AS15	Asbestos PCM	Air	MCE Cassette	1/8/2018	9.934	10.065	2799.86	Liters	8:35:00 AM	1:15:00 PM	280	9.9995	L/min
	18010029	Blank 1	Asbestos PCM	Air	MCE Cassette	1/8/2018				Liters					L/min
	18010030	Blank 2	Asbestos PCM	Air	MCE Cassette	1/8/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples (overnight)		14:53 1/8/18			
Samples		06:53 1/9/18	A&I	1/9/18 12:12	good

ADVANTAGE Environmental INC.

Clean your world.

January 11, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/08/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/08/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/8/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/9/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/9/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/11/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010032	1091801	0.5	100	0.5/100
18010033	1091802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010034	1091803	Area	AS24	8:23 AM	1:05 PM	9.992	9.731
18010035	1091804	Area	AS26	8:32 AM	1:18 PM	9.95	9.988
18010036	1091805	Area	AS15	8:48 AM	1:42 PM	9.989	10.001

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010034	1091803	282	9.8615	2780.94	7	100	0.0025	0.0675	8.599	0.0012	1.785	<0.0021	N/A
18010035	1091804	286	9.969	2851.13	6	100	0.0025	0.0575	7.325	0.0010	1.839	<0.0018	N/A
18010036	1091805	294	9.995	2938.53	9	100	0.0025	0.0875	11.146	0.0015	1.705	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/10/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-137

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010032	Blank 1	Asbestos PCM	Air	MCE Cassette	1/9/2018				Liters					L/min
	18010033	Blank 2	Asbestos PCM	Air	MCE Cassette	1/9/2018				Liters					L/min
	18010034	AS24	Asbestos PCM	Air	MCE Cassette	1/9/2018	9.992	9.731	2780.94	Liters	8:23:00 AM	1:05:00 PM	282	9.8615	L/min
	18010035	AS26	Asbestos PCM	Air	MCE Cassette	1/9/2018	9.95	9.988	2851.13	Liters	8:32:00 AM	1:18:00 PM	286	9.969	L/min
	18010036	AS15	Asbestos PCM	Air	MCE Cassette	1/9/2018	9.989	10.001	2938.53	Liters	8:48:00 AM	1:42:00 PM	294	9.995	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	START	16:09 1/9/18	Sidney Carter HEF	1/10/18 715	Good
Samples	START	06:52 1/10/18			

ADVANTAGE Environmental INC.

Clean your world.

January 12, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/10/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/10/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/10/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/11/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/11/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/12/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010040	1111801	0	100	0/100
18010041	1111802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010037	1111803	Area	AS26	9:19 AM	1:47 PM	9.918	10.1
18010038	1111804	Area	AS15	8:34 AM	1:12 PM	9.9468	10.138
18010039	1111805	Area	AS24	9:09 AM	1:23 PM	10.006	10.168

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010037	1111803	268	10.009	2682.41	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0021	N/A
18010038	1111804	278	10.0424	2791.79	7	100	0.0025	0.0675	8.599	0.0012	1.785	<0.0021	N/A
18010039	1111805	254	10.087	2562.10	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/11/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-138

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010037	AS26	Asbestos PCM	Air	MCE Cassette	1/10/2018	9.918	10.1	2682.41	Liters	9:19:00 AM	1:47:00 PM	268	10.009	L/min
	18010038	AS15	Asbestos PCM	Air	MCE Cassette	1/10/2018	9.9468	10.138	2791.79	Liters	8:34:00 AM	1:12:00 PM	278	10.0424	L/min
	18010039	AS24	Asbestos PCM	Air	MCE Cassette	1/10/2018	10.006	10.168	2562.1	Liters	9:09:00 AM	1:23:00 PM	254	10.087	L/min
	18010040	Blank 2	Asbestos PCM	Air	MCE Cassette	1/10/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18010041	Blank 1	Asbestos PCM	Air	MCE Cassette	1/10/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	[signature] START	14:41 1/10/18	Sidney Carter AEI	1/11/18 7:20	Good
Samples	[signature] START	7:20 1/11/18			

ADVANTAGE Environmental INC.

Clean your world.

January 15, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/11/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/11/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/11/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/12/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/12/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/15/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010045	1121801	0.5	100	0.5/100
18010046	1121802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010042	1121803	Area	AS26	8:34 AM	1:27 PM	10.012	9.9755
18010043	1121804	Area	AS15	9:17 AM	1:54 PM	9.9644	10.021
18010044	1121805	Area	AS24	8:52 AM	1:18 PM	9.9199	9.8883

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010042	1121803	293	9.9938	2928.18	6	100	0.0025	0.0575	7.325	0.0010	1.839	<0.0018	N/A
18010043	1121804	277	9.9927	2767.98	5.5	100	0.0025	0.0525	6.688	< LOD	1.871	<1.8705	N/A
18010044	1121805	266	9.9041	2634.49	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/12/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-139

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010042	AS26	Asbestos PCM	Air	MCE Cassette	1/11/2018	10.012	9.9755	2928.18	Liters	8:34:00 AM	1:27:00 PM	293	9.9938	L/min
	18010043	AS15	Asbestos PCM	Air	MCE Cassette	1/11/2018	9.9644	10.021	2767.98	Liters	9:17:00 AM	1:54:00 PM	277	9.9927	L/min
	18010044	AS24	Asbestos PCM	Air	MCE Cassette	1/11/2018	9.9199	9.8883	2634.49	Liters	8:52:00 AM	1:18:00 PM	266	9.9041	L/min
	18010045	Blank 1	Asbestos PCM	Air	MCE Cassette	1/11/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18010046	Blank 2	Asbestos PCM	Air	MCE Cassette	1/11/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	START	~~15:21~~ 14:31 1/11/18	ACET	1/12/18 12:68	good

ADVANTAGE Environmental INC.

Clean your world.

January 16, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/12/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/12/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/12/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/13/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/13/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/16/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010047	1131801	0	100	0/100
18010048	1131802	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010049	1131803	Area	AS24	7:30 AM	2:41 PM	9.9449	9.9526
18010050	1131804	Area	AS26	7:41 AM	2:54 PM	10.174	10.153
18010051	1131805	Area	AS15	8:08 AM	3:11 PM	10.034	9.994

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010049	1131803	431	9.9488	4287.93	6	100	0.005	0.0550	7.006	0.0006	1.839	<0.0012	N/A
18010050	1131804	433	10.1635	4400.8	8	100	0.005	0.0750	9.554	0.0008	1.741	<0.0015	N/A
18010051	1131805	423	10.014	4235.92	6.5	100	0.005	0.0600	7.643	0.0007	1.810	<0.0013	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 1/12/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-140

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010047	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/12/2018	0	0	0	Liters	7:15:00 AM	3:15:00 PM	480	0	L/min
	18010048	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/12/2018	0	0	0	Liters	7:20:00 AM	3:20:00 PM	480	0	L/min
	18010049	AS24	Asbestos PCM	Air	MCE Cassette	1/12/2018	9.9449	9.9526	4287.93	Liters	7:30:00 AM	2:41:00 PM	431	9.9488	L/min
	18010050	AS26	Asbestos PCM	Air	MCE Cassette	1/12/2018	10.174	10.153	4400.8	Liters	7:41:00 AM	2:54:00 PM	433	10.1635	L/min
	18010051	AS15	Asbestos PCM	Air	MCE Cassette	1/12/2018	10.034	9.994	4235.92	Liters	8:08:00 AM	3:11:00 PM	423	10.014	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/overnight storage.	Ryan Whitchurch / START	1/12/2018 17:04			
Samples	START	12:19 1/13/2018	AEI	1/13/18 12:20	good

ADVANTAGE Environmental INC.

Clean your world.

January 17, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/13/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/13/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/13/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/15/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/15/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/16/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010055	1151801	1	100	1/100
18010056	1151802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010052	1151803	Area	AS15	8:50 AM	12:58 PM	9.9451	9.9292
18010053	1151804	Area	AS24	8:31 AM	12:45 PM	10.087	9.9344
18010054	1151805	Area	AS26	8:14 AM	12:37 PM	10.04	9.8965

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010052	1151803	248	9.9372	2464.43	8	100	0.0075	0.0725	9.236	0.0014	1.741	<0.0025	N/A
18010053	1151804	254	10.0107	2542.72	6.5	100	0.0075	0.0575	7.325	< LOD	1.810	<1.8100	N/A
18010054	1151805	263	9.9683	2621.65	10	100	0.0075	0.0925	11.783	0.0017	1.670	<0.0029	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/15/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-141

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010052	AS15	Asbestos PCM	Air	MCE Cassette	1/13/2018	9.9451	9.9292	2464.43	Liters	8:50:00 AM	12:58:00 PM	248	9.9372	L/min
	18010053	AS24	Asbestos PCM	Air	MCE Cassette	1/13/2018	10.087	9.9344	2542.72	Liters	8:31:00 AM	12:45:00 PM	254	10.0107	L/min
	18010054	AS26	Asbestos PCM	Air	MCE Cassette	1/13/2018	10.04	9.8965	2621.66	Liters	8:14:00 AM	12:37:00 PM	263	9.9683	L/min
	18010055	Blank 1	Asbestos PCM	Air	MCE Cassette	1/13/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18010056	Blank 2	Asbestos PCM	Air	MCE Cassette	1/13/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
overnight Samples	START	13:22 1/13/18	Sidney Carter AEI	1/15/18 715	Good

ADVANTAGE Environmental INC.

Clean your world.

January 17, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/15/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/15/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/15/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/16/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/16/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/17/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010060	1161801	1	100	1/100
18010061	1161802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010057	1161803	Area	AS24	8:13 AM	12:51 PM	10.014	9.92
18010058	1161804	Area	AS26	8:37 AM	1:11 PM	9.981	10.021
18010059	1161805	Area	AS15	8:31 AM	1:01 PM	10.055	10.087

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010057	1161803	278	9.9670	2770.83	9	100	0.005	0.0850	10.828	0.0015	1.705	<0.0026	N/A
18010058	1161804	274	10.001	2740.27	6	100	0.005	0.0550	7.006	< LOD	1.839	<1.8390	N/A
18010059	1161805	270	10.0710	2719.17	7.5	100	0.005	0.0700	8.917	0.0013	1.775	<0.0022	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/16/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-142

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010057	AS24	Asbestos PCM	Air	MCE Cassette	1/15/2018	10.014	9.92	2770.83	Liters	8:13:00 AM	12:51:00 PM	278	9.967	L/min
	18010058	AS26	Asbestos PCM	Air	MCE Cassette	1/15/2018	9.981	10.021	2740.27	Liters	8:37:00 AM	1:11:00 PM	274	10.001	L/min
	18010059	AS15	Asbestos PCM	Air	MCE Cassette	1/15/2018	10.055	10.087	2719.17	Liters	8:31:00 AM	1:01:00 PM	270	10.071	L/min
	18010060	Blank 1	Asbestos PCM	Air	MCE Cassette	1/15/2018				Liters					L/min
	18010061	Blank 2	Asbestos PCM	Air	MCE Cassette	1/15/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Marlen Fulton START	1/15/18 14:43	ACCI	1/16/18 7:20	good

ADVANTAGE Environmental INC.

Clean your world.

January 18, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/16/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/16/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/16/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/17/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/17/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/18/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010065	1171801	0	100	0/100
18010066	1171802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010062	1171803	Area	AS24	7:59 AM	12:49 PM	10.074	9.854
18010063	1171804	Area	AS26	8:13 AM	1:17 PM	9.933	9.915
18010064	1171805	Area	AS15	8:22 AM	1:06 PM	10.011	9.916

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010062	1171803	290	9.9640	2889.56	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0019	N/A
18010063	1171804	304	9.924	3016.9	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0017	N/A
18010064	1171805	284	9.9635	2829.63	7.5	100	0.0025	0.0725	9.236	0.0013	1.775	<0.0022	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/17/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-143

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010062	AS24	Asbestos PCM	Air	MCE Cassette	1/16/2018	10.074	9.854	2889.56	Liters	7:59:00 AM	12:49:00 PM	290	9.964	L/min
	18010063	AS26	Asbestos PCM	Air	MCE Cassette	1/16/2018	9.933	9.915	3016.9	Liters	8:13:00 AM	1:17:00 PM	304	9.924	L/min
	18010064	AS15	Asbestos PCM	Air	MCE Cassette	1/16/2018	10.011	9.916	2829.63	Liters	8:22:00 AM	1:06:00 PM	284	9.9635	L/min
	18010065	Blank 1	Asbestos PCM	Air	MCE Cassette	1/16/2018				Liters					L/min
	18010066	Blank 2	Asbestos PCM	Air	MCE Cassette	1/16/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	[illegible] START	1/16/18 15:09	Sidney Carter AEI	1/17/18 650	Good

ADVANTAGE Environmental INC.

Clean your world.

January 19, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/17/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/17/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/17/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/18/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/18/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/19/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010067	1181801	0.5	100	0.5/100
18010068	1181802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010069	1181803	Area	AS24	8:15 AM	1:25 PM	10.094	9.9845
18010070	1181804	Area	AS26	7:59 AM	1:33 PM	9.9034	9.897
18010071	1181805	Area	AS15	8:39 AM	1:45 PM	9.9158	9.971

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010069	1181803	310	10.0393	3112.18	11	100	0.005	0.1050	13.376	0.0017	1.655	<0.0027	N/A
18010070	1181804	334	9.9002	3306.67	8	100	0.005	0.0750	9.554	0.0011	1.741	<0.0019	N/A
18010071	1181805	306	9.9434	3042.68	9	100	0.005	0.0850	10.828	0.0014	1.705	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/17/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-144

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010067	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/17/2018	0	0	0	Liters	7:30:00 AM	1:50:00 PM	380	0	L/min
	18010068	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/17/2018	0	0	0	Liters	7:35:00 AM	1:55:00 PM	380	0	L/min
	18010069	AS24	Asbestos PCM	Air	MCE Cassette	1/17/2018	10.094	9.9845	3112.18	Liters	8:15:00 AM	1:25:00 PM	310	10.0393	L/min
	18010070	AS26	Asbestos PCM	Air	MCE Cassette	1/17/2018	9.9034	9.897	3306.67	Liters	7:59:00 AM	1:33:00 PM	334	9.9002	L/min
	18010071	AS15	Asbestos PCM	Air	MCE Cassette	1/17/2018	9.9158	9.971	3042.68	Liters	8:39:00 AM	1:45:00 PM	306	9.9434	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL (overnight storage)	Ryan Whitchurch START RIO	1/17/2018 1431	Sidney Carter AEI	1/18/18 9:15	Good

ADVANTAGE Environmental INC.

Clean your world.

January 22, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/18/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/18/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/18/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/19/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/19/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/22/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010075	1191801	0.5	100	0.5/100
18010076	1191802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010072	1191803	Area	AS24	8:14 AM	12:56 PM	10.118	10.02
18010073	1191804	Area	AS26	8:35 AM	1:25 PM	10.026	10.032
18010074	1191805	Area	AS15	8:25 AM	1:15 PM	10.032	10.026

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010072	1191803	282	10.0690	2839.46	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0020	N/A
18010073	1191804	290	10.029	2908.41	8	100	0.0025	0.0775	9.873	0.0013	1.741	<0.0023	N/A
18010074	1191805	290	10.0290	2908.41	9.5	100	0.0025	0.0925	11.783	0.0016	1.690	<0.0026	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/19/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-145

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010072	AS24	Asbestos PCM	Air	MCE Cassette	1/18/2018	10.118	10.02	2839.46	Liters	8:14:00 AM	12:56:00 PM	282	10.069	L/min
	18010073	AS26	Asbestos PCM	Air	MCE Cassette	1/18/2018	10.026	10.032	2908.41	Liters	8:35:00 AM	1:25:00 PM	290	10.029	L/min
	18010074	AS15	Asbestos PCM	Air	MCE Cassette	1/18/2018	10.032	10.026	2908.41	Liters	8:25:00 AM	1:15:00 PM	290	10.029	L/min
	18010075	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/18/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18010076	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/18/2018	0		0	Liters	7:35:00 AM		380	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	Marcus Fulton START	14:47 1/18/18	AEI	1/19/18 7:20	good

ADVANTAGE Environmental INC.

Clean your world.

January 22, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/19/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/19/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/19/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/20/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/20/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/22/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010080	1201801	0.5	100	0.5/100
18010081	1201802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010077	1201803	Area	AS24	7:43 AM	1:10 PM	10.074	9.949
18010078	1201804	Area	AS26	7:53 AM	1:29 PM	10.019	9.996
18010079	1201805	Area	AS15	8:04 AM	1:19 PM	9.998	10.011

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010077	1201803	327	10.0115	3273.76	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0017	N/A
18010078	1201804	336	10.0075	3362.52	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0016	N/A
18010079	1201805	315	10.0045	3151.42	9.5	100	0.005	0.0900	11.465	0.0014	1.690	<0.0024	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/20/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-146

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010077	AS24	Asbestos PCM	Air	MCE Cassette	1/19/2018	10.074	9.949	3273.76	Liters	7:43:00 AM	1:10:00 PM	327	10.0115	L/min
	18010078	AS26	Asbestos PCM	Air	MCE Cassette	1/19/2018	10.019	9.996	3362.52	Liters	7:53:00 AM	1:29:00 PM	336	10.0075	L/min
	18010079	AS15	Asbestos PCM	Air	MCE Cassette	1/19/2018	9.998	10.011	3151.42	Liters	8:04:00 AM	1:19:00 PM	315	10.0045	L/min
	18010080	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/19/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18010081	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/19/2018	0		0	Liters	7:35:00 AM		380	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all/to lab	[illegible] START	1/19/18 14:44	[illegible]	1/20/18 6:56	good

ADVANTAGE Environmental INC.

Clean your world.

January 24, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/20/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/20/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/20/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/22/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/22/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/23/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010085	1221801	0.5	100	0.5/100
18010086	1221802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010082	1221803	Area	AS24	7:59 AM	1:06 PM	10	9.873
18010083	1221804	Area	AS26	8:12 AM	1:23 PM	10.091	10.124
18010084	1221805	Area	AS15	8:26 AM	1:16 PM	9.933	10.037

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010082	1221803	307	9.9365	3050.51	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0019	N/A
18010083	1221804	311	10.1075	3143.43	9	100	0.0025	0.0875	11.146	0.0014	1.705	<0.0023	N/A
18010084	1221805	290	9.9850	2895.65	8.5	100	0.0025	0.0825	10.510	0.0014	1.720	<0.0024	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/22/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-147

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010082	AS24	Asbestos PCM	Air	MCE Cassette	1/20/2018	10	9.873	3050.51	Liters	7:59:00 AM	1:06:00 PM	307	9.9365	L/min
	18010083	AS26	Asbestos PCM	Air	MCE Cassette	1/20/2018	10.091	10.124	3143.43	Liters	8:12:00 AM	1:23:00 PM	311	10.1075	L/min
	18010084	AS15	Asbestos PCM	Air	MCE Cassette	1/20/2018	9.933	10.037	2895.65	Liters	8:26:00 AM	1:16:00 PM	290	9.985	L/min
	18010085	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/20/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18010086	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/20/2018	0		0	Liters	7:35:00 AM		380	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all / To lab	[illegible] START	1/20/18 14:00	Sidney Carter AEI	1/22/18 650	Good

ADVANTAGE Environmental INC.

Clean your world.

January 24, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/22/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/22/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/22/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/23/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/23/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/24/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010087	1231801	1	100	1/100
18010088	1231802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010089	1231803	Area	AS24	8:02 AM	1:15 PM	9.913	9.9213
18010090	1231804	Area	AS26	8:21 AM	1:25 PM	9.9085	10.085
18010091	1231805	Area	AS15	8:50 AM	2:31 PM	9.8814	10.062

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010089	1231803	313	9.9172	3104.08	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0017	N/A
18010090	1231804	304	9.99675	3039.03	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0019	N/A
18010091	1231805	341	9.9717	3400.35	9	100	0.005	0.0850	10.828	0.0012	1.705	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/22/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-148

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010087	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/22/2018	0	0	0	Liters	7:30:00 AM	2:35:00 PM	425	0	L/min
	18010088	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/22/2018	0	0	0	Liters	7:35:00 AM	2:40:00 PM	425	0	L/min
	18010089	AS24	Asbestos PCM	Air	MCE Cassette	1/22/2018	9.913	9.9213	3104.08	Liters	8:02:00 AM	1:15:00 PM	313	9.9172	L/min
	18010090	AS26	Asbestos PCM	Air	MCE Cassette	1/22/2018	9.9085	10.085	3039.03	Liters	8:21:00 AM	1:25:00 PM	304	9.9968	L/min
	18010091	AS15	Asbestos PCM	Air	MCE Cassette	1/22/2018	9.8814	10.062	3400.35	Liters	8:50:00 AM	2:31:00 PM	341	9.9717	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL / overnight storage in trailer	Ryan Whitchurch START	1/22/2018 15:40	AEI	1/23/18 10:56	good

ADVANTAGE Environmental INC.

Clean your world.

January 26, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/23/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/23/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/23/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/24/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/24/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/26/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010095	1241801	0.5	100	0.5/100
18010096	1241802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010092	1241803	Area	AS24	8:53 AM	1:23 PM	9.9422	9.8411
18010093	1241804	Area	AS26	8:36 AM	1:14 PM	10.115	9.9449
18010094	1241805	Area	AS15	9:18 AM	1:41 PM	9.9043	9.9404

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010092	1241803	270	9.8917	2670.76	7	100	0.0025	0.0675	8.599	0.0012	1.785	<0.0022	N/A
18010093	1241804	278	10.02995	2788.34	10	100	0.0025	0.0975	12.420	0.0017	1.670	<0.0029	N/A
18010094	1241805	263	9.9224	2609.59	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/23/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/24/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/24/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/26/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010095	1241801	0.5	100	0.5/100
18010096	1241802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010092	1241803	Area	AS24	8:53 AM	1:23 PM	9.9422	9.8411
18010093	1241804	Area	AS26	8:36 AM	1:14 PM	10.115	9.9449
18010094	1241805	Area	AS15	9:18 AM	1:41 PM	9.9043	9.9404

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010092	1241803	270	9.8917	2670.76	7	100	0.0025	0.0675	8.599	0.0012	1.785	<0.0022	N/A
18010093	1241804	278	10.02995	2788.34	10	100	0.0025	0.0975	12.420	0.0017	1.670	<0.0029	N/A
18010094	1241805	263	9.9224	2609.59	6	100	0.0025	0.0575	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/24/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-149

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010092	AS24	Asbestos PCM	Air	MCE Cassette	1/23/2018	9.9422	9.8411	2670.76	Liters	8:53:00 AM	1:23:00 PM	270	9.8917	L/min
	18010093	AS26	Asbestos PCM	Air	MCE Cassette	1/23/2018	10.115	9.9449	2788.34	Liters	8:36:00 AM	1:14:00 PM	278	10.03	L/min
	18010094	AS15	Asbestos PCM	Air	MCE Cassette	1/23/2018	9.9043	9.9404	2609.59	Liters	9:18:00 AM	1:41:00 PM	263	9.9224	L/min
	18010095	Blank 1	Asbestos PCM	Air	MCE Cassette	1/23/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18010096	Blank 2	Asbestos PCM	Air	MCE Cassette	1/23/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	[illegible] START	1/23/18 14:22	Sidney Carter AEI	1/24/18 655	Good

ADVANTAGE Environmental INC.

Clean your world.

January 26, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/24/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/24/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/24/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/25/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/25/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/26/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010097	1251801	0.5	100	0.5/100
18010098	1251802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010099	1251803	Area	AS24	8:04 AM	1:09 PM	9.8416	9.9046
18010100	1251804	Area	AS26	8:17 AM	1:25 PM	9.5565	9.6548
18010101	1251805	Area	AS15	8:35 AM	1:39 PM	9.937	10.06

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010099	1251803	305	9.8731	3011.3	9	100	0.005	0.0850	10.828	0.0014	1.705	<0.0024	N/A
18010100	1251804	308	9.60565	2958.56	7.5	100	0.005	0.0700	8.917	0.0012	1.775	<0.0021	N/A
18010101	1251805	304	9.9985	3039.54	6	100	0.005	0.0550	7.006	0.0009	1.839	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 1/24/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-150

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010097	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/24/2018	0	0	0	Liters	7:30:00 AM	1:50:00 PM	380	0	L/min
	18010098	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/24/2018	0	0	0	Liters	7:35:00 AM	1:55:00 PM	380	0	L/min
	18010099	AS24	Asbestos PCM	Air	MCE Cassette	1/24/2018	9.8416	9.9046	3011.3	Liters	8:04:00 AM	1:09:00 PM	305	9.8731	L/min
	18010100	AS26	Asbestos PCM	Air	MCE Cassette	1/24/2018	9.5565	9.6548	2958.56	Liters	8:17:00 AM	1:25:00 PM	308	9.6057	L/min
	18010101	AS15	Asbestos PCM	Air	MCE Cassette	1/24/2018	9.937	10.06	3039.54	Liters	8:35:00 AM	1:39:00 PM	304	9.9985	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL - overnight storage in trailer	Ryan Whitchurch START	1/24/2018 1514	Sidney Carter AEI	1/25 651	Good

ADVANTAGE Environmental INC.

Clean your world.

January 29, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/25/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/25/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/25/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/26/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/26/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/29/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010102	1261801	1	100	1/100
18010103	1261802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010104	1261803	Area	AS24	7:38 AM	1:24 PM	9.8719	9.9349
18010105	1261804	Area	AS26	7:51 AM	1:31 PM	9.5108	9.6982
18010106	1261805	Area	AS15	8:13 AM	1:45 PM	9.9094	10.061

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010104	1261803	346	9.9034	3426.58	9	100	0.005	0.0850	10.828	0.0012	1.705	<0.0021	N/A
18010105	1261804	340	9.6045	3265.53	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0017	N/A
18010106	1261805	332	9.9852	3315.09	6.5	100	0.005	0.0600	7.643	0.0009	1.810	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 1/25/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-151

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010102	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/25/2018	0	0	0	Liters	7:15:00 AM	1:50:00 PM	395	0	L/min
	18010103	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/25/2018	0	0	0	Liters	7:20:00 AM	1:55:00 PM	395	0	L/min
	18010104	AS24	Asbestos PCM	Air	MCE Cassette	1/25/2018	9.8719	9.9349	3426.58	Liters	7:38:00 AM	1:24:00 PM	346	9.9034	L/min
	18010105	AS26	Asbestos PCM	Air	MCE Cassette	1/25/2018	9.5108	9.6982	3265.53	Liters	7:51:00 AM	1:31:00 PM	340	9.6045	L/min
	18010106	AS15	Asbestos PCM	Air	MCE Cassette	1/25/2018	9.9094	10.061	3315.09	Liters	8:13:00 AM	1:45:00 PM	332	9.9852	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL / overnight storage in trailer desk	Ryan Whitchurch START - R10	1/25/2018 1409	AEI	1/26/18 7:12	good

ADVANTAGE Environmental INC.

Clean your world.

January 29, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/26/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/26/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/26/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/27/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/27/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/29/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010107	1271801	1	100	1/100
18010108	1271802	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Pete Coleman

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010109	1271803	Area	AS24	7:19 AM	1:20 PM	9.8697	9.98
18010110	1271804	Area	AS26	7:31 AM	1:15 PM	9.443	9.6105
18010111	1271805	Area	AS15	8:07 AM	1:33 PM	9.8258	10.061

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010109	1271803	361	9.9249	3582.87	14	100	0.01	0.1300	16.561	0.0018	1.590	<0.0028	N/A
18010110	1271804	344	9.5268	3277.22	12	100	0.01	0.1100	14.013	0.0016	1.620	<0.0027	N/A
18010111	1271805	326	9.9434	3241.55	7.5	100	0.01	0.0650	8.280	0.0010	1.775	<0.0017	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 1/26/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steven Hall

Contact Phone: 206-920-1739

No: PDX-152

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010107	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/26/2018	0	0	0	Liters	6:50:00 AM		-410	0	L/min
	18010108	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/26/2018	0	0	0	Liters	6:55:00 AM		-415	0	L/min
	18010109	AS24	Asbestos PCM	Air	MCE Cassette	1/26/2018	9.8697	9.98	3582.89	Liters	7:19:00 AM	1:20:00 PM	361	9.9249	L/min
	18010110	AS26	Asbestos PCM	Air	MCE Cassette	1/26/2018	9.443	9.6105	3277.22	Liters	7:31:00 AM	1:15:00 PM	344	9.5268	L/min
	18010111	AS15	Asbestos PCM	Air	MCE Cassette	1/26/2018	9.8258	10.061	3241.55	Liters	8:07:00 AM	1:33:00 PM	326	9.9434	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/ Analysis	(START E+E)	1/26/18 1350		1/27/18 6:59	

ADVANTAGE Environmental INC.

Clean your world.

January 30, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/27/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/27/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/27/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/29/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/29/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/30/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010112	1291801	0	100	0/100
18010113	1291802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010114	1291803	Area	AS24	7:58 AM	1:21 PM	10.01	9.8183
18010115	1291804	Area	AS26	8:11 AM	1:32 PM	9.4888	9.4509
18010116	1291805	Area	AS15	8:28 AM	1:42 PM	9.9158	9.9429

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010114	1291803	323	9.9142	3202.27	7	100	0.0025	0.0675	8.599	0.0010	1.785	<0.0018	N/A
18010115	1291804	321	9.4699	3039.82	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0019	N/A
18010116	1291805	314	9.9294	3117.82	6.5	100	0.0025	0.0625	7.962	0.0010	1.810	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 1/27/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-153

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010112	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/27/2018	0	0	0	Liters	7:25:00 AM	1:45:00 PM	380	0	L/min
	18010113	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/27/2018	0	0	0	Liters	7:30:00 AM	1:50:00 PM	380	0	L/min
	18010114	AS24	Asbestos PCM	Air	MCE Cassette	1/27/2018	10.01	9.8183	3202.29	Liters	7:58:00 AM	1:21:00 PM	323	9.9142	L/min
	18010115	AS26	Asbestos PCM	Air	MCE Cassette	1/27/2018	9.4888	9.4509	3039.84	Liters	8:11:00 AM	1:32:00 PM	321	9.4699	L/min
	18010116	AS15	Asbestos PCM	Air	MCE Cassette	1/27/2018	9.9158	9.9429	3117.83	Liters	8:28:00 AM	1:42:00 PM	314	9.9294	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/overnight storage for AEI	Ryan Whitchurch START	1/27/2018 1456	Sidney Carter AEI	1/29/18 647	Good

ADVANTAGE Environmental INC.

Clean your world.

January 31, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/29/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/29/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/29/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/30/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/30/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	1/31/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010120	1301801	0	100	0/100
18010121	1301802	1	100	1/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010117	1301803	Area	AS24	8:00 AM	1:12 PM	9.995	9.8293
18010118	1301804	Area	AS26	8:08 AM	1:17 PM	9.9814	10.012
18010119	1301805	Area	AS15	8:16 AM	1:23 PM	9.9367	9.9001

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010117	1301803	312	9.9122	3092.61	6.5	100	0.005	0.0600	7.643	0.0010	1.810	<0.0017	N/A
18010118	1301804	309	9.9967	3088.98	6	100	0.005	0.0550	7.006	0.0009	1.839	<0.0016	N/A
18010119	1301805	307	9.9184	3044.95	8	100	0.005	0.0750	9.554	0.0012	1.741	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 1/30/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-154

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010117	AS24	Asbestos PCM	Air	MCE Cassette	1/29/2018	9.995	9.8293	3092.61	Liters	8:00:00 AM	1:12:00 PM	312	9.9122	L/min
	18010118	AS26	Asbestos PCM	Air	MCE Cassette	1/29/2018	9.9814	10.012	3088.98	Liters	8:08:00 AM	1:17:00 PM	309	9.9967	L/min
	18010119	AS15	Asbestos PCM	Air	MCE Cassette	1/29/2018	9.9367	9.9001	3044.95	Liters	8:16:00 AM	1:23:00 PM	307	9.9184	L/min
	18010120	Blank 1	Asbestos PCM	Blank	MCE Cassette	1/29/2018	0			Liters	7:45:00 AM	1:30:00 PM			L/min
	18010121	Blank 2	Asbestos PCM	Blank	MCE Cassette	1/29/2018	0			Liters	7:46:00 AM	1:31:00 PM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com, and rlocke@ene.com. Samples and original COC custody sealed in bag overnight in START desk in jobsite trailer.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	[signature] ENE/START	1-29-18/1348	[signature] ACL	1/30/18 7:52	good

ADVANTAGE Environmental INC.

Clean your world.

February 1, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/30/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/30/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/30/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	1/31/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	1/31/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/1/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010125	1311801	0	100	0/100
18010126	1311802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010122	1311803	Area	AS24	7:53 AM	1:18 PM	9.9344	10.14
18010123	1311804	Area	AS26	8:11 AM	1:28 PM	10.022	10.239
18010124	1311805	Area	AS15	8:07 AM	1:34 PM	9.9331	10.164

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010122	1311803	325	10.0372	3262.09	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A
18010123	1311804	317	10.1305	3211.37	6	100	0.0025	0.0575	7.325	0.0009	1.839	<0.0016	N/A
18010124	1311805	327	10.0486	3285.88	8	100	0.0025	0.0775	9.873	0.0012	1.741	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 1/31/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-155

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	~~17120040~~	~~AS24~~	~~Asbestos PCM~~	~~Air~~	~~MCE Cassette~~	~~12/13/2017~~				~~Liters~~					~~L/min~~ BC
	18010122	AS24	Asbestos PCM	Air	MCE Cassette	1/30/2018	9.9344	10.14	3262.09	Liters	7:53:00 AM	1:18:00 PM	325	10.0372	L/min
	18010123	AS26	Asbestos PCM	Air	MCE Cassette	1/30/2018	10.022	10.239	3211.37	Liters	8:11:00 AM	1:28:00 PM	317	10.1305	L/min
	18010124	AS15	Asbestos PCM	Air	MCE Cassette	1/30/2018	9.9331	10.164	3285.89	Liters	8:07:00 AM	1:34:00 PM	327	10.0486	L/min
	18010125	Blank 1	Asbestos PCM	Air	MCE Cassette	1/30/2018				Liters	7:30:00 AM	1:35:00 PM			L/min
	18010126	Blank 2	Asbestos PCM	Air	MCE Cassette	1/30/2018				Liters	7:31:00 AM	1:36:00 PM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	By [illegible] EHE/START	1-30-18/1355	Sidney Carter AEI	1/31/18 7:05	Good

ADVANTAGE Environmental INC.

Clean your world.

February 2, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 1/31/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 1/31/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	1/31/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/1/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/1/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/2/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18010130	2011801	0.5	100	0.5/100
18010131	2011802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18010127	2011803	Area	AS24	7:55 AM	1:25 PM	9.8104	9.9727
18010128	2011804	Area	AS26	8:01 AM	1:32 PM	9.9485	10.178
18010129	2011805	Area	AS15	8:08 AM	1:36 PM	9.9097	10.075

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18010127	2011803	330	9.8916	3264.23	7	100	0.005	0.0650	8.280	0.0010	1.785	<0.0017	N/A
18010128	2011804	331	10.0633	3330.95	8.5	100	0.005	0.0800	10.191	0.0012	1.720	<0.0020	N/A
18010129	2011805	328	9.9924	3277.51	6	100	0.005	0.0550	7.006	0.0008	1.839	<0.0015	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/1/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-156

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18010127	AS24	Asbestos PCM	Air	MCE Cassette	1/31/2018	9.8104	9.9727	3264.23	Liters	7:55:00 AM	1:25:00 PM	330	9.8916	L/min
	18010128	AS26	Asbestos PCM	Air	MCE Cassette	1/31/2018	9.9485	10.178	3330.95	Liters	8:01:00 AM	1:32:00 PM	331	10.0633	L/min
	18010129	AS15	Asbestos PCM	Air	MCE Cassette	1/31/2018	9.9097	10.075	3277.51	Liters	8:08:00 AM	1:36:00 PM	328	9.9924	L/min
	18010130	Blank 2	Asbestos PCM	Air	MCE Cassette	1/31/2018				Liters					L/min
	18010131	Blank1	Asbestos PCM	Air	MCE Cassette	1/31/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	[illegible] ENE/START	1-31-18/1400	[illegible] AGI	12:04 2/1/18	good

ADVANTAGE Environmental INC.

Clean your world.

February 5, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/01/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/01/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/1/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/2/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/2/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/5/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020001	2021801	0	100	0/100
18020002	2021802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020003	2021803	Area	AS24	7:55 AM	1:14 PM	9.884	9.8012
18020004	2021804	Area	AS26	8:08 AM	1:20 PM	9.9182	9.9853
18020005	2021805	Area	AS15	8:38 AM	1:26 PM	9.9167	10.013

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020003	2021803	319	9.8426	3139.79	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0019	N/A
18020004	2021804	312	9.9518	3104.96	5.5	100	0.0025	0.0525	6.688	< LOD	1.871	<1.8705	N/A
18020005	2021805	288	9.9649	2869.89	9	100	0.0025	0.0875	11.146	0.0015	1.705	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

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USEPA

DateShipped: 2/2/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-157

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020001	Blank 1	Asbestos PCM	Blank	MCE Cassette	2/1/2018	0	0	0	Liters	7:15:00 AM		-435	0	L/min
	18020002	Blank 2	Asbestos PCM	Blank	MCE Cassette	2/1/2018	0	0	0	Liters	7:20:00 AM		-440	0	L/min
	18020003	AS24	Asbestos PCM	Air	MCE Cassette	2/1/2018	9.884	9.8012	3139.79	Liters	7:55:00 AM	1:14:00 PM	319	9.8426	L/min
	18020004	AS26	Asbestos PCM	Air	MCE Cassette	2/1/2018	9.9182	9.9853	3104.96	Liters	8:08:00 AM	1:20:00 PM	312	9.9518	L/min
	18020005	AS15	Asbestos PCM	Air	MCE Cassette	2/1/2018	9.9167	10.013	2869.89	Liters	8:38:00 AM	1:26:00 PM	288	9.9649	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples, Analysis	(START E+E)	2/1/18 1342			
Samples	START	07:16 2/2/18		7:16 1/2/18	good

ADVANTAGE Environmental INC.

Clean your world.

February 5, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/02/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/02/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/2/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/3/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/3/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/5/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020009	2031801	0.5	100	0.5/100
18020010	2031802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020006	2031803	Area	AS24	9:04 AM	2:04 PM	9.9603	9.9371
18020007	2031804	Area	AS26	8:37 AM	1:58 PM	10.04	10.014
18020008	2031805	Area	AS15	9:40 AM	2:18 PM	9.9389	9.9782

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020006	2031803	300	9.9487	2984.61	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0020	N/A
18020007	2031804	321	10.0270	3218.67	5.5	100	0.0025	0.0525	6.688	< LOD	1.871	<1.8705	N/A
18020008	2031805	278	9.9586	2768.49	6.5	100	0.0025	0.0625	7.962	0.0011	1.810	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/3/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-158

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020006	AS24	Asbestos PCM	Air	MCE Cassette	2/2/2018	9.9603	9.9371	2984.61	Liters	9:04:00 AM	2:04:00 PM	300	9.9487	L/min
	18020007	AS26	Asbestos PCM	Air	MCE Cassette	2/2/2018	10.04	10.014	3218.67	Liters	8:37:00 AM	1:58:00 PM	321	10.027	L/min
	18020008	AS15	Asbestos PCM	Air	MCE Cassette	2/2/2018	9.9389	9.9782	2768.49	Liters	9:40:00 AM	2:18:00 PM	278	9.9586	L/min
	18020009	Blank 1	Asbestos PCM	Air	MCE Cassette	2/2/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020010	Blank 2	Asbestos PCM	Air	MCE Cassette	2/2/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight		14:51 2/2/18	AEI	2/3/18 12:04	good
Samples		12:03 2/3/18			

ADVANTAGE Environmental INC.

Clean your world.

February 6, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/03/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/03/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/3/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/5/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/5/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/6/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020017	2051801	0.5	100	0.5/100
18020018	2051802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020014	2051803	Area	AS24	8:16 AM	1:44 PM	9.9441	9.8787
18020015	2051804	Area	AS26	8:26 AM	1:31 PM	10.025	10.128
18020016	2051805	Area	AS15	8:44 AM	1:53 PM	9.9751	10.09

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020014	2051803	328	9.9114	3250.94	6	100	0.005	0.0550	7.006	0.0008	1.839	<0.0015	N/A
18020015	2051804	305	10.0765	3073.33	8.5	100	0.005	0.0800	10.191	0.0013	1.720	<0.0022	N/A
18020016	2051805	309	10.0326	3100.07	9	100	0.005	0.0850	10.828	0.0013	1.705	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 2/5/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-161

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020014	AS24	Asbestos PCM	Air	MCE Cassette	2/3/2018	9.9441	9.8787	3250.94	Liters	8:16:00 AM	1:44:00 PM	328	9.9114	L/min
	18020015	AS26	Asbestos PCM	Air	MCE Cassette	2/3/2018	10.025	10.128	3073.33	Liters	8:26:00 AM	1:31:00 PM	305	10.0765	L/min
	18020016	AS15	Asbestos PCM	Air	MCE Cassette	2/3/2018	9.9751	10.09	3100.07	Liters	8:44:00 AM	1:53:00 PM	309	10.0326	L/min
	18020017	Blank 1	Asbestos PCM	Air	MCE Cassette	2/3/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020018	Blank 2	Asbestos PCM	Air	MCE Cassette	2/3/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight	START	14:39 2/3/18	Sidney Carter AEI	2/5/18 710	Good

ADVANTAGE Environmental INC.

Clean your world.

February 7, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/05/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/05/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/5/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/6/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/6/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/7/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020022	2061801	0.5	100	0.5/100
18020023	2061802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020019	2061803	Area	AS24	8:20 AM	1:27 PM	9.9682	9.9305
18020020	2061804	Area	AS26	8:39 AM	1:35 PM	9.9242	10.068
18020021	2061805	Area	AS15	8:52 AM	1:49 PM	9.8722	10.027

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020019	2061803	307	9.9494	3054.47	5.5	100	0.0025	0.0525	6.688	< LOD	1.871	<1.8705	N/A
18020020	2061804	296	9.9961	2958.85	7	100	0.0025	0.0675	8.599	0.0011	1.785	<0.0020	N/A
18020021	2061805	297	9.9496	2955.03	6	100	0.0025	0.0575	7.325	0.0010	1.839	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/6/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-162

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020019	AS24	Asbestos PCM	Air	MCE Cassette	2/5/2018	9.9682	9.9305	3054.47	Liters	8:20:00 AM	1:27:00 PM	307	9.9494	L/min
	18020020	AS26	Asbestos PCM	Air	MCE Cassette	2/5/2018	9.9242	10.068	2958.85	Liters	8:39:00 AM	1:35:00 PM	296	9.9961	L/min
	18020021	AS15	Asbestos PCM	Air	MCE Cassette	2/5/2018	9.8722	10.027	2955.03	Liters	8:52:00 AM	1:49:00 PM	297	9.9496	L/min
	18020022	Blank 1	Asbestos PCM	Air	MCE Cassette	2/5/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020023	Blank 2	Asbestos PCM	Air	MCE Cassette	2/5/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples overnight		15:14 2/5/18	ACI	2/6/18 9:57	awesome ☺

ADVANTAGE Environmental INC.

Clean your world.

February 8, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/06/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/06/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/6/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/7/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/7/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/8/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020027	2071801	1	100	1/100
18020028	2071802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020024	2071803	Area	AS24	8:32 AM	1:14 PM	10.027	9.945
18020025	2071804	Area	AS26	8:46 AM	1:19 PM	10.046	10.167
18020026	2071805	Area	AS15	9:14 AM	1:50 PM	9.975	10.101

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020024	2071803	282	9.9860	2816.05	7	100	0.005	0.065	8.280	0.0011	1.785	<0.0020	N/A
18020025	2071804	273	10.1065	2759.07	12	100	0.005	0.115	14.650	0.0020	1.620	<0.0033	N/A
18020026	2071805	276	10.0380	2770.49	6	100	0.005	0.055	7.006	0.0010	1.839	<0.0018	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/7/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-163

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020024	AS24	Asbestos PCM	Air	MCE Cassette	2/6/2018	10.027	9.945	2816.05	Liters	8:32:00 AM	1:14:00 PM	282	9.986	L/min
	18020025	AS26	Asbestos PCM	Air	MCE Cassette	2/6/2018	10.046	10.167	2759.07	Liters	8:46:00 AM	1:19:00 PM	273	10.1065	L/min
	18020026	AS15	Asbestos PCM	Air	MCE Cassette	2/6/2018	9.975	10.101	2770.49	Liters	9:14:00 AM	1:50:00 PM	276	10.038	L/min
	18020027	Blank 1	Asbestos PCM	Air	MCE Cassette	2/6/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020028	Blank 2	Asbestos PCM	Air	MCE Cassette	2/6/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature]	15:30 2/6/18	[signature] AEI	2/7/18	Good

ADVANTAGE Environmental INC.

Clean your world.

February 9, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/07/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/07/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/7/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/8/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/8/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/9/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020032	2081801	0	100	0/100
18020033	2081802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020029	2081803	Area	AS24	8:50 AM	1:06 PM	10.022	10.056
18020030	2081804	Area	AS26	9:04 AM	12:59 PM	9.9087	10.055
18020031	2081805	Area	AS15	9:28 AM	1:13 PM	9.9898	10.133

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020029	2081803	256	10.0390	2569.98	6	100	0.0025	0.058	7.325	0.0011	1.839	<0.0020	N/A
18020030	2081804	235	9.9819	2345.73	6.5	100	0.0025	0.063	7.962	0.0013	1.810	<0.0024	N/A
18020031	2081805	225	10.0614	2263.82	7	100	0.0025	0.068	8.599	0.0015	1.785	<0.0026	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 2/8/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-165

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020029	AS24	Asbestos PCM	Air	MCE Cassette	2/7/2018	10.022	10.056	2569.98	Liters	8:50:00 AM	1:06:00 PM	256	10.039	L/min
	18020030	AS26	Asbestos PCM	Air	MCE Cassette	2/7/2018	9.9087	10.055	2345.75	Liters	9:04:00 AM	12:59:00 PM	235	9.9819	L/min
	18020031	AS15	Asbestos PCM	Air	MCE Cassette	2/7/2018	9.9898	10.133	2263.82	Liters	9:28:00 AM	1:13:00 PM	225	10.0614	L/min
	18020032	Blank 1	Asbestos PCM	Air	MCE Cassette	2/7/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020033	Blank 2	Asbestos PCM	Air	MCE Cassette	2/7/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[signature] START	14:41 2/7/18	Sidney Carter AEI	2/8/18 705	Good

ADVANTAGE Environmental INC.

Clean your world.

February 12, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/08/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/08/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/8/2019
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/9/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/9/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/12/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020038	2091801	0	100	0/100
18020039	2091802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020035	2091803	Area	AS24	8:26 AM	1:28 PM	9.989	9.8449
18020036	2091804	Area	AS26	8:37 AM	1:07 PM	9.9606	9.9222

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020035	2091803	302	9.9170	2994.93	7.5	100	0.0025	0.073	9.236	0.0012	1.775	<0.0021	N/A
18020036	2091804	270	9.9414	2684.18	6	100	0.0025	0.058	7.325	0.0011	1.839	<0.0019	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/9/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-166

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020035	AS24	Asbestos PCM	Air	MCE Cassette	2/8/2018	9.989	9.8449	2994.93	Liters	8:26:00 AM	1:28:00 PM	302	9.917	L/min
	18020036	AS26	Asbestos PCM	Air	MCE Cassette	2/8/2018	9.9606	9.9222	2684.18	Liters	8:37:00 AM	1:07:00 PM	270	9.9414	L/min
	18020038	Blank 1	Asbestos PCM	Air	MCE Cassette	2/8/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020039	Blank 2	Asbestos PCM	Air	MCE Cassette	2/8/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	[illegible] START	14:05 2/8/18	[illegible] ACI	7:18 2/9/18	good

ADVANTAGE Environmental INC.

Clean your world.

February 12, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/09/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/09/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/9/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/10/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/10/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/12/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020043	2091801	1	100	1/100
18020044	2091802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020040	2091803	Area	AS24	8:46 AM	1:11 PM	10.144	9.983
18020041	2091804	Area	AS26	8:56 AM	1:28 PM	10.036	9.957
18020042	2091805	Area	AS15	9:15 AM	1:18 PM	10.058	9.998

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020040	2091803	265	10.0635	2666.83	6	100	0.005	0.055	7.006	0.0010	1.839	<0.0019	N/A
18020041	2091804	272	9.9965	2719.05	9	100	0.005	0.085	10.828	0.0015	1.705	<0.0026	N/A
18020042	2091805	243	10.0280	2436.8	7.5	100	0.005	0.070	8.917	0.0014	1.775	<0.0025	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/10/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-167

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020040	AS24	Asbestos PCM	Air	MCE Cassette	2/9/2018	10.144	9.983	2666.83	Liters	8:46:00 AM	1:11:00 PM	265	10.0635	L/min
	18020041	AS26	Asbestos PCM	Air	MCE Cassette	2/9/2018	10.036	9.957	2719.05	Liters	8:56:00 AM	1:28:00 PM	272	9.9965	L/min
	18020042	AS15	Asbestos PCM	Air	MCE Cassette	2/9/2018	10.058	9.998	2436.8	Liters	9:15:00 AM	1:18:00 PM	243	10.028	L/min
	18020043	Blank 1	Asbestos PCM	Air	MCE Cassette	2/9/2018				Liters					L/min
	18020044	Blank 2	Asbestos PCM	Air	MCE Cassette	2/9/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	[illegible]	14:45 2/9/18	[illegible] AET	10:26 2/10/18	good

ADVANTAGE Environmental INC.

Clean your world.

February 13, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/10/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/10/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/10/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/12/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/12/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/13/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020048	2121801	0.5	100	0.5/100
18020049	2121802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020045	2121803	Area	AS24	8:38 AM	1:23 PM	9.8439	9.9972
18020046	2121804	Area	AS26	8:28 AM	1:30 PM	9.999	10.15
18020047	2121805	Area	AS15	8:07 AM	1:12 PM	9.92283	10.07

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020045	2121803	285	9.9206	2827.37	8.5	100	0.0025	0.083	10.510	0.0014	1.720	<0.0025	N/A
18020046	2121804	302	10.0745	3042.5	7	100	0.0025	0.068	8.599	0.0011	1.785	<0.0019	N/A
18020047	2121805	305	9.9964	3048.9	15	100	0.0025	0.148	18.790	0.0024	1.575	<0.0037	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/12/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-168

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020045	AS24	Asbestos PCM	Air	MCE Cassette	2/10/2018	9.8439	9.9972	2827.37	Liters	8:38:00 AM	1:23:00 PM	285	9.9206	L/min
	18020046	AS26	Asbestos PCM	Air	MCE Cassette	2/10/2018	9.999	10.15	3042.5	Liters	8:28:00 AM	1:30:00 PM	302	10.0745	L/min
	18020047	AS15	Asbestos PCM	Air	MCE Cassette	2/10/2018	9.92283	10.07	3048.9	Liters	8:07:00 AM	1:12:00 PM	305	9.9964	L/min
	18020048	Blank 1	Asbestos PCM	Air	MCE Cassette	2/10/2018				Liters	8:00:00 AM	8:00:00 AM			L/min
	18020049	Blank 2	Asbestos PCM	Air	MCE Cassette	2/10/2018				Liters	8:00:00 AM	8:00:00 AM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	13:53 2/10/2018		0712 2/12/2018	Good
55 samples PCM					

ADVANTAGE Environmental INC.

Clean your world.

February 15, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/12/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/12/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/12/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/13/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/13/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/14/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020053	2131801	0	100	0/100
18020054	2131802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020050	2131803	Area	AS24	8:04 AM	1:31 PM	9.8995	10.011
18020051	2131804	Area	AS26	8:11 AM	1:43 PM	9.9411	10.016
18020052	2131805	Area	AS15	8:20 AM	1:47 PM	9.9366	10.074

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020050	2131803	327	9.9553	3255.38	7	100	0.0025	0.068	8.599	0.0010	1.785	<0.0018	N/A
18020051	2131804	332	9.9786	3312.9	6.5	100	0.0025	0.063	7.962	0.0009	1.810	<0.0017	N/A
18020052	2131805	327	10.0053	3271.73	5.5	100	0.0025	0.053	6.688	0.0008	1.871	<0.0015	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/13/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-169

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020050	AS24	Asbestos PCM	Air	MCE Cassette	2/12/2018	9.8995	10.011	3255.38	Liters	8:04:00 AM	1:31:00 PM	327	9.9553	L/min
	18020051	AS26	Asbestos PCM	Air	MCE Cassette	2/12/2018	9.9411	10.016	3312.9	Liters	8:11:00 AM	1:43:00 PM	332	9.9786	L/min
	18020052	AS15	Asbestos PCM	Air	MCE Cassette	2/12/2018	9.9366	10.074	3271.73	Liters	8:20:00 AM	1:47:00 PM	327	10.0053	L/min
	18020053	Blank 1	Asbestos PCM	Air	MCE Cassette	2/12/2018				Liters					L/min
	18020054	Blank 2	Asbestos PCM	Air	MCE Cassette	2/12/2018				Liters					L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	[illegible] E&E/START	2-12-18/1422	[illegible]	2/13/18 7:45	good

ADVANTAGE Environmental INC.

Clean your world.

February 15, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/13/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/13/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/13/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/14/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/14/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/15/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020058	2141801	0.5	100	0.5/100
18020059	2141802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020055	2141803	Area	AS24	8:17 AM	1:31 PM	9.9391	10.313
18020056	2141804	Area	AS26	8:26 AM	1:37 PM	9.9696	10.239
18020057	2141805	Area	AS15	8:38 AM	1:43 PM	9.9134	10.202

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020055	2141803	314	10.1261	3179.6	6.5	100	0.005	0.060	7.643	0.0009	1.810	<0.0017	N/A
18020056	2141804	311	10.1043	3142.44	9	100	0.005	0.085	10.828	0.0013	1.705	<0.0023	N/A
18020057	2141805	305	10.0577	3067.6	6	100	0.005	0.055	7.006	0.0009	1.839	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/14/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206.920.1739

No: PDX-170

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020055	AS24	Asbestos PCM	Air	MCE Cassette	2/13/2018	9.9391	10.313	3179.6	Liters	8:17:00 AM	1:31:00 PM	314	10.1261	L/min
	18020056	AS26	Asbestos PCM	Air	MCE Cassette	2/13/2018	9.9696	10.239	3142.44	Liters	8:26:00 AM	1:37:00 PM	311	10.1043	L/min
	18020057	AS15	Asbestos PCM	Air	MCE Cassette	2/13/2018	9.9134	10.202	3067.6	Liters	8:38:00 AM	1:43:00 PM	305	10.0577	L/min
	18020058	Blank 1	Asbestos PCM	Air	MCE Cassette	2/13/2018				Liters	7:30:00 AM	2:00:00 PM			L/min
	18020059	Blank 2	Asbestos PCM	Air	MCE Cassette	2/13/2018				Liters	7:31:00 AM	2:00:00 PM			L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples/Analysis	By E+E START	2-13-18/14:04	[illegible] AEI	2/14/18 0710	

ADVANTAGE Environmental INC.

Clean your world.

February 19, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/14/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/14/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/14/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/15/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/15/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/16/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020063	2151801	0.5	100	0.5/100
18020064	2151802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020060	2151803	Area	AS24	9:09 AM	1:29 PM	9.975	9.4098
18020061	2151804	Area	AS26	9:01 AM	1:40 PM	10.046	9.7625
18020062	2151805	Area	AS15	9:23 AM	1:48 PM	10.074	9.9309

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020060	2151803	260	9.6924	2520.02	7	100	0.0025	0.068	8.599	0.0013	1.785	<0.0023	N/A
18020061	2151804	279	9.9043	2763.3	6.5	100	0.0025	0.063	7.962	0.0011	1.810	<0.0020	N/A
18020062	2151805	265	10.0025	2650.66	6	100	0.0025	0.058	7.325	0.0011	1.839	<0.0020	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/14/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-171

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020060	AS24	Asbestos PCM	Air	MCE Cassette	2/14/2018	9.975	9.4098	2520.02	Liters	9:09:00 AM	1:29:00 PM	260	9.6924	L/min
	18020061	AS26	Asbestos PCM	Air	MCE Cassette	2/14/2018	10.046	9.7625	2763.3	Liters	9:01:00 AM	1:40:00 PM	279	9.9043	L/min
	18020062	AS15	Asbestos PCM	Air	MCE Cassette	2/14/2018	10.074	9.9309	2650.66	Liters	9:23:00 AM	1:48:00 PM	265	10.0025	L/min
	18020063	Blank 1	Asbestos PCM	Air	MCE Cassette	2/14/2018	0	0	0	Liters	8:00:00 AM	1:50:00 PM	350	0	L/min
	18020064	Blank 2	Asbestos PCM	Air	MCE Cassette	2/14/2018	0	0	0	Liters	8:00:00 AM	1:50:00 PM	350	0	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com. Fault on AS-24 pump for unknown duration between 10:41 and 12:55 due to generator stall.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/over-night storage	Ryan Whitchurch / START R10	Feb 14, 2018 / 1434	[illegible]	2/15/2018 0710	

ADVANTAGE Environmental INC.

Clean your world.

February 19, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/15/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/15/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/15/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/16/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/16/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/19/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020065	2161801	0.5	100	0.5/100
18020066	2161802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020067	2161803	Area	AS24	8:01 AM	1:35 PM	9.7058	9.5926
18020068	2161804	Area	AS26	8:16 AM	1:44 PM	9.83	9.7495
18020069	2161805	Area	AS15	8:40 AM	1:57 PM	9.9003	9.995

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020067	2161803	334	9.6492	3222.83	7	100	0.0025	0.068	8.599	0.0010	1.785	<0.0018	N/A
18020068	2161804	328	9.7898	3208.3	6	100	0.0025	0.058	7.325	0.0009	1.839	<0.0016	N/A
18020069	2161805	317	9.9477	3153.42	6	100	0.0025	0.058	7.325	0.0009	1.839	<0.0016	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/15/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-172

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020065	Blank 1	Asbestos PCM	Blank	MCE Cassette	2/15/2018	0	0	0	Liters	7:20:00 AM	2:00:00 PM	400	0	L/min
	18020066	Blank 2	Asbestos PCM	Blank	MCE Cassette	2/15/2018	0	0	0	Liters	7:25:00 AM	2:05:00 PM	400	0	L/min
	18020067	AS24	Asbestos PCM	Air	MCE Cassette	2/15/2018	9.7058	9.5926	3222.83	Liters	8:01:00 AM	1:35:00 PM	334	9.6492	L/min
	18020068	AS26	Asbestos PCM	Air	MCE Cassette	2/15/2018	9.813	9.7495	3208.27	Liters	8:16:00 AM	1:44:00 PM	328	9.7813	L/min
	18020069	AS15	Asbestos PCM	Air	MCE Cassette	2/15/2018	9.9003	9.995	3153.42	Liters	8:40:00 AM	1:57:00 PM	317	9.9477	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All / overnight storage	Ryan Whitchurch START	Feb 15, 2018 / 15:06	ACI	7:16 2/16/18	good

ADVANTAGE Environmental INC.

Clean your world.

February 20, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/16/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/16/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/16/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/19/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/19/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/20/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020070	2191801	1	100	1/100
18020071	2191802	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020072	2191803	Area	AS24	7:52 AM	1:10 PM	9.8377	9.679
18020073	2191804	Area	AS26	8:09 AM	1:14 PM	9.8362	9.8264
18020074	2191805	Area	AS15	8:38 AM	1:31 PM	9.8034	9.8622

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020072	2191803	318	9.7584	3103.17	6.5	100	0.005	0.060	7.643	0.0009	1.810	<0.0017	N/A
18020073	2191804	305	9.8313	2998.55	7	100	0.005	0.065	8.280	0.0011	1.785	<0.0019	N/A
18020074	2191805	293	9.8328	2881.01	7.5	100	0.005	0.070	8.917	0.0012	1.775	<0.0021	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/16/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-173

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020070	Blank 1	Asbestos PCM	Blank	MCE Cassette	2/16/2018	0	0	0	Liters	7:15:00 AM	1:35:00 PM	380	0	L/min
	18020071	Blank 2	Asbestos PCM	Blank	MCE Cassette	2/16/2018	0	0	0	Liters	7:20:00 AM	1:40:00 PM	380	0	L/min
	18020072	AS24	Asbestos PCM	Air	MCE Cassette	2/16/2018	9.8377	9.679	3103.17	Liters	7:52:00 AM	1:10:00 PM	318	9.7584	L/min
	18020073	AS26	Asbestos PCM	Air	MCE Cassette	2/16/2018	9.8362	9.8264	2998.55	Liters	8:09:00 AM	1:14:00 PM	305	9.8313	L/min
	18020074	AS15	Asbestos PCM	Air	MCE Cassette	2/16/2018	9.8034	9.8622	2881.01	Liters	8:38:00 AM	1:31:00 PM	293	9.8328	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All-over-night storage	Ryan Whitehead START R10	Feb 16, 2018 15:03	Sidney Carter AEI	2/16/18 710	Good

ADVANTAGE Environmental INC.

Clean your world.

February 23, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/19/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/19/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/19/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/22/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/22/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/23/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020075	2221801	0.5	100	0.5/100
18020076	2221802	0.5	100	0.5/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020077	2221803	Area	AS24	8:14 AM	12:43 PM	9.928	9.981
18020078	2221804	Area	AS26	8:35 AM	1:05 PM	9.928	10.124
18020079	2221805	Area	AS15	8:24 AM	12:55 PM	9.885	10.026

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020077	2221803	269	9.9545	2677.76	8	100	0.005	0.075	9.554	0.0014	1.741	<0.0024	N/A
18020078	2221804	270	10.0260	2707.02	6	100	0.005	0.055	7.006	0.0010	1.839	<0.0018	N/A
18020079	2221805	271	9.9555	2697.94	7.5	100	0.005	0.070	8.917	0.0013	1.775	<0.0023	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

USEPA

DateShipped: 2/20/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-174

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020075	Blank 1	Asbestos PCM	Blank	MCE Cassette	2/19/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18020076	Blank 2	Asbestos PCM	Blank	MCE Cassette	2/19/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18020077	AS24	Asbestos PCM	Air	MCE Cassette	2/19/2018	9.928	9.981	2677.76	Liters	8:14:00 AM	12:43:00 PM	269	9.9545	L/min
	18020078	AS26	Asbestos PCM	Air	MCE Cassette	2/19/2018	9.928	10.124	2707.02	Liters	8:35:00 AM	1:05:00 PM	270	10.026	L/min
	18020079	AS15	Asbestos PCM	Air	MCE Cassette	2/19/2018	9.885	10.026	2697.94	Liters	8:24:00 AM	12:55:00 PM	271	9.9555	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
all to lab	Marlen Fulton (START)	2/19/18 13:45	Sidney Carter AEI	2/20/18 9:15	Good

ADVANTAGE Environmental INC.

Clean your world.

February 23, 2018

Environmental Quality Management
Jerry Wade
18939 120th Ave NE, Suite 103
Bothell, WA 98011

RE: 2/20/2018 START-Asbestos Air Sampling Results 1300 North River St. Portland, OR:

Personal &/or Area samples were collected utilizing 25mm mixed cellulose-ester filter cassettes with a 50mm extension cowl. Sampling pumps were calibrated to flow rates specified by OSHA 29 CFR Parts 1910 and 1926, Occupational Exposure to Asbestos. Final Rules dated June 29, 1995. All samples were analyzed utilizing the NIOSH 582 Method.

Personal samples were collected within the workers breathing zones, area samples were collected from specified areas with sampling cassettes at approximately 60" in elevation.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 0.1 fibers per cubic centimeter as an 8 hour time weighted average TWA.

The Oregon Administrative rules also state that workers shall not to be exposed to asbestos airborne concentrations of asbestos fibers in excess of 1.0 fibers per cubic centimeter as average over a sampling period of thirty (30) minutes.

Laboratory analysis of Personal samples (including STEL) short term excursion limit samples and/or Area samples collected on 2/20/2018 by Ecology & Environmental, Inc. (START) are below the permissible exposure limits (PELS) as specified in the Oregon Administrative Rules, Oregon Occupational Safety and Health 1926.1101.

Anomalies
No anomalies found in any air samples that were collected and analyzed for this day.

Air Data Results
Current air data for this day was below the PELS and acceptable limits.

Technician report
Unknown, see START

Respectfully,

Sidney Carter
Senior Project Manager/AHERA Project Designer

ADVANTAGE ENVIRONMENTAL, INC. AIR SAMPLE ANALYSIS REPORT

CLIENT	Ecology and Environmental, Inc. (START)	**ADVANTAGE PROJECT #**	17-225a	**DATE COLLECTED**	2/20/2018
ATTENTION	Erin Lynch	**CLIENT PROJECT #**	10QD	**DATE RECEIVED**	2/22/2018
CONTRACTOR	Ecology and Environmental, Inc. (START)	**REPORT #**	1	**DATE ANALYZED**	2/22/2018
PROJECT	River Street Water Front Portland, OR	**PAGE** 1	**OF** 1	**DATE REPORTED**	2/23/2018

BLANK INFORMATION

Sample ID	Lab ID #	fibers	fields	fibers/fields
18020080	2221806	0.5	100	0.5/100
18020081	2221807	0	100	0/100

SAMPLES COLLECTED BY: START

SAMPLES ANALYZED BY: Jibri Johnson

SAMPLE INFORMATION

Filter Information: MCE 0.8 um pore size.

Sample ID	Lab ID #	Type of Sample	Sample Location / Work Performed / Respiratory Protection	Time Started	Time Ended	Flow Rate Start	Flow Rate End
18020082	2221808	Area	AS24	7:35 AM	10:49 AM	9.9713	9.71
18020083	2221809	Area	AS26	7:50 AM	10:53 AM	9.8512	9.7542
18020084	2221810	Area	AS15	8:23 AM	11:32 AM	9.7507	9.724

ANALYTICAL INFORMATION

LOD = 5.5 Fibers

Graticule Field Area = 0.00785 mm^2

Sample ID	Lab ID#	Total Minutes Sampled	Average Flow Rate	Sample Volume	fibers	fields	Average Blank Count	Adjusted Fiber Count	fibers / mm^2	fibers/cc	Coefficient of Variation	95% UCL	8-hour TWA
18020082	2221808	194	9.8407	1909.1	7	100	0.0025	0.068	8.599	0.0017	1.785	<0.0031	N/A
18020083	2221809	183	9.8027	1793.89	6.5	100	0.0025	0.063	7.962	0.0017	1.810	<0.0031	N/A
18020084	2221810	189	9.7374	1840.37	5.5	100	0.0025	0.053	6.688	0.0014	1.871	<0.0026	N/A

Method of Analysis: NIOSH 7400 Issue 2, 8/15/94, or OSHA Reference Method 1926.1101 Appendix A. Working Range of NIOSH 7400 is 100 to 1,300 fibers/mm2. Limit of Quantitation (LOQ) = 100 fibers/mm2. Limit of Detection (LOD) = 7 fibers/mm2.

Abbreviations: **A**=Area, **AC**=Aggressive Clearance, **AD**=Area During Abatement, **AO**=Area Outside Work Area, **AP**=Area Prior to Abatement, **B**=Blank, **C**=Passive Clearance, **P**=Personal Breathing Zone, **PDU**=Pressure Differential Unit, **STEL**=Short Term Excursion Limit, **WLO**=Waste Load Out, **< LOD=** Below Laboratory Reporting Limit

WARRANTY: The information contained in this report is based on information furnished by the client and observations and test results provided by Advantage Environmental, Inc. (AEI). These observations are time dependent, are subject to changing site conditions, and revisions to Federal, state, and local regulations. AEI warrants that these findings have been promulgated after being prepared in accordance with generally accepted practices in the asbestos testing and abatement industry. No other warranties are implied or expressed.

Advantage Environmental, Inc. P.O. Box 1026, Camas, Washington 98607 PHONE: (503) 709-0879

USEPA

DateShipped: 2/21/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-175

Lab: Advantage Environmental Inc.

Lab Phone: 503-522-1369

Lab Address: P.O. Box 1026

Lab #	Sample #	Location	Analyses	Matrix	Sample Media	Collected	Start Flow Rate	Stop Flow Rate	Volume	Vol Units	Start_Time	Stop_Time	Total_Time	Avg_Flow	Flow_Units
	18020080	Blank 1	Asbestos PCM	Blank	MCE Cassette	2/20/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18020081	Blank 2	Asbestos PCM	Blank	MCE Cassette	2/20/2018	0		0	Liters	7:30:00 AM		380	0	L/min
	18020082	AS24	Asbestos PCM	Air	MCE Cassette	2/20/2018	9.9713	9.71	1909.1	Liters	7:35:00 AM	10:49:00 AM	194	9.8407	L/min
	18020083	AS26	Asbestos PCM	Air	MCE Cassette	2/20/2018	9.8512	9.7542	1793.89	Liters	7:50:00 AM	10:53:00 AM	183	9.8027	L/min
	18020084	AS15	Asbestos PCM	Air	MCE Cassette	2/20/2018	9.7507	9.724	1840.37	Liters	8:23:00 AM	11:32:00 AM	189	9.7374	L/min

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com, mwoodke@ene.com, elynch@ene.com and rlocke@ene.com.

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All-overnight storage	Ryan Whitchurch START-R10	2/20/2018 12:19	Sidney Carter AEI	2/22/18 7:16	Good

J Analytical Data – Sediment Disposal and Gravel Fill Sampling

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ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 16, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 gravel/sediment sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Chlorinated Pesticides (EPA Method 8081) and Polychlorinated Biphenyls (PCBs - EPA Method 8082) analyses were performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The sample was numbered: 18020034

Data Qualifications:

1. Sample Holding Times: Acceptable.

The sample was maintained at 0°C to 6°C. The sample was collected on February 7, 2018, extracted on February 8, 2018, and was analyzed by February 9, 2018, therefore meeting QC criteria of less than 14 days between collection and solid sample extraction and less than 40 days between extraction and analysis. There are no holding time limits for Method 8082 PCBs.

2. Instrument Performance: Acceptable.

The surrogate retention time percent difference between the initial calibration standards and the remaining standards and samples was $\leq$ 0.3% for capillary column analyses.

3. Initial and Continuing Calibration: Satisfactory.

All initial calibration relative standard deviations (RSDs) were within QC limits. All continuing calibration % differences (% D) were within QC limits except one low Aroclor 1268 peak on one column (the results on the other column were greater than QC limits and Aroclor 1268 was not detected in the sample; therefore no qualifiers were applied). Sample non-detects with high recovery outliers were not qualified.

4. Error Determination: Not Provided.

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although

the flags are not found on the Form I's.

5. **Blanks: Acceptable.**

A method blank was prepared at the required frequency of every time samples were extracted for each matrix and for each concentration level, or every 20 samples, whichever is greater, and for each analytical system. No target analytes were detected in the laboratory blanks.

6. **Performance Evaluation Samples: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

7. **System Monitoring Compounds (SMCs): Acceptable.**

All recoveries of the SMCs were within QC limits.

8. **Blank Spike (BS) Analysis: Acceptable.**

BS recoveries were within QC limits.

9. **Compound Identification: Satisfactory.**

All results were dual-column confirmed with differences between the columns less than 25% except heptachlor and 4,4'-DDD. Positive sample results with percent differences between the columns greater than 25% were qualified as estimated quantities with an unknown bias (JK).

10. **Target Compound Quantitation and Quantitation Limits: Acceptable.**

Sample results and quantitation limits were correctly calculated.

11. **Laboratory Contact**

No laboratory contact was required.

12. **Overall Assessment**

A total of 38 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers, holding time outliers, incorrect sample containers, spike accuracy outliers, or sample temperature outliers. No sample results were rejected (R). No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle
Job No.: 580-74941-1
SDG No.:
Client Sample ID: 18020034
Lab Sample ID: 580-74941-1
Matrix: Solid
Lab File ID: 45B0918030.D
Analysis Method: 8081B
Date Collected: 02/07/2018 11:13
Extraction Method: 3546
Date Extracted: 02/08/2018 09:09
Sample wt/vol: 10.108(g)
Date Analyzed: 02/09/2018 18:27
Con. Extract Vol.: 10(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
GC Column: ZB-CLPest-1 ID: 0.25(mm)
% Moisture: 5.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 267034
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
309-00-2	Aldrin	ND		1.0	0.094
319-84-6	alpha-BHC	ND		1.0	0.17
319-85-7	beta-BHC	ND		2.1	0.49
319-86-8	delta-BHC	ND		1.0	0.10
58-89-9	gamma-BHC (Lindane)	ND		1.0	0.031
72-54-8	4,4'-DDD	0.16	J Q	2.1	0.094
72-55-9	4,4'-DDE	ND		2.1	0.063
50-29-3	4,4'-DDT	ND		2.1	0.15
60-57-1	Dieldrin	ND		2.1	0.36
959-98-8	Endosulfan I	ND		1.0	0.14
33213-65-9	Endosulfan II	ND		2.1	0.052
1031-07-8	Endosulfan sulfate	ND		2.1	0.083
72-20-8	Endrin	ND		2.1	0.13
7421-93-4	Endrin aldehyde	ND		2.1	0.50
1024-57-3	Heptachlor epoxide	ND		1.0	0.31
72-43-5	Methoxychlor	ND		10	0.39
53494-70-5	Endrin ketone	ND		2.1	0.38
8001-35-2	Toxaphene	ND		100	7.0
5103-71-9	alpha-Chlordane	ND		1.0	0.13
5103-74-2	gamma-Chlordane	ND		1.0	0.20

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	77		38-121
2051-24-3	DCB Decachlorobiphenyl	77		16-123

2/16/18

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle
Job No.: 580-74941-1
SDG No.:
Client Sample ID: 18020034
Lab Sample ID: 580-74941-1
Matrix: Solid
Lab File ID: 45B0918030.D
Analysis Method: 8081B
Date Collected: 02/07/2018 11:13
Extraction Method: 3546
Date Extracted: 02/08/2018 09:09
Sample wt/vol: 10.108(g)
Date Analyzed: 02/09/2018 18:27
Con. Extract Vol.: 10(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
GC Column: ZB-CLPest-2 ID: 0.25(mm)
% Moisture: 5.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 267034
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
76-44-8	Heptachlor	0.095	J ~~P~~ K	2.1	0.063

2-16-18

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle
Job No.: 580-74941-1
SDG No.:
Client Sample ID: 18020034
Lab Sample ID: 580-74941-1
Matrix: Solid
Lab File ID: 34B0818021.d
Analysis Method: 8082A
Date Collected: 02/07/2018 11:13
Extraction Method: 3546
Date Extracted: 02/08/2018 09:09
Sample wt/vol: 10.108(g)
Date Analyzed: 02/09/2018 15:08
Con. Extract Vol.: 10(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
GC Column: ZB-CLPest-1 ID: 0.25(mm)
% Moisture: 5.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 267039
Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.026	0.0077
11104-28-2	PCB-1221	ND		0.011	0.0044
11141-16-5	PCB-1232	ND		0.011	0.0051
53469-21-9	PCB-1242	ND		0.010	0.0017
12672-29-6	PCB-1248	ND		0.011	0.0030
11097-69-1	PCB-1254	ND		0.010	0.0016
11096-82-5	PCB-1260	ND		0.010	0.0020

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	78		25-149
877-09-8	Tetrachloro-m-xylene	87		35-130

2-16-18

ecology and environment, inc.
Global Environmental Specialists
720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 16, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 gravel/sediment sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Semivolatile Organic Compound (SVOC) analysis (EPA Method 8270) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The sample was numbered: 18020034

Data Qualifications:

1. Sample Holding Times: Acceptable.

The sample was maintained and received within the QC limits of 0°C to 6°C. The sample was collected on February 7, 2018, and was extracted and analyzed by February 9, 2018, therefore meeting holding time criteria of less than 14 days between collection and extraction and less than 40 days between extraction and analysis.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Satisfactory.

All average Relative Response Factors (RRFs) were within the QC limits except n-Nitroso-di-n-propylamine; the associated sample quantitation limit was rejected (R). All Relative Standard Deviations (RSDs) were within the QC limits.

4. Continuing Calibration: Satisfactory.

All RRFs were within the QC limits. All % differences were within the QC limits except several outliers with high recoveries (no qualifiers were applied as these analytes were not detected in the sample) and bis(chloroisopropyl)ether with a low recovery (the associated sample quantitation limit was qualified as an estimated quantity with a low bias [UJL]).

5. Blanks: Acceptable.

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. System Monitoring Compounds (SMCs): Satisfactory.

All SMC recoveries were within QC limits except nitrobenzene-d5 failed the surrogate recovery criteria high in sample 18020034. The other surrogates were within control and the sample had no analyte detections; therefore, no qualifiers were applied.

7. Blank Spike (BS) Analysis: Acceptable.

BS analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits except bis(chloroisopropyl)ether failed the recovery criteria low (the associated sample quantitation limit was qualified as an estimated quantity with a low bias [UJL]) and 2-nitroaniline failed the recovery criteria high (no qualifications were applied as this analyte was not detected in the sample).

8. Internal Standards: Acceptable.

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

9. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

10. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

11. Overall Assessment of Data for Use

A total of 67 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers. A total of 1 sample result were qualified as an estimated quantity (J) based on spike accuracy outliers. One sample result was rejected (R). No sample results were qualified as estimated quantities (J) based on holding time outliers, incorrect sample containers, or based on sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle
Job No.: 580-74941-1
SDG No.:
Client Sample ID: 18020034
Lab Sample ID: 580-74941-1
Matrix: Solid
Lab File ID: 020918a019.D
Analysis Method: 8270D
Date Collected: 02/07/2018 11:13
Extract. Method: 3550B
Date Extracted: 02/09/2018 08:51
Sample wt/vol: 10.345(g)
Date Analyzed: 02/09/2018 21:30
Con. Extract Vol.: 10(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture: 5.1
GPC Cleanup:(Y/N) N
Analysis Batch No.: 267064
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
108-95-2	Phenol	ND		150	39
111-44-4	Bis(2-chloroethyl)ether	ND		200	41
95-57-8	2-Chlorophenol	ND		200	43
541-73-1	1,3-Dichlorobenzene	ND		51	4.9
106-46-7	1,4-Dichlorobenzene	ND		51	8.5
100-51-6	Benzyl alcohol	ND		4100	38
95-50-1	1,2-Dichlorobenzene	ND		51	12
95-48-7	2-Methylphenol	ND		150	38
15831-10-4	3 & 4 Methylphenol	ND		200	15
621-64-7	N-Nitrosodi-n-propylamine	ND		200	45
67-72-1	Hexachloroethane	ND		150	39
98-95-3	Nitrobenzene	ND		200	43
78-59-1	Isophorone	ND		150	38
88-75-5	2-Nitrophenol	ND		200	47
105-67-9	2,4-Dimethylphenol	ND		100	15
65-85-0	Benzoic acid	ND		2500	1100
111-91-1	Bis(2-chloroethoxy)methane	ND		200	42
120-83-2	2,4-Dichlorophenol	ND		100	15
120-82-1	1,2,4-Trichlorobenzene	ND		51	6.1
91-20-3	Naphthalene	ND		25	5.1
106-47-8	4-Chloroaniline	ND		1500	410
87-68-3	Hexachlorobutadiene	ND		51	15
59-50-7	4-Chloro-3-methylphenol	ND		150	34
91-57-6	2-Methylnaphthalene	ND		51	9.0
77-47-4	Hexachlorocyclopentadiene	ND		100	26
88-06-2	2,4,6-Trichlorophenol	ND		150	37
95-95-4	2,4,5-Trichlorophenol	ND		200	46
91-58-7	2-Chloronaphthalene	ND		25	5.1
88-74-4	2-Nitroaniline	ND		100	15
131-11-3	Dimethyl phthalate	ND		150	34
208-96-8	Acenaphthylene	ND		25	5.1
606-20-2	2,6-Dinitrotoluene	ND		150	35
99-09-2	3-Nitroaniline	ND		200	41
83-32-9	Acenaphthene	ND		25	5.1

FORM I 8270D

02/13/2018

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-74941-1

SDG No.:

Client Sample ID: 18020034 | Lab Sample ID: 580-74941-1

Matrix: Solid | Lab File ID: 020918a019.D

Analysis Method: 8270D | Date Collected: 02/07/2018 11:13

Extract. Method: 3550B | Date Extracted: 02/09/2018 08:51

Sample wt/vol: 10.345(g) | Date Analyzed: 02/09/2018 21:30

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 5.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 267064 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
51-28-5	2,4-Dinitrophenol	ND		1000	200
100-02-7	4-Nitrophenol	ND		1500	370
132-64-9	Dibenzofuran	ND		150	37
121-14-2	2,4-Dinitrotoluene	ND		200	44
84-66-2	Diethyl phthalate	ND		560	130
7005-72-3	4-Chlorophenyl phenyl ether	ND		200	42
86-73-7	Fluorene	ND		25	5.1
100-01-6	4-Nitroaniline	ND		100	20
534-52-1	4,6-Dinitro-2-methylphenol	ND		1000	100
86-30-6	N-Nitrosodiphenylamine	ND		61	15
101-55-3	4-Bromophenyl phenyl ether	ND		200	42
118-74-1	Hexachlorobenzene	ND		51	5.1
87-86-5	Pentachlorophenol	ND		410	93
85-01-8	Phenanthrene	ND		61	12
120-12-7	Anthracene	ND		25	5.1
84-74-2	Di-n-butyl phthalate	ND		510	58
206-44-0	Fluoranthene	ND		25	5.1
129-00-0	Pyrene	ND		61	15
85-68-7	Butyl benzyl phthalate	ND		200	51
91-94-1	3,3'-Dichlorobenzidine	ND		410	100
56-55-3	Benzo[a]anthracene	ND		25	5.1
218-01-9	Chrysene	ND		61	13
117-81-7	Bis(2-ethylhexyl) phthalate	ND		610	140
117-84-0	Di-n-octyl phthalate	ND		1000	230
50-32-8	Benzo[a]pyrene	ND		61	13
193-39-5	Indeno[1,2,3-cd]pyrene	ND		41	5.1
53-70-3	Dibenz(a,h)anthracene	ND		51	12
191-24-2	Benzo[g,h,i]perylene	ND		61	15
86-74-8	Carbazole	ND		150	32
90-12-0	1-Methylnaphthalene	ND		31	5.1
205-99-2	Benzo[b]fluoranthene	ND		25	5.1
207-08-9	Benzo[k]fluoranthene	ND		61	14
108-60-1	bis(chloroisopropyl) ether	ND		250	38

VOL

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-74941-1

SDG No.:

Client Sample ID: 18020034 | Lab Sample ID: 580-74941-1

Matrix: Solid | Lab File ID: 020918a019.D

Analysis Method: 8270D | Date Collected: 02/07/2018 11:13

Extract. Method: 3550B | Date Extracted: 02/09/2018 08:51

Sample wt/vol: 10.345(g) | Date Analyzed: 02/09/2018 21:30

Con. Extract Vol.: 10(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 5.1 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 267064 | Units: ug/Kg

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol (Surr)	106		36-125
4165-62-2	Phenol-d5 (Surr)	95		59-113
4165-60-0	Nitrobenzene-d5 (Surr)	118	~~X~~ MW	54-113
321-60-8	2-Fluorobiphenyl	87		57-110
118-79-6	2,4,6-Tribromophenol (Surr)	78		10-126
1718-51-0	Terphenyl-d14 (Surr)	101		68-120

MW 2/6/18

ecology and environment, inc.
Global Environmental Specialists
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Seattle, Washington 98104
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MEMORANDUM

DATE: February 16, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 gravel/sediment sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Volatile Organic Compound (VOC) analysis (EPA Method 8260) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The sample was numbered: 18020034

Data Qualifications:

1. Sample Holding Times: Acceptable.

The sample was maintained and received within the QC limits of 4°C ± 2°C. The sample was collected on February 7, 2018, was received at the laboratory on February 8, 2018, and was analyzed by February 8, 2018, therefore meeting QC criteria of less than 14 days between collection and extraction/analysis for solid samples.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Acceptable.

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) and/or correlation coefficients were within the QC limits.

4. Continuing Calibration: Satisfactory.

All RRFs were within the QC limits. All % differences were within the QC limits except the continuing calibration verification (CCV) associated with batch 580-267021 recovered above the upper control limit for carbon tetrachloride (the samples associated with this CCV were non-detects for the affected analytes; therefore, no qualifiers were required) and the CCV associated with batch 580-267021 recovered below QC limits for 1,2,3-Trichlorobenzene (the associated sample quantitation limit was qualified as an estimated quantity with a low bias [UJL]).

5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. **System Monitoring Compounds (SMCs): Acceptable.**

All SMC recoveries were within QC limits.

7. **Blank Spike (BS)/BS Duplicate (BSD) Analysis: Acceptable.**

BS and BSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

8. **Duplicate Analysis: Acceptable.**

Spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits.

9. **Internal Standards: Acceptable.**

All internal standards were within $\pm$ 30 seconds of the continuing calibration internal standard retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

10. **Precision and Bias Determination: Not Performed.**

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

11. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

12. **Overall Assessment of Data for Use**

A total of 60 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No sample results were rejected (R). No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

<u>Data Qualifiers and Definitions</u>

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle
Job No.: 580-74941-1
SDG No.:
Client Sample ID: 18020034
Lab Sample ID: 580-74941-1
Matrix: Solid
Lab File ID: B0818017.D
Analysis Method: 8260C
Date Collected: 02/07/2018 11:13
Sample wt/vol: 12.41(g)
Date Analyzed: 02/08/2018 17:26
Soil Aliquot Vol: 1.075 (mL)
Dilution Factor: 1
Soil Extract Vol.: 10(mL)
GC Column: DB-VRX ID: 0.25(mm)
% Moisture: 5.1
Level: (low/med) Medium
Analysis Batch No.: 267021
Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
75-71-8	Dichlorodifluoromethane	ND		180	41
74-87-3	Chloromethane	ND		90	9.1
75-01-4	Vinyl chloride	ND		140	24
74-83-9	Bromomethane	ND		180	12
75-00-3	Chloroethane	ND		360	14
75-69-4	Trichlorofluoromethane	ND		180	34
75-35-4	1,1-Dichloroethene	ND		18	4.4
75-09-2	Methylene Chloride	ND		230	58
156-60-5	trans-1,2-Dichloroethene	ND		36	13
75-34-3	1,1-Dichloroethane	ND		36	3.8
594-20-7	2,2-Dichloropropane	ND		36	11
156-59-2	cis-1,2-Dichloroethene	ND		36	4.4
74-97-5	Bromochloromethane	ND		36	5.6
67-66-3	Chloroform	ND		36	3.8
71-55-6	1,1,1-Trichloroethane	ND		36	3.1
56-23-5	Carbon tetrachloride	ND		18	3.4
563-58-6	1,1-Dichloropropene	ND		36	4.8
71-43-2	Benzene	ND		18	7.8
107-06-2	1,2-Dichloroethane	ND		18	5.0
79-01-6	Trichloroethene	ND		23	7.2
78-87-5	1,2-Dichloropropane	ND		18	2.2
74-95-3	Dibromomethane	ND		54	6.7
75-27-4	Bromodichloromethane	ND		36	3.3
10061-01-5	cis-1,3-Dichloropropene	ND		18	3.6
108-88-3	Toluene	ND		140	29
10061-02-6	trans-1,3-Dichloropropene	ND		36	6.3
79-00-5	1,1,2-Trichloroethane	ND		18	2.5
127-18-4	Tetrachloroethene	ND		18	4.8
142-28-9	1,3-Dichloropropane	ND		36	5.0
124-48-1	Dibromochloromethane	ND		36	10
106-93-4	1,2-Dibromoethane	ND		18	3.1
108-90-7	Chlorobenzene	ND		36	8.8
100-41-4	Ethylbenzene	ND		36	8.2
630-20-6	1,1,1,2-Tetrachloroethane	ND		36	9.6
79-34-5	1,1,2,2-Tetrachloroethane	ND		18	2.1
179601-23-1	m-Xylene & p-Xylene	ND		180	29

MW

FORM I 8260C

MW 2-16-18

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle | Job No.: 580-74941-1

SDG No.:

Client Sample ID: 18020034 | Lab Sample ID: 580-74941-1

Matrix: Solid | Lab File ID: B0818017.D

Analysis Method: 8260C | Date Collected: 02/07/2018 11:13

Sample wt/vol: 12.41(g) | Date Analyzed: 02/08/2018 17:26

Soil Aliquot Vol: 1.075 (mL) | Dilution Factor: 1

Soil Extract Vol.: 10(mL) | GC Column: DB-VRX ID: 0.25(mm)

% Moisture: 5.1 | Level: (low/med) Medium

Analysis Batch No.: 267021 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
95-47-6	o-Xylene	ND		36	12
100-42-5	Styrene	ND		36	5.5
75-25-2	Bromoform	ND		180	24
98-82-8	Isopropylbenzene	ND		36	7.8
108-86-1	Bromobenzene	ND		90	15
103-65-1	N-Propylbenzene	ND		36	6.1
96-18-4	1,2,3-Trichloropropane	ND		36	10
95-49-8	2-Chlorotoluene	ND		36	7.9
108-67-8	1,3,5-Trimethylbenzene	ND		36	6.9
106-43-4	4-Chlorotoluene	ND		36	8.8
98-06-6	t-Butylbenzene	ND		36	6.9
95-63-6	1,2,4-Trimethylbenzene	ND		36	5.4
135-98-8	sec-Butylbenzene	ND		36	7.3
541-73-1	1,3-Dichlorobenzene	ND		54	5.3
99-87-6	4-Isopropyltoluene	ND		36	7.0
106-46-7	1,4-Dichlorobenzene	ND		54	9.7
104-51-8	n-Butylbenzene	ND		36	11
95-50-1	1,2-Dichlorobenzene	ND		36	4.1
96-12-8	1,2-Dibromo-3-Chloropropane	ND		230	89
120-82-1	1,2,4-Trichlorobenzene	ND		54	14
87-61-6	1,2,3-Trichlorobenzene	ND		36	13
87-68-3	Hexachlorobutadiene	ND		90	16
91-20-3	Naphthalene	ND		54	11
1634-04-4	Methyl tert-butyl ether	ND		36	5.4

JL

CAS NO.	SURROGATE	%REC	Q	LIMITS
2037-26-5	Toluene-d8 (Surr)	96		75-120
460-00-4	4-Bromofluorobenzene (Surr)	99		47-150
1868-53-7	Dibromofluoromethane (Surr)	101		80-118
98-08-8	Trifluorotoluene (Surr)	108		60-150
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		80-121

2/6/18

USEPA

DateShipped: 2/7/2018

CHAIN OF CUSTODY RECORD

Site #: 10QD

Contact Name: Steve Hall

Contact Phone: 206-920-1739

No: PDX-164

Lab: Test America Lab

Lab Phone: 253-922-2310

Lab Address: 5755 8th Street E

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	18020034	Gravel-01	TCLP, PCB, Pesticides, Totals	Sediment	2/7/2018	2	8 oz glass jar	4 C	
	18020034	Gravel-01	VOC, SVOC	Sediment	2/7/2018	2	core in one	4 C	

580-74941 Chain of Custody

Special Instructions: Please process air samples within 24 hrs. Please send results to sghall@ene.com and wade1109@msn.com

SAMPLES TRANSFERRED FROM

CHAIN OF CUSTODY # 4.3

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
Samples	START	14:18 2/7/18	TA-POR	2/7/18 1450	

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 waste sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Toxicity Characteristic Leaching Procedure (TCLP) Volatile Organic Compound (VOC) analysis (EPA Methods 1311 and 8260) analyses were performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The sample was numbered: 18020013

Data Qualifications:

1. Sample Holding Times: Acceptable.

The sample was maintained and received within the QC limits of 4°C ± 2°C. The sample was collected on February 2, 2018, was received at the laboratory on February 3, 2018, and was analyzed by February 7, 2018, therefore meeting QC criteria of less than 14 days between collection and analysis for solid samples.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Acceptable.

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) and/or correlation coefficients were within the QC limits.

4. Continuing Calibration: Acceptable.

All RRFs were within the QC limits. All % differences were within the QC limits.

5. Blanks: Acceptable.

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. System Monitoring Compounds (SMCs): Acceptable.

All SMC recoveries were within QC limits.

7. Blank Spike (BS)/BS Duplicate (BSD) Analysis: Acceptable.

BS and BSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

8. Duplicate Analysis: Acceptable.

Spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits.

9. Internal Standards: Acceptable.

All internal standards were within $\pm$ 30 seconds of the continuing calibration internal standard retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

10. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

11. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

12. Overall Assessment of Data for Use

A total of 10 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No sample results were rejected (R). No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc.

Job Number: 580-74860-1

Client Sample ID: 18020013

Lab Sample ID: 580-74860-1
Client Matrix: Solid

Date Sampled: 02/02/2018 1649
Date Received: 02/03/2018 1030

8260C Volatile Organic Compounds by GC/MS-TCLP

Analysis Method:	8260C	Analysis Batch:	580-266812	Instrument ID:	SEA102
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	B071818.D
Dilution:	100	Leach Batch:	580-266704	Initial Weight/Volume:	5 mL
Analysis Date:	02/07/2018 1859			Final Weight/Volume:	5 mL
Prep Date:	02/07/2018 1859				
Leach Date:	02/05/2018 1653				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
Vinyl chloride		ND		22	100
1,1-Dichloroethene		ND		78	400
2-Butanone		ND		470	2000
Chloroform		ND		50	500
Carbon tetrachloride		ND		30	300
Benzene		ND		42	200
1,2-Dichloroethane		ND		45	200
Trichloroethene		ND		18	300
Tetrachloroethene		ND		33	300
Chlorobenzene		ND		17	200

Surrogate	%Rec	Qualifier	Acceptance Limits
Toluene-d8 (Surr)	92		80 - 122
4-Bromofluorobenzene (Surr)	100		75 - 125
Dibromofluoromethane (Surr)	101		77 - 120
Trifluorotoluene (Surr)	107		80 - 120
1,2-Dichloroethane-d4 (Surr)	105		80 - 126

MW 2-12-18

ecology and environment, inc.
Global Environmental Specialists

720 Third Avenue, Suite 1700
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 1 waste sample collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Toxicity Characteristic Leaching Procedure (TCLP) Semivolatile Organic Compound (SVOC) analysis (EPA Methods 1311 and 8270) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The sample was numbered: 18020013

Data Qualifications:

1. **Sample Holding Times: Acceptable.**

The sample was maintained and received within the QC limits of 0°C to 6°C. The sample was collected on February 2, 2018, was extracted and analyzed by February 7, 2018, therefore meeting holding time criteria of less than 14 days between collection and extraction and less than 40 days between extraction and analysis.

2. **Tuning: Acceptable.**

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. **Initial Calibration: Acceptable.**

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) were within the QC limits.

4. **Continuing Calibration: Acceptable.**

All RRFs were within the QC limits. All % differences were within the QC limits.

5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. System Monitoring Compounds (SMCs): Acceptable.

All SMC recoveries were within QC limits.

7. Blank Spike (BS)/BS Duplicate (BSD) Analysis: Acceptable.

BS and BSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

8. Duplicate Analysis: Satisfactory.

Duplicate and spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits except pyridine; the associated non-detect result was qualified as an estimated quantity with an unknown bias (UJK).

9. Internal Standards: Acceptable.

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

10. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

11. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

12. Overall Assessment of Data for Use

A total of 12 results were validated in this data memorandum. A total of 1 sample result was qualified as an estimated quantity with an unknown bias (JK) based on duplicate precision outliers. No sample results were qualified as estimated quantities based on spike accuracy outliers, holding time outliers, incorrect sample containers, or sample temperature outliers. No sample results were rejected (R). No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate

concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc.

Job Number: 580-74860-1

Client Sample ID: **18020013**

Lab Sample ID: 580-74860-1
Client Matrix: Solid

Date Sampled: 02/02/2018 1649
Date Received: 02/03/2018 1030

8270D Semivolatile Organic Compounds (GC/MS)-TCLP

Analysis Method:	8270D	Analysis Batch:	580-266854	Instrument ID:	TAC023
Prep Method:	3510C	Prep Batch:	580-266838	Lab File ID:	020718a013.D
Dilution:	1.0	Leach Batch:	580-266670	Initial Weight/Volume:	200 mL
Analysis Date:	02/07/2018 1903			Final Weight/Volume:	2 mL
Prep Date:	02/07/2018 1247			Injection Volume:	1 uL
Leach Date:	02/05/2018 1316				

Analyte	DryWt Corrected: N	Result (ug/L)	Qualifier	MDL	RL
1,4-Dichlorobenzene		ND		0.20	2.0 U
2-Methylphenol		ND		0.50	3.0
3 & 4 Methylphenol		ND		0.25	4.0
Hexachloroethane		ND		1.3	5.0
Nitrobenzene		ND		0.20	3.0
Hexachlorobutadiene		ND		1.2	5.0
2,4,6-Trichlorophenol		ND		0.50	3.0
2,4,5-Trichlorophenol		ND		0.50	2.0
2,4-Dinitrotoluene		ND		0.50	5.0
Hexachlorobenzene		ND		0.20	3.0
Pentachlorophenol		ND		3.9	25
Pyridine		ND MW	MW	3.0	15 JK

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol (Surr)	75		20 - 147
Phenol-d5 (Surr)	34		21 - 135
Nitrobenzene-d5 (Surr)	95		60 - 120
2-Fluorobiphenyl	75		63 - 120
2,4,6-Tribromophenol (Surr)	86		28 - 131
Terphenyl-d14 (Surr)	97		66 - 120

MW 2/28/18

USEPA
DateShipped: 2/3/2018

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-160
Lab: Test America Lab
Lab Phone: 253-922-2310
Lab Address: 5755 8th Street E

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	18020013	Waste 01	TCLP VOCs/SVOCs	Waste	2/2/2018	1	8 oz glass jar	4 C	

Loc: 580
74860

580-74860 Chain of Custody

Therm. ID IR5 Cor 4.3 Unc 4.3
Cooler Dsc Sm Red @Lab
Wet/Packs Packing Bub
Custody Seal: Yes ___ No ✓
Chi

Special Instructions:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
All/overnight storage	Ryan Whitchurch START	2/2/2018 7:44pm	START	2/3/2018 08:00	Good
Transport to Lab	START	2/3/2018 9:30	Mark Rode EOE	2-3-18 0980	
To Lab	Mark Rode EOE	2-3-18 1000	Kevin Hilker TASEA	2-3-18 1030	

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K Analytical Data – Portland Harbor Sediment Sampling

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Global Environmental Specialists

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MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 sediment samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Semivolatile Organic Compound (SVOC) analysis (EPA Method 8270) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020011 18020012

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained and received within the QC limits of 0°C to 6°C. The samples were collected on February 2, 2018, were extracted and analyzed by February 8, 2018, therefore meeting holding time criteria of less than 14 days between collection and extraction and less than 40 days between extraction and analysis.

2. Tuning: Acceptable.

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. Initial Calibration: Satisfactory.

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) were within the QC limits except bis(2-ethylhexyl)phthalate; associated positive results and sample quantitation limits were qualified as estimated quantities with an unknown bias (JK or UJK).

4. Continuing Calibration: Satisfactory.

All RRFs were within the QC limits. All % differences were within the QC limits except hexachlorobenzene and anthracene with high recoveries; associated positive results were qualified as estimated quantities with a high bias (JH).

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5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. **System Monitoring Compounds (SMCs): Acceptable.**

All SMC recoveries were within QC limits.

7. **Matrix Spike (MS)/MS Duplicate (MSD) Analysis: Satisfactory.**

MS and MSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits except bis(2-ethylhexyl)phthalate with a low recovery associated with sample 18020012, 1-methylnapthalene, 2-methylnaphthalene, and dibenz(a,h)anthracene with low recoveries and anthracene, benzo(a)anthracene, fluoranthene, phenanthrene, and pyrene with high recoveries associated with sample 18020011. Positive results and sample quantitation limits were qualified as estimated quantities with a low bias (JL or UJL) for results associated with low recovery outliers. Positive results were qualified as estimated quantities with a high bias (JH) for results associated with high recovery outliers.

8. **Blank Spike (BS) Analysis: Acceptable.**

BS analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

9. **Duplicate Analysis: Satisfactory.**

Spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All spike duplicate results were within QC limits except bis(2-ethylhexyl)phthalate, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, naphthalene, phenanthrene, and pyrene. Positive results and sample quantitation limits were qualified as estimated quantities with an unknown bias (JK or UJK) for results associated with low recovery outliers.

10. **Internal Standards: Acceptable.**

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

11. **Precision and Bias Determination: Not Performed.**

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

12. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

13. **Overall Assessment of Data for Use**

A total of 40 results were validated in this data memorandum. A total of 4 sample results were qualified as estimated quantities (J) based on duplicate precision outliers. A total of 8 sample results were qualified as estimated quantities (J) based on spike accuracy outliers. No sample results were rejected (R). No sample results were qualified as estimated quantities (J) based on holding time outliers, incorrect

sample containers, or based on sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.

NJ - The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020011**

Lab Sample ID: 580-74859-2
Client Matrix: Solid
% Moisture: 25.7

Date Sampled: 02/02/2018 1622
Date Received: 02/03/2018 1030

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-266691	Instrument ID:	SEA101
Prep Method:	3546	Prep Batch:	580-266644	Lab File ID:	020518a018.D
Dilution:	1.0			Initial Weight/Volume:	10.207 g
Analysis Date:	02/05/2018 2229			Final Weight/Volume:	10 mL
Prep Date:	02/05/2018 0925			Injection Volume:	2 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1-Methylnaphthalene		6.2	J ~~F1~~ ~~MW~~ Q	0.83	6.6
2-Methylnaphthalene		9.8	~~F1~~ JL	0.59	6.6
Acenaphthene		6.9	~~F1~~ ~~MW~~	0.79	6.6
Acenaphthylene		22	~~F2~~ F1 JK	0.66	6.6
Anthracene		22	~~F2~~ F1 JK	0.79	6.6
Benzo[a]anthracene		72	~~F2~~ F1 JK	1.0	6.6
Benzo[a]pyrene		130	~~F2~~ F1 JK	0.53	6.6
Benzo[b]fluoranthene		160	~~F2~~ F1 JK	0.78	6.6
Benzo[g,h,i]perylene		120	~~F1~~ ~~MW~~	0.66	6.6
Benzo[k]fluoranthene		63	~~F1~~ ~~MW~~	0.79	6.6
Chrysene		110	~~F2~~ F1 JK	2.0	6.6
Dibenz(a,h)anthracene		20	~~F1~~ JH	0.95	6.6
Fluoranthene		240	~~F2~~ F1 MW JK	1.8	6.6
Fluorene		6.1	~~J F1~~ ~~MW~~ JQ	0.66	6.6
Indeno[1,2,3-cd]pyrene		130	~~F1~~ ~~MW~~	0.79	6.6
Naphthalene		25	~~F2~~ F1 JK	1.1	6.6
Phenanthrene		110	~~F2~~ F1 JK	0.91	6.6
Pyrene		300	~~F2~~ F1 MW JK	1.3	6.6

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14	82		68 - 138

MW 2-12-18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: 18020012

Lab Sample ID: 580-74859-1
Client Matrix: Solid
% Moisture: 26.0

Date Sampled: 02/02/2018 1625
Date Received: 02/03/2018 1030

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:	8270D SIM	Analysis Batch:	580-266691	Instrument ID:	SEA101
Prep Method:	3546	Prep Batch:	580-266644	Lab File ID:	020518a017.D
Dilution:	1.0			Initial Weight/Volume:	10.308 g
Analysis Date:	02/05/2018 2204			Final Weight/Volume:	10 mL
Prep Date:	02/05/2018 0925			Injection Volume:	2 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
1-Methylnaphthalene		1.9	J Q	0.83	6.6
2-Methylnaphthalene		2.8	J	0.59	6.6
Acenaphthene		4.3	J	0.79	6.6
Acenaphthylene		3.2	J	0.66	6.6
Anthracene		10	JH	0.79	6.6
Benzo[a]anthracene		28		1.0	6.6
Benzo[a]pyrene		32		0.52	6.6
Benzo[b]fluoranthene		37		0.77	6.6
Benzo[g,h,i]perylene		21		0.66	6.6
Benzo[k]fluoranthene		14		0.79	6.6
Chrysene		36		2.0	6.6
Dibenz(a,h)anthracene		4.0	J Q	0.94	6.6
Fluoranthene		73		1.8	6.6
Fluorene		3.6	J Q	0.66	6.6
Indeno[1,2,3-cd]pyrene		23		0.79	6.6
Naphthalene		5.7	J Q	1.0	6.6
Phenanthrene		39		0.90	6.6
Pyrene		76		1.3	6.6

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14	88		68 - 138

MW 2-12-18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020011**

Lab Sample ID: 580-74859-2
Client Matrix: Solid
% Moisture: 25.7

Date Sampled: 02/02/2018 1622
Date Received: 02/03/2018 1030

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-266728	Instrument ID:	TAC051
Prep Method:	3550B	Prep Batch:	580-266648	Lab File ID:	0206A031.D
Dilution:	1.0			Initial Weight/Volume:	20.556 g
Analysis Date:	02/06/2018 2257			Final Weight/Volume:	1 mL
Prep Date:	02/05/2018 0938			Injection Volume:	2 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Hexachlorobenzene		~~ND~~		0.33	3.3 U
Bis(2-ethylhexyl) phthalate		12	J Q	8.9	39

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (Surr)	93		68 - 120

MW 2-12-18

Client: Ecology and Environment, Inc. Job Number: 580-74859-1

Client Sample ID: 18020012

Lab Sample ID: 580-74859-1 Date Sampled: 02/02/2018 1625
Client Matrix: Solid % Moisture: 26.0 Date Received: 02/03/2018 1030

8270D Semivolatile Organic Compounds (GC/MS)

Analysis Method:	8270D	Analysis Batch:	580-266728	Instrument ID:	TAC051
Prep Method:	3550B	Prep Batch:	580-266648	Lab File ID:	0206A028.D
Dilution:	1.0			Initial Weight/Volume:	20.632 g
Analysis Date:	02/06/2018 2143			Final Weight/Volume:	1 mL
Prep Date:	02/05/2018 0938			Injection Volume:	2 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Hexachlorobenzene		~~ND~~ MW		0.33	3.3 U
Bis(2-ethylhexyl) phthalate		12	JQ ~~J F2 F1~~ MW	8.9	39

Surrogate	%Rec	Qualifier	Acceptance Limits
Terphenyl-d14 (Surr)	89		68 - 120

MW 2-12-18

ecology and environment, inc.
Global Environmental Specialists

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MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 sediment samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. PSEP organotins analysis (Method Organotins) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020011 18020012

Data Qualifications:

1. **Sample Holding Times: Acceptable.**

The samples were maintained and received within the QC limits of 0°C to 6°C. The samples were collected on February 2, 2018, were extracted and analyzed by February 6, 2018, therefore meeting holding time criteria of less than 14 days between collection and extraction and less than 40 days between extraction and analysis.

2. **Tuning: Acceptable.**

Tuning was performed at the beginning of each 12-hour analysis sequence. All results were within QC limits.

3. **Initial Calibration: Acceptable.**

All average Relative Response Factors (RRFs) were within the QC limits. All Relative Standard Deviations (RSDs) were within the QC limits.

4. **Continuing Calibration: Satisfactory.**

All RRFs were within the QC limits. All % differences were within the QC limits except tributyltin and monobutyltin with high recoveries. No actions were taken as these analytes were not detected in the samples.

5. **Blanks: Acceptable.**

A method blank was analyzed for each 20 sample batch per matrix. There were no detections in any method blank.

6. **System Monitoring Compounds (SMCs): Acceptable.**

All SMC recoveries were within QC limits.

7. **Matrix Spike (MS)/MS Duplicate (MSD) Analysis: Acceptable.**

MS and MSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

8. **Blank Spike (BS)/BS Duplicate (BSD) Analysis: Acceptable.**

BS and BSD analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All recoveries were within QC limits.

9. **Duplicate Analysis: Satisfactory.**

Duplicate and spike duplicate analyses were performed per SDG or per matrix per concentration level, whichever was more frequent. All duplicate and spike duplicate results were within QC limits except di-butyltin and tetra-n-butyltin. Positive results and sample quantitation limits associated with the duplicate outliers were qualified as estimated quantities with an unknown bias (JK or UJK).

10. **Internal Standards: Acceptable.**

All internal standards (IS) were within $\pm$ 30 seconds of the continuing calibration IS retention times. All area counts were within 50 % to 200 % of the continuing calibration area counts.

11. **Precision and Bias Determination: Not Performed.**

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

12. **Performance Evaluation Sample Analysis: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

13. **Overall Assessment of Data for Use**

A total of 8 results were validated in this data memorandum. A total of 2 sample results were qualified as estimated quantities (UJK) based on duplicate precision outliers. No sample results were qualified as estimated quantities based on spike accuracy outliers, incorrect sample containers, sample temperature outliers, or holding time outliers. No potential contaminants of concern were detected in the laboratory blanks. No sample results were rejected (R).

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/ Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation

Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".

NJ - The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc. Job Number: 580-74859-1

Client Sample ID: **18020011**

Lab Sample ID: 580-74859-2 Date Sampled: 02/02/2018 1622
Client Matrix: Solid % Moisture: 25.7 Date Received: 02/03/2018 1030

Organotins Organotins, PSEP (GC/MS)

Analysis Method:	Organotins	Analysis Batch:	580-266757	Instrument ID:	TAC040
Prep Method:	Organotin Prep	Prep Batch:	580-266663	Lab File ID:	40tin020618a009.D
Dilution:	1.0			Initial Weight/Volume:	11.260 g
Analysis Date:	02/06/2018 1714			Final Weight/Volume:	2 mL
Prep Date:	02/05/2018 1242			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Dibutyltin		ND		3.6	16
Monobutyltin		ND		2.4	9.6
Tetra-n-butyltin		ND		14	48
Tributyltin		ND		1.8	8.4

Surrogate	%Rec	Qualifier	Acceptance Limits
Tripentyltin	38		10 - 113

JMW 2-12-18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020012**

Lab Sample ID: 580-74859-1
Client Matrix: Solid
% Moisture: 26.0

Date Sampled: 02/02/2018 1625
Date Received: 02/03/2018 1030

Organotins Organotins, PSEP (GC/MS)

Analysis Method:	Organotins	Analysis Batch:	580-266757	Instrument ID:	TAC040
Prep Method:	Organotin Prep	Prep Batch:	580-266663	Lab File ID:	40tin020618a006.D
Dilution:	1.0			Initial Weight/Volume:	10.268 g
Analysis Date:	02/06/2018 1557			Final Weight/Volume:	2 mL
Prep Date:	02/05/2018 1242			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
Dibutyltin		ND	~~F2~~	4.0	17 UJK
Monobutyltin		ND		2.6	11
Tetra-n-butyltin		ND	~~F2~~	15	53 JK
Tributyltin		ND		2.0	9.2

Surrogate	%Rec	Qualifier	Acceptance Limits
Tripentyltin	24		10 - 113

MW 2-12-18

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MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO. TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 sediment samples collected from the River Street Warehouse Asbestos site located in Portland, Oregon, has been completed. Analysis for Extended Diesel Range Total Petroleum Hydrocarbons (Ecology Method NWTPH-Dx) was performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2B and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020011 18020012

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at 4°C ± 2°C. The samples were collected on February 2, 2018, extracted on February 5, 2018, and analyzed by February 5, 2018, therefore meeting QC criteria of less than 14 days between collection and extraction for soil samples and less than 40 days between extraction and analysis.

2. Initial Calibration: Acceptable.

Calculations were verified as correct. All relative percent differences (RPDs) were within the laboratory control limits.

3. Continuing Calibration: Acceptable.

Calculations were verified as correct. All percent differences (%Ds) were within the laboratory control limits.

4. Error Determination: Not Performed.

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although the flags are not found on the Form I's.

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5. **Blanks: Acceptable.**

A method blank was analyzed for each extraction batch for each matrix and analysis system. Diesel- and motor oil-range TPHs were not detected in the method blank.

6. **System Monitoring Compounds (SMC): Acceptable.**

All recoveries of the SMCs were greater than 10% and within QC limits.

7. **Performance Evaluation Samples: Not Provided.**

Performance evaluation samples were not provided to the laboratory.

8. **Blank Spike (BS) and BS Duplicate (BSD): Acceptable.**

BS and BSD recoveries were within QC limits.

9. **Duplicates: Acceptable.**

All spike duplicate results were within QC limits.

10. **Quantitation and Quantitation Limits: Acceptable.**

Sample concentrations were correctly calculated.

11. **Laboratory Contact: Not Required.**

No laboratory contact was required.

12. **Overall Assessment of Data for Use**

A total of 4 results were validated in this data memorandum. No sample results were qualified as estimated quantities (J) based on duplicate precision outliers, spike accuracy outliers, holding time outliers, incorrect sample containers, and sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks. No sample results were rejected (R).

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Analytical Data

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020011**

Lab Sample ID: 580-74859-2
Client Matrix: Solid
% Moisture: 25.7

Date Sampled: 02/02/2018 1622
Date Received: 02/03/2018 1030

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	580-266650	Instrument ID:	SEA012
Prep Method:	3546	Prep Batch:	580-266643	Lab File ID:	011F1301.D
Dilution:	1.0			Initial Weight/Volume:	10.263 g
Analysis Date:	02/05/2018 2018			Final Weight/Volume:	10 mL
Prep Date:	02/05/2018 0924			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
#2 Diesel (C10-C24)		~~ND~~ MW		16	66 U
Motor Oil (>C24-C36)		31	J Q	12	66

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	70		50 - 150

MW 2-12-18

Analytical Data

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: 18020012

Lab Sample ID: 580-74859-1
Client Matrix: Solid
% Moisture: 26.0

Date Sampled: 02/02/2018 1625
Date Received: 02/03/2018 1030

NWTPH-Dx Northwest - Semi-Volatile Petroleum Products (GC)

Analysis Method:	NWTPH-Dx	Analysis Batch:	580-266650	Instrument ID:	SEA012
Prep Method:	3546	Prep Batch:	580-266643	Lab File ID:	010F1201.D
Dilution:	1.0			Initial Weight/Volume:	10.003 g
Analysis Date:	02/05/2018 1956			Final Weight/Volume:	10 mL
Prep Date:	02/05/2018 0924			Injection Volume:	1 uL

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
#2 Diesel (C10-C24)		~~ND~~		17	68 U
Motor Oil (>C24-C36)		27	J Q	12	68

Surrogate	%Rec	Qualifier	Acceptance Limits
o-Terphenyl	73		50 - 150

2-12-18

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MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington MW

SUBJ: **Inorganic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 sediment samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Selected Target Analyte List (TAL) metals analyses (EPA Methods 6020 and 7471) were performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020011 18020012

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at < 6°C (only applies to mercury). The samples were collected on February 2, 2018, and were analyzed by February 8, 2018, therefore meeting QC criteria of less than 6 months between collection, extraction, and analysis (28 days for mercury).

2. Initial and Continuing Calibration: Acceptable.

A minimum of one calibration standard and a blank were analyzed at the beginning of the ICP analysis sequence and after every 10 samples. No results were greater than 110% of the highest calibration standard. All ICP recoveries were within the QC limits. All AA recoveries were within QC limits and the initial calibration correlation coefficient was > 0.995.

3. Blanks: Acceptable.

A preparation blank was analyzed for each 20 samples or per matrix per concentration level. Blanks were analyzed after each Initial or Continuing Calibration Verification. There were no detections in any blanks.

4. ICP Interference Check Sample: Acceptable.

An Interference Check Sample (ICS) was analyzed at the beginning of each sequence or at least twice every 8 hours, whichever was more frequent. All applicable ICS (solution AB) results were within QC limits of 80% - 120% recovery.

5. Precision and Bias Determination: Not Performed.

Samples necessary to determine precision and bias were not provided to the laboratory. All results were flagged "PND" (Precision Not Determined) and "RND" (Recovery Not Determined), although the flags do not appear on the data sheets.

6. Performance Evaluation Sample Analysis: Not Provided.

Performance evaluation samples were not provided to the laboratory.

7. ICP Serial Dilution: Acceptable.

A serial dilution analysis was performed per matrix per concentration or per sample delivery group, whichever was more frequent. All serial dilution results were within QC limits.

8. Matrix Spike Analysis: Acceptable.

A matrix spike analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. Spike recoveries were within the QC limits.

9. Duplicate Analysis: Satisfactory.

A laboratory duplicate analysis was performed per SDG or per matrix per concentration level, whichever was more frequent. All duplicate and spike duplicate results were within QC limits except lead; associated positive results and sample quantitation limits were qualified as estimated quantities with an unknown bias (JK or UJK).

10. Laboratory Control Sample Analysis: Acceptable.

A Laboratory Control Sample (LCS) was analyzed per SDG per matrix. All LCS and LCS duplicate results were within the established control limits.

11. Overall Assessment of Data for Use

A total of 12 results were validated in this data memorandum. A total of 2 sample results were qualified as estimated quantities (J) based on duplicate precision outliers. No sample results were qualified as estimated quantities (J) based on spike accuracy outliers, holding time outliers, incorrect sample containers, sample temperature outliers, laboratory blanks, or serial dilution outliers. No sample results were rejected (R).

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc. Job Number: 580-74859-1

Client Sample ID: 18020011

Lab Sample ID: 580-74859-2 Date Sampled: 02/02/2018 1622
Client Matrix: Solid % Moisture: 25.7 Date Received: 02/03/2018 1030

6020A Metals (ICP/MS)

Analysis Method:	6020A	Analysis Batch:	580-266706	Instrument ID:	SEA044
Prep Method:	3050B	Prep Batch:	580-266661	Lab File ID:	098SMPL.D
Dilution:	10			Initial Weight/Volume:	1.4582 g
Analysis Date:	02/05/2018 1427			Final Weight/Volume:	50 mL
Prep Date:	02/05/2018 1122				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		5.7		0.092	0.46
Cadmium		0.16	J Q	0.071	0.37
Copper		27		0.20	0.92
Lead		13	JK	0.044	0.46
Zinc		92		1.5	4.6

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	580-266676	Instrument ID:	TAC103
Prep Method:	7471A	Prep Batch:	580-266646	Lab File ID:	266613B.CSV
Dilution:	1.0			Initial Weight/Volume:	0.8118 g
Analysis Date:	02/05/2018 1138			Final Weight/Volume:	50 mL
Prep Date:	02/05/2018 0937				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.035		0.0090	0.030

MW 2-12-18

Client: Ecology and Environment, Inc. Job Number: 580-74859-1

Client Sample ID: 18020012

Lab Sample ID: 580-74859-1 Date Sampled: 02/02/2018 1625
Client Matrix: Solid % Moisture: 26.0 Date Received: 02/03/2018 1030

6020A Metals (ICP/MS)

Analysis Method:	6020A	Analysis Batch:	580-266706	Instrument ID:	SEA044
Prep Method:	3050B	Prep Batch:	580-266661	Lab File ID:	099SMPL.D
Dilution:	10			Initial Weight/Volume:	1.4580 g
Analysis Date:	02/05/2018 1431			Final Weight/Volume:	50 mL
Prep Date:	02/05/2018 1122				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Arsenic		6.7		0.093	0.46
Cadmium		0.21	J Q	0.071	0.37
Copper		27		0.20	0.93
Lead		19	JK	0.044	0.46
Zinc		100		1.5	4.6

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	580-266676	Instrument ID:	TAC103
Prep Method:	7471A	Prep Batch:	580-266646	Lab File ID:	266613B.CSV
Dilution:	1.0			Initial Weight/Volume:	0.7142 g
Analysis Date:	02/05/2018 1129			Final Weight/Volume:	50 mL
Prep Date:	02/05/2018 0937				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
Mercury		0.039		0.010	0.034

MW 2/2/18

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MEMORANDUM

DATE: February 12, 2018

TO: Erin Lynch, START-IV Project Manager, E & E, Portland, Oregon

FROM: Mark Woodke, START-IV Chemist, E & E, Seattle, Washington

SUBJ: **Organic Data Quality Assurance Review, River Street Warehouse Asbestos Site, Portland, Oregon**

REF: TO: TO-23-T1-SS1 PAN: 1004530.0023.001.01

The data quality assurance review of 2 sediment samples collected from the River Street Warehouse Asbestos site in Portland, Oregon, has been completed. Chlorinated Pesticides (EPA Method 8081) and Polychlorinated Biphenyls (PCBs - EPA Method 8082) analyses were performed by Test America, Inc., Tacoma, Washington. All sample analyses were evaluated following EPA's Stage 2 and/or 4 Data Validation Electronic and/or Manual Process (S2B/4VE/M).

The samples were numbered: 18020011 18020012

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at 0°C to 6°C. The samples were collected on February 2, 2018, extracted on February 5, 2018, and were analyzed by February 5, 2018, therefore meeting QC criteria of less than 14 days between collection and solid sample extraction and less than 40 days between extraction and analysis. There are no holding time limits for Method 8082 PCBs.

2. Instrument Performance: Acceptable.

The surrogate retention time percent difference between the initial calibration standards and the remaining standards and samples was $\leq$ 0.3% for capillary column analyses.

3. Initial and Continuing Calibration: Satisfactory.

All initial calibration relative standard deviations (RSDs) were within QC limits. All continuing calibration % differences (% D) were within QC limits except the following: the continuing calibration verification (CCV) associated with batch 580-266709 recovered above the upper control limit for PCB-1254. The samples associated with this CCV were non-detects for the affected analytes; therefore, no qualifiers were applied. The CCV standard associated with batch 580-266709 recovered outside acceptance criteria for %D for the surrogate DCB on the confirmation column only. Since the % recovery was within the acceptance criteria for the surrogate in the CCV and associated samples, no qualifications were applied.

The CCV standard associated with samples 18020011 and 18020012 recovered outside acceptance criteria for %D for surrogate DCB on the primary column only. Since the % recovery is within the acceptance criteria for the surrogate in the CCV and associated samples, the data have been reported from the confirmation column. No qualifications were required.

The CCV associated with samples 18020011 and 18020012 recovered outside the control limits for Chlordane (technical), 2,4'-DDD, and 2,4'-DDE on the primary column. Results are confirmed on both columns and reported from the passing column. To be consistent, all analytes are reported from the confirmation column. No qualifications were required.

Sample non-detects with high recovery outliers were not qualified.

4. Error Determination: Not Provided.

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although the flags are not found on the Form I's.

5. Blanks: Acceptable.

A method blank was prepared at the required frequency of every time samples were extracted for each matrix and for each concentration level, or every 20 samples, whichever is greater, and for each analytical system. No target analytes were detected in the laboratory blanks.

6. Performance Evaluation Samples: Not Provided.

Performance evaluation samples were not provided to the laboratory.

7. System Monitoring Compounds (SMCs): Satisfactory.

All recoveries of the SMCs were within QC limits. DCB failed the surrogate recovery criteria high for 18020012MSD. No actions were taken based on this high QC sample SMC outlier.

8. Blank Spike (BS) and BS Duplicate (BSD) Analyses: Satisfactory.

BS and BSD recoveries were within QC limits. The BS associated with analytical batch 580-266682 recovered outside acceptance criteria on the primary column for Dieldrin, alpha-Chlordane and 4,4'-DDE. The associated sample results for those analytes were reported from the confirmation column which met acceptance criteria. No qualifiers were applied based on these primary column outliers.

9. Matrix Spike (MS) and MS Duplicate (MSD) Analyses: Satisfactory.

MS and MSD recoveries were within QC limits except PCB-1260 failed the recovery criteria low for the MS of sample 18020011. 4,4'-DDD failed the recovery criteria low for the MS of sample 18020012 and 4,4'-DDE failed the recovery criteria low for the MSD of sample 18020012. Positive results and sample quantitation limits associated with low recovery outliers were qualified as estimated quantities with a low bias (JL or UJL).

10. Duplicates: Acceptable.

Relative Percent Differences (RPDs) of all spiked analytes were within the required control limits.

11. Compound Identification: Satisfactory.

All results were dual-column confirmed with differences between the columns less than 25% except PCB 1260 in both samples, 4,4'-DDE in sample 18020012, alpha-chlordane, 2,4'-DDD, and 4,4'-DDD in sample 18020011, and in the pesticide MS and MSD analyses (no actions were taken based on these MS/MSD outliers). Positive sample results with percent differences between the columns greater than 25% were qualified as estimated quantities with an unknown bias (JK).

The following sample has clear evidence of the presence of chlordane based on the presence of alpha and gamma chlordane; however, the chlordane peaks in the sample do not closely match the laboratory's Technical Chlordane standard: 18020011. This result was qualified as not detected (U).

12. Target Compound Quantitation and Quantitation Limits: Acceptable.

Sample results and quantitation limits were correctly calculated.

13. Laboratory Contact

No laboratory contact was required.

14. Overall Assessment

From the case narrative: The following samples appears to contain polychlorinated biphenyls (PCBs); however, due to weathering or other environmental processes, the PCBs in the sample do not closely match any of the laboratory's Aroclor standards used for instrument calibration: 18020011 and 18020012. The samples have been quantified and reported as the predominant Aroclor. Due to the poor match with the Aroclor standard(s), there is increased qualitative and quantitative uncertainty associated with these results. The associated positive results were qualified as estimated quantities with an unknown bias (JK).

A total of 38 results were validated in this data memorandum. A total of 3 sample results were qualified as estimated quantities (J) based on duplicate precision outliers. No sample results were rejected (R). No sample results were qualified based on holding time outliers, incorrect sample containers, spike accuracy outliers, or sample temperature outliers. No potential contaminants of concern were detected in the laboratory blanks.

The reviewer used professional judgment to apply a single bias qualifier when more than one bias qualifier was applicable to an individual estimated sample result.

The overall usefulness of the data is based on the criteria outlined in the Site-Specific Sampling Plan and/or Sampling and Quality Assurance Plan, the OSWER Guidance Document "Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan, and Data Validation Procedures" (EPA/540/G-90/004), the analytical method(s), the EPA Region 10 Emergency Management Program SOG 144E Analytical Data Validation, and/or the Office of Emergency and Remedial Response Publication "National Functional Guidelines for Superfund Organic Methods Data Review, January 2018". Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

<u>Data Qualifiers and Definitions</u>

H - The sample result is biased high.

J - The result is an estimated quantity. The associated numerical value is the approximate

concentration of the analyte in the sample.

K - The bias of the sample is not known.

L - The sample result is biased low.

Q - Detected concentration is below the method reporting limit/Contract Required Quantitation Limit, but is above the method quantitation limit.

R - The data is rejected and unusable. The analyte may or may not be present in the sample.

U - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ - The material was analyzed for but was not detected. The reported detection limit is estimated because QC criteria were not met.

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: 18020011

Lab Sample ID: 580-74859-2
Client Matrix: Solid
% Moisture: 25.7

Date Sampled: 02/02/2018 1622
Date Received: 02/03/2018 1030

8081B Organochlorine Pesticides (GC)

Analysis Method:	8081B	Analysis Batch:	580-266682	Instrument ID:	TAC045
Prep Method:	3546	Prep Batch:	580-266645	Initial Weight/Volume:	21.596 g
Dilution:	3.0			Final Weight/Volume:	2 mL
Analysis Date:	02/05/2018 1903			Injection Volume:	1 uL
Prep Date:	02/05/2018 0925			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4'-DDD		0.14	~~J pm~~ JQ	0.034	0.75
2,4'-DDE		~~ND~~ mu		0.071	0.75 U
2,4'-DDT		0.69	J Q	0.060	0.75
4,4'-DDD		0.61	~~J pm~~ JQ	0.034	0.75
4,4'-DDE		0.51	J Q	0.022	0.75
4,4'-DDT		2.7		0.052	0.75
Aldrin		~~ND~~ mu		0.034	0.37 U
alpha-Chlordane		0.062	J Q	0.045	0.37
Chlordane (technical)		ND		0.29	3.7 U
Dieldrin		ND		0.13	0.75
gamma-BHC (Lindane)		ND mu		0.011	0.37
gamma-Chlordane		0.095	J Q	0.071	0.37

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	106		16 - 123
Tetrachloro-m-xylene	91		38 - 121

JMW 2-12-18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020012**

Lab Sample ID: 580-74859-1
Client Matrix: Solid

% Moisture: 26.0

Date Sampled: 02/02/2018 1625
Date Received: 02/03/2018 1030

8081B Organochlorine Pesticides (GC)

Analysis Method:	8081B	Analysis Batch:	580-266682	Instrument ID:	TAC045
Prep Method:	3546	Prep Batch:	580-266645	Initial Weight/Volume:	20.126 g
Dilution:	3.0			Final Weight/Volume:	2 mL
Analysis Date:	02/05/2018 1807			Injection Volume:	1 uL
Prep Date:	02/05/2018 0925			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	MDL	RL
2,4'-DDD		~~ND~~		0.036	0.81 U
2,4'-DDE		~~ND~~ mu		0.077	0.81 U
2,4'-DDT		0.55	J Q	0.064	0.81
4,4'-DDD		0.23	~~J F1~~ mu JQ	0.036	0.81
4,4'-DDE		0.42	~~J F1~~ mu JQ	0.024	0.81
4,4'-DDT		2.2		0.056	0.81
Aldrin		~~ND~~		0.036	0.40 U
alpha-Chlordane		~~ND~~ mu		0.048	0.40 U
Chlordane (technical)		0.60	J Q	0.31	4.0
Dieldrin		~~ND~~		0.14	0.81 U
gamma-BHC (Lindane)		~~ND~~ mu		0.012	0.40 U
gamma-Chlordane		0.079	J Q	0.077	0.40

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	90		16 - 123
Tetrachloro-m-xylene	97		38 - 121

MW 2-12-18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: **18020011**

Lab Sample ID: 580-74859-2
Client Matrix: Solid
% Moisture: 25.7

Date Sampled: 02/02/2018 1622
Date Received: 02/03/2018 1030

8082A Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082A	Analysis Batch:	580-266709	Instrument ID:	TAC034
Prep Method:	3546	Prep Batch:	580-266645	Initial Weight/Volume:	21.596 g
Dilution:	1.0			Final Weight/Volume:	2 mL
Analysis Date:	02/05/2018 1818			Injection Volume:	1 uL
Prep Date:	02/05/2018 0925			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
PCB-1016		~~ND~~		0.00092	0.0031 U
PCB-1221		ND		0.00052	0.0014
PCB-1232		ND		0.00061	0.0014
PCB-1242		ND		0.00020	0.0012
PCB-1248		ND		0.00036	0.0014
PCB-1254		ND MW		0.00019	0.0012
PCB-1260		0.00085	~~JF1~~ MW JQ	0.00024	0.0012

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	62		25 - 149
Tetrachloro-m-xylene	78		35 - 130

MW 2/2/18

Client: Ecology and Environment, Inc.

Job Number: 580-74859-1

Client Sample ID: 18020012

Lab Sample ID: 580-74859-1
Client Matrix: Solid
% Moisture: 26.0

Date Sampled: 02/02/2018 1625
Date Received: 02/03/2018 1030

8082A Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analysis Method:	8082A	Analysis Batch:	580-266709	Instrument ID:	TAC034
Prep Method:	3546	Prep Batch:	580-266645	Initial Weight/Volume:	20.126 g
Dilution:	1.0			Final Weight/Volume:	2 mL
Analysis Date:	02/05/2018 1758			Injection Volume:	1 uL
Prep Date:	02/05/2018 0925			Result Type:	PRIMARY

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	MDL	RL
PCB-1016		~~ND~~		0.00099	0.0034 U
PCB-1221		~~ND~~		0.00056	0.0015
PCB-1232		~~ND~~		0.00066	0.0015
PCB-1242		~~ND~~		0.00021	0.0013
PCB-1248		~~ND~~		0.00039	0.0015
PCB-1254		~~ND~~ MW		0.00020	0.0013
PCB-1260		0.00063	J Q	0.00026	0.0013

Surrogate	%Rec	Qualifier	Acceptance Limits
DCB Decachlorobiphenyl	85		25 - 149
Tetrachloro-m-xylene	91		35 - 130

MW 2-12-18

Loc: 580
74859

USEPA
DateShipped: 2/3/2018

CHAIN OF CUSTODY RECORD
Site #: 10QD
Contact Name: Steve Hall
Contact Phone: 206-920-1739

No: PDX-159
Lab: Test America Lab
Lab Phone: 253-922-2310
Lab Address: 5755 8th Street E

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Lab QC
	18020012	Bank 02	Metals, Hg, NWTPH-Dx, Organotin	Sediment	2/2/2018	1	8 oz glass jar	4 C	
	18020011	Bank 01	Metals, Hg, NWTPH-Dx, Organotin,	Sediment	2/2/2018	1	8 oz glass jar	4 C	
	18020011	Bank 01	Pest, PCB, BEHP, PAH	Sediment	2/2/2018	1	8 oz glass jar	4 C	
	18020012	Bank 02	Pest, PCB, BEHP, PAH	Sediment	2/2/2018	1	8 oz glass jar	4 C	

580-74859 Chain of Custody

Therm. ID IR5 Cor 4.3 Unc 4.3
Cooler Dsc Sm Rel @Lab
Wet/Packs Packing Bub
CTj
Custody Seal: Yes ___ No ✓

Special Instructions: For pesticides (dieldrin), PCBs, and SVOCs (BEHP), please extract an extra volume to achieve lower resporting limits.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
ALL/overnight Storage	Ryan Whitchurch START	2/2/2018 07:44pm	[signature]	2/3/2018 08:00	Good
Transport to Lab	[signature] START	2/3/2018 09:30am	[signature] EHP	2-3-18 0900	
To Lab	[signature] EHP	2-3-18 1030	[signature] TASea	2-3-18 1030	

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