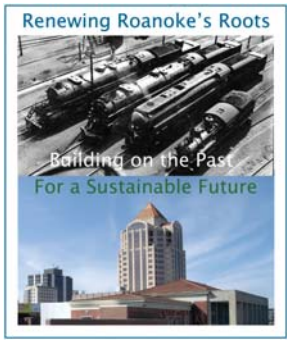
Sampling and Analysis Plan

Virginian Railway
Passenger Station-
Remedial Actions

National Railway Historical Society
Roanoke, Virginia
Brownfield Redevelopment Program

January 14, 2011



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Virginian Railway Passenger Station
Remedial Actions

Brownfield Redevelopment Program
National Railway Historical Society
Roanoke Chapter, Virginia

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January 14, 2011
Day/Month/Year

Cooperative Agreement Recipient: _____
Signature
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Printed Name/Date

Project QA Officer: _____
Signature
_____
Printed Name/Date

U.S. EPA Project Manager Approval: _____
Signature
_____
Printed Name/Date

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Laboratory Qualifications Package to be forwarded separately.

This Site-Specific Sampling and Analysis Plan is a companion document to the Generic Quality Assurance Project Plan (QAPP) for the City of Roanoke's Brownfield Redevelopment Program. All of the policies and procedures specified in the Generic QAPP will be followed for this project in accordance with Section 6. R of Amendment No. 1 of the Secondary Subgrant Agreement Dated December 16, 2009.

1.0 PROJECT MANAGEMENT

1.1 Site Information/Background

The Virginian Railway Passenger Station (Virginian Station) is an approximately 0.77 acre site located at 1402 South Jefferson Street, which is southeast of Interstate 581 at the intersection of South Jefferson Street and Williamson Road SE in Roanoke, Virginia. The property was operated as a railway station from 1910 to 1956. In 1959, Norfolk & Western obtained the property via a merger with the Virginian Railroad. From 1959 until 2001, the station was leased out and operated as a feed and seed store. The parcel was donated to the Roanoke Chapter of the National Railway Historical Society (NHRS) in June, 2004 by the Norfolk Southern Railway Company. The property is located in the South Jefferson Redevelopment Area (SJRA) redevelopment plan and is intended to be renovated into commercial office space, storage for historical NHRS archives, and a public museum. The Virginian Station is composed of 2 buildings divided by a breezeway and joined by a common roof. The western building was formerly used as the passenger station and the eastern building was formerly used as the baggage room. The current state of the structure is dilapidated due to a fire in 2001 that destroyed portions of the ceiling, roof trusses, and roof.

An Analysis of Brownfield Cleanup Alternatives (ABCA) was completed in November, 2010. The preferred alternative of cleanup included a phased demolition and renovation approach to the confirmed Asbestos Containing Material (ACM) and Lead-Based Paint (LBP) that is present at the Virginian Station. A summary of the ACM and LBP inspections follows:

On May 22, 2008, Baratta & Associates collected 21 samples of suspect ACMs. Eleven samples were determined to have greater than 1% asbestos content. Four of the samples were determined to have trace asbestos minerals and six had no detectable asbestos present. The following building materials confirmed to be ACMs were as follows:

- Wall and ceiling plaster, white
- Thermal System Insulation (TSI) – Pipe run, white
- TSI – Pipe fitting
- Black roof felt

Baratta & Associates deemed all of the wall and ceiling plaster and TSI to be Friable ACMs and the black roof felt to be Category I Non-Friable ACM. The Asbestos Hazard Emergency Response Act (AHERA) physical assessment of the wall and ceiling plaster were categorized as Damaged Friable Surfacing ACM. The physical assessment of the pipe run and fitting TSI was Damaged or Significantly Damaged TSI-ACM.

The following materials *did not* contain asbestos:

- Window glazing and caulk

Baratta & Associates' sub-consultant, HDH Technical, tested from lead in paint and coatings at the site via 147 X-ray fluorescence (XRF) readings throughout the Virginian Station. It was determined that LBP was present within some of the painted surfaces. The United States Department of Housing and Urban Development (HUD) and Virginia define a LBP as paint with lead levels equal to or greater than 1.0 mg/cm^2. The following surfaces contained lead greater than or equal to 1.0 mg/cm^2 :

- Plaster walls and ceilings,
- Interior wood windows components in former baggage room,
- Interior wood trim in the rest rooms and boiler room of the former baggage room,
- Wood ceilings, joists, and columns in the former baggage room,
- Wood stairs and mezzanine components in the former baggage room,
- Exterior wood, metal door, and window components,
- Wood surfaces in the breezeway,
- Lower portions of the exterior downspouts,
- Exterior woodwork, and
- Exterior metal guards.

The following surfaces *did not* contain lead greater than or equal to 1.0 mg/cm^2:

- Ceramic tiles,
- Interior wood trim in the former passenger station,

- Painted brickwork, and

- Painted concrete surfaces.

Although not all surfaces were inspected, the testing was performed on representative locations, which allows for adequate characterization of the entire building. **Figure 1** shows the site with the areas of ACM impact.

1.2 Project Description

The scope of planned remedial actions involves the following:

1. Prepare site for abatement activities, including structural stabilization for a safe work environment.
2. Perform abatement of ACMs.
3. Demolish unsalvageable LBP coated material.
4. Perform abatement of LBP on material to be renovated.
5. Dispose ACMs and LBP material.

The Data Quality Objectives (DQOs) focus primarily on:

1. Verifying the abatement procedures.
2. Confirmation that ACM and LBP have been removed to cleanup levels in accordance with the cleanup levels outlined in **Section 1.4.**
3. Ensure that removed ACM and LBP material are properly disposed.

More specifically, the detailed DQOs for the project based on the Generic City of Roanoke QAPP are summarized in the following table.

SUMMARY OF DATA QUALITY OBJECTIVES

1.	**State the Problem:**	Previous site characterization indicates the presence of ACMs and LBP at the Virginian Station.
2.	**Identify the decision(s):**	• Confirm that all abatement efforts have effectively rendered the structure safe for planned redevelopment. • Confirm that removal of ACMs and LBP have attained the site cleanup goals.
3.	**Identify Inputs in the Decision(s):**	• Redevelopment objectives of planned usage for the Virginian Station. • The delineated areas described in the ABCA to be abated. • Regulations set forth by the Environmental Protection Agency (EPA) for demolition and renovation of ACMs and LBP. • The established cleanup goals for ACMs and LBP in the ABCA.
4.	**Define the Boundaries of**	The study is focused on collection of data to confirm effective remediation and ensure proper disposal.

SUMMARY OF DATA QUALITY OBJECTIVES

	the Study:	
5.	**Develop a Decision Rule**	• If ACM final air clearance testing results exceed standards set forth in Section **1.4**, then emission controls will remain in place until air emission concentrations are safe and acceptable. • If lead dust sample concentrations are above clearance levels specified in the ABCA, abatement area will be cleaned again. • If lead dust sample concentrations are below clearance levels specified in the ABCA, the abatement area will be considered clean. • If Toxicity Characteristics Leaching Procedure (TCLP) values exceed Toxicity Limits in lead abatement debris, then disposal will occur at a RCRA Hazardous waste disposal facility. • If TCLP values are all below Toxicity Limits in lead abatement debris samples, then disposal will occur at a Non-Hazardous waste disposal facility.
6.	**Specify Limits on Decision Errors:**	• Data must be precise and accurate to determine if the air emissions control are effective and inclusive. • Data must be precise and accurate to determine if abatement efforts have successfully removed LBP. • Data must be precise and accurate to determine disposal options for the LBP material.
7.	**Optimize the Design:**	• All sampling will be performed in accordance with the regime outlined in **Section 1.5**. • Strict adherence to sampling procedures and laboratory test methods will result in viable data that meets the DQOs.

The goal of the project is to abate the documented ACMs and LBP at the Virginian Station and collect valid data that can be used for emissions control, appropriate abatement measures, and disposal options for the remediation activities.

The sample collection, analysis reporting and other associated activities will be performed by a consulting firm that is selected by a bidding process. The consultant shall perform the work in accordance with this Sampling and Analysis Plan (SAP) and any approved amendments as well as the Generic Quality Assurance Project Plan for the City's Brownfield program.

1.3 Project Time Line

The duration of the remedial activities is expected to last for approximately 5 weeks from submittal of this SAP for approval (and selection of a consultant to execute the work), through formal reporting of the remedial efforts and associated data.

Specific tasks include the following:

- Submit SAP for EPA review and approval.

- Submit Request for Proposal for abatement activities.
- Select consultant to perform the work.
- Begin structural stabilization.
- Begin ACM remedial activities.
- Collect air samples to confirm ACM abatement.
- Review air sample data to determine if abatement efforts are sufficient.
- Disposal of ACMs.
- Begin demolition of the unsalvageable LBP materials.
- Begin LBP abatement activities on materials to be renovated.
- Collect samples from LBP abatement areas for laboratory analysis.
- Determine if abatement areas are below clearance levels.
- Collect samples from LBP disposal material and submit for laboratory analysis.
- Determine LBP material disposal requirements.
- Prepare written report.

The project timeline will be dependent on the stepwise approach of select abatement of salvageable and unsalvageable materials at the Virginian Station.

1.4 Cleanup Levels

Asbestos

The cleanup level of 0.01 fibers/cm^3 of air proposed for the ACM abatement air emissions are based on 40 CFR §763, Subpart E. The levels are summarized in **Table 2**.

Lead Dust

The cleanup levels proposed for the LBP abatement areas are as follows:

- 250 µg/ft^2 for interior window sills,
- 400 µg/ft^2 for window troughs.
- 400 mg/kg for all bare soil areas around the building

Lead Debris Waste

The regulatory disposal level proposed for disposal as hazardous waste is based on concentrations from the Virginia Hazardous Waste Management Regulations for lead utilizing the TCLP method. The wastes would be considered hazardous with respect to lead if the concentration of lead is 5.0 mg/L or greater. These levels are summarized in **Table 2**.

1.5 Sampling Design

The sample design includes three components of the abatement process to address the DQOs, sampling air emissions from ACM abatement, lead dust sampling within abatement areas, and sampling for LBP waste disposal options. Air sampling will be performed during and after ACM removal. Lead dust swipe sampling will be performed within the LBP abatement areas post-abatement. The removed LBP material from demolition activities will be sampled for disposal determination. Specific sampling regime designs are discussed in the following sections.

Validation of ACM Abatement Efforts

All representative tasks performed within a controlled or regulated work zone should be monitored to establish exposure levels, if any, that exist. This will be done at the initial stages of the project. Supervision will be performed by a competent person who will frequently inspect the site, materials and equipment, and who is qualified to make decisions regarding worker health and safety. A competent person defined by OSHA is as follows:

- An individual who has taken a 40-hour asbestos supervisor training course under the asbestos model curriculum by a certified training provider.

An abatement area shall be visually clean of dust and debris, and airborne fiber concentrations shall be within air sampling requirements of 40 CFR Part 763. Sampling will by performed by collecting air samples in the work area where abatement takes place after a 3rd party Project Monitor has conducted a visual inspection and determined that there is no residual dust or debris associated with the specified ACM. All air samples collected for this purpose will be analyzed by Phased Contrast Microscopy (NIOSH Method 7400) by a certified testing laboratory. The 3rd party Project Monitor is responsible for collecting the final air clearance samples.

Validation of LBP Abatement Efforts

Lead dust wipe samples will be collected in accordance with ASTM E1728-10: *Standard Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques.* The wipe material will be in accordance with ASTM E1792-03: *Standard Specification for Wipe Sampling Materials for Lead in Surface Dust.*

Lead dust wipe samples will be analyzed by EPA Method SW 846 6010 and EPA Method SW 846 7420.

Qualification of LBP Disposal Options

TCLP sampling of the removed LBP materials will determine if the waste meets the definition of EPA Toxicity and the applicable RCRA Hazardous waste disposal regulations that would apply.

1.6 Sampling Methods Requirements

1.6.1 Asbestos

Air sampling that meets the requirements of 29 CFR 1926.1101 will by performed by collecting air samples in the breathing zone of selected individuals and by collecting perimeter samples around the work zone. The competent person and/or third party Project Monitor are responsible for collecting exposure assessment air samples. Sampling procedures and analytical methods that will be used for the ACM abatement emission samples can be seen in **Table 3**.

1.6.2 Lead

Lead Dust

The following post-abatement clearance procedures shall be performed only by a certified inspector or risk assessor. Following abatement, a visual inspection shall be performed to determine if deteriorated painted surfaces and/or visible amounts of dust, debris or residue are still present. If deteriorated painted surfaces or visible amounts of dust, debris or residue are present, these conditions must be eliminated prior to the continuation of the clearance procedures.

Lead dust samples shall be collected by swiping preferably hard, smooth surfaces utilizing a moist wipe material that is durable and not torn easily. The following abatement areas shall be sampled:

- One dust sample shall be collected from each windowsill and window trough,. No more than 4 rooms need to be sampled.

Sampling procedure for window sills, and troughs:

- Window sills and troughs - the sampling area shall be approximately 1.0 ft^2.

Sampling procedure for bare soil areas includes collecting one aliquot of soil per side of the building. The soil is collected using a stainless steel sampling device of surface soils down to a depth of ½ inch. The soil is placed into a centrifuge tube for transport to the analytical laboratory.

Table 3 provides information about the sampling procedures and analytical methods that will be used for the lead dust and soil samples and the recovered LBP coated material.

Lead-Based Paint Material Disposal

Disposal options of the removed LBP material will be determined as hazardous or non-hazardous waste from samples collected from the LBP material. Representative portions of each

component (plaster, soffit, window trim, etc.) of the waste pile shall be collected and composited for analysis. The component samples shall be collected utilizing a power drill or removing portions of the components. All sampling activities will be in accordance with ASTM E 1908-10: *Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure Testing for Leachable Lead.*

Table 2 provides information about the sampling techniques that will be used for the lead dust samples and the recovered LBP coated material.

1.7 Analytical Methods Requirements

1.7.1 Asbestos

All air samples collected for this purpose will be analyzed by Phased Contrast Microscopy (NIOSH Method 7400) by a certified EPA approved testing laboratory. The competent person is responsible for collecting exposure assessment air samples and the Project Monitor is responsible for collecting final air clearance samples.

Table 3 provides information about the analytical methods being used for this project.

1.7.2 Lead

Lead Dust

Lead dust and soil samples will be analyzed by EPA Method SW 846 6010 and EPA Method SW 846 7420.

Lead-Based Paint Material Disposal

Samples collected for verification of the LBP material disposal avenues will be analyzed for lead utilizing TCLP method as presented in **Table 3**.

Additional analyses and/or samples may be collected if required by disposal facilities. Any such samples would be collected and analyzed in accordance with the Generic QAPP for the City of Roanoke's Brownfield Redevelopment Program.

The City's selected consultant will have discretion to use an analytical laboratory of its choice to perform the work. A copy of that laboratory's Qualifications Package will be reviewed by the City and forwarded to EPA under separate cover.

Table 3 provides information about the analytical methods being used for this project.

2.0 DATA VALIDATION AND USABILITY

2.1 Reconciliation with User Requirements

All data shall be validated following the procedures outlined in the Generic QAPP.

The DQOs for this project, as identified in Section 1.2, are to:

1. Verifying the abatement procedures.
2. Confirmation that ACM and LBP have been removed to cleanup levels as specified in the **Section 1.4**.
3. Ensure that removed ACM and LBP material are properly disposed.

Reconciliation of these goals will be based largely on the precision and accuracy of the data along with completeness of the data set.

First, accuracy will be assessed to confirm that the laboratory analysis would detect the target analytes if present at concentrations above the action limits. Accuracy for each sampling event is described below:

- For an asbestos air sample, analysis by Transmission Electron Microscopy (TEM) using NIOSH Method 7402.
- For lead dust sampling, accuracy will depend on correctly choosing and measuring a sampling area that is best representative of the abatement work area.
- For TCLP sampling, accuracy will depend on collecting samples that are best representative of the material to be disposed.

Secondly, precision is important from a magnitude stand point so that the quantification of the detected target analyses can be viewed with confidence. Precision will be determined through the use of field duplicates and duplicate quality control samples for the asbestos, lead dust and soil, and LBP material samples. Precision is also as follows:

- Concerning the asbestos samples, precision is also dependent upon the total number of fibers counted and the uniformity of the fiber distribution on the filter. A general rule is to count at least 20 and not more than 100 fields. The count is discontinued when 100 fibers are counted, provided that 20 fields have already been counted. Counting more than 100 fibers results in only a small gain in precision. As the total count drops below 10 fibers, an accelerated loss of precision is noted.
- Lead Dust and Soil precision will be related to sample homogeneity.
- TCLP sampling precision will be related to sample homogeneity.
- Field duplicates of all sampling parameters will be collected at a rate of 1 per 10 samples (10%), with a minimum of one field duplicate per sample parameter in the event less than 10 samples are collected.

Finally, completeness will be evaluated to measure the actual amount of valid data compared to

the amount that was expected to be obtained under normal conditions. Data completeness will be expressed as the percentage of valid data obtained from the sampling activities. Data must meet all the acceptable criteria including accuracy and precision, as well as any other criteria required by the prescribed analytical method to be considered valid.

3.0 REFERENCES

ASTM Standard E1728-10: *Standard Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques.* ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/E1728-10.

ASTM Standard E1792-03: *Standard Specification for Wipe Sampling Materials for Lead in Surface Dust.* ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/E1792-03.

ASTM Standard E1908-10: *Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure Testing for Leachable Lead.* ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/E1908-10.

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TABLE I
PROJECT TIME LINE

Activities ***(Includes Products and/or Services)***	**Dates** ***(MM/DD/YY)***	
	Activity Start Date	**Activity End Date**
Approval of SAP (concurrent selection of consultant)	1/17/2011	2/17/2011
Begin site remediation activities	2/17/2011	4/1/2011
Laboratory analysis/receive analytical results	4/1/2010	4/15/2011
Prepare written report	4/15/2011	5/1/2011

TABLE 2
MEASUREMENT QUALITY INDICATORS

Compound	Matrix	Cleanup Levels	Precision[1]	Accuracy[1]	Completeness
Asbestos – Total (air emissions)					
Asbestos	Air	0.01 fiber/ cm^3	±20%	±20%	100%
Total Lead (lead dust)					
Lead	Dust – Window Sills	250 µg/m3	±20%	±20%	100%
	Dust – Window Troughs	400 µg/m3	±20%	±20%	100%
	Soil	400 mg/kg	20%	20%	100%
Target Analyte List Metal – TCLP (LBP material)					
Lead	LBP Material	5 mg/l	±20%	±20%	100%

[1] The listed indicators will be considered along with method specific quality control limits during data review

TABLE 3
SAMPLING AND ANALYTICAL METHODS REQUIREMENTS

Matrix	Parameter[1]	Number of Samples	Sampling Material	Sample Preparation/Extraction Method Number	Analytical Method Number
Air	Asbestos	5	• Air emissions from abatement area	Phased Contrast Microscopy	NIOSH Method 7400
Dust	Lead	35	• Dust from abatement area		EPA Method SW 846 6010 and EPA Method SW 846 7420
Soil	Lead	4	• Soil from Dripline of Building		
LBP Material	Lead	2	• Removed LBP material	TCLP	EPA Method 1311/EPA Method 7420

[1] May include other categories of analyses or individual analyses