MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Site Reassessment

Phase I

Sampling and Analysis Plan

Shapiro Brothers Salvage Site

Festus, MO

Jefferson County

Prepared By:

Missouri Department of Natural Resources
Division of Environmental Quality
Hazardous Waste and Environmental Services Programs

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1.0 Introduction

As authorized under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986, the Missouri Department of Natural Resources (Department), Hazardous Waste Program (HWP), Site Assessment Unit (SAU) is conducting a Site Reassessment (SR) at the Shapiro Brothers Salvage Site in Festus, MO (EPA ID MON000706345).

The objective of this investigation is to supplement data collected during the Site Inspection/Removal Site Evaluation (SI/RSE) completed September 25, 2012 and determine whether the site warrants additional removal action. The investigation will proceed in two phases. The first phase will include soil sampling at commercial properties located adjacent to or near the Shapiro facility. The second phase will include sampling for the air exposure pathway, which will include collection of indoor dust samples at residential properties where yard soil cleanups are planned based on the PA/SI findings, and potentially additional air pathway sampling.

2.0 Site Information

2.1 Location

The Shapiro Scrap yard facility is located at the intersection of 12th Street and Vine in east-central Festus, MO. It is a rectangular 7-acre area, oriented primarily north-south, along the boundary that separates Festus and Crystal City, MO (red boundary in Figure 1). The site addressed by this CERCLA investigation includes residential and commercial properties adjacent to and near the facility and along truck haul routes into and out of the facility where contaminants attributable to the facility have come to be located.

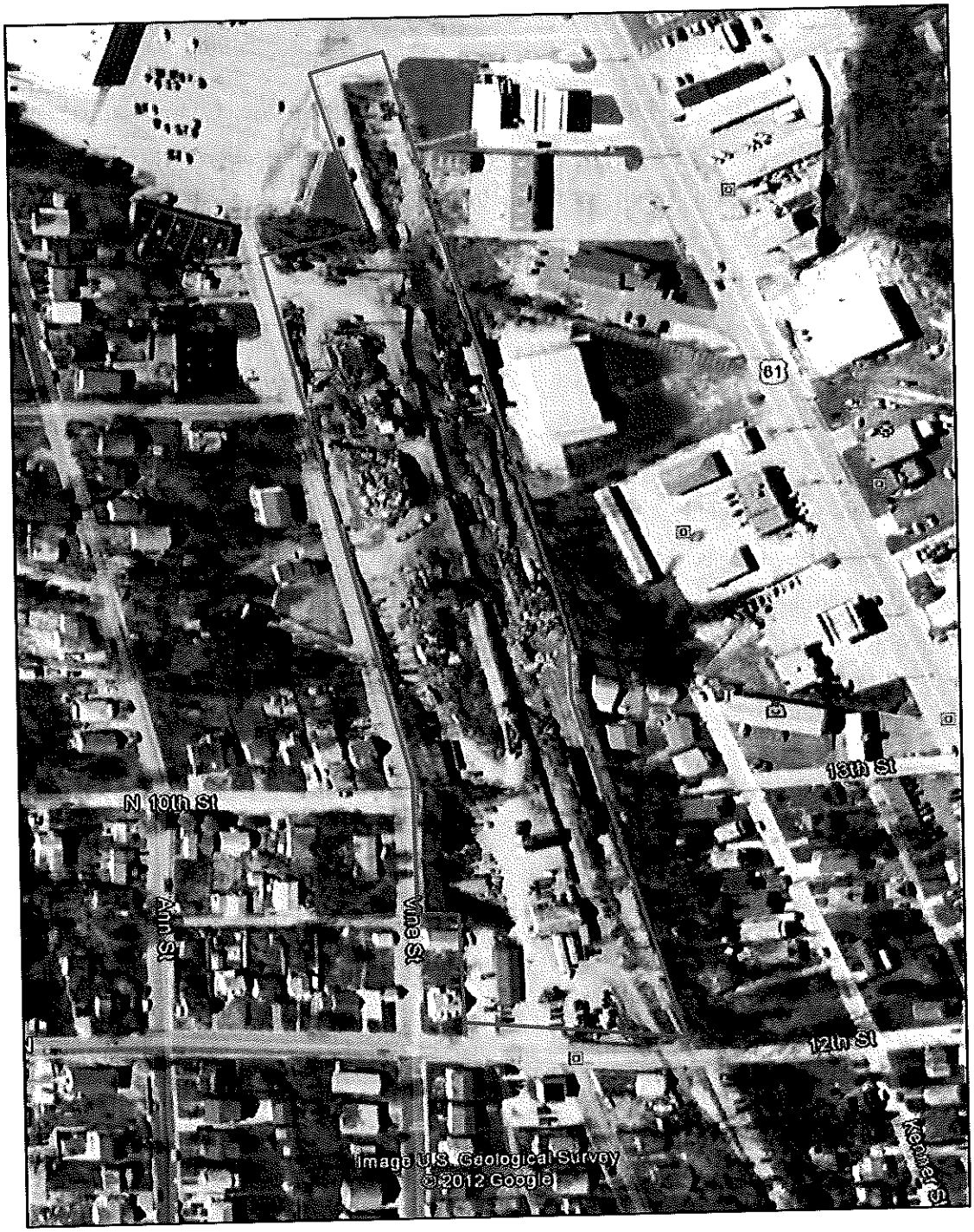


Figure 1. Shapiro Brothers Facility, Festus, MO.

2.2 Description

Shapiro Brothers, Inc. has been used as metal scrap processing and recycling facility since the 1940s. They also offer demolition services, dismantle out of service rail cars, and offer transportation services to their clients for scrap metal materials. Materials brought to the facility are processed by cutting with a torch, or with a 450 horsepower shear or 3500 horsepower shredder. The metal is processed and compressed into sizes that are accepted by a steel mill for recycling. All non-metal items are separated out - this is called auto fluff- and taken to a sanitary landfill.

Most of the facility operations are conducted in unpaved gravel-covered areas, areas with exposed bare soil or soil mixed with gravel. During periods of wet soil conditions, trucks leaving the facility would likely have historically tracked mud through the streets on their way out of the facility. There are two gates into the facility; a north gate and a south gate. Most of the traffic into and out of the facility occurs through the south gate, although fluff pile material is loaded onto trucks near the northern end of the facility which may also exit through the northern gate. A truck wash system was installed in the fall of 2011 to clean the undercarriage and wheels of trucks leaving the southern gate. The facility recently started operating a street sweeper in the roads around the facility to remove residual material tracked into the streets by trucks.

Prior to the spring of 2011, trucks primarily approached the facility by traveling along 12th Street to and from Truman Blvd. (U.S. Highway 61). A heavy spring flood event in 2011 washed out the culvert beneath 12th Street near the facility making the road impassable. Since then, trucks have traveled south from the facility on the residential street Delmar Ave. before connecting with Truman Blvd. via 6th Street.

2.3 History/Contaminants of Concern

The site came to the departments' attention following complaints made to the City of Festus by nearby residents regarding the dust created at the facility and by trucks hauling material in and out of the facility. The department conducted a facility inspection in September 2011 and identified violations of hazardous waste management and water pollution. The facility is working with the department to address violations noted during the facility inspection under an Abatement Order on Consent (AOC) (in draft at time of this SAP).

The results of the facility inspections together with public complaints about track-out of soil from the facility prompted a PA/SI investigation which was completed in September 2012 (MDNR, 2012). That investigation identified lead contamination in the yard soils of residences located adjacent to the facility or along major haul routes. The facility is working with the department to address this contamination under a second AOC (also in draft at time of this SAP).

On December 14, 2012, Jefferson County Health Department staff conducted dust wipe sampling on floor and window well surfaces at the daycare facility located 200 feet east of the Shapiro facility at 1302 Kenner Street. Four of the 5 wipe samples were non-detect for lead, and one floor sample contained 75 ug/ft^2. A sample was also collected of the gravel/soil in the outside play area and found to contain 270 mg/kg lead. The daycare ceased operation shortly after the sampling, but has reopened recently under new ownership. The outdoor play area has been moved to an area just west of the building.

The soil sampling conducted during the PA/SI investigation was limited to residential properties. There are a number of commercially owned properties located adjacent to or near the facility which were not sampled.

3.0 Data Quality Objectives

To help ensure precise, accurate, representative, complete, and comparable data, all field work and analyses will be conducted in accordance with the Quality Assurance Project Plan (QAPP) for Pre-Remedial/Pre-Removal and Targeted Brownfields Site Assessments Revision 6, December 7, 2007, and ongoing (MDNR, 2007). The QAPP describes the general data quality objectives (DQO) for site assessment investigations conducted by the HWP and the Environmental Services Program (ESP). Those DQOs specific to this project are described below.

3.1 Problem Statement

Decades of metal shredding, cutting, processing, and hauling have resulted in releases of various heavy metals and other contaminants to surface soil at the facility. Lead has been documented to have been released from the facility to yard soils at nearby residences. Nearby commercial properties, including a recently re-located daycare play area may have been impacted by lead releases from the facility. Sampling is necessary to assess these nearby properties.

3.2 Planning Team

The planning team includes staff from the HWP Superfund Section, Air Pollution Control Program, EPA Region 7, ESP Field Services and Chemical Analysis Sections, Missouri Department of Health and Senior Services (DHSS) and Jefferson County Health Department risk assessors.

3.3 Conceptual Site Model

Elevated levels of arsenic, cadmium, chromium, copper, lead, nickel, and zinc have been measured in surface and shallow subsurface soil at the facility. Those same metals have also been measured in solids collected from the truck washing station near the facility entrance and in street sweepings samples collected from residential roads adjacent to the facility. Based on a

comparison of the concentrations measured relative to common health-based screening benchmarks, it is clear that the primary contaminant of concern for off-site soils is lead. Levels of lead exceeding 37,000 mg/kg have been measured in surface soil at the facility, and concentrations up to 4,800 mg/kg have been measured in street sweepings collected from residential streets nearby. Levels of lead in residential yard soils near the facility have been measured at levels exceeding 2,000 mg/kg. Dust wipe samples collected from the exterior surfaces at residences near the facility have contained lead levels up to 4,900 ug/ft^2.

Site-related contaminants can be released in a number of ways. Fine particulates from contaminated soils disturbed at the facility, from the material processing activities, or from fires reported to occur periodically at the facility could be transported off the facility via wind. Contaminated soils clinging to trucks leaving the facility could be released to roadways in residential areas where it could be transported as dust, or with runoff following rain events. Fine particulates released from the facility in these ways could be deposited onto residential yards, exterior surfaces, or could be drawn into homes through open windows or HVAC systems. Contaminated yard soil could be tracked into homes on shoes or by other means. Residents or patrons/employees of commercial properties could be exposed to contaminated particulates through direct contact with soil, dust on surfaces, or inhalation of particulates in ambient air.

The residential soil exposure was addressed as part of the PA/SI investigation. The primary pathways of concern for this investigation are air exposure and commercial property soil exposure pathways.

Decision Units

Each commercial property is a separate exposure unit (EU) and will be sampled as individual decision units (DUs). The outdoor play area at the day care facility on Kenner Street will be sampled as a DU. The sampling design is further discussed in Section 3.9.

3.4 Study Question

The primary study question for this Phase I of investigation:

- Do mean concentrations of lead in the fine fraction of surface soil (0"-2") in commercial property DUs significantly exceed background levels and/or health-based screening levels?

3.5 Inputs to Study Question

The following lists the primary inputs required to address the principal study question.

- Screening Levels
  Generally EPA removal decisions for lead contamination at residential properties and commercial/industrial properties are based on a Regional Screening Level (RSL) of 400 mg/kg and 800 mg/kg respectively.

- Estimates of mean lead concentrations
  - In the fine fraction (<0.25 mm) of soil from the top two inches DUs established at commercial properties

- Estimates of variability in lead concentrations in each DU sampled

3.6 Study Boundary

The site consists of the facility itself plus areas where contaminants from the site have come to be located. Access was requested from approximately eight commercial property owners who own property adjacent to or near the facility or the main haul roads. Six property owners granted access for sampling. Access was also requested and granted at the daycare located at 1302

Kenner Street in Crystal City. These properties are shown in Figure 2 and listed in the following table.

Commercial Properties Included in the Site Reassessment/Phase I Sampling	
Address	**Access Granted**
1101 Vine Street, Festus, MO 63028	Yes
1302 Kenner St., Crystal City, MO 63019 (daycare)	Yes
1201 &1203 N. Truman Blvd., Crystal City, MO 63019 (combined properties; one owner)	Yes
1223 N. Truman Blvd., Crystal City, MO 63019	Yes
1225-1231 N. Truman Blvd., Crystal City, MO 63019 (combined properties; one owner)	Yes
1235 N. Truman Blvd., Crystal City, MO 63019	Yes
1237 N. Truman Blvd., Crystal City, MO 63019	Yes
1313 N. Truman Blvd., Crystal City, MO 63019	No
1241 N. Truman Blvd., Crystal City, MO 63019	No
1245 N. Truman Blvd., Crystal City, MO 63019	No

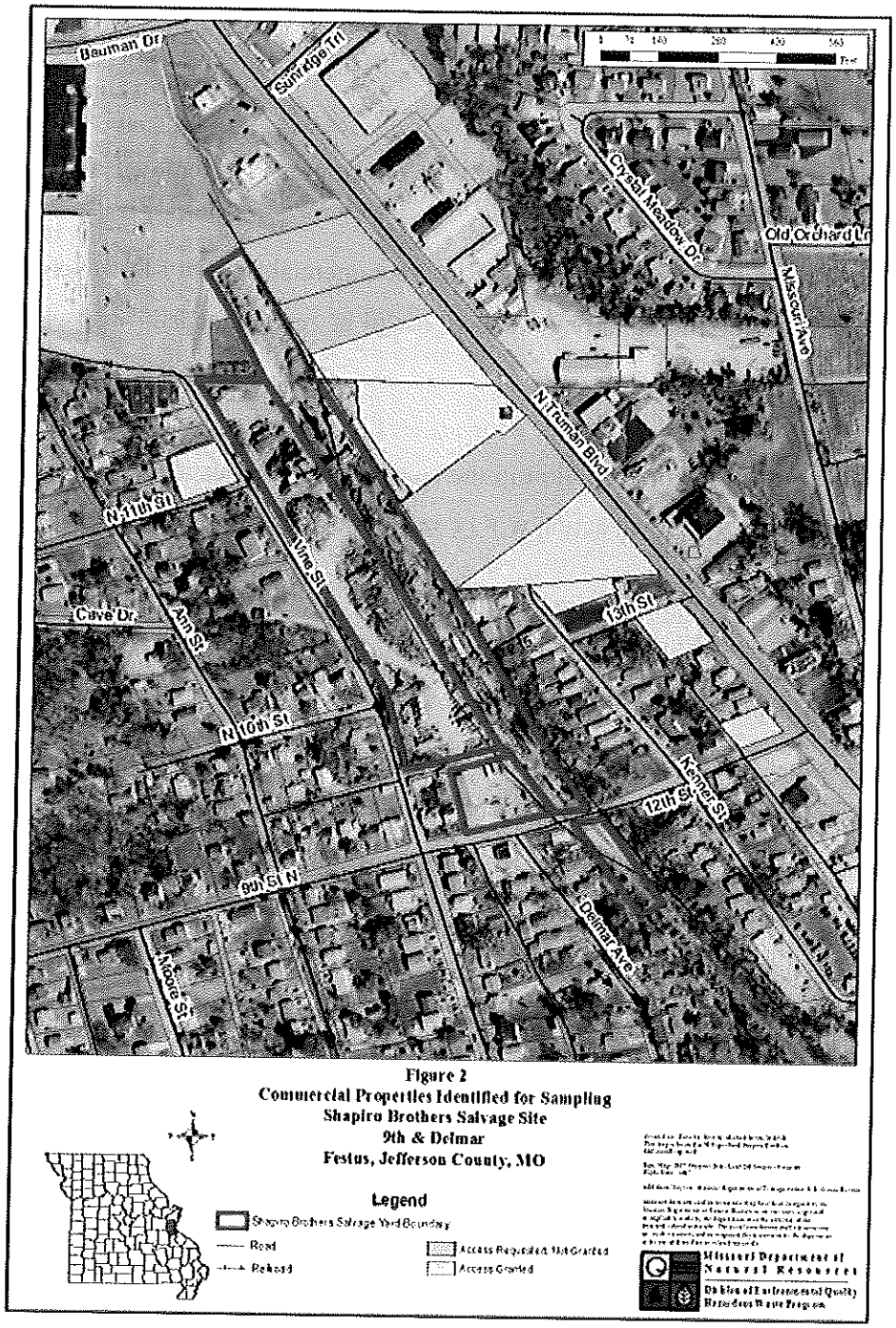


Figure 2
Commercial Properties Identified for Sampling
Shapiro Brothers Salvage Site
9th & Delmar
Festus, Jefferson County, MO

3.7 Decision Rules

Investigation data will be used to determine whether to recommend a Removal Action.

If the estimate of the mean lead concentration in a commercial property DU exceeds the EPA Industrial Soil RSL of 800 mg/kg, a removal action will be recommended; otherwise no further action will be taken for that property.

If the estimate of mean lead concentration in the daycare play area exceeds the Residential Soil EPA RSL or 400 mg/kg, a removal action will be recommended; otherwise no further action will be taken.

3.8 Tolerable Limits on Decision Error

Our hypothesis is that commercial property soils near the facility and along haul routes have site-related contamination at concentrations above health-based screening levels. Falsely rejecting that hypothesis, considered a Type I decision error, would mean mistakenly concluding that yards are clean. Falsely accepting this hypothesis, considered the Type II decision error, would mean concluding that the yards are contaminated when in fact they are not. The Type I error would result in the taking no action at yards actually contaminated at levels that could pose a health threat to residents. A Type II error would result in the unnecessary use of resources to conduct removal and/or removal action at yards that do not warrant it. The Type I error is considered more severe since it results in potential threats to human health.

A sampling design has been chosen to control error and minimize the likelihood of making a Type I decision error. An incremental composite sampling (ICS) approach will be used to

collect soil samples in each DU. ICS is designed to obtain single soil sample that contain contaminants in the same proportion in the sample as they are present in the DU (e.g. are representative samples). This is achieved through inclusion of many increments of adequate-mass soil across each DU. Representative sampling will decrease the likelihood of committing either type of error.

The ICS sampling procedure will be replicated and results of the replicates will be used to provide a conservative estimate (95% UCL) of the true mean lead concentration. By using a conservative estimate of mean concentration, we will protect against underestimating the true mean, and therefore potentially walking away from a property that is actually contaminated.

3.9 Sampling Design

Most of the commercial properties to be assessed are primarily paved with smaller discontinuous areas of soil. At each property, the unpaved areas combined together will be considered as the DU. At the daycare, only the children's play area is unpaved, and this area will be considered as the DU. In each DU a 30-increment ICS will be collected from the 0-2 inch surface soil. The ICS will be air dried, disaggregated, sieved, and analyzed by XRF.

Replicate ICS will be collected from the daycare play area and from one other commercial property DU. Variability calculated from the replicate ICS will then be used to calculate upper confidence limits on the mean lead concentration for each DU. Decisions will be based on the 95% UCL on the mean lead concentration calculated for each DU.

4.0 Field Activities

The Phase I SR investigation sampling event will include collection of surface soil samples at 7 commercial properties for which the department has gained access. No background soil sampling is planned. Background data for lead in soil was collected as part of the PA/SI investigation in 2011, and that data will be used as part of this study.

4.1 Sample Collection

Except as otherwise noted, all aspects of sampling shall be performed using standard operating procedures (SOPs) established within the ESP, Environmental Emergency Response/Field Services Section (EER/FSS) for the collection, preservation, and transport of various media sampled. Modifications to the following sampling methods are described below and others may be made in the field based upon conditions encountered. Any modifications to the methods will be noted on the field sheets and in the SI/RSE Report prepared by SAU.

A field sketch of each property will be created on field sheets prior to sample collection. The sketch will include structures, paved and unpaved portions of the site and any other significant features. Surface soil ICS samples will be collected as follows. An EVS™ or EnviroStat™ stainless steel incremental sampling tool will be used to collect equal-mass increments of soil at equal spacing across each DU. A 2-cm diameter, 6-cm long stainless steel sampling core will be used. The sampling core will be advanced into the soil and ejected into a 2-gallon size heavy duty sealable plastic bag. This process will be repeated at each increment collection location, and all increments will be combined together into one bag. Bags will be labeled with the Location ID, date, time, & sampler's initials. At properties where there are discontinuous unpaved areas combined into a single DU, the number of increments collected from each

unpaved area will be based on each area's relative contribution to the overall size of the DU as estimated visually in the field.

ICS samples will be conditioned as described in Section 4.3 and analyzed for lead by XRF. A portion of the samples will also be submitted for laboratory confirmation analysis.

4.2 Sampling Order

Though not always practical, attempts will be made to collect all samples in the order from least-to-most contaminated.

4.3 Sample Conditioning and Analysis

Soil samples will be returned to the laboratory and air dried in aluminum pans lined with wax paper. The air dried samples will be returned to their original bags, placed inside an additional bag, and then disaggregated by striking the sample 30 times with a mallet to disaggregate clumps of soil if necessary. The soil sample will then be passed through a 0.25mm sieve to obtain the target particle size. The soil passing through the sieve will be placed inside a thin-walled resealable plastic baggie. XRF analysis will be conducted on the dried/sieved soil samples following the SOP in Appendix C.

Should the investigation indicate that a removal action is warranted, it may be of interest to know whether yard soil would need to be handled as hazardous waste should it be excavated. Instructions will be relayed to analytical personnel on selected DU ICS samples that toxicity characteristic leaching procedure (TCLP) analysis will be performed.

4.4 Number of Samples, and Container and Preservation

The estimated number of samples for laboratory analysis is provided in the following table. Note that samples receiving XRF analysis only are not included. The actual number of samples submitted will depend on lead concentrations observed during XRF analysis and visual observations made during collection of the samples.

Matrix	Analytes	Number of Samples
Soil	Lead, Cadmium, Arsenic	5

Refer to the following tables for container and preservation requirements on all samples. Note that soil samples will initially be collected in large resealable plastic bags for transport to ESP. Once samples have been air dried, disaggregated, sieved, and analyzed by XRF, they will be submitted for laboratory analysis. All samples will be collected in certified-clean containers and preserved in the field as appropriate.

Soil Samples			
Parameters	**Container(s)/Volume**	**Preservative(s)**	**Holding Time**
Total Metals (As,Cd,Cu,Pb,Zn)	One or more 8-oz glass jars or a 1-gallon resealable baggie	Cool, 2^0C	6 months

4.5 Chain-of-Custody

The ICS soil samples will be stored in the plastic bags in which they were collected. Each bag will be labeled with a unique DU identifier, date, collector initials using permanent marker. The samples will be recorded on a separate COC form (Appendix B). The samples will remain in the

custody of ESP field personnel during sample processing and XRF analysis. Those samples identified for laboratory analysis will be placed into appropriate sample containers and entered onto an ESP COC form to be relinquished to a sample custodian at the state's environmental laboratory for analysis.

5.0 Quality Control

5.1 Field Decontamination

Clean disposable latex gloves will be worn by sampling personnel and clean or field decontaminated equipment will be utilized for each separate DU to minimize the possibility of cross-contamination. Reusable soil sampling equipment will be cleaned between DUs as follows:

- Scraping with putty knife or similar tool to remove soil clumps;
- Brushing with stiff-bristle nylon brush to remove visible soil debris;
- Immersion in a 5-gallon bucket of soapy water and further brushing;
- Rinsing tool with DI water;
- Wiping dry with clean paper towels

5.2 Quality Assurance/Quality Control (QA/QC) Samples

The following samples will be collected as part of the quality control/quality assurance procedures for the investigation.

5.2.1 Equipment Rinsate Blank

An equipment rinsate blank will be collected after decontaminating the soil coring tool between DUs once per day of sampling. Following decontamination of the tool, DI water will be rinsed

over the core cylinder and into a sample container which will travel with the other samples back to the laboratory for analysis.

5.2.2 Replicate Field ICS

Replicate ICS will be collected to measure precision of the overall soil sampling and analysis process, and to provide data for calculating a conservative estimate of the mean concentration. Within selected DUs, after the initial ICS is collected, a two additional ICS will be collected in an identical manner, except the increment locations will be off-set as much as possible from each within the DU. The replicate samples will be labeled with the DU name and "replicate 1", "replicate 2", and "replicate 3". DUs will be chosen for replicate sampling based on the proximity of the yard to the facility and other field observations.

A relative standard deviation among the lead results in replicate samples of less than 30% will generally indicate acceptable precision; however the degree of precision required depends on how close the estimated mean concentration is to the removal action limit. Thus, more data variability may be tolerable if the concentrations measured are either well above or well below the action limis.

5.2.3 XRF Precision Samples

The precision of bagged sample XRF analyses will be evaluated by conducting multiple analyses of selected samples at a frequency of once per day per analyzer. For bagged samples, the precision sample will be selected based on lead concentrations. Samples will be chosen to reflect the full range of concentrations observed, however, special emphasis will be placed on selecting samples near the action limits if possible. The selected sample will be analyzed seven separate times without moving the bagged sample (without moving the analyzer for in-situ analysis)

between each analysis. The relative standard deviation among the multiple analyses will be assessed as an indication of instrument precision.

5.2.4 Laboratory Subsampling Replicates

Laboratory subsample replicates will be requested on selected ICS samples submitted to the laboratory. The laboratory will subsample the container two times and conduct two separate analyses. This procedure measures the within-sample container matrix heterogeneity and the error associated with subsampling the container. Samples will be identified for replicate subsampling by indicating in the "comments" field of the ESP COC form.

5.2.5 Laboratory QC

Laboratory precision and accuracy will be assessed as described in the QAPP for Pre-Remedial/Pre-Removal and Targeted Brownfields Site Assessments Revision 6, December 7, 2012, and ongoing.

6.0 Investigation Derived Wastes (IDW) Plan

Efforts will be made to minimize IDW generation. IDW may include soil, sediment, decontamination fluids, disposable sampling equipment, and disposable personal protective equipment (PPE).

Field personnel will attempt to return unused soils to their source immediately after generation or, if warranted, containerize and return to the ESP laboratory for proper disposal. Disposable PPE and disposable sampling equipment will generally be handled as solid waste, containerized, and properly disposed. Wash and rinse waters generated during equipment decontamination will

generally be discharged to the ground on-site or, if warranted, containerized and returned to the ESP laboratory for proper disposal.

7.0 Site Safety

A safety briefing will be held on-site prior to initiating field activities and field personnel will be required to read and sign the site-specific health and safety plan. The site safety plan is attached as Appendix A.

8.0 Reporting

ESP will provide a copy of the chain of custodies and laboratory result sheets. SAU will prepare an Investigation Report.

References

MDNR, 2007 Missouri Department of Natural Resources, QAPP for Pre-Remedial, Pre-Removal and Targeted Brownfields Assessments, December 7, 2007.

MDNR, 2012 Missouri Department of Natural Resources, Preliminary Assessment/Site Inspection Report, September 25, 2012.

USEPA, 1990 U.S. Environmental Protection Agency Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51583, December 14, 1990, http://www.thefederalregister.com/d.p/2007-05-25-E7-10055.

USEPA, 1992 U.S. EPA, Hazard Ranking System Guidance Manual, EPA/540/R-92/026, November, 1992. http://www.epa.gov/superfund/sites/npl/hrsres/index.htm

SIGNATURES

Prepared by:

Michael Stroh
Environmental Specialist
Site Assessment Unit
Hazardous Waste Program

Sean Counihan
Environmental Specialist
Field Services Unit
Environmental Services Program

Approved by:

Valerie Wilder
Unit Chief
Site Assessment Unit
Hazardous Waste Program

Date: 6/12/13

APPENDIX A

Health & Safety Plan

(From the 2012 PA/SI Investigation)

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES PROGRAM

SITE HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

This plan has been prepared for implementation by DNR employees, using operating procedures for which they are specifically trained. Any use of the plan by other agencies, organizations, or private individuals is at their own risk.

2.0 KEY PERSONNEL

MDNR OSC: Sean Counihan SAFETY OFFICER: Sean Counihan

OTHER MDNR PERSONNEL/TITLE:

Enivirnmental Specialists Ken Hannon, Michael Stroh, Valerie Wilder, Shelly, Jackson, Paul Embree, Joe Twellman, Darren Bernat,

3.0 SITE INFORMATION

Site name Shapiro Brothers Scrap Yard County/City: Jefferson County/ Festus

Sampling date: 04/09/2012 Site Description: The site is located at 9th Street and Delmar Street. It is a scrap metal processing plant. They buy and sell scrap, dismantle railroad cars, and are a demolitions contractor. After complaints about dust and dirt covering houses and vehicles, the city collected a composite soil sample from the vicinity of the business at 9th St., Delmar Street, and Vine Street. The results of that sample indicated high levels of lead. Samples from a MDNR RCRA investigation in September of 2011 confirmed the presence of lead in hazardous amounts, whereas samples collected and analyzed by the PRP did not. This additional sampling will help evaluate the site for further action.

3.1 Overall Incident Risk/Hazard Analysis

Chemical:	____Serious	____Moderate	X___Low	____Unknown
Physical:	____Serious	____Moderate	X___Low	____Unknown

3.2 Contaminant(s) of Concern: Contents are unknown

3.2.1 Physical State: _____Liquid X_____Solid _____Sludge _____Gas/Vapor

Chemical Characteristics: (check all that apply)

_____a. carcinogen	_____b. biological	_____c. corrosive	_____d. combustible
_____e. explosive	_____f. flammable	_____g. volatile	X_____h. poison
_____i. radioactive	_____j. reactive	_____k. other: Unknown Chemicals_____	

3.2.2 Physical Hazards: (check all that apply)

a. _____overhead	_____b. below grade	_____c. confined space	X____d. noise
e.X____splash	_____f. fire/burn	X_____g. puncture	_____h. heat stress
i. X____cut	X_____j. slip/trip/fall	_____k. cold stress	_____l. electrical
m. _____mechanical/heavy equipment		_____n. other:_____	

The need for confined space entry by ESP personnel shall be evaluated on a site-by-site basis. A confined space entry permit must be signed by the appropriate Unit or Section Chief prior to ESP employees entering a confined space (29 CFR 1910.146). Confined space entry shall be screened in at least Level B prior to downgrade. **Adequate resources must be available and specific planning and tasks determined before confined space entry is initiated.**

3.3 Task-Specific Risk Analysis (attach additional sheets as necessary)

Task Description	Chemical Hazards	Physical Hazards	Level of Protection
Sample collection	h	e d g i j	Level D
	a b c d e f g h i j k	a b c d e f g h i j k l m n	
	a b c d e f g h i j k	a b c d e f g h i j k l m n	
	a b c d e f g h i j k	a b c d e f g h i j k l m n	

4.0 MEDICAL SURVEILLANCE AND PERSONNEL TRAINING REQUIREMENTS

All ESP field personnel participate in a medical monitoring program and are trained at least to the level of "Hazardous Substance Emergency Response-Technician" as required and specified in the department's written health and safety program located in Section 2 of the MDNR-Hazardous Substances Emergency Response Plan (HSERP). The written policy satisfies requirements set out in 29 CFR 1910.120. MDNR ESP's respiratory protection program meets the requirements of 29 CFR 1910.134.

ESP personnel will ascertain as much information as possible regarding health and safety issues associated with the

site prior to initial entry. Information shall include chemical and physical hazards as listed above, types and amounts of materials involved, and citizens/areas threatened by the incident.

5.0 PERSONAL PROTECTIVE EQUIPMENT

ESP shall utilize the Protection Level categories defined in 29 CFR 1910.120, Appendix B, and known as Levels A, B, C, and D. Refer to Section 2 of the MDNR-HSERP for definitions of Protection Levels. ESP personnel shall inspect APRs and SCBAs at least monthly and maintain a record of such to ensure equipment is functional.

Levels of protection shall be reassessed and upgraded as conditions change and information is updated to comply with worker safety while performing site activities.

Action Levels for evacuation of work zone pending reassessment of conditions:

X	Level D:O_2 < 19.5% or > 25%; explosive atmosphere > 10% LEL; organic vapors > background levels; othe
X	Level C:O_2 < 19.5% or > 25%; explosive atmosphere > 20% LEL; organic vapors (in breathing zone) > 5 m.
X	Level B:O_2 Explosive atmosphere > 20% LEL; unknown organic vapors (in breathing zone) > 500 m.u.; oth
X	Level A: ESP personnel shall evaluate the need for entry on a site-specific basis and may utilize its emergency response contractor for Level A situations which may arise.

6.0 FREQUENCY AND TYPE OF AIR MONITORING/SAMPLING

Instrument	Contaminant of Concern	Sample Location (Area/Source)	Frequency	Odor Threshold/ Description

7.0 SITE CONTROL MEASURES

7.1 The "Buddy-System": ESP personnel performing any work activities within the exclusion zone shall employ the "buddy-system" at all times, as required and defined in Section 2 of the MDNR-HSERP. The "buddy-system" may not be required while an ESP staff member is observing or providing oversight of cleanup activities performed by a contractor or responsible party.

7.2 Safe work Practices: Refer to Section 2 of the MDNR-HSERP for written safety practices to be followed at all times by ESP personnel while on-site at an incident.

7.3 Site Communications: The use of two-way radios or establishment of hand signals for communications shall be determined prior to entering the work zone and followed by ESP personnel.

7.4 Radiation Safety: Due to the possibility of an unknown radiation hazard being present on a site, ESP personnel shall be required to wear radiation indicator badges (TLD badges) while on-site.

7.5 Work Zones: ESP personnel shall ensure work zones are established and be aware of their locations.

8.0 DECONTAMINATION PROCEDURE/SOLUTIONS:

Personnel: Gloves and clothing will be placed in a garbage bag and returned to Jefferson City for proper disposal.

Equipment: Returned to Jefferson City for proper decontamination.

Instruments: Returned to Jefferson City for proper decontamination or disposed of back in Jefferson City.

Decontamination fluids/materials may be to be containerized for proper disposal.

9.0 EMERGENCY INFORMATION:

In the event of an emergency, notify the MDNR Environmental Emergency Response Office at 573/634-2436. The Duty Officer will make the appropriate notifications.

10.0 ADDITIONAL EMERGENCY INFORMATION/NUMBERS:

Hospital: Jefferson Regional Hospital 636-933-1000

Location/Specific directions from Site: 1400 Highway 61 South, Festus, MO- refer to map

	Name/Location	Telephone Number
Ambulance:	Joachim-Plattin Ambulance 619 Collins Drive, Festus, MO	636-937-2224
Police/Sheriff:	Festus Police Department 100 Park Ave. Festus, MO	636-931-3646
Fire:	Festus Fire Department 212 North Mill Street, Festus, MO	636-937-6646
Poision Control:		
Cellular Telephones/Other:	Sean Counihan mobile 573-644-3697	

1) Central Accident Reporting Office- WORK RELATED INJURY 1-800-624-2354

This number is to be called in the event of a NON LIFE THREATENING injury PROIR to seeking medical care.

11.0 SIGNATURES

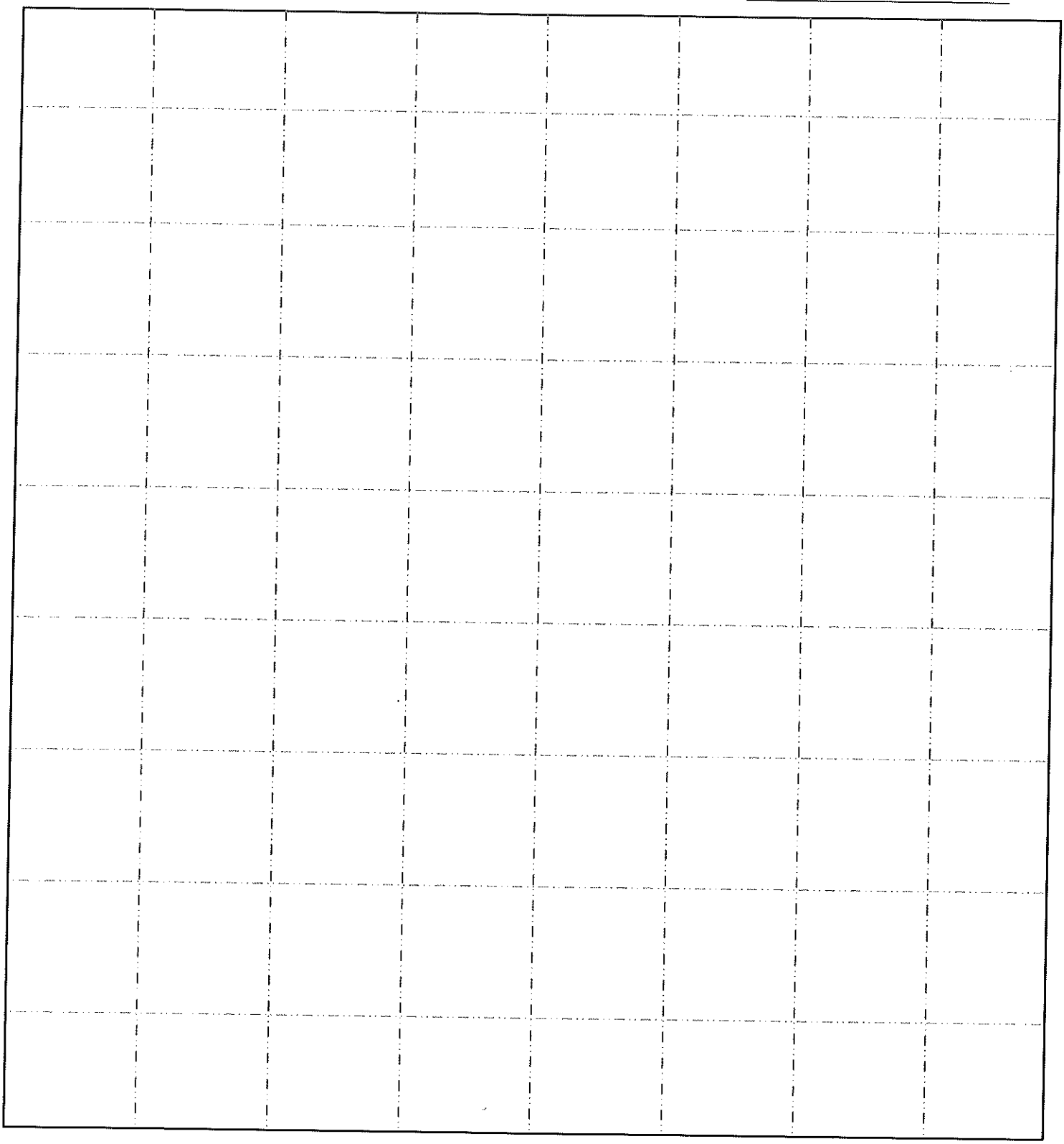
ESP personnel shall certify they have read the plan and addressed any questions regarding worker health and safety by signing and dating below followed by printing their name and title.

Signature	Printed Name/Title	Date	TLD Badge
	Michael Stroh / ESDII	6-13-13	
	Sean Counihan ESIII	6-13-13	

Missouri Department of Natural Resources

SHAPIRO BROTHERS SITE
FIELD SHEET
LOCATION ID:_____ STREET: _____

N



Date Screened/Sampled_____

Team Member(s):_____

Location ID #:_____

Owner Contact Information:

Owner: _____

Physical Address of Property Sampled: _____

Phone 1: _____ Phone 2: _____

Physical Description of Property:

Comments:

Permission to Sample Granted Verbally By: **On (date):**

APPENDIX C

XRF SOP

Standard Operating Procedure for XRF Analyzers

Shapiro Brothers Salvage Yard SI/RSE Investigation - Bagged Samples

Bagged soil samples will be analyzed with the analyzer in the testing stand and controlled from a laptop PC. A 45 second analysis time for all bagged samples. Note, do not operate the laptop PC software with the laptop connected to the network servers.

All XRF analyses will be recorded either on field sheets or in a written log book for each instrument. The analyst will record the date, the XRF run number (automatically generated by the XRF), sample ID information, and the total Pb result in mg/kg.

I. Startup

- Power up the analyzer and start the InnovX PC software.
- The instrument will automatically perform an initialization procedure, which lasts for 1-2 minutes.
- Following initialization, place the stainless steel standardization disc over the instrument's sampling window in the test stand and close the stand cover.
- Click the "Standardize" button from the upper left window titled "Soil" in the PC software. The instrument will perform an internal 60-second standardization procedure. During standardization, and any other time the x-ray tube is on, the red light on top of the test stand will flash. When the x-ray tube is off, the red light will remain on solid. ***Do not open the test stand lid when the light is flashing.***
- Following standardization, an information window will pop up displaying the analyzer resolution. Record the resolution in the XRF Log Book along with the Run number automatically assigned by the analyzer.
- The analyzer is now ready to analyze standard reference materials (SRMs).

II. Calibration Check

- The NIST 5861 (41ppm Pb), 4315 (244ppm), 2586 (431ppm), 2711 (1162), and 2710 (5532ppm), and Blank SRMs will be analyzed at the beginning of each use. Selected SRMs will also be reanalyzed periodically during the day based on site findings and length of time in the field.
- On the PC software main menu bar, select "Edit" and then chose "Edit Test Information". A data entry window will pop up allowing input of information about the next test.
- Select your name from the "Analyst" dropdown menu & select the check sample from the "Chk_Sampl" dropdown list.
- Click the "Start" button in the Soil Window in the upper left corner of the screen to initiate the test.
- Assess instrument calibration by comparing the measured values to the control chart prepared for each analyzer for each SRM. Verify that the result is within 2SD of the control chart mean, if so, continue to In-situ or Bagged Sample Analysis sections below.
- If values outside 2SD of control chart mean are observed, re-analyze the calibration check sample, or if there are more than one SRM sample cup, analyze another one. If the measured value is still outside 2SD, re-standardize as described above, and re-analyze the standard(s). If the result is still outside 2SD, note the failure in the logbook. If more than one check sample fails this procedure on a given day (particularly if the exceedances are in the same direction – e.g. both 2SD above or below the mean), it may be necessary to update the control charts, manually enter new calibration response factors into the analyzers, or both.

III. Sample Analysis

All XRF analyses will be conducted using InnovX X-ray tube analyzers.

- Following successful calibration check, click Edit from the main menu bar and select Edit Sample Information.
- Enter all applicable information about the first sample to be analyzed from the bag label, using the dropdown menus and direct edit fields
- Gently roll the sieved soil around inside the bag to homogenize;
- Place the sample over the analyzer's sampling window ensuring that the soil and bag are in as close contact with the window as possible.
- Close the stand cover.
- Click the Start button from the Soil window to initiate the test.
- The data being acquired will appear in the Chemistry window in the lower center of the PC screen during analysis.
- After analysis, the results will appear in the Results window on the PC.
- A running list of the analyses will appear in the window at the lower left of the PC screen.
- The sample information will remain from the previous test, so no changes are necessary for subsequent replicate analyses on a given sample bag.

- Roll the sieved soil around inside the bag, and re-analyze. Repeat analysis 2 more times.
- Calculate a mean and 95%UCL for the replicate analyses.

> If the mean and the 95% UCL lead concentrations straddle the 400ppm or 1,200 ppm screening level, conduct 3 additional replicate analyses, recalculate the mean and UCL and reassess. This process may need to be repeated for another round of 3 analyses in an effort to get both the mean and UCL on one side of the

- After completing replicate analysis on a bagged sample, click the Edit Sample Information again and enter information for the next bagged sample as above.
- Place the second sample in the test stand, close the cover and initiate the analysis.
- Repeat for remaining samples
- An instrument precision check will be conducted at a frequency of 5%. This will consist of analyzing a sample seven separate times without moving the sample in between each analysis. The %RSD on the replicate analyses should not exceed 15%. Select a bagged sample for the precision check that has elevated lead levels, preferably a concentration near the action level of 400 mg/kg if possible.

IV. Data Downloading

- After the last analysis for the day, select Readings from the main menu bar, and chose Export Readings.
- In the Export pop up box, verify that the "Export readings on date" radio button is selected, the Mode to export is "All", and today's date is circled on the calendar.
- Click OK.
- Insert a USB thumb drive in the laptop, download data to it, and then move data onto network server. Select the directory and file name for the downloaded data. For this project, file naming convention is date & XRF serial number (e.g. 10_14_11_5434)
- Verify that the file type is "Comma Separated Values", and click Save.
- A message will pop up indicating a successful download, and asking whether you would like to open the file. Select Yes, and file will open in Excel. Verify that the data appears correct. Make any corrections you had noted in the run log book.
- Choose Save As from the File menu, and select File Type "Microsoft Excel 97 Workbook.
- Close the InnovX software, power down the analyzer, and shut down the laptop PC.
- Copy the file from thumb drive to the network as soon as possible after analyses. Files will be stored in the H:/Sections/Superfund/SiteFiles/Shapiro/XRF data directory.

Note: For any operation that requests a password, the administrator password is lower case z, and the factory password is 1234.