AECOM Environment

Prepared for:
Prairie Ronde Realty
Dowagiac, Michigan

Prepared by:
AECOM
Grand Rapids, Michigan
60143510
March 2012

INDOOR AIR and SUB-SLAB SOIL GAS SAMPLING WORK PLAN FOR PRR BUILDING

Prairie Ronde Realty Company
415 East Prairie Ronde Street
Dowagiac, Michigan
MID 005 068 507

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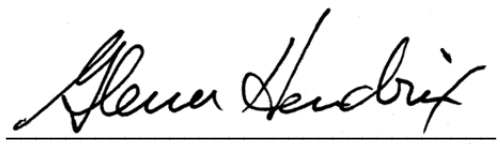
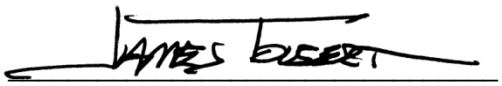


Prepared By [Name]



Reviewed By [Name]

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Attachment

1.0 Introduction

Prairie Ronde Realty (PRR) prepared this Indoor Air and Sub-Slab Soil Gas Sampling Work Plan in response to a request from the U.S. Environmental Protection Agency (USEPA) Region 5 for sampling indoor air and sub-slab soil gas at the former PRR manufacturing building (PRR building). The PRR building is located at 415 East Prairie Ronde Road in Dowagiac, Michigan. During a meeting on January 13, 2012 and in a letter dated February 21, 2012, USEPA Region 5 requested the following:

- Investigate the indoor air quality at the PRR building;
- Collect paired sub-slab soil gas samples at the PRR building to assist in the evaluation of indoor air quality; and
- Collect one ambient air quality sample upwind of the PRR building to assist in the evaluation of indoor air quality.

PRR provided USEPA Region 5 an *Indoor Air & Sub-Slab Sampling Work Plan* in February 2009. That work plan addressed sampling at nearby residences, but did not include sampling at the PRR building. This work plan for the PRR building specifies the same indoor and sub-slab air sampling techniques and analytical methods as the previously-approved February 2009 work plan.

1.1 Objectives

The objectives for this work are to:

- Collect seven indoor air samples from occupied areas of the PRR building;
- Collect sub-slab soil gas samples from approximately the same locations as the indoor air samples;
- Collect an ambient air sample from upwind of the PRR building;
- Analyze the air and soil gas samples for specified chlorinated volatile organic compounds (CVOCs);
- Report the results to the USEPA.

1.2 Prairie Ronde Realty (PRR) Building

Parts of the PRR building are leased to several tenants. The leased areas are used for offices, manufacturing and storage of recreational vehicles and boats. Approximately 36 people work full-time in the building in a single 8-hour shift. Several additional people each work approximately 10 hours a month in warehousing operations.

The building occupies approximately 617,000 square feet, and has 6 to 8-inch thick concrete floors.

2.0 Site Mobilization

2.1 Health and Safety Plan (HASP)

A Health and Safety Plan (HASP) will be prepared to provide specific guidelines and establish procedures to protect personnel during the investigation activities planned at the PRR building. HASP procedures will be updated if additional information is discovered which requires altering the plan (i.e., other health and safety concerns are identified within the PRR building). The HASP will be reviewed and signed by each sampling staff member prior to work on-site.

2.2 Field Documentation

All data concerning sample collection and contact with property manager and tenants will be documented in a field notebook. Examples of information which will be entered into the field notebook include:

- Project identification;
- Field activity subject;
- General work activity;
- Sampling staff on-site, including contractors;
- Weather conditions;
- Time and topics of safety meetings;
- Unusual events;
- Visitors on-site;
- Communication with co-workers, property owner, tenants, laboratory contacts, clients or others;
- Sample locations and basis for selection;
- All sample numbers and corresponding chain-of-custody numbers;
- Results from required calibration and calibration checks;
- Any variance from project plans and procedures;
- Photographs taken and identification numbers; and
- Any problems encountered and their resolution.

3.0 Sampling Plan

3.1 Sampling Locations

Seven sampling locations are proposed within the PRR building (**Figure 1**) at currently leased locations. The samples will be collected using Summa™ canisters located in the seven occupied areas of the building:

- Former Model Shop;
- Office Area;
- AC Press Room;
- Carbon Room;
- Engineering Offices;
- RV/Boat Storage Room 1; and
- RV/Boat Storage Room 2.

New sub-slab monitoring points will be established adjacent to each indoor air sample location. The samples will be collected from each room in the area with the highest occupancy that does not interfere with work and is not located near known potential VOC sources. The indoor air samples will be collected approximately 5 feet above the slab surface. All indoor air samples will be collected in accordance with the protocol outlined in the following sections. The soil gas samples will be collected approximately one inch or less below the bottom of the concrete slab that is the floor of the PRR building. Each location and the reasons for selecting the location will be documented in the report resulting from this work.

The ambient air sample will be collected from an outdoor location on the PRR property, up-wind of the PRR building and approximately five feet above the ground surface. To the extent possible, this ambient air sample will be collected away from obvious potential sources such as storage, parking and loading areas. The ambient air sample location will be determined based on wind conditions at the time the samples are collected.

3.2 Sampling Strategy

One indoor air sample will be collected from each of the seven sample locations presented on **Figure 1**. The samples will be analyzed for the following CVOCs.

- Tetrachloroethylene;
- Trichloroethylene;
- Cis-1,2-Dichloroethylene;
- Trans-1,2-Dichloroethylene;
- Vinyl chloride;
- 1,1,1-Trichloroethane;
- 1,1-Dichloroethane;
- Chloroethane; and
- Isopropyl alcohol (IPA), sub-slab samples only.

The sampling procedures and methods are detailed in the following sections.

3.2.1 Information Acquisition

Various types of information will be obtained and recorded for this sampling effort.

The *Canister Data Form* in **Attachment A** will be used to record data on the condition of the canisters, sampling times, vacuum, etc.

The room and general area where sampling will occur will also be surveyed for conditions that could affect sample results. This survey will be documented on the *Vapor Intrusion Building Survey Form* in **Attachment A**.

3.2.2 Sampling and Analytical Methods

Sampling methods used will be consistent with USEPA protocols for collecting air samples using TO-15 Summa™ canister sampling and analysis methods (*Compendium of Methods for the Determination of Compounds in Ambient Air, Second Edition, Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GCMS).* EPA/625/R96/01b, 1999). Each batch of canisters will be certified clean by the selected laboratory according to USEPA Method TO-15. TO-15 SIM will be used for the indoor air samples to obtain a lower detection limit for VOCs. TestAmerica in Los Angeles, California will analyze the samples. Turnaround time will be approximately 14 calendar days (standard turnaround times).

3.2.3 Indoor Air Sampling

The indoor air samples will be collected using a Summa^{TM} canister (6-Liter capacity) equipped with a critical orifice flow regulation device sized to allow an air sample to be collected over a 24-hour sampling period. Care will be taken to deploy the canisters away from the direct influence of any forced air emanating from air conditioning units, central air conditioning vents, furnaces or heaters.

The indoor air sampling procedure is described as follows.

- Building spaces will be examined to determine a location for deploying the sample. An attempt will be made to deploy the canister in areas not subject to disturbances and which will not interfere with the occupant's normal activities.
- Air sample canisters will be labeled with a unique sample designation number. The sample number and location will be recorded in the field log book.
- The canister vacuum will be measured using an integrated vacuum gauge immediately prior to canister deployment, and recorded in the field log book. The critical orifice flow controller will be installed, as supplied by the laboratory, on the canister, the canister will be opened fully at the beginning of sample collection period, and the start time will be recorded.
- Other data recorded will include: outside and interior temperatures at the start and end of the sample period, equipment serial numbers, sampler name, and any comments.

- The canister valve will be closed fully at the end of the sample period (after 24-hours) and the end time recorded. Any evidence of canister disturbance during the sample collection will be recorded.

- The canister vacuum will be measured and recorded immediately after canister retrieval at the end of the sample period. Any samples where the canister reached atmospheric pressure will be rejected, and the canisters returned for cleaning. Once the vacuum is measured, the safety cap will be securely tightened on the canister inlet. Field data will be verified as correctly entered into field books prior to shipment; and canisters will be shipped to the laboratory under a chain-of-custody.

- Building occupants will be requested to keep out of the sampling area, if possible, during the sampling event.

3.2.4 Sub-Slab Soil Gas Sampling

Sub-slab sampling points will be installed to collect soil gas immediately below the slab at each of the seven indoor air sampling locations. Sub-slab gas samples will be collected using a 6-Liter Summa™ canister fitted with a flow orifice pre-calibrated to collect a 6-Liter sample over a 24-hour period. Once the 24-hour sampling period has been completed, the canister will be boxed and shipped to the laboratory for analysis. A brief summary of the sampling protocol is provided below.

A subsurface utility location will be identified prior to installation of sub-slab vapor sampling points. The sub-slab vapor points will be installed by first advancing a small diameter hole (approximately 3/8-inches in diameter) through the floor slab to determine thickness followed by a 1-inch hole several inches deep. The holes will be drilled via hammer drill or concrete core. The core hole will extend through the slab and terminate at the interface with underlying material (i.e. gravel base or soil). A sample point consisting of a stainless length of tubing fitted with compression fittings and will be placed into the boring. The cored slab annulus will be filled with quick-setting cement placed around the stainless steel sub-slab vapor point. The bottom of the sub-slab vapor point will extend to the bottom of slab. The new sub-slab vapor collection points will be allowed to equilibrate for approximately 24 hours before the samples are collected.

Prior to sub-slab soil gas sample collection, the monitoring point and above grade tubing will be purged at a rate not exceeding 200 ml/min. The total volume purged prior to sample collection will equal three volumes of air in the open space of tubing and the sample point. Isopropyl alcohol (IPA) will be used as a field tracer during sampling. The IPA will be introduced as a spray next to the above grade sampling train and Summa™ canister.

At the start of the sampling event, a pressure gauge reading will be performed. Values will be recorded. Flow rates will be less than 200 mL/min, and sampling will continue until a complete 24-hour sample has been collected. At the end of the sampling event, a pressure gauge reading will be recorded.

The 6-Liter canister with a calibrated 24-hour orifice will be connected to the stainless steel vapor point via nylon tubing. (Collecting with a calibrated orifice will ensure the flow rate is not greater than 200 mL/min, which is the flow threshold above which VOC stripping from soil may occur.) After the sample has been collected, the safety cap will be installed.

All data concerning sample collection will be documented in a field notebook and respective canister sampling forms.

The following summarizes the above.

- Sub-slab sampling points will be constructed of hollow stainless steel 0.25-inch diameter tubing fitted with compression-type fittings.
- The sub-slab sampling point construction will be permanent, with the stainless steel sampling points securely mounted through the concrete slab and grouted in place using a quick-setting cement mixture.
- New sub-slab vapor sampling points will be allowed to equilibrate for approximately 24 hours before the samples are collected.
- Samples will be collected over a 24-hour period at a flow rate not greater than 200 mL/min.
- IPA will be used as a field tracer during sampling. The IPA will be introduced as a spray next to the above grade sampling train and Summa™ canister.
- Field documentation will be maintained in a field notebook and on field data forms.

3.2.5 Ambient Air Sampling

The ambient air samples will be collected in the same manner as the indoor air samples.

4.0 Analytical Findings

The sampling will be completed in March 2012, predicated on USEPA approval of this work plan. PRR will prepare a sampling and data summary report after the analyses are completed and will provide this report to the USEPA and the Michigan Department of Environmental Quality.

The results of the indoor air and sub-slab sol gas sampling will be included with the *Corrective Measures Proposal* presently in preparation. Decision criteria and evaluation of the data will also be included in the *Corrective Measures Proposal.*

FIGURE

LOUISE AVENUE

PROPERTY LINE

MODEL SHOP

OFFICE AREA

AC PRESS ROOM

ENGINEERING OFFICE

RUDY ROAD

CARBON ROOM

RECREATIONAL VEHICLE AND BOAT PARKING

RECREATIONAL VEHICLE AND BOAT PARKING

N

0’ 50’ 100’

SCALE (APPROX.)

LEGEND:

PROPOSED INDOOR AIR SAMPLING LOCATION

ORIGINAL BASEMAP PREPARED BY R. DAVID MURSCH, PE.

AECOM

FIGURE 1

PROPOSED INDOOR AND SUB-SLAB SOIL GAS SAMPLING LOCATIONS

NATIONAL COPPER PRODUCTS, INC
415 EAST PRAIRIE RONDE, DOWAGIAC, MICHIGAN 49047

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
60143510_Fig1b.DWG	DPE	60143510	2/2012	1

Plotted By: eggerdingd
Layout–Sheet Name: FIGURE–1B
Plot File Date Created: Mar/06/2012 7:50 AM

Filename: P:\60143510\CAD\ES\60143510_FIG1B.DWG

APPENDIX A

Canister Data Form, Building Information Form, Tenant Questionnaire, and Indoor Air Testing Tenant Instructions

FORM A-1
CANISTER DATA FORM

I. GENERAL INFORMATION

Company Name: _____
Canister ID No.:_____

Company Contact: _____
Sampler ID No.: _____

Company Address: _____
Vacuum Controller ID No.: _____

_____
Flow Controller ID No.: _____

Telephone No.: _____
Canister Leak Check Date: _____

Facsimile No.: _____
Shipping Date: _____

II. SAMPLING INFORMATION

Sampling Date: _____

Sampling Address: _____

Location of Canister is Place: _____

Use of Room Where Canister is Place: _____

Room Furnishings: _____

Materials Stored in Room: _____

Weather Conditions During Test: _____

TEMPERATURE:
BAROMETRIC PRESSURE

	I NTERIOR	AMBIENT	MAXIMUM	MINIMUM
START				
STOP				

Canister VACUUM on OPENING Valve: _____

DATE Canister Valve OPENED: _____ TIME Canister Valve OPENED: _____

DATE Canister Valve CLOSED: _____ TIME Canister Valve CLOSED: _____

_____ _ _____
Signature Date

FORM A-2
BUILDING INFORMATION FORM

Date: _____ Time: _____ Inspector: _____

Pictures Allowed: ☐ Yes ☐ No

Sample No. _____

Address: _____

Contact Name: _____

Years at this Address: _____

BUILDING TYPE: One story: _____ Multi-story _____ Brick _____ Siding _____ Stucco _____

WEATHER SEALS: General Condition: Good _____ Fair _____ Poor _____

BASEMENT:	None	☐inished	Unfinished	Depth below grade
	Partial	☐ ——☐	☐	_____
	Full	☐ ——☐	☐	_____
	Crawl space	☐ na	na ____	_____

Foundation construction: Poured concrete ☐ Cinder block ☐

Condition at floor/wall joint (if visible) _____

Floor drains, sump _____

Vents, fans, windows _____

Floor condition (type, cracks, drains) _____

Wall openings, utility pipe penetrations _____

Moisture Condition (dry, damp, wet) _____

FURNACE: Location: _____

Type: gas ☐ Forced air ☐

oil ☐ hot water ☐

electric ☐ other _____

Blower capacity (if applicable) _____

Does furnace have outside combustion air vent? _____

Winter temperature setting: day _____ night _____

AIR CONDITIONER: None _____ Central _____ (if yes, capacity?) _____ Room _____

(If yes, which rooms and capacities? _____

RADON SYSTEM: Yes ____ No ____ If yes, floor scaled? _____

Floor drain/sump vent? _____
Other ventilation? _____

Pictures Taken:

1.
2.
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20.

FORM A-3
TENANT QUESTIONNAIRE

VOCs are found in outside air and in the air inside of buildings. VOCs can be found in solvents and other household items such as pesticides, insecticides, adhesives, aerosols, paints, coatings, dry cleaning, carpet and drapery cleaning fluids, and household spot removers. Other common VOC sources include telephone and computer cables, plastic items, vinyl cove molding, PVC plumbing, linoleum, concrete blocks, latex paint, carpet padding, foam rubber, lubricants, and cosmetics.

Your answer to the following questions will help us determine if VOC sources exist in your building. Please answer each question to the best of your knowledge.

1. When was the last time dry-cleaned clothes were brought into the building?

   ☐ 0 to 5 days ago ☐ 6 to 10 days ago ☐ More than 10 days ago

2. When was the carpet installed?

   ☐ In the last six months ☐ More than six months ago

3. When was the last time the carpet was cleaned?

   ☐ In the last six month ☐ More than six months ago

4. Are there any spot removers in the building?

   ☐ Yes ☐ No

5. Do your tasks include model building, arts and crafts, model railroading metal cleaning, or others that require paints, thinners, solvents, or glue?

   ☐ Yes ☐ No

6. Is automotive or other vehicle maintenance or repair performed at the building?

   ☐ Yes ☐ No

7. Please review the following list, and check items you know are in the building.

   ☐ Latex caulk

   ☐ Latex paint

   ☐ Vinyl cove molding

   ☐ Linoleum tile

   ☐ Large diameter telephone cable

   ☐ Small diameter telephone cable

   ☐ Black rubber molding

   ☐ Vinyl edge molding

☐ Polystyrene foam insulation

☐ Cement block

☐ Treated metal roofing

8. Are there any pesticides in the building?

☐ Yes ☐ No ☐ Unsure

9. Are there any spray insecticides in the building?

☐ Yes ☐ No ☐ Unsure

10. Has the building interior been painted in the last 12 months?

☐ Yes ☐ No

11. Has the building exterior been painted in the last 12 months?

☐ Yes ☐ No

12. If question 10 or 11 is yes, please indicate what paint was used.

☐ Enamel

☐ Vinyl

☐ Latex

☐ Other

13. Where are paint, thinner, pesticides, insecticides stored?

☐ Garage

☐ Basement

☐ Storage shed

☐ Other

☐ These are not stored in the building.

14. Are there pets or other animals in the building?

☐ Yes ☐ No

If yes, what type? _____
If yes, number _____

FORM A-4

INDOOR AIR TESTING TENANT INSTRUCTIONS

1. The duration of this test is approximately 24 hours.
2. The canister is made of clean stainless steel. It does not contain any moving parts or chemicals.
3. Please do not handle or move a canister during testing.
4. Please do not smoke around the canister.
5. To the extent possible, leave doors and windows closed during testing.
6. To the extent possible, do not use paint, solvents, glues and spray cans during testing.
7. If possible, do not bring dry cleaning into the building during the testing.
8. We will be back at the end of the day to pick up the canister about this time.

Canister pick up:

Day _____

Time _____

Thank you for your cooperation.