**Title and Approval Page**

# Sampling and Analysis Plan (SAP)

# Indoor Air and Soil Gas Survey

# Providence Barrel Superfund Site Smithfield, RI

# May 2008

**U.S. ENVIRONMENTAL PROTECTION AGENCY**
**NEW ENGLAND REGIONAL LABORATORY**
**OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION**
**11 TECHNOLOGY DRIVE**
**NORTH CHELMSFORD, MASSACHUSETTS 01863**

Prepared for: Office of Site Remediation & Restoration, Removal Program
U.S. Environmental Protection Agency, New England

Prepared by: _____ Date: April 24, 2008
Peter R. Kahn, ECA Air Monitoring Team Engineer, EPA Project Manger

Approved by: _____ Date: 4/24/08
Dick Siscanaw, Quality Assurance Officer

# 1. Introduction

**This SAP is an addendum to the QAU approved Generic Air QAPP, revision 2, October, 2007, RFA # 08002.**

The EPA New England, Office of Environmental Measurement and Evaluation (OEME), at the request of Ted Bazenas, On-Scene Coordinator (OSC) for the Providence Barrel Site in Smithfield, Rhode Island, will perform indoor air and sub-slab soil gas sampling and analysis, inspect residential basements for soil gas points of entry, and collect air samples as needed during the week of May 19, 2008. A soil gas survey was performed the week of December 3, 2007 around nine homes selected by the OSC. The selected homes were based on if the contaminated groundwater plume was moving underneath the home or the home was in close proximity to the site and if access to the property was granted by the home owner. The results of the December 2007 survey were used to select homes for this phase of the project where indoor air and sub-slab soil gas samples will be collected.

Peter Kahn is the EPA sampling project manager for this study and will be responsible for the following tasks: write the Sampling and Analysis Plan (SAP), communicate all aspects of the project to the OSC, coordinate EPA field and laboratory analytical support with OEME laboratory personnel, prepare and collect ambient and indoor air canister samples, canister sub-slab soil gas confirmation samples and prepare the final report for these activities. Scott Clifford will be responsible for collecting grab samples and on-site analysis of soil gas and air grab samples using the OEME Mobile Laboratory. Dan Curran will operate the OEME Laboratory GC/MS which will be used to analyze indoor air, ambient air and soil gas confirmation canister grab samples. Ted Bazenas will obtain property access agreements and establish a sampling schedule with the home owner and occupants for the week of May 19, preferably on Monday, Tuesday and Wednesday. The SAP will be distributed to Ted Bazenas and all other interested parties.

The primary contaminants of concern for this project are tetrachloroethylene (PCE) and trichloroethylene (TCE). RIDEM has adopted the Connecticut standards for indoor air, groundwater volatilization and soil vapor intrusion. The levels of concern to be used for this project are the Minumum Risk Levels for PCE and TCE developed by the Agency for Toxic Substances and Disease Registry (ATSDR), and Indoor Air Background Levels for VOCs which are based on the Proposed Connecticut Department of Public Health Remediation Standard Regulations, Volatilization Criteria, March 2003. The residential soil vapor volatilization and indoor air criteria for the target compounds are shown below. Table 1 shows the complete list of VOCs that will be reported for this project.

| Compound | Soil Gas Action Level (ppb/v) | Indoor Air Background Levels (ppb/v) |
|---|---|---|
| Trichloroethylene | 140 | 0.186 |
| Tetrachloroethylene | 560 | 0.737 |

***ATSDR Minimum Risk Levels***

ATSDR has published minimum risk levels (MRLs) for both TCE and PCE (Table 3) and has published Toxicological Reviews of both PCE and TCE [*a,b*].

| ***Compound*** | ***Acute (ppb(v))*** | ***Intermediate (ppb(v))*** | ***Chronic (ppb(v))*** |
|---|---|---|---|
| Trichloroethylene | 2,000 | 100 | N/A* |
| Tetrachloroethylene | 200 | N/A | 40 |

* N/A: Not available

An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects over a specified duration of exposure. These substance specific estimates, which are intended to serve as screening levels, are used by ATSDR health assessors and other responders to identify contaminants and potential health effects that may be of concern at hazardous waste sites. It is important to note that MRLs are not intended to define clean up or action levels for ATSDR or other agencies.

# 2. Sampling Design

The results of the December 2007 survey were used to select homes for this phase of the project where indoor air and sub-slab soil gas samples will be collected. Refer to the attached figure for the December 2007 sampling locations and Tables 2 – 10 for sampling results. The following homes have been selected for this survey:
13 Maple Avenue,
11 Maple Avenue,
5 Maple Avenue,
2-4 Oak Street and
10-12 Oak Street.

Three additional homes that were not part of the December 2007 survey will be added to this project if access to the property can be obtained from the owner:
6-8 Oak St.,
14-16 Oak St. ,
and 18-20 Oak St.

These additional homes are adjacent to the site and situated above the contaminated groundwater plume.

Each home will have at least one 24-hour indoor air sample collected in the basement. If the building is a duplex with the basement sectioned off into two separate areas, two 2-hour air samples will be collected. The basement is being selected because it is the first area of the building where soil gases will migrate into and it is also the area where air levels tend to be the highest. Indoor air data will be compared to a 24-hour background outdoor air sample, that will be collected each day indoor air samples are collected. For quality control purposes, a collocated canister sample will be collected each day over a 24-hour period in one of the homes selected for that day's sampling event. The location of the duplicate sample will be selected based on the home with the greatest potential for having the highest indoor air concentrations. Data collected from the previous survey will be used to make this determination. All canister samples will be analyzed for the VOCs listed on Table 1, particularly the target compounds mentioned above, using a GC/MS.

Sub-slab soil gas sampling probes will be installed by a Scott Clifford and Peter Kahn through the concrete slab of each home using the EPA Region I Standard Operating Procedure for Sub-Slab Soil Gas Sampling, August 1, 2007, Revision 1. If a home has a basement floor made of dirt, either a slam bar or a manually driven GeoProbe will be used to insert the soil gas sampling probe. A maximum of three soil gas sampling probes will be inserted through the basement floor. Scott Clifford will collect the soil gas samples and immediately analyzed them on-site using EPA's Mobile laboratory. One canister confirmation grab sample will be collected from each home and then analyzed at the EPA Regional Laboratory using a GC/MS. In addition, grab air samples will be collected by Scott Clifford using a glass syringe from areas where soil gases have the greatest potential to migrate into the basement (i.e. openings in the basement walls and floors and drain pipes) and then analyzed on-site in the mobile lab. The collected data will be compared to the Proposed Connecticut Department of Public Health Remediation Standard Regulations, Volatilization Criteria, March 2003 and evaluated by ATSDR and RIDOH a risk assessor to determine if detected levels pose a risk to the building occupants.

# 3. Data Evaluation

Analytical results from the indoor air sample collection effort that exceed background levels will be evaluated by ATSDR and RIDOH for potential impact to the residents. Decisions regarding management of soil vapors will be made by EPA and RIDEM following data evaluation.

# 4. Sampling and Analytical Summary Table

| Parameter | Matrix | Number of Samples (Include field QC) | Analytical Methods | Sampling SOPs | Containers | Preservation | Maximum Holding Time |
|---|---|---|---|---|---|---|---|
| VOCs | air | 25 (10%) | EIASOP-Aircan9 | ECASOP-CanisterSampling.SOP.Rev4.doc | 6 L canisters | none | 14 days |
| VOCs | air | 30 (10%) | EIASOP-FLDGRAB4 (field work) | None | syringe | none | none |
| VOCs | soil gas | 30 (10%) | EIASOP-FLDGRAB4 (field work) | None | syringe | none | none |

# 5. Site Map and December 2007 Sampling Locations

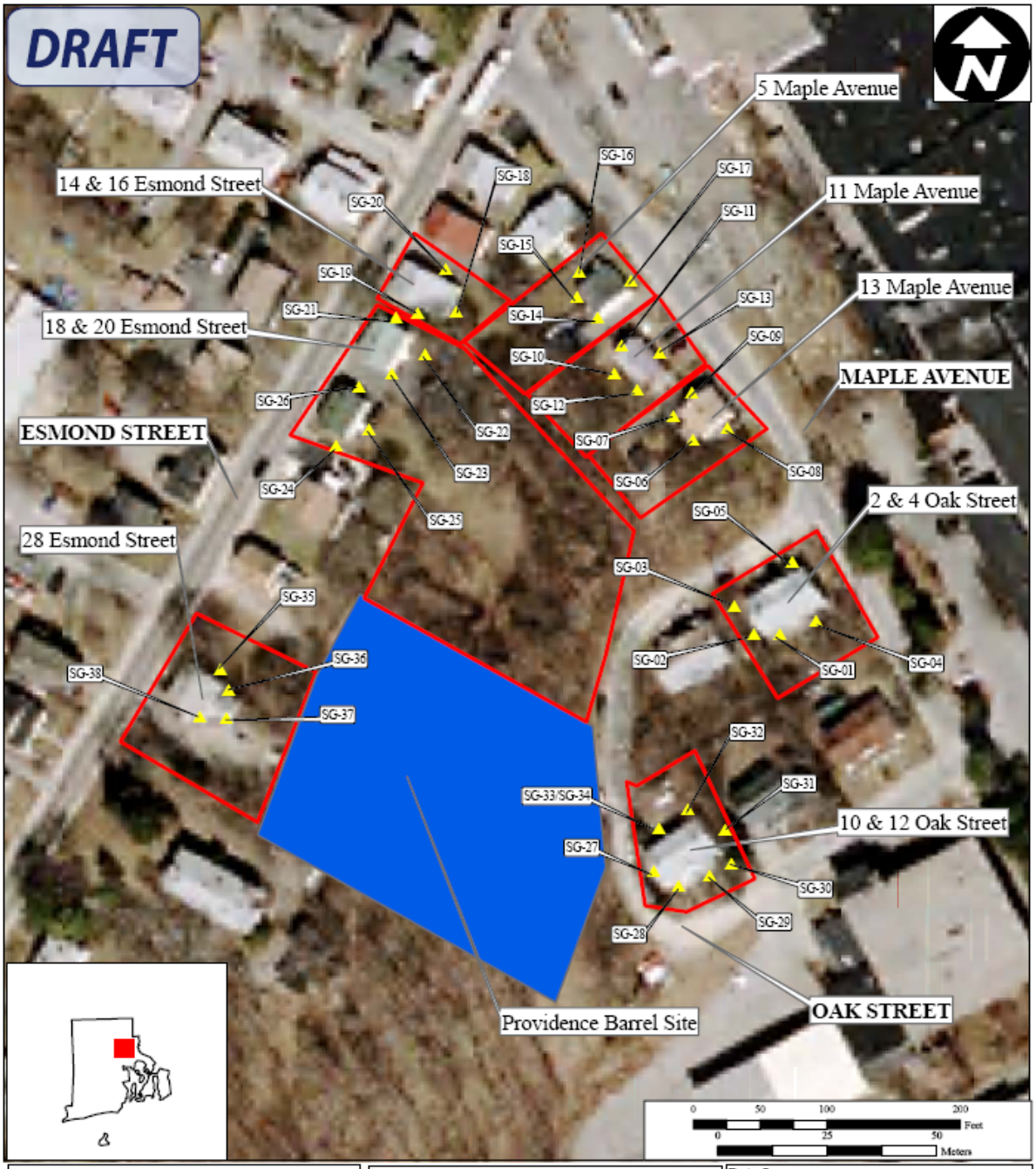


**Figure 2**

**Sample Location Map**

**Providence Barrel**
**Esmond Street**
**Smithfield, Rhode Island**

**EPA Region I**
**Superfund Technical Assessment and Response Team (START) III**
**Contract No. EP-W-05-042**

| | |
|---|---|
| **TDD Number:** | 07-11-0010 |
| **Created by:** | T. Benton |
| **Created on:** | 30 November 2007 |
| **Modified by:** | T. Benton |
| **Modified on:** | 2 January 2008 |

**Data Sources:**
2003-04 RIDOT Orthophotographs Name(s): Smithfield, Rhode Island
All other data: START

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E:\RI_gis\Providence Barrel\MXDs\Figure 2_Aerial.mxd

# TABLE 1

## EPA METHOD TO15 TARGET VOC LIST

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethylene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromoethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Butadiene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2-Hexanone
4-Ethyl Toluene
Acrylonitrile
Allyl Chloride
Benzene
Benzylchloride
Bromodichloromethane
Bromoform
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Cyclohexane
Dibromochloromethane
Dichlorodifluoromethane (F12)
Dichlorotetrafluoroethane
Ethyl Benzene
Heptane
Hexachloro-1,3-butadiene
Hexane
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Methyl-t-butyl ether
Methyl Bromide (Bromomethane)
Methyl Chloride (Chloromethane)
Methylene Chloride
Styrene
Tetrachloroethene
Tetrahydrofuran
Toluene
Trichloroethene
Trichlorofluoromethane
Trichlorotrifluoroethane
Vinyl Bromide
Vinyl Chloride
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
m,p-Xylene
o-Xylene
trans-1,2-Dichloroethene
trans-1,3-Dichloropropene

**Table 2**
**December 4, 2007**
**2 - 4 Oak Street Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **2 - 4 Oak Street** | | |
| *Basement Area* | | |
| SG-1: 7 ft. from west wall, 5 ft. 5 in. from south wall, 2 ft. 4 in. below the dirt floor | 28 | 226 |
| Grab-1: in the breathing zone above where SG-1 was collected | ND (0.3) | ND (0.8) |
| *Outside House* | | |
| SG-01: south side of house 43 ft. from southeast corner, 8 ft. from the foundation, 5 ft. below ground surface | ND (0.3) | ND (0.8) |
| SG-02: west side of house 23.5 ft. from northwest corner, 7 ft. from the foundation, 5 ft. below ground surface | ND (0.3) | 6.3 |
| SG-03: west side of house 4 ft. from northwest corner, 7 ft. from the foundation, 5 ft. below ground surface | 35 | 32 |
| SG-03 canister confirmation sample (canister #15059) | 34 | 36 |
| SG-04: south side of house 21 ft. from southeast corner, 8.5 ft. from the foundation, 5 ft. below ground surface | ND (0.3) | 2.3 |
| SG-05: north side of house near the northeast corner, 3 ft. from the foundation, 5 ft. below ground surface | ND (0.3) | ND (0.8) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v

TCE = 0.186 ppb/v

**Table 3**
**December 4, 2007**
**13 Maple Ave. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **13 Maple Ave.** | | |
| *Basement Area* | | |
| Grab-1: air space above dirt floor in crawl space located in southwest corner | 1.4 | 3.0 |
| Grab-1 canister confirmation sample (canister #22684) | 1.4 | 0.85 |
| Grab-2: in the breathing zone from the middle of the northern portion of the basement | 1.2 | 2 |
| *Outside House* | | |
| SG-06: back of house near the southwest corner 2.5 ft. from the foundation, 6 ft. below ground surface | 30 | 50 |
| SG-07: back of house near the northwest corner 2 ft. from the foundation, 6 ft. below ground surface | 45 | 69 |
| SG-08: south side of house 16 ft. from southeast corner, 3.5 ft. from the foundation, 6 ft. below ground surface | 81 | 35 |
| SG-09: north side of house 18 ft. from southeast corner, 2 ft. from the foundation, 6 ft. below ground surface | 1.2 | ND (0.9) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v
TCE = 0.186 ppb/v

**Table 4**
**December 4, 2007**
**11 Maple Ave. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **11 Maple Ave.** | | |
| *Basement Area* | | |
| Grab-1: in the breathing zone from the middle of the basement | 1.3 | ND (0.8) |
| Grab-1 canister confirmation sample (canister #22685) | 1.6 | 0.13 |
| SG-1: 4 ft. from the west wall, 12 ft. from the north wall, 2 ft. 10 in. below the dirt floor | 85 | 57 |
| SG-2: 4 ft. from the east wall, 11 ft. 6 in. from the north wall, 2 ft. 5 in. below the dirt floor | 346 | 7.9 |
| *Outside House* | | |
| SG-10: back of house 25 ft. from the southwest corner, 2 ft. from the foundation, 5 - 6 ft. below ground surface | ND (0.3) | ND (0.9) |
| SG-11: north side of house 21 feet from the northeast corner, 1 ft. from the foundation, 5 - 6 ft. below ground surface | ND (0.3) | ND (0.9) |
| SG-12: at the southwest corner of the house 1 ft. from the foundation, 5 - 6 ft. below ground surface | 2.9 | 4.8 |
| SG-13: east side of house 12 ft. from southeast corner, 1 ft. from the foundation, 5 - 6 ft. below ground surface | 17 | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v

TCE = 0.186 ppb/v

**Table 5**
**December 5, 2007**
**5 Maple Ave. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **5 Maple Ave.** | | |
| *Basement Area* | | |
| Grab-1: crack in foundation wall in the southwest corner 1 in. above the floor | 21 | ND (1.0) |
| Grab-2: crack in foundation wall in the northeast corner at floor level | 1.4 | ND (1.0) |
| Grab-3: in the breathing zone from the middle of the basement | ND (0.4) | ND (1.0) |
| Grab-4: crack in foundation wall between the wall and old sewer pipe located 4 ft. 5 in. from northwest corner and 1 ft. 6 in. above the floor | ND (0.4) | ND (1.0) |
| *Outside House* | | |
| SG-14: 1 ft. from the southwest corner, 1 ft. 6 in. from the foundation, 6 ft. below ground surface | 19 | ND (1.0) |
| SG-14 canister confirmation sample (canister #15052) | 18 | 0.03 |
| SG-15: back of the house 1 ft. 6 in. from the northeast corner 1 ft. 6 in. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-16: north side of the house 4 ft. from the northwest corner 1 ft. 6 in. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-17: east side of house 9 ft. from southeast corner, 1 ft. from the foundation, 6 ft. below ground surface | 12 | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v

TCE = 140 ppb/v TCE = 0.186 ppb/v

**Table 6**
**December 5, 2007**
**14 -16 Esmond St. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **14 -16 Esmond St.** | | |
| *Basement Area* | | |
| Grab-1: gap between water line and the foundation wall located in the north wall | ND (0.4) | ND (1.0) |
| Grab-2: crack in foundation wall located at floor level in the south wall adjacent to section of floor removed for drainage | ND (0.4) | ND (1.0) |
| SG1: 14 ft. from the west wall, 14 in. from the south wall, 18 in. below the floor | ND (0.4) | ND (1.0) |
| *Outside House* | | |
| SG-18: back of the house 4 ft. from the southwest corner, 1 ft. from the foundation, 5 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-19: west side of the house 22 ft. from the northeast corner, 2 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-20: east side of the house 22 ft. from the northeast corner 1 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v
TCE = 0.186 ppb/v

**Table 7**
**December 5, 2007**
**18 Esmond St. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **18 Esmond St.** | | |
| *Basement Area* | | |
| Grab-1: hole in foundation south wall 2 ft. 6 in. from west wall, 4 ft. above the floor | ND (0.4) | ND (1.0) |
| *Outside House* | | |
| SG-21: east side of the house 16 ft. 6 in. from the northeast corner, 1 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-22: south side of the house 11 ft. from the southeast corner, 1 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-23: at southwest corner of the house 1 ft. from the foundation, 5 ft. 6 in. below ground surface | ND (0.4) | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v
TCE = 0.186 ppb/v

**Table 8**
**December 5, 2007**
**20 Esmond St. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **20 Esmond St.** | | |
| *Basement Area* | | |
| Grab-1: gap between the water line and the PVC pipe surrounding the water line that comes through the north foundation wall | ND (0.4) | ND (1.0) |
| SG1: 9 ft. 10 in. from the west wall, 12 ft. from the north wall, 10 ft. from the south wall, 2 ft. 8 in. below the floor | ND (0.4) | ND (1.0) |
| SG-1 canister confirmation sample (canister #20856) | 1.0 | 0.05 |
| *Outside House* | | |
| SG-21: east side of the house 16 ft. 6 in. from the northeast corner, 1 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-22: south side of the house 11 ft. from the southeast corner, 1 ft. from the foundation, 6 ft. below ground surface | ND (0.4) | ND (1.0) |
| SG-23: at southwest corner of the house 1 ft. from the foundation, 5 ft. 6 in. below ground surface | ND (0.4) | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene
PCE = Tetrachloroethylene

Residential soil vapor volatilization criteria:
PCE = 560 ppb/v
TCE = 140 ppb/v

Residential target indoor air concentration:
PCE = 0.737 ppb/v
TCE = 0.186 ppb/v

**Table 9**
**December 6, 2007**
**10 - 12 Oak St. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **10 - 12 Oak St.** | | |
| *Basement Area* | | |
| SG1: 8 ft. 8 in. from the north wall, 7 ft. 3 in. from the west wall, 18 in. below the floor | 41 | 34 |
| SG2: 10 ft. 6 in. from the east wall, 13 ft. 6 in. from the south wall, 16 in. below the floor | 3.4 | 19 |
| *Outside House* | | |
| SG-27: west side of the house between the southwest and northwest corner 1 ft. 6 in. from the foundation, 6 ft. below ground surface | 29 | 81 |
| SG-28: south side of the house near the southwest corner 2 ft. 9 in. from the foundation, 6 ft. below ground surface | 14 | 181 |
| SG-29: middle of the south side of the house between two porches 1 ft. 9 in. from the foundation, 6 ft. below ground surface | 8.4 | 110 |
| SG-30: south side of the house near the southeast corner 1 ft. 6 in. from the foundation, 6 ft. below ground surface | ND (0.4) | 1.3 |
| SG-31: middle of the east side of the house 5ft. from the foundation, 6 ft. below ground surface | 8.1 | 50 |
| SG-32: north side of the house near the northeast corner 5 ft. 3 in. from the foundation, 6 ft. below ground surface | 2.3 | 11 |
| SG-33: north side of the house near the northwest corner 2 ft. 6 in. from the foundation, 6 ft. below ground surface | 42 | 19 |
| SG-34:(duplicate of SG-33): north side of the house near the northwest corner 2 ft. 6 in. from the foundation, 6 ft. below ground surface | 54 | 22 |
| SG-34 canister confirmation sample (canister #15057) | 42 | 33 |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene PCE = Tetrachloroethylene

**Table 10**
**December 6, 2007**
**28 Esmond St. Smithfield, RI**
**Soil Gas Grab, Indoor Air Grab Sampling Data**

| Sample Location | PCE (ppb/v) | TCE (ppb/v) |
|---|---|---|
| **28 Esmond St.** | | |
| *Basement Area* | | |
| Grab-1: gap between the water line and where it enters the basement through the north wall 2 ft. 6 inches from the west wall, 3 ft. below grade | ND (0.5) | ND (1.0) |
| Grab-2: gap between the sewer pipe and where it enters the basement through the south wall | ND (0.5) | ND (1.0) |
| Grab-3: gap in the south wall 11 ft. from the east wall, 20 ft. from the west wall, 2 ft. below grade | ND (0.5) | ND (1.0) |
| Grab-4: gap between a PVC pipe and the concrete floor, 15 ft. 6 in. from the west wall, 12 ft. from the south wall | 59 | ND (1.0) |
| Grab-4 Duplicate: | 64 | ND (1.0) |
| Grab-5: gap in the west wall 8 ft. from the north wall, 16 ft. from the south wall, 4 ft. below grade, 2 ft. above the floor | 2.5 | ND (1.0) |
| Grab-5 Duplicate: | 1.9 | ND (1.0) |
| Grab-6: breathing zone above where Grab-4 was collected | ND (0.5) | ND (1.0) |
| *Outside House* | | |
| SG-35: east side of the house between the southeast and northeast corner 9 in. from the foundation, 5 ft. below ground surface | ND (0.5) | ND (1.0) |
| SG-36: east side of the house near the northeast corner where the kitchen area meets the main house 1 ft. from the foundation, 7 ft. below ground surface | 1.6 | ND (1.0) |
| SG-36 canister confirmation sample (canister #20844) | 2.0 | 0.04 |
| SG-37: south side of the house/kitchen area near the southwest corner 1 ft. from the foundation, 6 ft. below ground surface | 4.9 | ND (1.0) |
| SG-38: west side of the house near the southwest corner of the main house 2ft. from the foundation, 7 ft. below ground surface | 4.6 | ND (1.0) |

**NOTES:**
ND = Not detected above reporting limits; reporting limit in parentheses
TCE = Trichloroethylene PCE = Tetrachloroethylene

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a. US Agency for Toxic Substances and Disease Registry: Toxicological Profile for Tetrachloroethylene (PERC). Atlanta, GA: US Department of Health and Human Services; September 1997.

b. US Agency for Toxic Substances and Disease Registry: Toxicological Profile for Trichloroethylene (TCEPERC). Atlanta, GA: US Department of Health and Human Services; September 1997.