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Senior Environmental Engineer

File on eDocs? yes no
Site Name National Grid - Rome (Kingsley Avenue)
Site # 633043
County Oneida
Town City of Rome
Foilable yes no
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JUL 27 2006

July 21, 2006

Mr. Anthony Karwiel
Project Manager
Remedial Bureau C, 11th Floor
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7014

Re: National Grid Rome (Kingsley Avenue) Former MGP Site
Operable Unit No. 2
Soil Vapor Sampling Work Plan

Dear Mr. Karwiel:

This letter provides a response to the New York State Department of Environmental Conservation's (NYSDEC's) June 28, 2006 comment letter in connection with the Soil Vapor Sampling Work Plan for Operable Unit No. 2 (OU-2) of the Rome (Kingsley Avenue) former Manufactured Gas Plant Site. For ease of review, the NYSDEC's comments have been reproduced followed by National Grid's response.

Comment 1

Page 2 of 3 (letter), section ***III, SOIL VAPOR SAMPLE LOCATIONS,*** *fourth sentence reads: "... approximately eight feet below the groundwater surface, to correspond with the depth of a typical basement."*

Please change the word "groundwater" to "ground".

Response

Comment has been incorporated.

Comment 2

Attachment 1, page 3, number 4, third sentence indicates that a cardboard box or plastic pail or plastic bag can serve to keep the tracer gas in contact with the probe during testing.

It has been the Department's experience that the plastic pail method seems to work the best.

Response.

The plastic pail method will be used in this soil vapor sampling program.

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Comment 3

*Attachment 1, page 5, section **VIII. Quality Assurance/Quality Control**, please discuss how the tracer gas atmosphere will be monitored for significant loss or how the soil gas sample will be analyzed for the tracer gas. Either way we must be sure that ambient air has not been introduced into the sample*

Response

A tracer vapor compound (helium) will be used during the soil-vapor sampling process to evaluate potential leakage of atmospheric air into the Summa canisters used to collect the soil vapor samples. After the tubing has been purged, a plastic pail will be placed over the borehole and sample tubing will be placed through a hole in the center of the pail. Any openings between the tubing and pail will be sealed and helium will be added underneath the pail near the top of the boring, next to the bentonite/clay sealed sampling point. A field helium detector will be connected to the soil vapor probe to evaluate potential seal issues. If high concentrations (> 20%) of tracer gas are observed in the sample, the probe seal will be enhanced to reduce the infiltration of ambient air. This approach has been utilized on other NYSDEC/NYSDOH approved work plans. Comment has been incorporated.

Comment 4

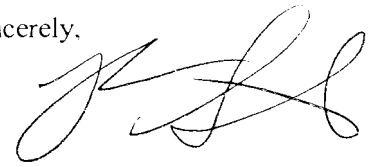
The plan advocates collecting soil vapor samples near monitoring wells which exhibit MGP/BTEX related groundwater contamination west of the Mohawk River. However, no sample locations are proposed west of the street (i.e., near mw30). Since aerial photos depict structures in this area, an additional sampling point in this area should be considered.

Response

The approach and sample locations in the Soil Vapor Sampling Work Plan were identified consistent with previous discussions with the NYSDEC. During the December 15, 2005 meeting with Robert Schick it was agreed that industrial/commercial properties would not be sampled for soil vapor. The buildings observed west of East Whitesboro Street are commercial/industrial, are not MGP related, and are outside the NYSDEC limits established for OU-2. The boundary for OU-2 as depicted on Figure 1 of the *Record of Decision for Niagara Mohawk's Rome-Kingsley Ave. Former Manufactured Gas Plant Site Operable Unit No. 1: Site No. 6-33-043, Rome, New York*, dated March 27, 2002, does not extend to the west side of East Whitesboro Street.

In closing, attached for your review/approval you will find the revised Soil Vapor Sampling Work Plan which incorporates the Department's June 28, 2006 comments, as appropriate. If you have any comments regarding the information presented above, please feel free to contact me.

Sincerely,



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Brian Stearns, P.E.
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Transmitted Via First Class Mail

July 21, 2006

Mr. Anthony Karwiel
Division of Environmental Remediation Construction Services
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7010

Re: Rome (Kingsley Avenue)
Former Manufactured Gas Plant Site
Operable Unit No. 2
Soil Vapor Sampling Work Plan

Dear Mr. Karwiel:

I. INTRODUCTION

This letter and associated attachments provide National Grid's Soil Vapor Sampling Work Plan (Work Plan) for Operable Unit No. 2 (OU-2) of the Rome (Kingsley Avenue) former Manufactured Gas Plant (MGP) Site (Site) (refer to Figure 1). This Work Plan has been prepared in response to the New York State Department of Environmental Conservation's (NYSDEC's) and the New York State Department of Health's (NYSDOH's) request for a soil vapor investigation, as discussed in a meeting between NYSDEC, NYSDOH, and National Grid on December 15, 2005. The soil vapor sampling activities described herein will be performed to assess whether Site-related volatile organic compounds (VOCs) are present in subsurface soil vapor near residences located proximate to existing monitoring well locations MW-25, MW-26, and MW-27.

This letter presents relevant background information, followed by a discussion of the proposed sampling locations, analytical method, schedule, and reporting.

II. BACKGROUND

The existing Site information provided in this letter was drawn from the following documents:

- *Remedial Investigation Report for the Rome (Kingsley Avenue) Site, City of Rome, New York,* (Parsons Engineering Science, Inc., March 1999);
- *"Off-Site" Remedial Investigation (RI) Report for the Rome (Kingsley Ave.) Site,* (Foster Wheeler Environmental Engineering Corporation, October 2000);

- *Feasibility Study Report for the Rome (Kingsley Ave.) Site,* (Foster Wheeler Environmental Engineering Corporation, January 2002); and

- *Feasibility Study Report for the Rome (Kingsley Avenue) Site Operable Unit No. 2, Rome, New York*, (Blasland, Bouck & Lee, Inc., February 2006).

These documents were previously submitted to the NYSDEC and provide a detailed discussion of Site conditions as they relate to OU-2.

As requested by the NYSDEC and NYSDOH in the December 15th meeting, soil vapor analysis will be performed near the monitoring well(s) within OU-2 that have had elevated benzene levels in groundwater samples collected from the deep overburden. The purpose of the sampling will be to confirm that soil vapors are not of concern and that further sampling is not necessary. Groundwater analytical results for VOCs are provided in attached Table 1.

III. SOIL VAPOR SAMPLE LOCATIONS

In response to the NYSDEC's request, soil vapor sampling is proposed in the vicinity of monitoring wells MW-25, MW-26, and MW-27. The northern and southern extent of sampling is limited because the nearest wells (i.e., MW04-35 to the north and MW-04-36 to the south) have little or no detectable VOCs. Subsurface soil vapor samples are proposed to be collected at a total of five sampling locations as part of this investigation. Subsurface soil vapor samples will be collected from approximately eight feet below the ground surface, to correspond with the depth of a typical basement. In addition, an ambient air sample will be collected upwind of the soil vapor sample collection points. The proposed sampling locations of the five proposed subsurface samples and the ambient air sample are shown on Figure 1 (subject to field verification).

IV. SOIL VAPOR SAMPLING AND ANALYTICAL METHOD

The methods for collecting subsurface soil vapor samples are detailed in Attachment 1 and Quality Assurance/Quality Control Procedures (QA/QC) are included as Attachment 2.

For this program, subsurface soil vapor sampling samples are proposed to be collected at temporary sampling points, with each soil vapor sample collected over an approximate 2-hour sample collection interval.

Samples (including a single duplicate sample drawn from a single canister) are to be collected in laboratory-certified clean 6-liter Summa passivated stainless-steel canisters and analyzed using the United States Environmental Protection Agency (USEPA) Method TO-15, including n-alkanes. The project-specific list of analytes is provided in Table 2 (attached). The proposed analyte list includes benzene and other constituents (i.e., toluene, ethylbenzene, xylenes, and naphthalene) that have historically been detected in deep overburden groundwater samples collected from MW-25, MW-26, and MW-27. The analytes will consist of VOCs that may be MGP-related and/or fuel-related, and therefore do not include chlorinated VOCs. To aid in evaluating whether VOC detections, if any, are potentially due to fuels (e.g., gasoline, diesel) rather than the former MGP, the analyses also include n-alkanes and other fuel-related VOCs. Analyses will be conducted by a laboratory with current New York State Environmental

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Laboratory Approval Program (ELAP) certification in accordance with USEPA Compendium Method TO-15. The data report will be a Category B-equivalent data package from which a Data Usability Summary Report (DUSR) will be prepared.

V. SCHEDULE AND REPORTING

Upon receipt of NYSDEC/NYSDOH written approval and procurement of access agreements with property owners, National Grid will notify the NYSDEC/NYSDOH of the investigation start date. Following receipt of the analytical data, the results will be validated and a sampling report will be provided to the NYSDEC and NYSDOH.

Please contact me at 315-428-5731 if you have any questions.

Sincerely,

FOR

Brian M. Stearns, P.E.
Senior Environmental Engineer

GPC/lar

cc: Greg Rys, NYSDOH – Herkimer
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Tables

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engineers, scientists, economists

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID Sample Date	NYSDEC Class GA Standards	MW04-31[1] 11/16/2004	MW04-31[2] 4/1/2005	MW04-32[1] 12/8/2004	MW04-32[2] 4/1/2005	MW04-33[1] 11/16/2004
VOCs						
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	3 U	3 U	3 U	3 U	3 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	2 U	2 U	2 U	2 U	2 U
1,2-Dichloroethane	0.6	2 U	2 U	2 U	2 U	2 U
1,2-Dichlorethene (total)	NA	--	--	--	--	--
1,2-Dichloropropane	1	1 U	1 U	1 U	1 U	1 U
2-Butanone (MEK)	50	5 U	5 U	5 U	5 U	5 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone (MIBK)	NA	5 U	5 U	5 U	5 U	5 U
Acetone	50	5 UJ	5 U	5 U	5 U	5 UJ
Benzene	1	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	4 U	4 U	4 U	4 U	4 U
Bromomethane	5	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	60	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	2 U	2 U	2 U	2 U	2 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U
Chloroethane	5	5 U	5 U	5 U	5 U	5 U
Chloroform	7	5 U	5 U	5 U	5 U	5 U
Chloromethane	5	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	50	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	4 U	4 U	4 U	4 U	4 U
Methyl bromide	NA	--	--	--	--	--
Methyl chloride	NA	--	--	--	--	--
Methylene chloride	5	3 U	3 U	3 U	3 U	3 U
Styrene	5	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U
Toluene	5	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U
Vinyl acetate	NA	--	--	--	--	--
Vinyl chloride	2	5 U	5 U	5 U	5 U	5 U
Xylenes (total)	5	5 U	5 U	5 U	5 U	5 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID Sample Date	NYSDEC Class GA Standards	MW04-33[2] 3/31/2005	MW04-34[1] 11/15/2004	MW04-34[2] 4/1/2005	MW04-35[1] 11/15/2004	MW04-35[2] 3/31/2005
VOCs						
1,1,1-Trichloroethane	5	5 U	0.3 U	5 U	0.3 U	5 U
1,1,2,2-Tetrachloroethane	5	1 U	0.5 U	1 U	0.5 U	1 U
1,1,2-Trichloroethane	1	3 U	0.3 U	3 U	0.3 U	3 U
1,1-Dichloroethane	5	5 U	0.4 U	5 U	0.4 U	5 U
1,1-Dichloroethene	5	2 U	0.3 U	2 U	0.3 U	2 U
1,2-Dichloroethane	0.6	2 U	0.4 U	2 U	0.4 U	2 U
1,2-Dichlorethene (total)	NA	--	--	--	--	--
1,2-Dichloropropane	1	1 U	0.4 U	1 U	0.4 U	1 U
2-Butanone (MEK)	50	5 U	0.9 U	5 U	0.9 U	5 U
2-Hexanone	50	5 U	0.9 U	5 U	0.9 U	5 U
4-Methyl-2-pentanone (MIBK)	NA	5 U	0.4 U	5 U	0.4 U	5 U
Acetone	50	5 U	1 UJ	5 U	1 UJ	5 U
Benzene	1	1 U	0.3 U	1 U	0.3	1 U
Bromodichloromethane	50	1 U	0.3 U	1 U	0.3 U	1 U
Bromoform	50	4 U	0.3 U	4 U	0.3 U	4 U
Bromomethane	5	5 U	0.3 UJ	5 U	0.3 UJ	5 U
Carbon disulfide	60	5 U	0.2 U	5 U	0.2 U	5 U
Carbon tetrachloride	5	2 U	0.3 U	2 U	0.3 U	2 U
Chlorobenzene	5	5 U	0.3 U	5 U	0.3 U	5 U
Chloroethane	5	5 U	0.4 UJ	5 U	0.4 UJ	5 U
Chloroform	7	5 U	0.3 U	5 U	0.3 U	5 U
Chloromethane	5	5 U	0.4 U	5 U	0.4 U	5 U
cis-1,2-Dichloroethene	5	5 U	0.4 U	5 U	0.4 U	5 U
cis-1,3-Dichloropropene	0.4	5 U	0.3 U	5 U	0.3 U	5 U
Dibromochloromethane	50	5 U	0.2 U	5 U	0.2 U	5 U
Ethylbenzene	5	4 U	0.3 U	4 U	0.3 U	4 U
Methyl bromide	NA	--	--	--	--	--
Methyl chloride	NA	--	--	--	--	--
Methylene chloride	5	3 U	0.9 U	3 U	0.9 U	3 U
Styrene	5	5 U	0.3 U	5 U	0.3 U	5 U
Tetrachloroethene	5	1 U	0.4 U	1 U	0.4 U	1 U
Toluene	5	5 U	0.3 U	5 U	0.3 U	5 U
trans-1,2-Dichloroethene	5	5 U	0.3 U	5 U	0.3 U	5 U
trans-1,3-Dichloropropene	0.4	5 U	0.4 U	5 U	0.4 U	5 U
Trichloroethene	5	1 U	0.4 U	1 U	0.4 U	1 U
Vinyl acetate	NA	--	--	--	--	--
Vinyl chloride	2	5 U	0.4 U	5 U	0.4 U	5 U
Xylenes (total)	5	5 U	0.2 U	5 U	0.2 U	5 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID Sample Date	NYSDEC Class GA Standards	MW04-36[1] 11/15/2004	MW04-36[2] 3/31/2005	MW04-36-DUP[2] 3/31/2005	MW-04S[3] 10/19/1994	MW-04S[3] 1/17/1995
VOCs						
1,1,1-Trichloroethane	5	0.3 U	5 U	5 U	10 U	--
1,1,2,2-Tetrachloroethane	5	0.5 U	1 U	1 U	10 U	--
1,1,2-Trichloroethane	1	0.3 U	3 U	3 U	10 U	--
1,1-Dichloroethane	5	0.4 U	5 U	5 U	10 U	--
1,1-Dichloroethene	5	0.3 U	2 U	2 U	10 U	--
1,2-Dichloroethane	0.6	0.4	2 U	2 U	10 U	--
1,2-Dichlorethene (total)	NA	--	--	--	10 U	--
1,2-Dichloropropane	1	0.4 U	1 U	1 U	10 U	--
2-Butanone (MEK)	50	0.9 U	5 U	5 U	10 U	--
2-Hexanone	50	0.9 U	5 U	5 U	10 U	--
4-Methyl-2-pentanone (MIBK)	NA	0.4 U	5 U	5 U	10 U	--
Acetone	50	1 UJ	5 U	5 U	10 U	--
Benzene	1	0.3 U	1 U	1 U	2 J	2
Bromodichloromethane	50	0.3 U	1 U	1 U	10 U	--
Bromoform	50	0.3 U	4 U	4 U	10 U	--
Bromomethane	5	0.3 UJ	5 U	5 U	10 U	--
Carbon disulfide	60	0.2 U	5 U	5 U	10 U	--
Carbon tetrachloride	5	0.3 U	2 U	2 U	10 U	--
Chlorobenzene	5	0.3 U	5 U	5 U	10 U	--
Chloroethane	5	0.4 UJ	5 U	5 U	10 U	--
Chloroform	7	0.3 U	5 U	5 U	10 U	--
Chloromethane	5	0.4 U	5 U	5 U	10 U	--
cis-1,2-Dichloroethene	5	0.4 U	5 U	5 U	--	--
cis-1,3-Dichloropropene	0.4	0.3 U	5 U	5 U	10 U	--
Dibromochloromethane	50	0.2 U	5 U	5 U	10 U	--
Ethylbenzene	5	0.3 U	4 U	4 U	10 U	1 U
Methyl bromide	NA	--	--	--	--	--
Methyl chloride	NA	--	--	--	--	--
Methylene chloride	5	0.9 U	3 U	3 U	10 U	--
Styrene	5	0.3 U	5 U	5 U	10 U	--
Tetrachloroethene	5	0.4 U	1 U	1 U	10 U	--
Toluene	5	0.3 U	5 U	5 U	10 U	1 U
trans-1,2-Dichloroethene	5	0.3 U	5 U	5 U	--	--
trans-1,3-Dichloropropene	0.4	0.4 U	5 U	5 U	10 U	--
Trichloroethene	5	0.4 U	1 U	1 U	10 U	--
Vinyl acetate	NA	--	--	--	--	--
Vinyl chloride	2	0.4 U	5 U	5 U	10 U	--
Xylenes (total)	5	0.2 U	5 U	5 U	10 U	1 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID Sample Date	NYSDEC Class GA Standards	MW-04D[3] 10/19/1994	MW-04D[3] 1/17/1995	MW25[3] 4/8/1997	MW25-DUP[3] 4/8/1997	MW25[4] 7/20/2000
VOCs						
1,1,1-Trichloroethane	5	10 U	--	--	--	5 U
1,1,2,2-Tetrachloroethane	5	10 U	--	--	--	5 U
1,1,2-Trichloroethane	1	10 U	--	--	--	5 U
1,1-Dichloroethane	5	10 U	--	--	--	5 U
1,1-Dichloroethene	5	10 U	--	--	--	5 U
1,2-Dichloroethane	0.6	10 U	--	--	--	5 U
1,2-Dichlorethene (total)	NA	10 U	--	--	--	--
1,2-Dichloropropane	1	10 U	--	--	--	5 U
2-Butanone (MEK)	50	10 U	--	--	--	10 U
2-Hexanone	50	10 U	--	--	--	10 U
4-Methyl-2-pentanone (MIBK)	NA	10 U	--	--	--	10 U
Acetone	50	18	--	--	--	10 U
Benzene	1	10 U	1 U	2,500 D	2,500 D	5 U
Bromodichloromethane	50	10 U	--	--	--	5 U
Bromoform	50	10 U	--	--	--	5 U
Bromomethane	5	10 U	--	--	--	10 U
Carbon disulfide	60	10 U	--	--	--	5 U
Carbon tetrachloride	5	10 U	--	--	--	5 U
Chlorobenzene	5	10 U	--	--	--	5 U
Chloroethane	5	10 U	--	--	--	10 U
Chloroform	7	10 U	--	--	--	5 U
Chloromethane	5	10 U	--	--	--	10 U
cis-1,2-Dichloroethene	5	--	--	--	--	5 U
cis-1,3-Dichloropropene	0.4	10 U	--	--	--	5 U
Dibromochloromethane	50	10 U	--	--	--	5 U
Ethylbenzene	5	10 U	1 U	42	38	5 U
Methyl bromide	NA	--	--	--	--	--
Methyl chloride	NA	--	--	--	--	--
Methylene chloride	5	10 U	--	--	--	5 U
Styrene	5	10 U	--	--	--	5 U
Tetrachloroethene	5	10 U	--	--	--	5 U
Toluene	5	10 U	1 U	260 JD	270 JD	5 U
trans-1,2-Dichloroethene	5	--	--	--	--	5 U
trans-1,3-Dichloropropene	0.4	10 U	--	--	--	5 U
Trichloroethene	5	10 U	--	--	--	5 U
Vinyl acetate	NA	--	--	--	--	10 U
Vinyl chloride	2	10 U	--	--	--	10 U
Xylenes (total)	5	10 U	1 U	24	22	5 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID Sample Date	NYSDEC Class GA Standards	MW25[5] 10/9/2000	MW25[6] 5/2/2001	MW26[3] 4/8/1997	MW26[4] 7/21/2000	MW26[5] 10/6/2000	MW26[6] 5/2/2001
VOCs							
1,1,1-Trichloroethane	5	50 U	--	--	100 U	500 U	--
1,1,2,2-Tetrachloroethane	5	50 U	--	--	100 U	500 U	--
1,1,2-Trichloroethane	1	50 U	--	--	100 U	500 U	--
1,1-Dichloroethane	5	50 U	--	--	100 U	500 U	--
1,1-Dichloroethene	5	50 U	--	--	100 U	500 U	--
1,2-Dichloroethane	0.6	50 U	--	--	100 U	500 U	--
1,2-Dichlorethene (total)	NA	50 U	--	--	--	500 U	--
1,2-Dichloropropane	1	50 U	--	--	100 U	500 U	--
2-Butanone (MEK)	50	100 U	--	--	200 U	1,000 U	--
2-Hexanone	50	100 U	--	--	200 U	1,000 U	--
4-Methyl-2-pentanone (MIBK)	NA	100	--	--	200 U	1,000 U	--
Acetone	50	160	--	--	110 U	1,000 U	--
Benzene	1	1,300	5 U	10,000 D	2,600	19,000	630
Bromodichloromethane	50	50 U	--	--	100 U	500 U	--
Bromoform	50	50 U	--	--	100 U	500 U	--
Bromomethane	5	--	--	--	200 U	--	--
Carbon disulfide	60	50 U	--	--	100 U	500 U	--
Carbon tetrachloride	5	50 U	--	--	100 U	500 U	--
Chlorobenzene	5	50 U	--	--	100 U	500 U	--
Chloroethane	5	100 U	--	--	200 U	1,000 U	--
Chloroform	7	50 U	--	--	100 U	500 U	--
Chloromethane	5	--	--	--	200 U	--	--
cis-1,2-Dichloroethene	5	50 U	--	--	100 U	500 U	--
cis-1,3-Dichloropropene	0.4	50 U	--	--	100 U	500 U	--
Dibromochloromethane	50	50 U	--	--	100 U	500 U	--
Ethylbenzene	5	23 J	5 U	620 JD	100 U	780	25 U
Methyl bromide	NA	100 U	--	--	--	1,000 U	--
Methyl chloride	NA	100 U	--	--	--	1,000 U	--
Methylene chloride	5	50 U	--	--	100 U	500 U	--
Styrene	5	50 U	--	--	100 U	500 U	--
Tetrachloroethene	5	50 U	--	--	100 U	500 U	--
Toluene	5	38 J	5 U	280 JD	100 U	120 J	0.9 J
trans-1,2-Dichloroethene	5	--	--	--	100 U	--	--
trans-1,3-Dichloropropene	0.4	50 U	--	--	100 U	500 U	--
Trichloroethene	5	50 U	--	--	100 U	500 U	--
Vinyl acetate	NA	100 U	--	--	200 U	1,000 U	--
Vinyl chloride	2	100 U	--	--	200 U	1,000 U	--
Xylenes (total)	5	14 J	5 U	350	100 U	430 J	25 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID / Sample Date	NYSDEC Class GA Standards	MW27[3] 4/8/1997	MW27[4] 7/20/2000	MW27[5] 10/6/2000	MW27[6] 5/2/2001	MW28[3] 7/20/2000	MW28[5] 10/6/2000
VOCs							
1,1,1-Trichloroethane	5	--	5 U	50 U	--	< 5	5 U
1,1,2,2-Tetrachloroethane	5	--	5 U	50 U	--	< 5	5 U
1,1,2-Trichloroethane	1	--	5 U	50 U	--	< 5	5 U
1,1-Dichloroethane	5	--	5 U	50 U	--	< 5	5 U
1,1-Dichloroethene	5	--	5 U	50 U	--	< 5	5 U
1,2-Dichloroethane	0.6	--	5 U	50 U	--	< 5	5 U
1,2-Dichlorethene (total)	NA	--	--	50 U	--	< 5	5 U
1,2-Dichloropropane	1	--	5 U	50 U	--	< 5	5 U
2-Butanone (MEK)	50	--	10 U	100 U	--	< 10	10 U
2-Hexanone	50	--	10 U	100 U	--	< 10	10 U
4-Methyl-2-pentanone (MIBK)	NA	--	10 U	100 U	--	< 10	10 U
Acetone	50	--	10 U	100 U	--	< 10	10 U
Benzene	1	72	95	1,300	5 U	< 5	0.7 J
Bromodichloromethane	50	--	5 U	50 U	--	< 5	5 U
Bromoform	50	--	5 U	50 U	--	< 5	5 U
Bromomethane	5	--	10 U	--	--	--	--
Carbon disulfide	60	--	5 U	50 U	--	< 5	5 U
Carbon tetrachloride	5	--	5 U	50 U	--	< 5	5 U
Chlorobenzene	5	--	5 U	50 U	--	< 5	5 U
Chloroethane	5	--	10 U	100 U	--	< 10	10 U
Chloroform	7	--	5 U	50 U	--	--	5 U
Chloromethane	5	--	10 U	--	--	--	--
cis-1,2-Dichloroethene	5	--	5 U	50 U	--	< 5	5 U
cis-1,3-Dichloropropene	0.4	--	5 U	50 U	--	< 5	5 U
Dibromochloromethane	50	--	5 U	50 U	--	< 5	5 U
Ethylbenzene	5	32	13	69	5 U	1	0.9 J
Methyl bromide	NA	--	--	100 U	--	< 10	10 U
Methyl chloride	NA	--	--	100 U	--	< 10	10 U
Methylene chloride	5	--	5 U	16 JB	--	5 U	5 U
Styrene	5	--	5 U	50 U	--	< 5	5 U
Tetrachloroethene	5	--	5 U	50 U	--	< 5	5 U
Toluene	5	12	28	230	5 U	< 5	5 U
trans-1,2-Dichloroethene	5	--	5 U	--	--	--	--
trans-1,3-Dichloropropene	0.4	--	5 U	50 U	--	< 5	5 U
Trichloroethene	5	--	5 U	50 U	--	< 10	5 U
Vinyl acetate	NA	--	10 U	100 U	--	< 10	10 U
Vinyl chloride	2	--	10 U	100 U	--	< 10	10 U
Xylenes (total)	5	17	6	32 J	5 U	< 5	5 U

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Sample ID / Sample Date	NYSDEC Class GA Standards	MW29[5] 7/20/2000	MW29[6] 10/6/2000	MW30[5] 7/20/2000	MW30[5] 10/6/2000
VOCs					
1,1,1-Trichloroethane	5	< 5	5 U	< 5	100 U
1,1,2,2-Tetrachloroethane	5	< 5	5 U	< 5	100 U
1,1,2-Trichloroethane	1	< 5	5 U	< 5	100 U
1,1-Dichloroethane	5	< 5	5 U	< 5	100 U
1,1-Dichloroethene	5	< 5	5 U	< 5	100 U
1,2-Dichloroethane	0.6	< 5	5 U	< 5	100 U
1,2-Dichlorethene (total)	NA	< 5	5 U	< 5	100 U
1,2-Dichloropropane	1	< 5	5 U	< 5	100 U
2-Butanone (MEK)	50	< 10	2 J	< 10	200 U
2-Hexanone	50	< 10	10 U	< 10	200 U
4-Methyl-2-pentanone (MIBK)	NA	< 10	10 U	< 10	200 U
Acetone	50	10 U	10 U	10 U	200 U
Benzene	1	< 5	14	< 5	2,200
Bromodichloromethane	50	< 5	5 U	< 5	100 U
Bromoform	50	< 5	5 U	< 5	100 U
Bromomethane	5	--	--	--	--
Carbon disulfide	60	< 5	5 U	< 5	100 U
Carbon tetrachloride	5	< 5	5 U	< 5	100 U
Chlorobenzene	5	< 5	5 U	< 5	100 U
Chloroethane	5	<10	10 U	< 10	200 U
Chloroform	7	< 5	5 U	< 5	100 U
Chloromethane	5	--	--	--	--
cis-1,2-Dichloroethene	5	< 5	5 U	< 5	100 U
cis-1,3-Dichloropropene	0.4	< 5	5 U	< 5	100 U
Dibromochloromethane	50	< 5	5 U	< 5	100 U
Ethylbenzene	5	< 5	4 J	< 5	36 J
Methyl bromide	NA	< 10	10 U	< 10	200 U
Methyl chloride	NA	< 10	10 U	< 10	200 U
Methylene chloride	5	5 U	5 U	10 U	100 U
Styrene	5	< 5	5 U	< 5	100 U
Tetrachloroethene	5	< 5	5 U	< 5	100 U
Toluene	5	< 5	3 J	< 5	100
trans-1,2-Dichloroethene	5	--	--	--	--
trans-1,3-Dichloropropene	0.4	< 5	5 U	< 5	100 U
Trichloroethene	5	< 10	5 U	< 5	100 U
Vinyl acetate	NA	< 10	10 U	< 10	200 U
Vinyl chloride	2	< 10	10 U	< 10	200 U
Xylenes (total)	5	< 5	2 J	< 5	53 J

See notes on page 8.

TABLE 1
GROUNDWATER ANALYTICAL RESULTS FOR
VOLATILE ORGANIC COMPOUNDS (VOCs)
micrograms per liter (ug/L)

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT NO. 2
ROME, NEW YORK

Notes:

[1] Data as presented in Niagara Mohawk, a National Grid Company. Letter to the NYSDEC regarding well installation and the first round of groundwater sampling and water level measurements for the new wells installed on OU-2, dated January 26, 2005.

[2] Data as presented in Niagara Mohawk, a National Grid Company. Letter to the NYSDEC regarding a second round of groundwater sampling on OU-2, dated August 1, 2005.

[3] Data as presented in Parsons Engineering Science, Inc. 1999. *Remedial Investigation Report for the Rome (Kingsley Avenue) Site, City of Rome, New York.* Prepared for Niagara Mohawk Power Corporation, Syracuse, New York. March 1999.

[4] Data as presented in Foster Wheeler Environmental Corporation, 2000. "Off-Site" Remedial Investigation (RI) Report for the Rome (Kingsley Ave.) Site. Prepared for Niagara Mohawk Power Corporation, October 2000.

[5] Data as presented in Foster Wheeler Environmental Engineering Corporation. 2002. *Feasibility Study Report for the Rome (Kingsley Ave.) Site.* Prepared for Niagara Mohawk Power Corporation, Syracuse, New York. January 2002.

[6] Data as presented in Niagara Mohawk, a National Grid Company. Letter to the NYSDEC in response to comments issued for the *Off-Site RI Work Plan* dated July 10, 2001.

All concentrations reported in micrograms per liter (ug/L); equivalent to parts per billion (ppb).
-- = Sample not analyzed for specified constituent.
New York State Department of Environmental Conservation Class GA Standards from "New York State Ambient Water Quality Standards and Guidance Values," June 1998.
NA = No criteria available.
BTEX and naphthalene were proposed to be analyzed in groundwater samples from MW-25, -26, and 27 in July 2001; however, a report presenting these analytical data could not be located.

Data Qualifiers:

B = Compound was also present in an associated blank.
D = Compound value reported is from a dilution sample.
J = Compound was positively identified; however, the associated numerical value is an estimated concentration only.
U = Compound was not detected at the indicated concentration.

TABLE 2
PROJECT ANALYTE LIST

SOIL VAPOR SAMPLING WORK PLAN
KINGSLEY AVENUE, OPERABLE UNIT No. 2
ROME, NEW YORK

I. Analyte List		
Compound	**Reporting Limit ppb(v/v)**	**Reporting Limit (ug/m^3)**
1,2,4-Trimethylbenzene	0.2	0.63
1,3,5-Trimethylbenzene	0.2	0.49
1,3-Butadiene	0.2	0.69
4-Ethyltoluene (p-Ethyltoluene)	0.2	0.86
Benzene	0.2	0.98
Cyclohexane	1	3.6
Ethylbenzene	0.5	2.62
Methyl tert-butyl ether	0.2	0.85
m-Xylene & p-Xylene	0.2	0.75
Naphthalene	0.2	0.98
n-Butane	0.2	0.98
n-Decane	0.2	0.86
n-Dodecane	0.2	0.86
n-Heptane	0.4	0.95
n-Hexane	1	5.81
n-Nonane	1	6.96
n-Octane	0.5	2.04
n-Pentane	0.5	1.76
n-Undecane	0.5	2.62
o-Xylene	0.4	1.86
Styrene	1	2.95
Toluene	1	6.39

Note:

1. The proposed analyte list includes benzene and other constituents (i.e., toluene, ethylbenzene, xylenes, and naphthalene) that have historically been detected in deep overburden groundwater samples collected from MW-25, MW-26, and MW-27. The analytes will consist of VOCs that may be MGP-related and/or fuel-related, and therefore do not include chlorinated VOCs. To aid in evaluating whether VOC detection, if any, are potentially due to fuels (e.g., gasoline, diesel) rather than the former MGP, the analyses also includes n-alkanes and other fuel-related VOCs.

Figure

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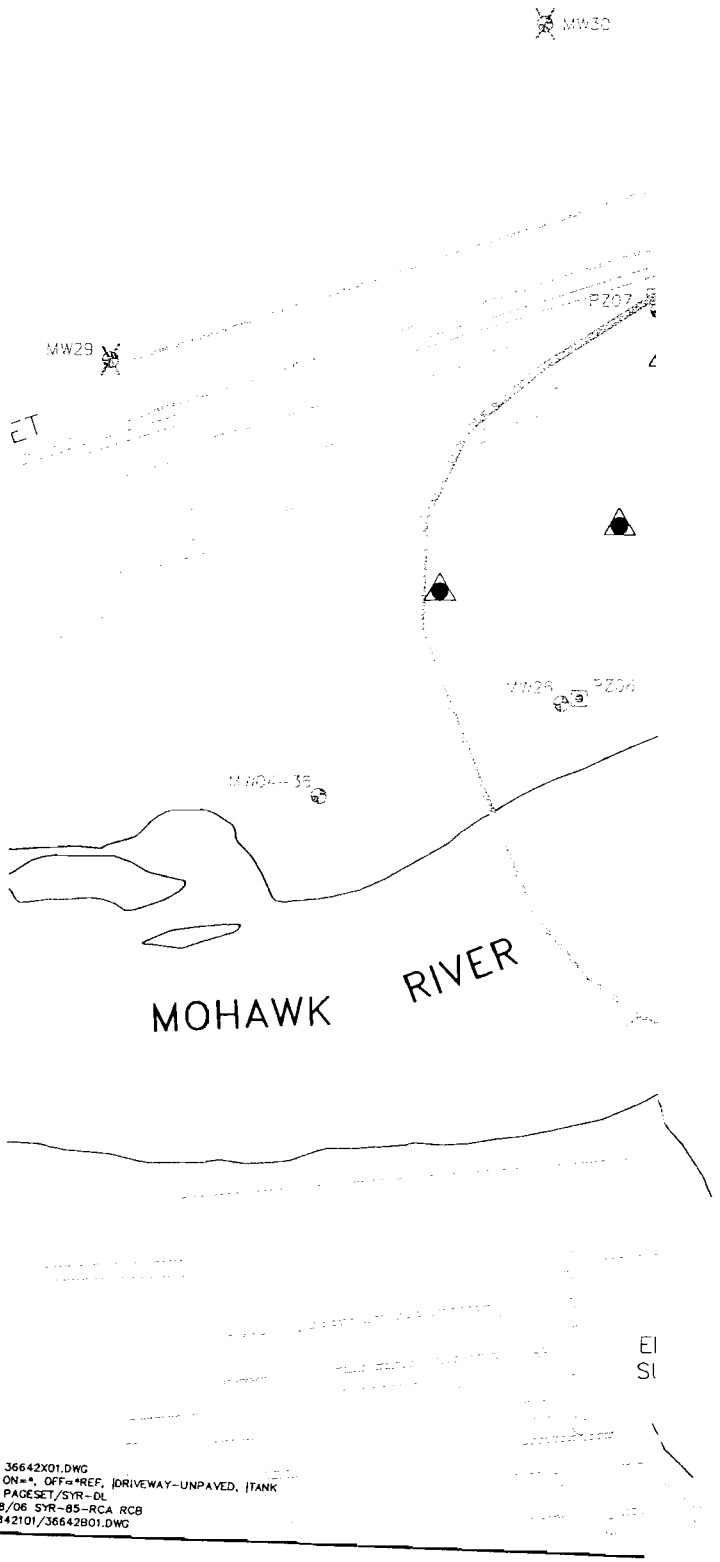

LEGEND:

- FORMER TAILRACE (APPROXIMATE)
- MW04-34 MONITORING WELL
- MW28 DECOMMISSIONED/MISSING/UNABLE TO LOCATE, OR DAMAGED MONITORING WELL
- PZ02 PIEZOMETER
- PROPOSED VAPOR MONITORING POINT
- PROPOSED AMBIENT AIR SAMPLE

NOTES:

1. BASE MAP SUPPLIED BY ERDMAN ANTHONY, AT A SCALE OF 1" = 40' TITLED "KINGSLEY AVENUE", WAS CREATED BY PHOTOGRAMMETRIC METHODS FROM DATA COLLECTED ON NOVEMBER 10, 2003.
2. ALL LOCATIONS ARE APPROXIMATE.
3. AS DEFINED IN THE RECORD OF DECISION (MARCH 2002), THERE IS AN AREA THAT IS IN BOTH OU-1 AND OU-2. THE SOIL/SEDIMENTS IN THE AREA ARE DEFINED AS BEING IN OU-1, AND THE GROUNDWATER/NAPL IS DEFINED AS BEING IN OU-2.
4. OU-2 BOUNDARY AS DEPICTED, OBTAINED FROM FIGURE 1 OF RECORD OF DECISION FOR SITE NO. 6-33-043, DATED MARCH 2002.

0 100' 200'

GRAPHIC SCALE

X: 36642X01.DWG
L: ON=*, OFF=*REF, |DRIVEWAY-UNPAVED, |TANK
P: PAGESET/SYR-DL
5/8/06 SYR-85-RCA RCB
36842101/36642B01.DWG

NATIONAL GRID
KINGSLEY AVENUE, OPERABLE UNIT No.2
ROME, NEW YORK

SOIL VAPOR SAMPLING WORK PLAN

SAMPLING PLAN

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FIGURE
1

Attachments

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Attachment 1

Subsurface Soil Vapor Sampling and Analysis

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Subsurface Soil Vapor Sampling and Analysis

I. Scope and Application

This document describes the procedures to collect subsurface soil-vapor samples for the analysis of volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15 (TO-15). The TO-15 method uses a 6-liter Summa passivated stainless-steel canister. An evacuated 6-liter Summa canister (<28 inches of mercury [Hg]) will provide a recoverable whole-gas sample of approximately 5.5 liters when allowed to fill to a vacuum of 2 inches of Hg. The whole-air sample will be analyzed for VOCs using a quadrupole or ion-trap gas chromatograph/mass spectrometer (GC/MS) system to provide compound detection limits of 0.5 parts per billion volume (ppbv).

The following sections list the necessary equipment and provide detailed instructions for the installation of soil-vapor probes (using direct-push technology and steel rods) and the collection of soil-vapor samples for VOC analysis.

II. Equipment List

The equipment required to install a soil vapor probe is presented below:

- Appropriate PPE (as required by the Health and Safety Plan);
- Direct-push rig (e.g., PowerProbe™) equipped with interconnecting 4-foot lengths of 1.25-inch-diameter steel rods;
- Expendable points (one per sample);
- Expendable point holder, and appropriate twist-to-lock connector;
- Photoionization Detector (with a lamp of 11.7 eV);
- Helium field detector;
- ¼-inch I.D. tubing (Teflon®, polyethylene, or similar);
- Commercially available clean sand or play sand; and
- Non-coated bentonite.

The equipment required for soil vapor sample collection is presented below:

- Stainless steel Summa canisters (order at least one extra);
- Flow controllers with in-line particulate filters and vacuum gauges; flow controllers are pre-calibrated to specified sample duration (e.g., 30 minutes, 8 hours, 24 hours) or flow rate (e.g., 200 milliliters per minute [mL/min]); confirm with the laboratory that the flow controller comes with an in-line particulate filter and pressure gauge (order at least one extra, if feasible);
- 1/4-inch I.D. tubing (Teflon®, polyethylene, or similar);
- Twist-to-lock fittings;
- Stainless steel "T" fitting (if collecting duplicate [i.e., split] samples);
- Portable vacuum pump capable of producing very low flow rates (e.g., 100 to 200 mL/min);
- Rotameter or an electric flow sensor if vacuum pump does not have a flow gauge;
- Helium gas source (to use as a tracer gas);
- PID;

- Appropriate-sized open-end wrench (typically 9/16-inch);
- Chain-of-custody form (COC);
- Sampling summary form (a blank form is attached); and
- Field notebook.

III. Preparation for Field Activities

Prior to the start of field work, all sampling personnel should be made aware that they must not handle volatile substances (such as gasoline), permanent marking pens, or smoke cigarettes before and/or during the sampling event.

Prior to the start of sampling the flow controllers must be checked to confirm that they are pre-calibrated to the proper sample collection time (confirm with laboratory). This is important since sample integrity is maintained if the sampling event is shorter than the target duration, but sample integrity can be compromised if the event is extended to the point that the canister reaches atmospheric pressure.

At least one additional canister and several additional flow controls should be ordered and held on-site for potential use if there is a problem with the other canisters and flow controllers.

IV. Health and Safety Considerations

Field sampling will be performed consistent with the site-specific Health and Safety Plan.

V. Sampling Procedure

Soil Vapor Steel Rod Monitoring Point Installation

1. Advance an assembly consisting of interconnected lengths of decontaminated 1.25-inch-diameter steel drive rods, affixed with an expendable point holder and expendable point at the downhole end, to the bottom of the desired sampling interval.

2. Cut a length of sample collection tubing slightly longer (e.g., 1 to 2 feet) than the collection depth. Attach a twist-to-lock connector to one end of the sample collection tubing and lower the twist-to-lock connector and attached tubing through the drive rods. Thread the twist-to-lock connector into the expendable point holder, by twisting counterclockwise.

3. Hydraulically retract the sampling assembly approximately 6 inches or more if needed, allowing the expendable point to fall off, and creating a void in the subsurface for soil vapor sample collection.

4. Fill annular space between the steel drive rod and the borehole wall (if any) with bentonite. Typically only a bentonite surface seal is needed since there is no annular space between the steel drive rods and the borehole wall.

5. Proceed to soil vapor sample collection.

Soil Vapor Sample Collection

Care will be used during all aspects of sample collection to ensure that sampling error is minimized and high-quality data are obtained. For example, care will be used to properly seal around the soil vapor probe at the ground surface to prevent leakage of atmospheric air into the probe during purging and sampling. Also, the sampling team will avoid actions (e.g., fueling vehicles, using permanent marking pens and wearing freshly dry-cleaned clothing or personal fragrances) which could potentially cause sample interference in the field.

Preparation of Summa-Type Canister and Collection of Sample

1. Record the following information in the field notebook, if appropriate (contact the local airport or other suitable information source [e.g., site-specific measurements, weatherunderground.com] to obtain the information):

    a. Wind speed and direction;
    b. Ambient temperature;
    c. Barometric pressure; and
    d. Relative humidity.

2. Connect a short piece of polyethylene tubing to the sub-slab sampling port using a twist-to-lock fitting.

3. Connect a portable vacuum pump to the sample tubing. Purge 1 to 2 (target 1.5) volumes of air from the vapor probe and sampling line using a portable pump at a rate of approximately 100 mL/min. Measure organic vapor levels with the PID.

    The purge volumes should be estimated using the following calculation:

    Equation (1) $\quad$ **Purge Volume** $= 1.5\ \pi\ r^2\ h$

    Where:

    Purge volume is in cubic feet,

    π is 3.14159 (unitless),

    r is radius of borehole (feet), and

    h is height from bottom of borehole (feet).

4. A tracer vapor compound (helium) will be used during the soil-vapor sampling process to evaluate potential leakage of atmospheric air into the Summa canisters used to collect the soil vapor samples. After the tubing has been purged, place a plastic pail over the borehole and guide sample tubing through a hole in the center of the pail. Seal any openings between tubing/pail, begin to add helium underneath the bucket near the top of the boring, next to the bentonite/clay sealed sampling point. Attach the field helium detector to the soil vapor probe to evaluate potential seal issues. Minor leakage around the probe seal should not materially affect the usability of the soil vapor sampling results. If high concentrations (> 20%) of tracer gas are observed in a sample, the probe seal should be enhanced to reduce the infiltration of ambient air.

5. Remove the brass plug from the Summa canister and connect the flow controller with in-line particulate filter and vacuum gauge to the Summa canister. Do not open the valve on the Summa canister. Record in the field notebook and the COC the flow controller number with the appropriate Summa canister number.

6. Connect the polyethylene sample collection tubing to the flow controller and the Summa canister valve. Record in the field notebook the time sampling began and the canister pressure.

7. Connect the other end of the polyethylene tubing to the sub-slab sampling port.

8. Open the Summa canister valves. Record in the field notebook the time sampling began and the canister pressure.

9. Take a photograph of the Summa canister and surrounding area.

Termination of Sample Collection

1. Arrive at the Summa canister location at least 10 to 15 minutes prior to the end of the required sampling interval (i.e., the 120- minute – sampling interval).

2. Record the final vacuum pressure. Stop collecting the sample by closing the Summa canister valves. The canister should have a minimum amount of vacuum (approximately 2 inches of Hg or slightly greater).

3. Record the date and local time (24-hour basis) of valve closing in the field notebook, sampling summary form, and COC.

4. Remove the particulate filter and flow controller from the Summa canister, re-install the brass plug on the canister fitting, and tighten with the appropriate wrench.

5. Package the canister and flow controller in the shipping container supplied by the laboratory for return shipment to the laboratory. The Summa canister does not require preservation with ice or refrigeration during shipment.

6. Complete the appropriate forms and sample labels as directed by the laboratory (e.g., affix card with a string).

Complete the COC and place the requisite copies in a shipping container. Close the shipping container and affix a custody seal to the container closure. Ship the container to the laboratory (via overnight carrier [e.g., Federal Express]) for analysis.

Soil Vapor Monitoring Point Abandonment

Once the soil vapor samples have been collected, the soil vapor monitoring points will be abandoned by removing the drive rods, and filling the resulting hole with bentonite.

VI. Waste Management

Field personnel will collect and remove all investigation-derived waste materials (including disposable equipment) for proper disposal.

VII. Data Recording and Management

Measurements will be recorded in the field notebook at the time of measurement with notations of the project name, sample date, sample start and finish time, sample location (e.g., GPS coordinates, distance from permanent structure, canister serial number, flow controller serial number, initial vacuum reading, and final pressure reading). Field sampling logs and COC records will be transmitted to the Project Manager.

VIII. Quality Assurance/Quality Control

Soil-vapor sample analysis will be performed using USEPA TO-15 methodology. This method uses a quadrupole or ion-trap GC/MS with a capillary column to provide optimum detection limits. The GC/MS system requires a 1-liter gas sample (which can be recovered from a 6-liter canister) to provide a 0.5-ppbv detection limit. The 6-liter canister also provides several additional 1-liter samples in case subsequent re-analyses or dilutions are required. This system also offers the advantage of the GC/MS detector, which confirms the identity of detected compounds by evaluating their mass spectra. The canisters used for soil vapor sampling with certified batch clean by the analytical laboratory. A New York State Department of Health Environmental Laboratory Approval Program (ELAP)-certified laboratory will be relied upon to perform the analyses.

All analytical results will be reported in units of $\mu g/m^3$.

Additional information on QA/QC may be found in Attachment 2.

Sampling Summary Form

1. SAMPLING INFORMATION

Sample Technician: _____ Phone number: ( ) _____ - _____

Sample Source: Exterior Soil Vapor

Sampler Type: Stainless Steel Canister

Analytical Method: TO-15 Cert. Laboratory: _____

Sample Locations:

Field ID # _____ - _____ Field ID # _____ - _____

Field ID # _____ - _____ Field ID # _____ - _____

2. METEOROLOGICAL CONDITIONS

Was there significant precipitation within 12 hours prior to (or during) the sampling event? *Yes / No*

Describe the general weather conditions: _____

_____

3. GENERAL OBSERVATIONS

Provide any information that may be pertinent to the sampling event and may assist in the data interpretation process.

_____

_____

_____

_____

Attachment 2

Quality Assurance/Quality Control Procedures

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Quality Assurance/Quality Control Procedures

I. Introduction

This attachment summarizes the quality assurance/quality control (QA/QC) procedures to be implemented in conjunction with the soil vapor sampling and analysis activities to be performed at OU-2. A summary of compounds to be analyzed and reporting limits are provided in Table 1.

II. Laboratory Qualifications

Analytical laboratory services must be provided by a qualified New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program-certified laboratory experienced in the analyses of soil vapor, ambient air, and groundwater samples using the methods specified herein.

III. Laboratory QA/QC Requirements

QA/QC for Laboratory Analysis

Specific procedures related to project-specific QA/QC for soil vapor samples are described in the following subsections. Specific procedures related to project-specific QA/QC for groundwater are described in the *Sampling, Analysis, and Monitoring Plan* (BBL, revised October 2003).

Method Blank Samples

A method blank sample will be analyzed by the laboratory at a frequency of 1 per 20 (or fewer) analyses. The method blank (consisting of an aliquot of humidified VOC-free air or nitrogen) will be carried through the entire analytical procedures.

Laboratory Control Samples

A Laboratory Control Sample (LCS) will be analyzed by the laboratory at a frequency of 1 per 20 (or fewer) investigative samples or once per tune period for the mass spectrometer, whichever is more frequent. The LCS will consist of a known standard prepared from a different source than the supplier of the calibration standard. The LCS will be used to evaluate accuracy of the analytical system, based on consistency with the control limits listed below. The following compounds will be part of the LCS standard: benzene and ethylbenzene.

Analyte	Concentration Spiked (ppbv)	Lower Control Limit %	Upper Control Limit %
Benzene	10.65	70	150
Ethylbenzene	10.9	65	145

Trip Blanks

A trip blank sample will accompany field samples at a rate of one trip blank per shipment container. Trip blanks will originate at the analytical laboratory. Each trip blank will consist of a canister, sent to the field with other canisters, and returned without being opened. The canister will be filled with humidified nitrogen (the same gas used for method blanks) upon return to the laboratory and will be analyzed. The trip blanks will accompany the sample containers throughout transport and sampling activities and will be returned to the laboratory with the field samples.

Duplicate Samples

Duplicate samples will be collected at a frequency of 1 per 20 (or fewer) as part of this project.

Calibration Procedures and Frequency

Calibration of instrumentation is required to ensure that the analytical system is operating correctly and functioning at the property sensitivity to meet established quantitation and reporting limits.

The quantitation limit (QL) is the value at which an instrument or method can measure an analytic at a specified level of accuracy. The QL is established by the upper and lower limits of the calibration range with the lower QL set at the concentration of the low calibration standard. Due to significant amount of error (~±100%) associated with results near the Method Detection Limit (MDL), the lower QL should be at least three times the MDL or greater.

The reporting limit (RL) is a threshold value for which results are reported as non-detected. In the absence of project specific or method requirements, the laboratory sets the RL at the same value as the QL (i.e., the RL is associated with the calibration standard). When project-specific RLs are established below the QL, sample results below the QL are quantified as estimated. If very low levels of quantitation are required and data cannot be estimated due to a risk assessment or compliance issue, upon client request, the laboratory will analyze a RL check standard (taken through appropriate sample prep procedures) to assess accuracy at this concentration. The performance criteria and/or any method modifications required to achieve a project RL is determined in conjunction with the client.

This procedure is based on 40 CFR Part 136, Appendix B and is intended to meet the requirements of the NELAC Quality Systems Standard, July 2001; the Department of Defense (DOD) Quality Systems Manual, Final Version, June 2002; and the United States Army Corps of Engineers (USACOE) Shell for Analytical Chemistry.

Each instrument will be calibrated with certified standard solutions and the linear range established for the analytical method. The frequency of calibration and the concentration of calibration standards will be determined by the analytical method.

Standards containing compounds of interest will be analyzed at various concentrations to establish the linear range of the detector, the limit of detection, and the retention time windows. All calibrations will be performed using either average response factors or first-order linear regression. Higher order fits will be allowed if permitted by the method, provided method criteria are met. The resulting calibration curves must meet all method specified criteria prior to sample analyses.

The calibration curve or average response factor will be verified each day at a frequency specified in the appropriate analytical method. The response from the continuing calibration standard will be checked against the average response factors or calibration curve established during initiation calibration.

Data Validation

Data assessment will be accomplished by the joint efforts of the Project QA/QC Officer and the Project Manager. The data assessment of the Project Manager will be based on the criteria that the sample was properly collected and handled according to the Standard Operating Procedures (Attachment 1). The project Manager will review logbooks, field logs, and sampling reports to monitor the integrity of all field operations.

All analytical data will be reported by the laboratory with NYSDEC Analytical Protocol Category B deliverables. An electronic data deliverable (EDD) will also be provided by the laboratory. The EDD will facilitate transfer of data into a project database for the Site. A copy of the laboratory data package and/or the EDD will be provided to the NYSDEC upon request.

A chemist(s) that is not employed by the analytical laboratory will validate the data generated by the contract laboratory. The chemist(s) will be experienced in performing data validations and will be familiar with the analytical methods used. The applicable analytical methods and the following document will be used to validate all data generated by the laboratory:

- "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA 540/R-99-088, October 1999

IV. Data Documentation and Reporting

A project file will be maintained that contains project plans, log books and data records, maps and drawings, sample identification documents, chain-of-custody records, the entire analytical data package provided by the laboratory including QA/QC documentation, data validation notes, references and literature, report notes and calculations, progress and technical reports, correspondence, and other pertinent information. A project file will be kept at BBL's office in Syracuse, New York, and the file will be maintained for the duration of the project.

The analytical laboratory will review appropriate quality control data to assure the validity of the analytical results. The analytical laboratory will prepare and retain full analytical and QA/QC documentation as required by the analytical methods used.

All results of chemical analyses will be supplied in a laboratory report that include the following items: custody documentation; methodology review, non-conformance summary; sample results summary; quality control summary including method blank, matrix spike, duplicate and laboratory control sample results; and initial and continuing calibration results. The analytical laboratory will supply one hard copy of the analytical and QA/QC documentation to BBL, which will be included with the reports of analyses in the project file.

V. References

- New York State Department of Health. February 2005. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York – Public Comment Draft.*

- New York Department of Environmental Conservation. November 22, 2004. *Evaluating Potential for Vapor Intrusion at Past, Current, and Future Sites – DEC Program Policy – Draft.*

- Environmental Protection Agency. 2001. *Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance).*