August 20, 2015

Joshua P. Cook, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
615 Erie Boulevard West
Syracuse, NY 13204-2400
Via e-mail: joshua.cook@dec.ny.gov

RE: Vapor Intrusion Sampling Work Plan - Revised
Former GE Farrell Road Site - Site # 7-34-055

FILE: 5851/50238

Dear Mr. Cook:

This letter constitutes a revised vapor intrusion (VI) sampling work plan (WP) for the above referenced site. Sampling was requested by the New York State Department of Environmental Conservation (NYSDEC) due to change of occupancy on Building 2 and the garage at the site, as described herein. This WP describes the sampling proposed to be conducted and requests NYSDEC's approval before conducting the sampling. It has been revised from the original work plan, dated July 14, 2015, based on the NYSDEC's comments provided in your letter to Jill Fonte, dated August 12, 2015, and during our conference call on August 20.

BACKGROUND

In response to a request by the NYSDEC in August 2006, Lockheed Martin Corporation (LMC) conducted sampling at Building 2 to assess the potential for vapor intrusion. LMC retained O'Brien & Gere (OBG) to conduct the vapor intrusion sampling, which was performed in February 2007 for the 2006-2007 heating season. The results of the sampling were summarized in a technical memorandum in May 2007, in which further monitoring for TCE and 1,1-DCE was recommended for two of the five sampling locations. Further monitoring was conducted in December 2007 for the 2007-2008 heating season, the results of which were reported by OBG in a technical memorandum in February 2008. Additional sampling was recommended at two locations to confirm the results.

Additional sampling was conducted in December 2008 for the 2008-2009 heating season and results were summarized in a technical memorandum in March 2009. Based on the sample results, and in conformance with NYSDOH's two soil vapor / indoor air matrices, OBG recommended that annual inspections be conducted to identify slab breaches and building modifications that could increase the potential for sub-slab vapors to intrude. NYSDEC approved the annual inspection approach in a December 9, 2009 letter from Javier Perez of NYSDEC to Myron Parkolap of LMC. NYSDEC also informed LMC that additional investigation may be necessary when the building's occupancy changes. Since 2009, OBG has conducted and reported annual slab inspections and findings to NYSDEC. From 2007 to present, the light warehousing use of Building 2 has not changed.

The current owner of the property (Widewaters Property Management Company) recently contracted with two separate tenants to occupy Building 2, with occupancy to begin in August 2015. Specific activities to be conducted in the tenant spaces for Building 2 have not been provided; however, warehousing and light to moderate manufacturing is anticipated. The layout of the proposed tenant spaces are illustrated in **Figure 1**.

The property owner has also contracted with tenants to occupy the former maintenance garage. Two of the three tenant spaces in the garage have already been occupied by a lawn care/snow removal business and a trailer washing and brake repair business that sublets a portion of its space to car enthusiasts and hobbyists that maintain their vehicles in their spare time.

As a result of the sites' "change of use" and at the request of NYSDEC to LMCO, OBG will conduct vapor intrusion sampling within Building 2 and the maintenance garage to acquire updated soil vapor data for the site. The following describes the proposed sampling.

VAPOR INTRUSION SAMPLING

OBG will collect sub-slab samples and indoor air samples from within Building 2 and the former maintenance garage. The sub-slab samples will be used to verify previously measured concentrations and the indoor air samples will be used to confirm there have been no changes in the indoor air quality related to VI since previous sampling events.

The sampling is proposed to be conducted prior to the occupancy of Building 2 spaces by the new tenants (currently in progress). Therefore, sampling will take place outside the heating season period. However, the building's heating and ventilating system does not create a negative indoor air pressure in either season (heating or non-heating). Efforts will be made to conduct the sampling with the building's overhead doors closed as much as practical.

SAMPLE TYPES AND LOCATIONS

The number of samples was selected to assess spatial variability of sub-slab soil vapor across the slabs of Building 2 and the former garage. New Jersey Department of Environmental Protection published a VI guidance document that recommends the number of samples based on the area of the slab. Given that Building 2's slab area is ~300,000 square feet and the former garage is ~8,000 square feet, the guidance recommends 10 sub-slab soil vapor samples be collected in Building 2, and four be collected in the former garage, depending on several factors. One of the factors pertinent to Building 2 is the presence of enclosed areas within the larger manufacturing and storage areas of both tenant spaces. **Figure 2** shows the anticipated enclosed areas as identified by the current property owner.

Figure 2 also show the number and locations of the proposed sampling. Also shown are previous sample locations that are not proposed for resampling. Building 2 samples will be collected in the four largest enclosed areas, along the north end of the building where soil vapor has been found to be highest, and other locations to provide spatial representation. The total number of sample locations, including previously sampled ones, is 11.

There are three separate areas within the former garage. The north end area is vacant. Therefore, samples will be collected in the two occupied areas. Although the total number of sample locations (2) is less than recommended, sampling in the former garage is expected to be significantly impacted by indoor air sources of the same petroleum related compounds that could possibly be found in soil vapor. LMC has committed to do more sampling in the former garage during the upcoming heating season if warranted by the proposed sampling event results.

In summary, OBG will collect a total of 10 sets of samples (each set consisting of one sub-slab sample and one indoor air sample) from within Building 2 and the former maintenance garage, at locations shown in **Figure 2**. One ambient air sample will be collected upwind of both buildings, simultaneously with the sub-slab/indoor air samples.

SAMPLE COLLECTION METHODOLOGY

All sample collection procedures will be conducted in accordance with the approved September 19, 2006 work plan for this site, which was modified by an addendum, dated January 8, 2007, and which was modified and approved by NYSDEC in a letter dated January 19, 2007, all of which are provided as **Attachment 1**. Example sample collection field form and a building survey form are provided in **Attachment 2**. As part of the building survey, a chemical inventory will be performed. The inventory will attempt to identify any chemicals used or stored in the building that may affect indoor air sampling.

Sub-slab samples will be collected through temporary or permanent sampling points in the concrete floor as shown on Figure 2. All samples will be collected over an 8-hour period, utilizing batch-certified clean 6-liter pre-evacuated canisters for sub-slab samples and individually-certified clean canisters for indoor air and ambient air samples.

SAMPLE ANALYSIS

Samples (canisters) will be delivered to a laboratory that is certified by the Environmental Laboratory Approval Program (ELAP) and certified by NYSDOH for USEPA Method TO-15 under routine Chain-of-Custody protocols. The samples will be analyzed for standard compounds via USEPA Method TO-15.

QUALITY ASSURANCE/QUALITY CONTROL

One duplicate sample of sub-slab vapor will be collected to assess overall precision. No trip or equipment blanks are planned. Leak testing of sub-slab sampling probes will be conducted using helium tracer gas in accordance with the attached standard operating procedure (**Attachment 3**). Analytical QA/QC requirements of USEPA Method TO-15 will be followed by the laboratory. Data will be validated and a data usability summary report (DUSR) will be prepared.

DATA EVALUATION AND REPORTING

Sample results will be evaluated to determine the current status of the site. A Technical Memorandum will be prepared following data validation, and will consist of the following:

- Sampling program overview
- Sampling and analytical methods
- Field forms
- QA/QC results and discussion
- Laboratory reports (Category B documentation)
- Data usability summary report
- Results and discussion
- Data evaluation
- Recommendations for follow-on actions

LMC has committed to conduct VI sampling at this site during the upcoming heating season. The Technical Memorandum will propose modifications to this work plan based on the results of this proposed sampling event.

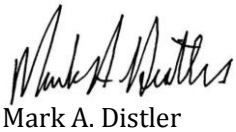
Once the NYSDEC provides written approval of this sampling plan, we will coordinate the fieldwork with the current property owner and tenants. If you have questions regarding this plan or require additional information, please do not hesitate to contact Eric Alongi at (315) 956-6674 or Mark Distler at (315) 956-6536.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Eric Alongi
Project Associate

O'BRIEN & GERE ENGINEERS, INC.

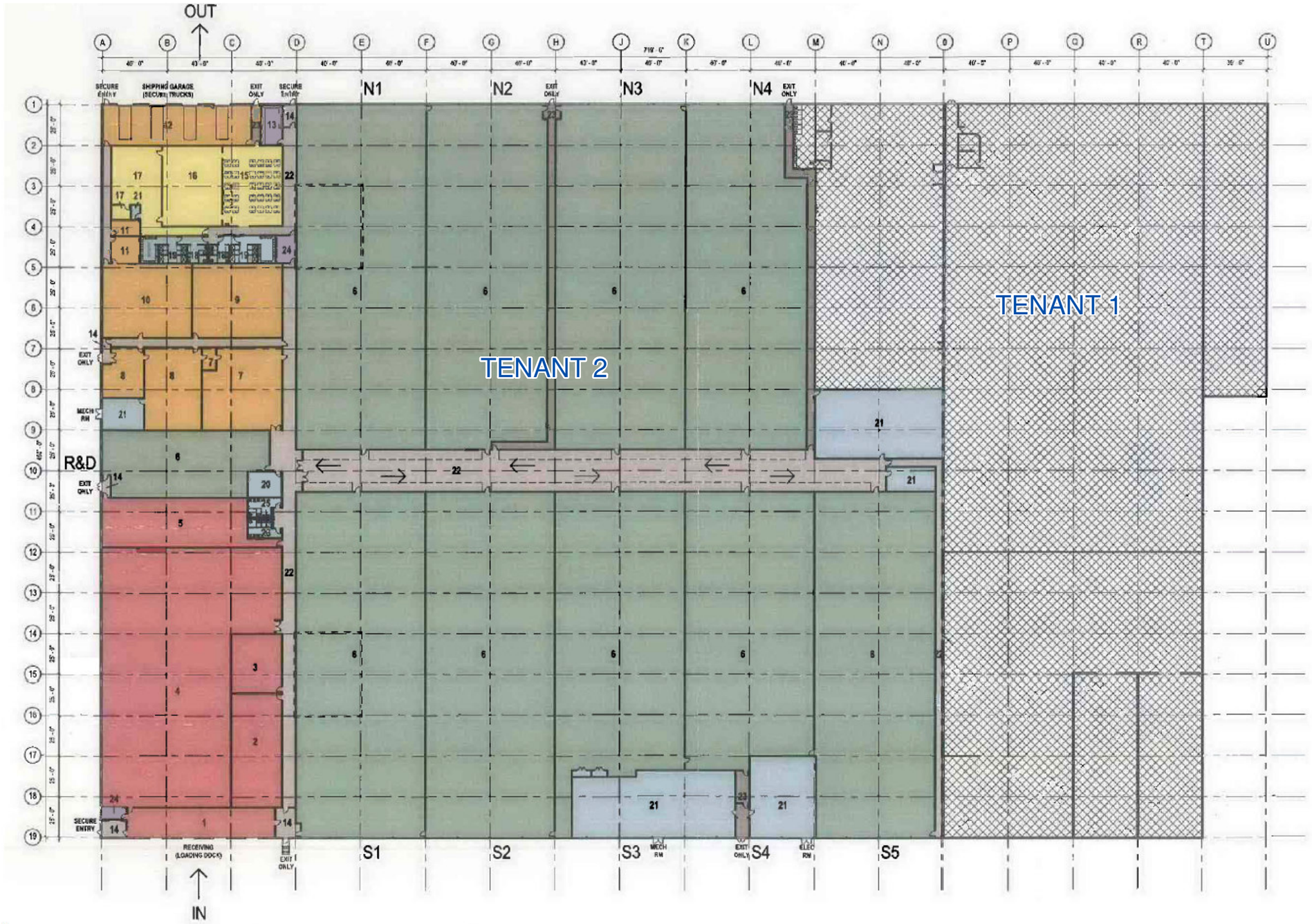


Mark A. Distler
Senior Vice President

Attachments: Figure 1 – Building 2 Floor Plan
Figure 2 – Proposed Sampling Locations
Attachment 1 – Previously Approved Work Plan Correspondence
Attachment 2 – Example Field Forms
Attachment 3 – Sub-Slab Soil Vapor Sampling SOP

cc: Mark Sergott – NYSDOH, Albany (1 hard copy, 1 electronic copy)
Maureen Schuck – NYSDOH, Albany (1 electronic copy)
Harry Warner – NYSDEC, Syracuse (1 electronic copy)
Marco Marzocchi – Widewaters (1 electronic copy)
Jill Fonte – LMC (1 hard copy, 1 electronic copy)
Myron Parkolap – LMC (1 electronic copy)
Ginny Robbins – BSK (1 electronic copy)

FIGURE 1



N

SPACE USE TYPE

- Manufacturing
- Manufacturing
- Manufacturing
- Security
- Cafeteria
- Support
- Circulation
- Exit Passageway
- Other Tenant

FORMER GE
FARRELL ROAD SITE
GEDDES, NY

BUILDING 2
FLOOR PLAN

SCALE IS APPROXIMATE

JULY 2015
5851/50238

O'BRIEN & GERE

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FIGURE 2

N

LEGEND

- SUB-SLAB, INDOOR AIR SAMPLE PAIR. SUB-SLAB SAMPLE COLLECTED THROUGH PERMANENT SAMPLE POINT.
- SUB-SLAB, INDOOR AIR SAMPLE PAIR. SUB-SLAB SAMPLE COLLECTED THROUGH TEMPORARY SAMPLE POINT.
- TENANT SPACE

NOTE:
- LOCATIONS APPROXIMATE

FORMER GE
FARRELL ROAD SITE
GEDDES, NY

PROPOSED SAMPLING LOCATIONS

0 60 120 240
Feet

JULY 2015
5851/50238

O'BRIEN & GERE

PLOTDATE: 07/13/15 2:20:12 PM newtonjm

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Previously Approved Work Plan Correspondence

September 19, 2006

Mr. Myron Parkolap
Lockheed Martin Corporation
PO Box 4840
Syracuse, NY 13221-4840

Re: Vapor Intrusion Sampling Work Plan
Former GE Farrell Road Site, Site # 7-34-055
Geddes, New York

File: 5851/37793 #5

Dear Mr. Parkolap:

In response to the New York State Department of Environmental Conservation's (NYSDEC) letter dated August 15, 2006, and as recommended in Lockheed Martin Corporation's (LMC) April 17, 2006 technical memorandum (Memorandum), O'Brien & Gere has prepared this vapor intrusion sampling work plan for the former GE Farrell Road site in Geddes, New York (Site). LMC has also retained O'Brien & Gere to conduct this sampling.

The NYSDEC August 15 letter was a response to an initial assessment conducted by LMC of available data on site-specific conditions and parameters to estimate the potential for vapor intrusion. The assessment was documented in the Memorandum, in which we concluded that sub-slab and indoor air sampling be conducted to further evaluate the vapor intrusion potential in the Site's Building 2. This letter constitutes a vapor intrusion sampling work plan for submission to the NYSDEC and the New York State Department of Health (NYSDOH) for review and approval prior to initiating the sampling.

Vapor Intrusion Sampling

Vapor intrusion sampling (sub-slab, indoor air, and ambient air) will be conducted at the Site's Building 2 during a normal 8-hour work shift, with applicable HVAC systems in operation under normal conditions. In addition, efforts will be made to conduct the sampling with overhead doors closed as much as practical..

Samples will be analyzed for only the eight compounds found in the Site's groundwater (see Table 1 from the Memorandum). As discussed in the Memorandum, large quantities of other compounds from indoor sources at the Site could interfere with the detection and quantification of the compounds detected in the Site groundwater. Thus analysis for only the eight compounds will minimize the detrimental impact that compounds from indoor air sources may have on the analytical method's sensitivity to detect Site-related compounds.

5000 Brittonfield Parkway / P.O. Box 4873, Syracuse, New York 13221-4873
(315) 437-6100 / FAX (315) 463-7554 ■ http://www.obg.com

Sample Types and Locations

O'Brien & Gere will collect one set of samples (each set consisting of one sub-slab sample and one indoor air sample) in the boiler room of Building 2 to evaluate vapor intrusion potential from the free product in the vicinity of AOC 7, as shown in Figure 1.

Two other sample sets will be collected from the northwest corner of Building 2. One of these sample sets will be collected within the fill material surrounding a storm sewer pipe, as shown in Figure 1. The remaining sample set will be collected at least 20 feet away from the storm sewer line. These sample sets will be collected to determine whether the sewer line is serving as a preferential pathway of vapors from the AOC 16 area. One ambient air sample will be collected upwind of Building 2, simultaneously with the sub-slab/indoor air sample sets.

Sample Collection Methodology

All sample collection procedures will be conducted in accordance with the NYSDOH February 2005 draft vapor intrusion guidance. A sample collection field form and a building survey form are provided in Attachment A. The following provides additional details and clarifications to the methods.

Sub-slab sampling procedures

Sub-slab samples will be collected by installing a temporary sampling point through the concrete floor. The following procedures for sub-slab sample collection will be followed:

- A section of ¼-inch food-grade Teflon® or polyethylene tubing will be inserted through a hole drilled through the slab. The tubing inlet will be installed approximately ¼-inch below the slab. The annular space between the hole and tubing will be sealed using 100% beeswax or permagum grout.

- The tubing will be purged using a polyethylene 60 cubic centimeter (cc) syringe. One to three tubing volumes will be purged prior to sample collection at a rate no greater than 0.2 liters per minute (lpm). The tubing will then be connected to a sample canister.

- A sample of sub-slab soil vapor will be collected over an 8-hour period, utilizing batch-certified clean 6-liter pre-evacuated canisters. The required sampling rate will be maintained by laboratory-supplied constant-differential low-volume flow controllers. Vacuum readings of the canisters will be obtained and documented prior to sample collection and upon completion of sampling. Sample identifications, vacuum readings, flow controller identification numbers, and other relevant information will be recorded on field forms.

Indoor air sampling procedures

Indoor air samples will be collected into individually-certified clean 6-liter pre-evacuated canisters positioned at approximately four to five feet above the slab (breathing zone), and during the same 8-hour period as the sub-slab sample. A chemical survey will be conducted during the sampling and documented on building survey forms.

The sampling rate will be maintained by laboratory-supplied constant-differential low-volume flow controllers. Vacuum readings of the canisters will be obtained and documented prior to sample collection and upon completion of sampling. Sample identification, vacuum readings, flow controller identification numbers, and other relevant information will be recorded on field forms.

Ambient air sampling procedures

The ambient air sample will be collected in the same manner as the indoor air samples. Sample identification, vacuum readings, flow controller identification numbers, and other relevant information will be recorded on field forms.

Sample Analysis

Samples (canisters) will be delivered to a laboratory that is certified by the Environmental Laboratory Approval Program (ELAP)and certified by NYSDOH for USEPA Method TO-15 under routine Chain-of-Custody protocols. The samples will be analyzed for the Site's eight compounds, identified in the Memorandum. Attachment B provides the reporting limits of undiluted samples using a low-level version of Method TO-15 needed to achieve low reporting limits for trichloroethylene of less than 0.25 micrograms per cubic meter ($\mu g/m^3$). The actual reporting limits may be higher than those identified in Attachment B depending on the amount of dilution needed for the analysis and calibration.

Quality Assurance/Quality Control

One duplicate sample of indoor air and one duplicate sample of sub-slab vapor will be collected to assess overall precision. No trip or equipment blanks are planned. Analytical QA/QC requirements of Method TO-15 will be followed by the laboratory. Data will be validated and a data usability summary report (DUSR) will be prepared.

Data Evaluation and Reporting

Sample results will be evaluated to determine if vapor intrusion is occurring at the Site. Indoor air concentrations that are attributable to vapor intrusion will be compared to their respective OSHA permissible exposure limit (PEL)[1].

A sampling report will be prepared following data validation , and will consist of the following:

- Sampling program overview
- Sampling and analytical methods
- Field forms
- QA/QC results and discussion
- Laboratory reports (Category B documentation)
- Results and discussion
- Data evaluation
- Recommendations for follow-on actions

Once we receive written approval of this sampling plan, we will coordinate the fieldwork with LMC, and

[1] 8-hour time weighted average, 29 CFR 1910.1000.

the property owner. If you have questions regarding this plan or require additional information, please do not hesitate to contact me at (315) 437-6100, ext. 2536.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Mark A. Distler
Vice President

Attachments: Figure 1 – Proposed Sampling Locations
Attachment A – Example Field Data Sheets
Attachment B – Target Compounds and Reporting Limits

FIGURES

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FIGURE 1

LEGEND

- SITE BOUNDARY*
- STORM SEWER*
- GROUND WATER EXTRACTION AREA*
- SUB-SLAB AND INDOOR AIR SAMPLE LOCATION*

NOTES:
* - APPROXIMATE LOCATIONS

FORMER GE
FARRELL ROAD SITE
GEDDES, NEW YORK

PROPOSED SAMPLING LOCATIONS

0 50 100 200
Feet

September 2006
37793.100.100

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PLOT DATE: 9/5/06 DIV. 001 KAC

ATTACHMENTS

ATTACHMENT A

Example Field Data Sheets

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Multiple Vapor Intrusion Sampling Form

Project # _____ Date _____

Project Name _____ Collector _____

Sample Location

_____ PID/FID meter ID _____

_____ Bar. Pressure _____

_____

Indoor Air Sample	Sub-structure Sample	Circle Sample Type: IA-DUP SS-DUP Ambient Air
Sample ID _____	Sample ID _____	Sample ID _____
Canister ID _____	Canister ID _____	Canister ID _____
Flow Controller ID _____	Flow Controller ID _____	Flow Controller ID _____
Date/Time start _____	Date/Time start _____	Date/Time start _____
Date/Time end _____	Date/Time end _____	Date/Time end _____
Gauge prior to start _____	Gauge prior to start _____	Gauge prior to start _____
Start vacuum _____	Start vacuum _____	Start vacuum _____
End vacuum _____	End vacuum _____	End vacuum _____
Complete all that apply:	Complete all that apply:	Complete all that apply:
Air temperature (°F) _____	Air temperature (°F) _____	Air temperature (°F) _____
PID/FID reading _____	PID/FID reading _____	PID/FID reading _____
in. tubing used _____	in. tubing used _____	in. tubing used _____
Purge volume _____	Purge volume _____	Purge volume _____
For indoor location:	For indoor location:	For outdoor location:
Noticeable odor _____	Noticeable odor _____	Noticeable odor _____
Intake height above floor (in) _____	Floor slab depth _____	Distance to road (ft) _____
Floor surface type _____	Intake depth below floor (in) _____	Direction to closest building (degrees) _____
Room _____	Floor surface type _____	Distance to closest building (ft) _____
Story/level _____	Room _____	Intake height above ground level (in) _____
_____	Story/level _____	Soil type _____

Comments: _____

_____

_____

_____

_____

Analytical method required _____

Laboratory used _____

O'BRIEN & GERE

Indoor Air Quality Building Survey

Date _____
Collector _____
Affiliation _____

Access Contact _____ Address _____
Phone _____
Best time to contact _____

Owner ☐ Renter ☐ Other ☐ Access Agreement Signed _____

Date built _____ Building type:
Yrs. of residence _____ Residential ☐ School ☐ Industrial ☐
No. of occupants _____ Commercial ☐ Church ☐ Other _____

Check all that apply:

Ranch ☐ Raised Ranch ☐ 2-Family ☐ Apartments ☐
Cape ☐ Colonial ☐ Duplex ☐ Condominium ☐
3-Family ☐ Mobile Home ☐ Other (specify) _____

Above grade building construction

Wood frame ☐ Poured concrete ☐ Stone ☐
Brick ☐ Concrete block ☐ Other _____

Foundation construction

Fieldstone ☐ Solid top concrete block ☐ Slab on grade ☐
Poured concrete ☐ Open top concrete block ☐ Other _____

Is the owner aware of any additions made to the original design of the structure? (please specify)

_____

_____

Utilities

Sewer:
Public ☐
Private ☐
Other _____

Water:
Public ☐
Private ☐
Other _____

Spring ☐
Well ☐

Hot water heater type:
Gas ☐ Electric ☐
Oil ☐ Other _____

Heating, ventilation, and air conditioning systems

Primary heat type:
Hot air ☐
Hot water ☐
Steam radiator ☐
Electric ☐
Solar ☐
Other _____

Fuel type (heat):
Natural gas ☐
Fuel oil ☐
Electric ☐
Wood ☐
Other _____

Secondary heat type:
Kerosene ☐
Wood stove ☐
Electric ☐
Propane ☐
Other _____

Ventilation types:
Attic fan ☐
Kitchen hood ☐
Bathroom fan ☐
Other _____

Ceiling fan ☐
Air filtration ☐
Induced fireplace ☐
Other _____

Air conditioning:
Window units ☐
Furnance unit ☐
Electric ☐
Other _____

Basement type

None ☐ Half ☐ Vented crawlspace ☐ Other _____
Full ☐ Slab on grade ☐ Unvented crawlspace ☐

If slab on grade, is there a garage with occupied space above? _____

Basement depth below grade (feet)

Front _____ Rear _____ Side 1 _____ Side 2 _____

Basement characteristics

General:		Floor:		Walls:			
No. of rooms	☐	Earth	☐	Finished	☐	Paneling	☐
Bathroom	☐	Concrete	☐	Unfinished	☐	Tile	☐
Basement use _____		Tile	☐	Painted	☐	Insulated	☐
		Carpet	☐	Sheetrock	☐	Uninsulated	☐
		Other _____		Other _____			

Check if present:

Fireplace	☐	Elevator	☐	French drain	☐
Sump pump	☐	Ash cleanout	☐	Floor cracks	☐
Floor drains	☐	Water damage	☐	Wall cracks	☐
Interior walls	☐	Jacuzzi/hot tub	☐	Other _____	

Does the basement have a moisture problem? _____
Does the basement ever flood? (specify frequency) _____
Does the basement have a radon system installed? _____
Has there been recent purchases of furnishings (carpets, rugs, linoleum, tile, or funiture) or remodeling (new construction,roofing, or floor stripping? (please specify) _____

Chemical usage, exposure and storage

Identify occupant hobbies:

Painting	☐	Electronics	☐	Model making	☐
Stained glass	☐	Woodworking	☐	Auto repair	☐
Jewelry making	☐	Furniture refinishing	☐	Other _____	

Where in the structure are these hobbies conducted? _____
Does the occupants' job require chemical exposure? _____
If so, where are the occupants clothes cleaned? _____

Has the structure been fumigated in the last year? _____
If so, is fumigation regularly performed? (how often) _____
Are pesticides frequently applied to lawn or garden? _____
If so, are they stored on the property? _____

Identify chemicals stored in the basement/1st floor living space, or garage if structure is slab on grade (include fuels, solvents, cleaners, etc.) Use separate inventory sheet for each area surveyed

Brand	Product	Amount stored

Comments

Is there any other information about the structural features of this building, the habits of its occupants or potential sources for chemical contaminents to the indoor air that may be of importance in facilitating the evaluation of the indoor air quality of the building?

Identify photographs taken as additional documentation of existing conditions.

Photo ID	Description of photo

Sketch lot and sample location layout (if applicable)

ATTACHMENT B

Target Compounds and Reporting Limits

Attachment B
TO-15 Low Level Target Analytes and Reporting Limits

Compound	ppbv	ug/m^3
1,1,1-Trichloroethane	0.01	0.05
1,1-Dichloroethane	0.01	0.04
1,1-Dichloroethene	0.01	0.04
Benzene	0.01	0.03
Ethylbenzene	0.01	0.04
Xylene (total)	0.01	0.04
Trichloroethene	0.01	0.05
Napthalene	0.5	2.62

O'BRIEN & GERE

January 8, 2007

Mr. Myron Parkolap
Lockheed Martin Corporation
PO Box 4840
Syracuse, NY 13221-4840

Re: Vapor Intrusion Sampling Work Plan Addendum
Former GE Farrell Road Site, Site # 7-34-055
Geddes, New York

File: 5851/37793 #5

Dear Mr. Parkolap:

In response to the New York State Department of Environmental Conservation's (NYSDEC) letter dated December 5, 2006, this is an addendum to the September 19, 2006 Vapor Intrusion Sampling Work Plan for the above referenced site.

Rather than three sets of samples (sub-slab and indoor air samples), five sets of samples will be collected in locations approximately shown on the attached revised Figure 1. One set of samples will be collected in an area down gradient of AOC#7. Three sets of samples will be collected near the northern end of Building 2. The fifth set of samples will be collected in the only office area in Building 2, which is located near the loading docks.

The samples will be analyzed for a larger list of USEPA TO-15 analytes, as shown in the attached revised Attachment B. This list is shorter than the standard TO-15 method because a low-level analysis will need to be conducted in order to achieve or be below the 0.25 microgram per cubic meter (ug/m^3) reporting limit for TCE as required by the NYSDOH guidance. As you may know, laboratories cannot achieve the low reporting limit for TCE without reducing the number of target analytes. All Site compounds are included on this list; naphthalene had to be specifically added.

All other details provided in the September 19, 2006 work plan remain the same.

5000 Brittonfield Parkway / P.O. Box 4873, Syracuse, New York 13221-4873
(315) 437-6100 / FAX (315) 463-7554 ■ http://www.obg.com

If you have any questions or comments on this addendum, please do not hesitate to contact me at (315) 437-6100, ext. 2536.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Mark A. Distler
Vice President

Attachments: Figure 1 (Revised) – Proposed Sampling Locations
Attachment B (Revised) – Target Compounds and Reporting Limits

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PLOT DATE: 12/21/06 DIV. 001 KAC

FIGURE 1

LEGEND

- SITE BOUNDARY*
- STORM SEWER*
- GROUND WATER EXTRACTION AREA*
- SUB-SLAB AND INDOOR AIR SAMPLE LOCATION*

NOTES:
* - APPROXIMATE LOCATIONS

FORMER GE
FARRELL ROAD SITE
GEDDES, NEW YORK

PROPOSED SAMPLING LOCATIONS

0 50 100 200
Feet

December 2006
37793.100.100

O'BRIEN & GERE ENGINEERS, INC.

Attachment B (Revised)
Target Analytes and Minimum Reporting Limits

Compound	Molecular Weight	Indoor Air & Ambient Air RL (ppbv)	Indoor Air & Ambient Air RL (ug/m$^{3)}$	Sub-Slab & Soil Gas RL (ppbv)	Sub-Slab & Soil Gas RL (ug/m$^{3)}$
1,1,1-Trichloroethane	133.42	0.04	0.22	0.16	0.9
1,1,2,2-Tetrachloroethane	167.86	0.04	0.27	0.16	1.1
1,1,2-Trichloroethane	133.42	0.04	0.22	0.16	0.9
1,1-Dichloroethane	98.97	0.04	0.16	0.16	0.65
1,1-Dichloroethene	96.95	0.04	0.16	0.16	0.63
1,2-Dibromoethane	187.88	0.04	0.31	0.16	1.2
1,2-Dichloroethane	98.96	0.08	0.32	0.16	0.65
1,2-Dichloropropane	112.99	0.08	0.37	0.16	0.74
1,3,5-Trimethylbenzene	120.19	0.04	0.20	0.16	0.8
1,3-Butadiene	54.09	0.08	0.18	0.4	0.9
2,2,4-Trimethylpentane	114.23	0.04	0.19	0.16	0.7
3-Chloropropene	76.53	0.08	0.25	0.4	1.3
4-Ethyltoluene	120.2	0.04	0.20	0.16	0.8
Benzene	78.11	0.04	0.13	0.16	0.51
Bromodichloromethane	163.83	0.04	0.27	0.16	1.1
Bromoethene	106.96	0.08	0.35	0.16	0.70
Bromoform	252.75	0.04	0.41	0.16	1.7
Bromomethane	94.95	0.08	0.31	0.16	0.62
Carbon Tetrachloride	153.84	0.04	0.25	0.16	1.0
Chloroethane	64.52	0.08	0.21	0.4	1.1
Chloroform	119.39	0.04	0.20	0.16	0.8
cis-1,2-Dichloroethene	96.95	0.04	0.16	0.16	0.63
cis-1,3-Dichloropropene	110.98	0.04	0.18	0.16	0.73
Cyclohexane	84.16	0.04	0.14	0.16	0.55
Dibromochloromethane	242.74	0.04	0.40	0.16	1.6
Dichlorodifluoromethane	120.92	0.04	0.20	0.4	2.0
Dichlorotetrafluoroethane	170.93	0.04	0.28	0.16	1.1
Ethylbenzene	106.16	0.04	0.17	0.16	0.69
m,p-Xylene	106.16	0.08	0.35	0.4	1.7
Methyl tert-Butyl Ether	88.15	0.04	0.14	0.4	1.4
n-Heptane	101.2	0.04	0.17	0.16	0.66
n-Hexane	86.18	0.08	0.28	0.4	1.4
o-Xylene	106.16	0.04	0.17	0.16	0.69
Tetrachloroethene	165.85	0.04	0.27	0.16	1.1
Toluene	92.13	0.04	0.15	0.16	0.60
trans-1,2-Dichloroethene	96.95	0.04	0.16	0.16	0.63
trans-1,3-Dichloropropene	110.98	0.04	0.18	0.16	0.73
Trichloroethene	131.4	0.04	0.21	0.16	0.9
Trichlorofluoromethane	137.38	0.04	0.22	0.16	0.9
Vinyl Chloride	62.5	0.08	0.20	0.16	0.41
Additional Analyte(s) - Special Request					
Naphthalene	128.17	0.5	2.62	0.5	2.62

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau B, Section B, 12th Floor
625 Broadway, Albany, New York 12233-7016
Phone: (518) 402-9774 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Denise M. Sheehan
Commissioner

January 19, 2007

Myron J. Parkolap
Environment, Safety & Health
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, NY 13221-4840

Re: Soil Vapor Intrusion Work Plan
G.E. Farrell Rd., Onondaga County
Site No. 734055

Dear Mr. Parkolap:

The New York State Departments of Health and Environmental Conservation have completed its review of the September 19, 2006 Vapor Intrusion Sampling Work Plan and the January 8, 2007 Vapor Intrusion Sampling Work Plan Addendum, prepared by O'brien & Gere on behalf of Lockheed Martin Corporation (LMC) for the subject site. Based upon the information and representations given in the Work Plan and the addendum, the Work Plan is hereby approved with the following requirements:

1. The samples should be analyzed for the full list of the EPA Method TO-15 compounds in the first round (at a minimum) and by methods that can achieve minimum reporting limits of 1 microgram per cubic meter ($\mu g/m^3$) or less to allow comparison of the result to background levels. Note that, for indoor air and ambient air samples only, if Trichloroethene (TCE) and Carbon Tetrachloride (CT), as analyzed under EPA Method TO-15, are non-detect at 1 $\mu g/m^3$, the sample shall be analyzed by EPA Method TO-15 SIMs for TCE and CT only to a required reporting limit of 0.25 $\mu g/m^3$.

2. All sample procedures will be conducted in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York - October 2006.

Please be aware that the report should not compare indoor air results to OSHA permissible exposure levels but rather to background ambient levels. A final report that does not provide the appropriate analysis will be returned for revision. Also, be aware that upon review of data from the pending sampling effort, additional soil vapor sampling may be necessary in certain areas to

further evaluate the potential of soil vapor intrusion. LMC should consider an expedited turn around time for the samples' analysis in an effort to maximize the level of investigation that can be performed during this heating season.

Finally, notify me at least one week prior any field activities. Should you have any questions regarding this communication, please call me at (518) 402-9774 or at 1-888-212-9586.

Sincerely,

Javier Perez
Environmental Engineer

ecc: S. Shearer
J. Burke
J. Quinn
M. Peachey
G. Laccetti
M. Van Valkenburgh

Example Field Forms

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Air conditioning: Central Air Window units Open Windows None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA
Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: Public Water Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

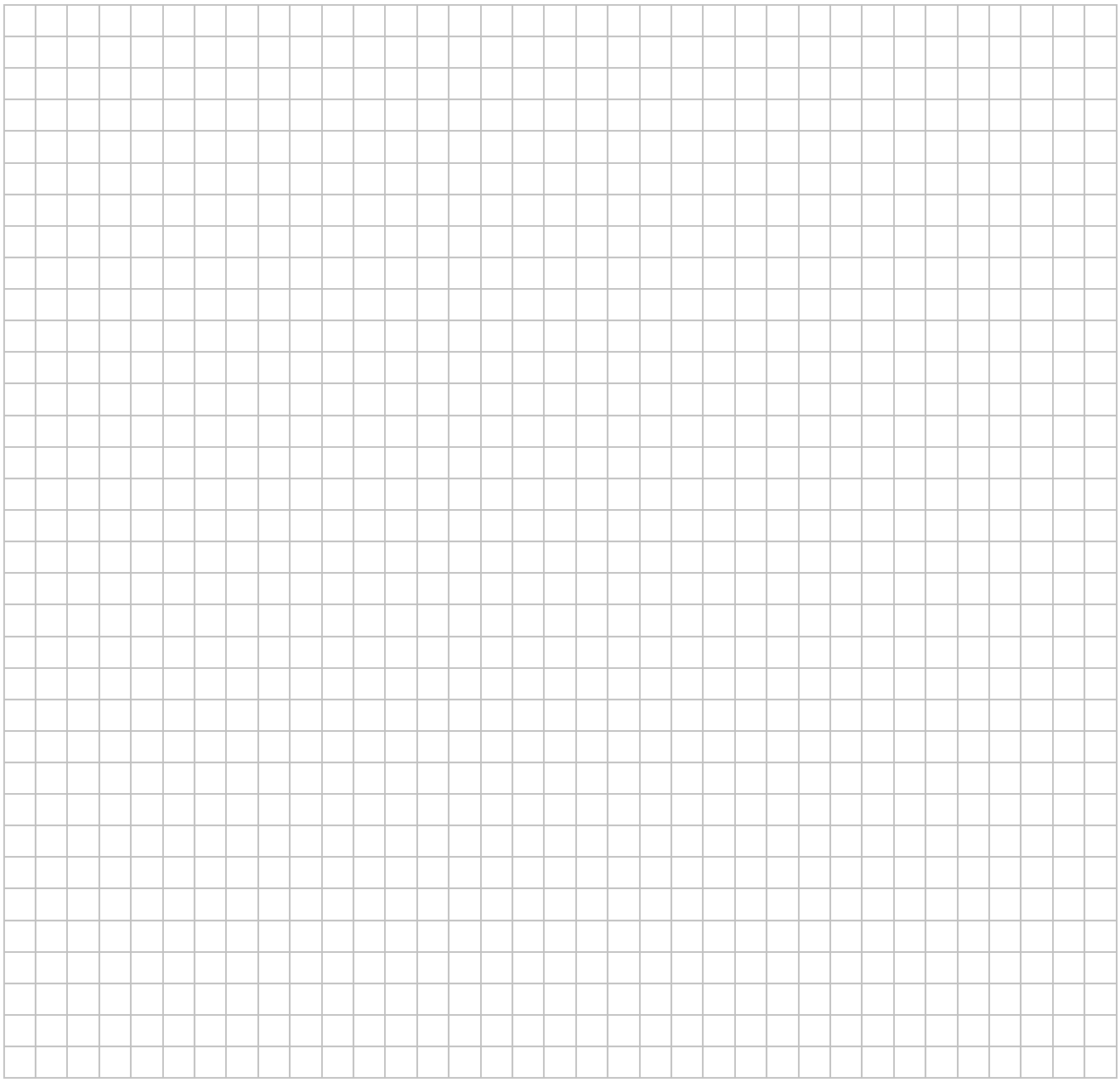
Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

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O'BRIEN & GERE

Multiple Vapor Intrusion Sampling Form

		Collector(s)		**Barometric Pressure(in Hg)**		**Building Survey/Chemical Inventory Form Completed?**	
		Structure Location		**Humidity(%)**		**Photographs Taken?**	
Project #		**Sample Location(s)**		**Weather Conditions**		**PID Meter ID**	
Project Name						**Date of Calibration**	
Site Code							
Date							

Indoor Air Sample		**Sub-structure Sample**		*Circle Sample Type:* **SS-DUP** **IA-DUP** **Indoor Air**		**Ambient**	
Sample ID		Sample ID		Sample ID		Sample ID	
Canister ID		Canister ID		Canister ID		Canister ID	
Flow Controller ID		Flow Controller ID		Flow Controller ID		Flow Controller ID	
Date/Time start		Date/Time start		Date/Time start		Date/Time start	
Date/Time end		Date/Time end		Date/Time end		Date/Time end	
Gauge prior to start		Gauge prior to start		Gauge prior to start		Gauge prior to start	
Start Pressure		Start Pressure		Start Pressure		Start Pressure	
End Pressure		End Pressure		End Pressure		End Pressure	
Complete all that apply:		Complete all that apply:		Complete all that apply:		Complete all that apply:	
		Air temperature (°F)					
Air temperature (°F)		PID reading		Air temperature (°F)		Air temperature (°F)	
PID reading		in. tubing used		PID reading		PID reading	
in. tubing used		Tubing purged?		in. tubing used		in. tubing used	
Tubing purged?		For indoor location:		Tubing purged?		Tubing purged?	
		Noticeable odor					
For indoor location:		Floor slab depth		For indoor location:		For outdoor location:	
		Intake depth below floor (in)				Noticeable odor	
Noticeable odor		Floor surface type		Noticeable odor		Distance to road (ft)	
Floor slab depth		Room		Floor slab depth		Direction to site building (°)	
Intake height above floor (in)		Story/level		Intake depth below/above floor (in)		Distance to site building (ft)	
Floor surface type		SS-Moisture(Circle) Dry Damp Saturated		Floor surface type		Intake height above ground level (in)	
Room				Room			
Story/level		SS-Material(Circle) Dirt Wood Stone Fill		Story/level		Wind Direction	
						Wind Speed	
Analytical methods required		Tracer Gas(if applicable)		Comments			
Laboratory used		Chamber concentration					
Sample Duration (Intended)		Purge Concentration					

Sub-Slab Soil Vapor Sampling SOP

SUB-SLAB VAPOR SAMPLE COLLECTION PROCEDURES

This set of procedures outlines the general steps to collect sub-slab vapor samples. It also includes leak testing of the sample probe with a helium tracer gas. The site-specific Sampling and Analysis Work Plan should be consulted for proposed sample locations, sample depths, and sampling duration.

Sub-Slab Vapor Probe Installation

Temporary sampling probes will be installed using the following procedures:

- Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).

- If appropriate, record weather information (temperature, barometric pressure, rainfall, wind speed, and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may have occurred over the past 24 to 48 hours and that do occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

- Identify sampling location(s) on a floor plan that also identifies any slab breeches (e.g., utility penetrations, sumps, drains, and cracks) and locations of HVAC equipment.

- Insert a section of food-grade (inert) Teflon® or other appropriate tubing through a 3/8-inch (approx.) hole drilled through the slab. If necessary, advance the drill bit 2 to 3 inches into the sub-slab material to create an open cavity. Use the bit to measure the slab thickness.

- Install the tubing inlet to the specified sampling depth at or near the bottom of the slab.

- Seal the annular space between the hole and tubing using 100% beeswax or another inert, non-shrinking sealing compound such as permagum®.

Sub-Slab Vapor Sample Collection

Sub-slab vapor samples will be collected by following the steps outlined below.

- Purge the tubing using a vacuum pump or gas-tight syringe (~60 cc). Calculate the volume of air (volume = $\pi r^2 h$) in the tubing and purge three tubing volumes prior to sample collection at a rate no greater than 0.2 liter per minute (lpm).

- Use an evacuated Summa® passivated (or equivalent) canister to collect the sub-slab vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre-calibrated by the laboratory for the desired flow rate or duration of sample collection, as defined in the site-specific work plan. The sampling flow rate should always be less than 0.2 lpm. The canisters will be individually certified as clean by the laboratory.

- Remove the protective brass plug from canister. Connect the pre-calibrated flow controller to the canister.

- Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment-specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of-custody form for each sample.

- Connect the tubing from the sub-slab vapor sampling probe to the flow controller.

- Completely open the valve on the canister. Record the time that the valve is opened (beginning of sampling) and the canister pressure on the vacuum gauge.

- Photograph the canister and the area surrounding the canister.

- Monitor the vacuum pressure in the canister routinely during sampling, when practical (sometimes the canister will sample over a 24-hour period and routine monitoring is not practical).

- Complete the building survey and chemical inventory form.

- Stop sample collection after the scheduled duration of sample collected, but when the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

- Record the final vacuum pressure and close the canister valve. Record the date and time that sample collection was stopped.

- Remove the flow controller from the canister and replace the protective brass plug.

- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.

- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

- Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.

- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.

- Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

- For temporary probes, remove the probe and seal the slab hole with cement. Repair flooring, if any.

Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the sub-slab soil vapor probe seal and assess the potential for introduction of indoor air into the sub-slab soil vapor sample. A tracer gas evaluation should be conducted on all soil vapor probes. After the initial round of sampling and with the approval of the regulating agency, the use of tracer gas may be reduced to a minimum of 10 percent for permanent and semi-permanent probes if the initial round results showed installations with competent seals.

The following tracer gas evaluation procedure uses in-field tracer gas measurements and tracer gases (e.g., helium) that can be measured by portable detectors.

- Retain the tracer gas around the sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.

- Make sure the chamber is suitably sealed to the floor surface.

- Introduce the tracer gas into the chamber. The chamber will have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the indoor air out while introducing tracer gas. A tracer gas detector will be attached to the valve fitting at the bottom of the chamber to verify the presence of the tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >50%.

- The chamber will have a gas-tight fitting or sealable penetration to allow the sub-slab soil vapor sample probe tubing to pass through and exit the chamber.

- After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that will be pre-calibrated to extract soil vapor at a rate of no more than 0.2 lpm. Purge the tubing using the pump. Calculate the volume of air in the tubing and probe and purge one to three tubing/probe volumes prior measuring the tracer gas concentration.

- Use the tracer gas detector to measure the tracer gas concentration in the pump exhaust.

- Record the tracer gas concentrations in the chamber and in the soil vapor sample.

If the evaluation indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the surface seal is not sufficient and requires improvement via repair or replacement prior to commencement of the sample collection. A non-detectable level of tracer gas is preferred; however, if the evaluation indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the sub-slab soil vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

OBG

THERE'S A WAY