DRAFT

Vapor Intrusion Interim Measures Quarterly Report No. 1

Chamberlain Manufacturing Corporation
Former Facility at
550 Esther Street
Waterloo Iowa
EPA Docket Nos.
RCRA-07-2010-002
CERCLA-07-2010-0005
November 3, 2011
Terracon Project No. 07107020

Prepared for:
Chamberlain Manufacturing Corporation
Elmhurst, Illinois

Prepared by:
Terracon Consultants, Inc.
Bettendorf, Iowa

Terracon

November 3, 2011

United States Environmental Protection Agency
Region 7
Air, RCRA and Toxics Division
901 North 5th Street
Kansas City, KS 66101

Attention: Mr. Bruce Morrison

Re: Vapor Intrusion Interim Measures Quarterly Report No. 1
Chamberlain Manufacturing Corporation
Former Facility at 550 Esther Street
Waterloo Iowa
EPA Docket Nos. RCRA-07-2010-002 and CERCLA-07-2010-0005

Dear Mr. Morrison:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Vapor Intrusion Interim Measures (VIIM) Quarterly Report for activities in conjunction with the site referenced above and completed between July 1, 2011 and September 30, 2011. The VIIM Quarterly Report presents a summary of completed activities related to the installation of vapor mitigation systems in residential structures which demonstrate an exceedance of human-health risk-based levels.

Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Terracon Consultants, Inc.

John F. Brimeyer, PE
Environmental Manager

for: Dennis R. Sensenbrenner, PG
Senior Associate

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Appendices

CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
City ..... City of Waterloo
COC ..... Chain of Custody
EPA ..... Environmental Protection Agency
Facility ..... Chamberlain Manufacturing facility
HASP ..... Health and Safety Plan
NELAC ..... National Environmental Laboratory Accreditation Conference
PCE ..... Tetrachloroethene (or Perchloroethene)
PID ..... Photoionization Detector
ppm ..... parts per million
QA ..... Quality Assurance
QAM ..... Quality Assurance Manual
QAPP ..... Quality Assurance Project Plan
QC ..... Quality Control
RCRA ..... Resource Conservation and Recovery Act
SOP ..... Standard Operating Procedure
SOW ..... Statement of Work
TCE ..... Trichloroethene
TestAmerica ..... TestAmerica, Inc.
TSOP ..... Terracon Standard Operating Procedure
UAO ..... Unilateral Administrative Order
USEPA ..... United States Environmental Protection Agency
VIC ..... Vapor Intrusion Characterization
VIIM ..... Vapor Intrusion Interim Measures
VOC ..... Volatile Organic Compound

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VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT No. 1
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Project No. 07107020
November 3, 2011

1.0 INTRODUCTION

Terracon has developed this VIIM Quarterly Report to identify interim remedial measures completed in residential structures in which vapor concentrations related to shallow groundwater contamination from the former Chamberlain Manufacturing Facility (Facility) exceed indoor air screening levels for the period of July 1, 2011 to September 30, 2011. This VIIM Quarterly Report is submitted in accordance with the requirements of the UAO, Docket Nos. RCRA 07-2010-002 and CERCLA 07-2010-005 (UAO) dated April 20, 2010 and Task IA of the SOW attached to the UAO. Capitalized terms not defined herein have the definitions set for the in the UAO or the SOW.

1.1 Site Conditions

The Facility is an irregularly shaped parcel containing approximately 22.8 acres and located at 550 Esther Street in Waterloo, Iowa. A Topographic Vicinity Map is included as Exhibit 1 in Appendix A. A Site Diagram is included as Exhibit 2.

The Facility manufactured metal washer wringers and projectile metal parts from approximately 1919 until 1996 when it was sold to Atlas Warehouse L.C. for use as a storage facility. The Facility was subsequently abandoned and is currently vacant. The City of Waterloo (City) acquired the Facility from Atlas Warehouse L.C in 2005 in an effort to facilitate redevelopment and has demolished a significant portion of the Facility.

The Facility is zoned Heavy Industrial (M-2) by the City. The Facility is adjoined by park land to the north and south, single family residential housing to the west, and Virden Creek followed by a golf course to the east. Virden Creek is within approximately 100 feet of the Facility at its closest point. Gates Park adjoins the Facility to the north across Louise Street, to the east across Virden Creek, and to the south across the railroad tracks. Single family residences are located across East 4th Street to the west of the Facility. Single family residences are also located along the east side of East 4th between Anita and Louise Streets.

1.2 Previous Assessment Activities

Beginning in 2004, the City conducted an environmental assessment of the site using a USEPA Brownfields Grant. Results of assessment activities identified impacts to soil and groundwater at the site including a chlorinated solvent plume that extends offsite to the south and west. Site assessment activities were not completed due to funding restrictions of the Brownfields Grant program.

Subsequently, environmental assessment activities of onsite soil and groundwater conditions and the offsite chlorinated solvent plume were completed by Chamberlain. The lateral extent of the chlorinated solvent plume has been determined to extend south and west from the Facility into an area of residential development. USEPA's preliminary evaluation of the vapor intrusion to indoor air pathway resulting from the groundwater plume identified the potential for vapor intrusion into residential structures.

To further evaluate the vapor intrusion pathway, the USEPA conducted subslab vapor sampling of selected residences in November 2008. Due to problems with the sampling and analysis equipment, the sampling activities were repeated in April/May 2009. Subslab vapor samples were collected from ten homes located along and near East 4th Street and analyzed for VOCs. In addition, one indoor air sample was collected from one of the ten homes. The results of sampling activities identified PCE and TCE in excess of subslab vapor screening levels. The elevated concentrations were generally located within the 2200, 2300, and 2400 block of East 4th Street.

In accordance with the approved VIC Work Plan, Terracon completed vapor intrusion characterization at 22 of the 23 Residences that responded with fully completed Sampling Request Forms and Access Agreements from both the property owner and current renter. Sampling activities were scheduled for Residence No. 72 and the sample ports were installed; however, the resident was not available at the scheduled sample time and could not be reached for rescheduling. Initial sub-slab, indoor air, and ambient air sampling was conducted between April 25, 2011 and May 3, 2011. Based on the analytical results, the reported concentrations of sub-slab samples in four Residences were greater than the sub-slab screening level and the indoor air concentrations were greater than the indoor air screening level.

In addition, the reported concentrations of sub-slab samples in four Residences were greater than the sub-slab screening level; however, indoor air samples were not collected. In accordance with the interim measures decision matrix, Terracon proposed to collect indoor air samples from these Residences. Indoor air samples were collected from each of these four Residences on June 16, 2011 and from one of the Residences on September 14, 2011. Based on the analytical results, the reported concentrations of indoor air samples in three of these four

Residences were greater than the indoor air screening level. Sub-slab and indoor air sample results were presented in the VIC Report dated July 5, 2011.

1.3 Project Objectives

The objective of this VIIM Quarterly Report is to present the information required by Section 4.0 of the approved VIIM Work Plan dated October 14, 2010 and revised on August 1, 2011. This information includes system design "as-built," information on the expected operational life of the system, a recommendation for the frequency for monitoring and maintaining the system, criteria for determining its effectiveness, a schedule for system replacement in whole or in part (as appropriate), the frequency of system inspection by the Respondent, the results of post-installation system monitoring, and any approved deviations from the approved VIIM Work Plan.

2.0 SCOPE OF SERVICES

2.1 Mitigation Determination

Based on the decision matrix and the results of vapor characterization, seven Residences were identified during this quarterly reporting period with indoor air concentrations greater than the indoor air screening level.

2.2 Mitigation Activities

A soil vapor mitigation system, similar to a radon mitigation system, was installed as a preventive measure beneath the existing slab at those seven identified residences that elected to have a system installed. The system functions as a subslab depressurization system to induce a negative pressure in the subslab soils (relative to the pressure within the residence) in order to provide a preferential pathway for subslab soil vapors to bypass the residence.

2.2.1 Site Access

Upon receipt of analytical results in excess of USEPA-approved screening levels and approval by the USEPA, notification was provided to Residences that exceeded risk management decision criteria for the site. The notification provided an offer to complete the installation of a vapor mitigation system and included a Mitigation System Request Form and a Permission to Install and Inspect Mitigation System form. Upon receipt of fully executed forms, the system installation was scheduled and completed at seven residences.

2.2.2 System Installation Activities

Vapor mitigation systems were installed by Crystal Heating & Plumbing, Inc. (Crystal), an Iowa Department of Public Health credentialed radon mitigation specialist, under sub-contract agreement with Terracon.

2.3 Site Access Protocol

Residences were contacted at least 48 hours in advance of the start of system installation to arrange a time and date for proposed activities.

3.0 PROCEDURES

This section presents the approach to design, install, and commission the vapor mitigation systems in Residence's accepting Chamberlain's offer for a system.

3.1 System Design

Upon arrival, Crystal reviewed the Residence with Terracon and the resident to identify possible locations for system components including withdrawal points, piping, exhaust fan, and vent stack. A preliminary design was developed and approved by the resident prior to the start of system installation. The system design was dependent on actual site conditions and was developed accordingly. A drawing was developed and provided to the resident, who signed the drawing indicating their approval of the placement of system apparatus with respect to esthetics and living-space interference. Crystal completed the installation in accordance with the design drawing.

3.2 Diagnostic Tests

Where feasible, diagnostic testing was performed prior to the installation of the mitigation system to evaluate the air flow characteristics and observe the capacity of the material beneath the slab. Diagnostic testing consisted of drilling two 3-inch diameter holes through the slab, applying a vacuum to one hole, and placing a smoke bomb in the other hole. The objective of the diagnostic testing was to investigate, evaluate, and document the development of negative pressure field, via the induced movement of the air flow beneath the slab as demonstrated by the (downward) advection of smoke (air), under negative pressure, into the subsurface media.

Test holes were placed on opposite sides of the Residence, such that the pressure field under the slab could be evaluated. A "shop vac" unit was used to pump air from the extraction hole. Following the test, the test holes were converted to system extraction points.

3.3 System Installation

Based on the size of the Residences (less than 1,000 square feet each) and, if available, the results of the diagnostic testing, it was determined that one or two extraction points would meet project goals. The extraction systems consist of the cored holes in the concrete slab with vertical pipes which are sealed at the floor and exit the building to draw and expel soil vapor from beneath the concrete slab of the building. Each mitigation system was installed with a pressure gage (U-tube manometer) to allow the Residence occupants to monitor for a system malfunction. Labels were placed on system components to provide a telephone number of a Terracon contact that the occupant can call for questions and repairs.

Slab cracks, holes, and other openings were sealed, caulked, or covered. Floor drains that are not connected to the municipal sewer were not identified. Covers were installed over the top of sumps to limit potential vapor transport from the sump to indoor air. An inline electric fan was installed to provide a vacuum to draw potential vapors to the preferential pathway.

3.4 System Commissioning

Upon completion, Terracon reviewed the system installation to document that it was installed properly, was achieving the design criteria, and was performing in accordance with defined performance specifications. Results of the commissioning were recorded on the *Installation and Operation Commissioning Checklist*. An as-built drawing was prepared for each commissioned system, showing locations of suction points, piping, and fans on a plan view of the Residence. Copies of *Installation and Operation Commissioning Checklist* and completed design drawing are included in Appendix C.

The static pressure in the extraction piping (u-tube manometer readings) was observed and generally ranged from one to two inches of mercury (in. Hg.). These measurements define the operating performance of the systems as they achieve depressurization across the slab.

System components were reviewed with the residents following completion of system installation.

The expected operational life of the mitigation system is limited only by the in-line exhaust fan. PVC piping and the inline manometer have no operating components and would be expected to last indefinitely. The expected life of the in-line exhaust fan is 10 years. Terracon proposes to replace exhaust fans after 10 years if interim measures are still required.

3.5 System Operations

System inspections were conducted within 30 days after completion of the system installation to document continued operation of the system.

3.6 Post-Installation Monitoring

Following the completion of system installation, periodic monitoring and sampling will be completed to document continued performance of the system. System monitoring will consist of observation of the exterior portions of the vapor mitigation system for indications of damage, deterioration, or other visible problems. System monitoring will include reading the in-line manometer and observing blower motor operation. Results of the periodic system monitoring will be documented on a data form specific to each system installed. To verify that the system is maintaining indoor air concentrations below indoor air screening levels, indoor air samples will be collected and analyzed consistent with the procedures identified in the VIC Work Plan. Ambient air samples will be collected at a rate of one per every five indoor air samples.

Post installation monitoring will be performed in accordance with Table 3-1.

Table 3-1 Post-Installation Monitoring Schedule

Monitoring Activity	Schedule
Initial Indoor Air Sampling	Within 30 days after completion of system installation
System Inspection	Annually beginning one year after system installation
Indoor Air Monitoring	Every three years beginning three years after system installation

Indoor air monitoring results will be evaluated to determine if interim measures can be discontinued if results are results are below the risk management criteria in the VIC Work Plan.

4.0 COMPLETED SYSTEM INSTALLATIONS

Interim mitigation systems were offered to, accepted by, and installed at seven Residences. A summary of each system installation, including deviations from the VIIM Work Plan is presented below.

4.1 Residence No. 22

A vapor mitigation system was installed at Residence No. 22 on September 14, 2011. Two extraction points were installed on the east and west side of the Residence based on observation of site conditions and the results of diagnostic testing. After reviewing the layout of

the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

An approximate 1-inch diameter hole was observed in the floor slab. The hole was sealed with caulking.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

4.2 Residence No. 28

A vapor mitigation system was installed at Residence No. 28 on September 13 and September 14, 2011. Based on the size of the Residence (approximately 730 square feet), a finished basement area that limited access, and sandy soils, Crystal determined that one extraction point would be adequate. The extraction point was installed near the center of the Residence based on observation of site conditions. A single hole was cored for the extraction point. A second hole, intended for diagnostic testing, was not cored in the floor to avoid creating a potential migration pathway for future vapors. As such, diagnostic testing was not completed.

After reviewing the layout of the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Further extension of the stack was not possible.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

4.3 Residence No. 37

A vapor mitigation system was installed at Residence No. 37 on September 13 and September 14, 2011. Two extraction points were installed on the north and south side of the Residence based on observation of site conditions and the results of diagnostic testing. After reviewing the layout of the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

Photographs of the system installation are included in Appendix D.

4.4 Residence No. 38

A vapor mitigation system was installed at Residence No. 38 on August 10, 2011. Two extraction points were installed on the east and west side of the Residence based on observation of site conditions and the results of diagnostic testing. After reviewing the layout of the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Broken concrete was observed around a sanitary sewer cleanout. The broken concrete was removed and the floor was patched with new concrete. A crawl space was sealed by covering the ground with plastic sheeting and sealing the plastic to the foundation walls. The floor of the crawl space was near ground level and well above the basement floor level. Due to Crystal's concerns about possible short-circuiting of exterior air and resulting decreased system performance, an extraction point was not installed in the crawl space.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond

three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

4.5 Residence No. 45

A vapor mitigation system was installed at Residence No. 45 on July 20, 2011. Based on the size of the Residence (approximately 690 square feet), a finished basement area that limited access, and sandy soils, Crystal determined that one extraction point would be adequate. The extraction point was installed near the center of the Residence based on observation of site conditions. Diagnostic testing was conducted by placing a smoke bomb in an existing sump pump pit and inducing a vacuum at the cored extraction point.

After reviewing the layout of the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

The existing sump pump was sealed by covering with plexiglass sheeting caulked and secured to the floor. As the sump was not intended to serve as a floor drain, a trapped drain was not installed in the cover.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

4.6 Residence No. 46

A vapor mitigation system was installed at Residence No. 46 on July 13, 2011. Two extraction points were installed on the east and west side of the Residence based on observation of site

conditions and the results of diagnostic testing. After reviewing the layout of the structure, and following discussions with the resident and the owner's property manager, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

4.7 Residence No. 48

A vapor mitigation system was installed at Residence No. 48 on August 5, 2011. Two extraction points were installed on the north and south side of the Residence based on observation of site conditions and the results of diagnostic testing. After reviewing the layout of the structure, and following discussions with the resident, it was decided that the exhaust system would exit the building through the basement wall and run up the exterior of the structure. The exhaust fan was located outside of the house at a location approximately three feet above ground level.

Due to the spacing of windows, the exhaust stack could not be located more than ten feet from openings into conditioned spaces; however, the stack was approximately centered between windows and extended approximately three feet above the eave. Extension of the stack beyond three feet would have increased the unsupported length excessively resulting in a possible hazard to the system operation or to occupants of the site.

At the recommendation of Crystal, the fan was hardwired to a breaker switch in the Residence electrical panel to avoid tampering by others.

Photographs of the system installation are included in Appendix D.

5.0 INITIAL INDOOR AIR MONITORING RESULTS

5.1 Sampling Activities

Initial indoor air monitoring was conducted within 30-days following completion of system installation in accordance with the VIIM Work Plan and ITRC Guidance. Because three systems were installed during September 2011, indoor air sampling was not conducted at these locations during this quarterly reporting period. Indoor air samples were collected using laboratory prepared six-liter Summa canisters and flow controllers. The flow controllers were pre-set by the laboratory to collect samples over a 24-hour period. Terracon requested that occupants close doors and windows and operate the heating, ventilating, and air conditioning (HVAC) system for the period beginning 24-hours prior to the start of sample collection to the end of sample collection.

Consistent with VIC activities and in accordance with the USEPA approval letter dated January 6, 2011, indoor air sampling was conducted in the basement and in the lowest occupied living area of each Residence. Terracon attempted to position sample containers in the same general area of the location used for previous indoor air sampling.

Terracon field personnel connected the flow controller to the Summa canister by removing the brass cap on the canister and tightening the stainless steel Swagelok fitting on the flow controller to the threads on the canister. A wrench was used to firmly tighten the fitting.

Once sample containers were positioned, air sampling forms (project information, equipment identifiers, sample location, and start time) were filled out and attached to the canisters. A Soil Vapor/Indoor Air Sampling Information Form indicating project information, equipment identifiers, sample location, sample time, initial and final vacuum readings, etc. was completed for each indoor air sample. A COC was completed indicating the start time for the samples.

To open the canister, the valve was rotated counter-clockwise at least one full turn or otherwise opened. After the 24-hours, Terracon personnel returned to the Residence, closed the valve on the canister and recorded the time and vacuum remaining in the Summa canister on the Terracon sampling forms and on the COC. The canisters and flow controllers were then transported to the laboratory.

Initial indoor air monitoring activities are summarized in Table 5-1

.

Table 5-1 Initial Indoor Air Monitoring

Residence No.	Sample Date	Basement Sample	1st Floor Sample
38	8/30/11	X	X
45	8/12/11	X	X
46	8/12/11	X	X
48	8/30/11	X	X

5.2 Air Monitoring Results

Sub-slab vapor, indoor air, and ambient air samples were collected using six-liter Summa canisters. The Summa canisters were submitted for analysis of PCE, TCE, vinyl chloride, trans-1,2-dichloroethene (trans-DCE), cis-1,2-dichloroethene (cis-DCE), 1,1-dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane (TCA), and 1,1,2- trichloroethane, using EPA Method TO-15.

Laboratory procedures were performed by TestAmerica, Knoxville, Tennessee. TestAmerica is NELAC accredited for the laboratory methods referenced above. The laboratory QAM is on file with the USEPA. A copy of the SOPs for the specified method was included as Appendix F of the VIC Work Plan. The TestAmerica data is reported in accordance with the QAM and SOP. Copies of the laboratory analytical reports are included in Appendix G

Analytical results indicate that the reported concentration of contaminants of concern in post-installation indoor air samples are less than the pre-installation system indoor air concentrations and are below indoor air screening levels identified in the VIC Work Plan at Residences 38, 45, and 46. Monitoring activities at these residences will continue in accordance with the post-installation monitoring schedule.

The reported concentration of post-installation samples collected in the basement of Residence No. 48 are less than the pre-installation concentrations, but continue to exceed the indoor air screening level. The reported concentrations of PCE and TCE in samples collected from the first floor of Residence No. 48 are greater than the pre-installation samples and the concentration of PCE continues to exceed indoor air screening levels. The elevated PCE concentrations are indicative of a possible indoor air source. As such, post-installation monitoring will be repeated and the Occupied Dwelling Questionnaire will be reviewed with the resident during the week of November 7, 2011.

Results of pre-installation and post-installation monitoring are summarized in Table 1 through Table 4, Appendix B. Copies of analytical reports are provided in Appendix E.

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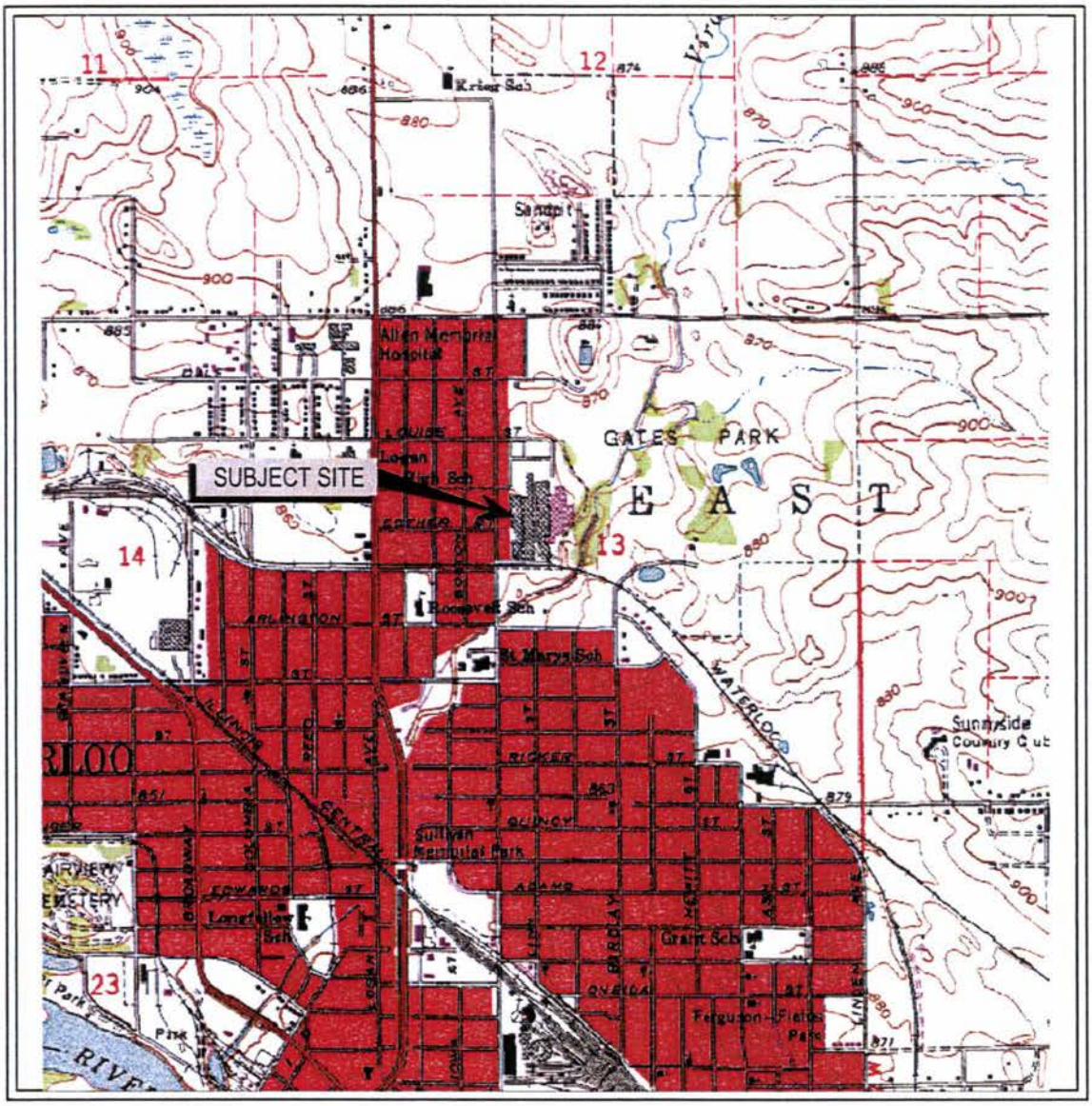
Appendix A – Exhibits

Exhibit 1 – Topographic Vicinity Map

Exhibit 2 – Site Diagram

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000

FEET

CONTOUR INTERVAL FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

TOPO LINES REPRESENT 10-FOOT CONTOURS

N

WATERLOO NORTH QUADRANGLE

7.5 MINUTE SERIES (TOPOGRAPHIC)

Project Mngr:	JFB
Drawn By:	JFB
Checked By:	JFB
Approved By:	JFB

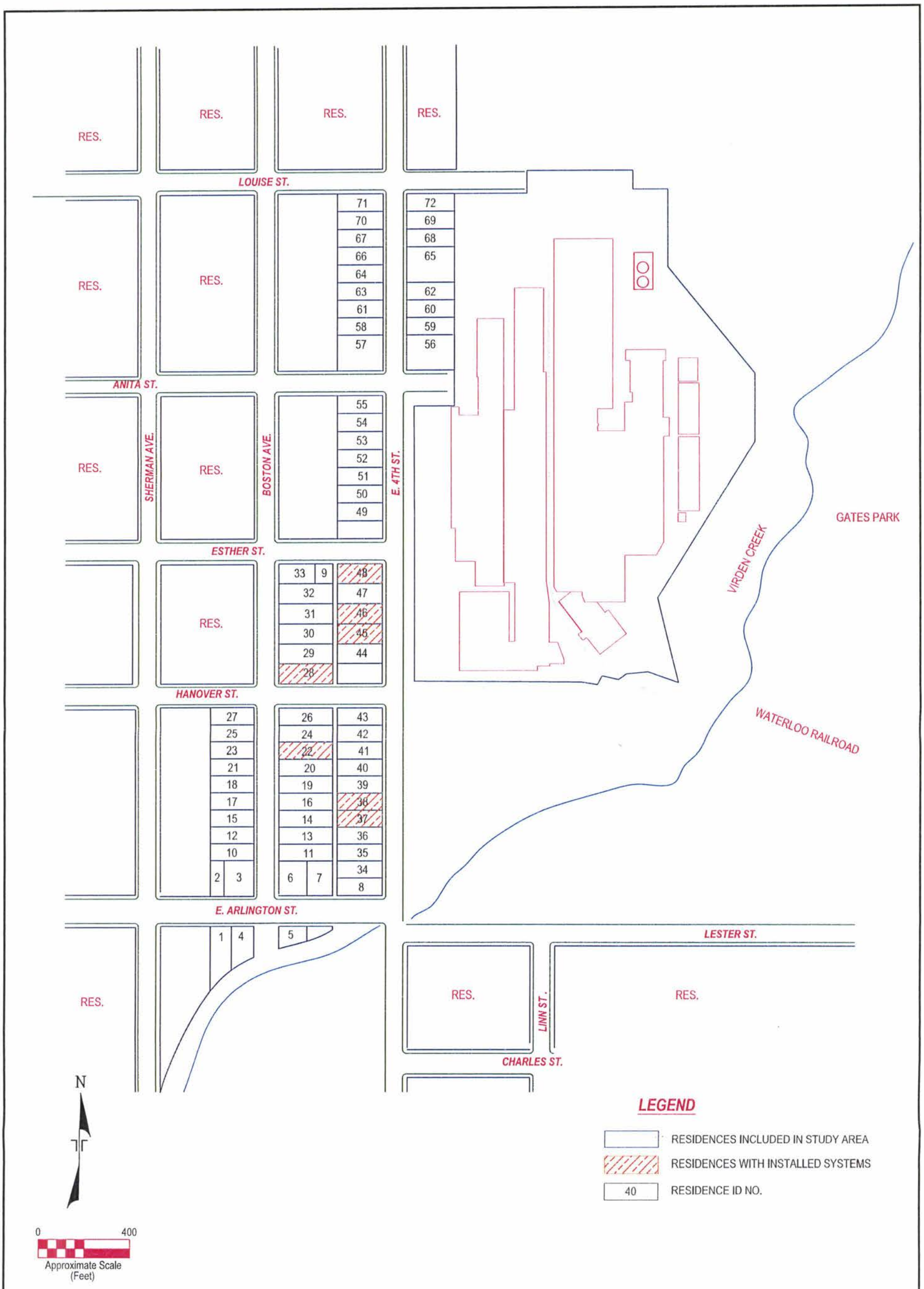
Project No.	07107020
Scale:	AS SHOWN
File No.	07107020-VIIMQR-FIG1
Date:	NOV 2011

Terracon
Consulting Engineers and Scientists
370 40th Avenue Bettendorf, Iowa 52722
(563) 355-0702 (563) 355-4789

TOPOGRAPHIC VICINITY MAP

VIIM QUARTERLY REPORT
FORMER CHAMBERLAIN MANUFACTURING FACILITY
550 ESTHER ST.
WATERLOO, IOWA

FIG. No. 1



REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists
870 40th Avenue, Bettendorf, Iowa 52722
(563) 355-0702 (563) 355-4789

SITE PLAN

VIIM QUARTERLY REPORT
FORMER CHAMBERLAIN MANUFACTURING FACILITY
550 ESTHER STREET
WATERLOO IOWA

EXHIBIT 2

PROJECT MGR:	JFB
DRAWN BY:	JFB
APPVD. BY:	JFB
SCALE:	AS SHOWN
DATE:	NOV 2011
PROJECT NO.	07107020
FILE NAME:	07107020-VIIMQR-FIG1
SHEET NO.:	2 OF 2

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Appendix B –Tables

Table 1 – Indoor Air Analytical Results – Residence No. 38
Table 2 – Indoor Air Analytical Results – Residence No. 45
Table 3 – Indoor Air Analytical Results – Residence No. 46
Table 4 – Indoor Air Analytical Results – Residence No. 48

TABLE 1
INDOOR AIR ANALYTICAL RESULTS
RESIDENCE NO. 38
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 1
CHAMBERLAIN MANUFACTURING

		Pre-Installation		Post Installation		Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level[2]
	Sample ID	IA-38-B	IA-38-MF	IA-B-38-2	IA-1-38-2			
	Date	4/29/2011	4/29/2011	8/30/2011	8/30/2011			
Analyte	Units							
Tetrachloroethene	µg/m^3	2	1.7	0.26 J	0.29 J	0.54[1]	0.11	0.41
Trichloroethene	µg/m^3	0.11 J	0.14 J	0.094 J	0.39	0.215	0.075	1.2
Vinyl chloride	µg/m^3	<0.2	<0.2	<0.2	<0.2	0.204[1]	0.074	0.165
trans-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.079	63
cis-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	0.4	0.317	0.095	63
1,1-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	0.13 J	0.317	0.052	210
1,1-Dichloroethane	µg/m^3	<0.32	<0.32	<0.32	0.068 J	0.324	0.040	1.5
1,1,1-Trichloroethane	µg/m^3	0.2 J	0.26 J	0.22 J	0.32 J	0.436	0.065	5200
1,1,2-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	<0.44	0.36[1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
A "D" following the first two letters or at the end of the Sample ID designates a sample duplicate
The numeric value following the sample type identify the Residence ID Number

TABLE 2
INDOOR AIR ANALYTICAL RESULTS
RESIDENCE NO. 45
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 1
CHAMBERLAIN MANUFACTURING

		Pre-installation		Post Installation		Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level[2]
	Sample ID	IA-B-45	IA-1-45	IA-B-45-2	IA-1-45-2			
	Date	5/3/2011	5/3/2011	8/12/2011	8/12/2011			
Analyte	Units							
Tetrachloroethene	µg/m^3	<0.54	<0.54	0.14 J	0.29 J	0.54[1]	0.11	0.41
Trichloroethene	µg/m^3	2.1	1.8	0.14 J	0.12 J	0.215	0.075	1.2
Vinyl chloride	µg/m^3	<0.2	<0.2	<0.2	<0.2	0.204[1]	0.074	0.165
trans-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.079	63
cis-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.095	63
1,1-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.052	210
1,1-Dichloroethane	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.324	0.040	1.5
1,1,1-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	<0.44	0.436	0.065	5200
1,1,2-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	<0.44	0.36[1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
A "D" following the first two letters or at the end of the Sample ID designates a sample duplicate
The numeric value following the sample type identify the Residence ID Number

TABLE 3
INDOOR AIR ANALYTICAL RESULTS
RESIDENCE NO. 46
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 1
CHAMBERLAIN MANUFACTURING

		Pre-installation		Post Installation		Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level[2]
	Sample ID	IA-B-46	IA-1-46	IA-B-46-2	IA-1-46-2			
	Date	5/3/2011	5/3/2011	8/12/2011	8/12/2011			
Analyte	Units							
Tetrachloroethene	µg/m^3	0.29 J	0.75	0.26 J	0.19 J	0.54[1]	0.11	0.41
Trichloroethene	µg/m^3	0.86	1.2	0.16 J	<0.21	0.215	0.075	1.2
Vinyl chloride	µg/m^3	<0.2	<0.2	<0.2	<0.2	0.204[1]	0.074	0.165
trans-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.079	63
cis-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.095	63
1,1-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.317	0.052	210
1,1-Dichloroethane	µg/m^3	<0.32	<0.32	<0.32	<0.32	0.324	0.040	1.5
1,1,1-Trichloroethane	µg/m^3	<0.44	1.2	<0.44	<0.44	0.436	0.065	5200
1,1,2-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	<0.44	0.36[1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
A "D" following the first two letters or at the end of the Sample ID designates a sample duplicate
The numeric value following the sample type identify the Residence ID Number

TABLE 4
INDOOR AIR ANALYTICAL RESULTS
RESIDENCE NO. 48
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 1
CHAMBERLAIN MANUFACTURING

		Pre-Installation			Post Installation				
	Sample ID	IA-48-B	IA-48-B-D	IA-48-MF	IA-B-48-2	IA-1-48-2	Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level[2]
	Date	4/29/2011	4/29/2011	4/29/2011	8/30/2011	8/30/2011			
Analyte	Units								
Tetrachloroethene	µg/m^3	1.7	2.5	0.69	0.81	0.91	0.54[1]	0.11	0.41
Trichloroethene	µg/m^3	0.18 J	0.2 J	0.16 J	0.095 J	0.27	0.215	0.075	1.2
Vinyl chloride	µg/m^3	<0.2	<0.2	<0.2	<0.2	<0.2	0.204[1]	0.074	0.165
trans-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.317	0.079	63
cis-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.317	0.095	63
1,1-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.317	0.052	210
1,1-Dichloroethane	µg/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.324	0.040	1.5
1,1,1-Trichloroethane	µg/m^3	0.13 J	0.12 J	0.12 J	<0.44	0.069 J	0.436	0.065	5200
1,1,2-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	<0.44	<0.44	0.36[1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
A "D" following the first two letters or at the end of the Sample ID designates a sample duplicate
The numeric value following the sample type identify the Residence ID Number
The letter or number ndicates the location for Indoor Air samples: B - Basement, 1 or MF - 1st or Main Floor

Terracon

Appendix C – Installation Forms

Installation and Operation Commissioning Checklist

Design Drawings

Residence No. 22

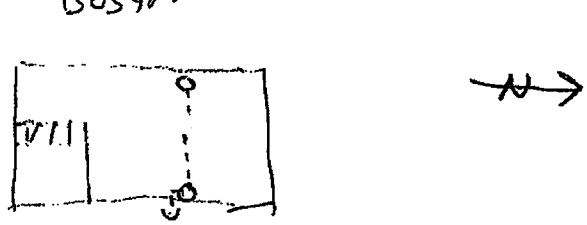
VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A
Vent pipe size/type and labeling			
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	✓		
Vent pipe diameter is approximately 3-4".	✓		
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	✓		
Vent pipe location and installation			
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	✓		
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.		✓	
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	✓		
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			✓
Vent pipe system integrity			
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	✓		
There are no visible openings or breaks in the pipe system.	✓		
A pressure monitor is present, operating, and is in an accessible location.	✓		
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)			
The sealing/caulking around the vent pipe in the basement floor is intact.	✓		
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			✓
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			✓
Electrical			
Vent fan plugged cord connection appears to be no more than 6-feet long.			✓
Vent fan plugged cord connection is visible, and not concealed within a wall.			✓
If outside the building, the vent/mitigation fan is hard wired to the electrical panel.	✓		
Vent fan appears to be wired into a non-switched circuit.	✓		
The circuit/breaker controlling the vent fan is labeled "Vapor System".	✓		
Vent or Mitigation Fan(s)			
If outside, the fan is not below ground (e.g., in a pit).	✓		
Vent fan is mounted in a vertical (not horizontal) section of pipe.	✓		
If inside, the fan is located in an unconditioned space, e.g., the attic.			✓
Sump			
If the sump is sealed and sump pit serves as a floor drain, a trapped drain (or equivalent) should be present and located in the sump cover.			✓

Comments Vent Pipe between windows and extended 3 feet above eave

Sketch:



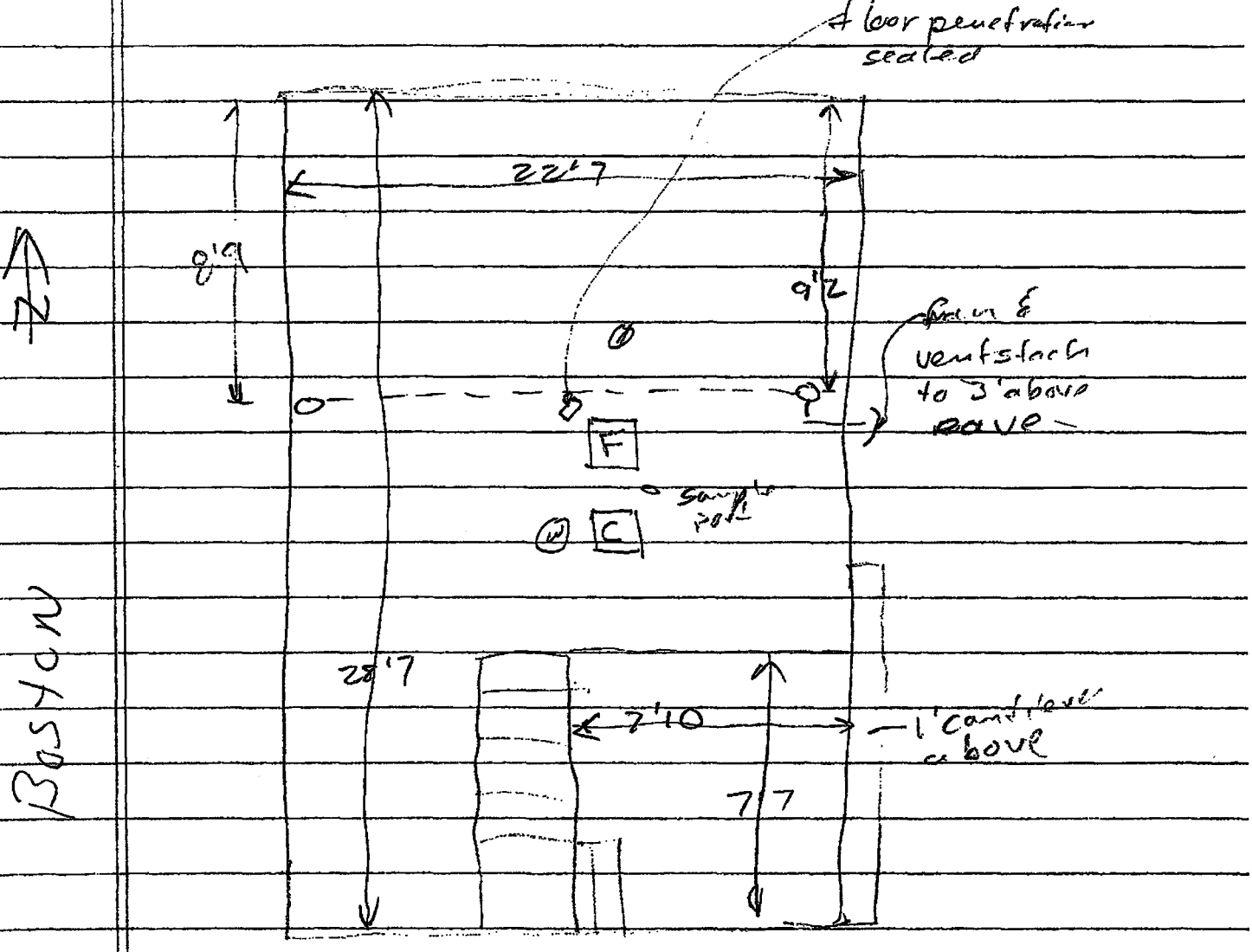
Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

System Installation Design

Residence No. 22

[redacted]

9/14/11



[redacted]

[redacted]

Residence No. 28

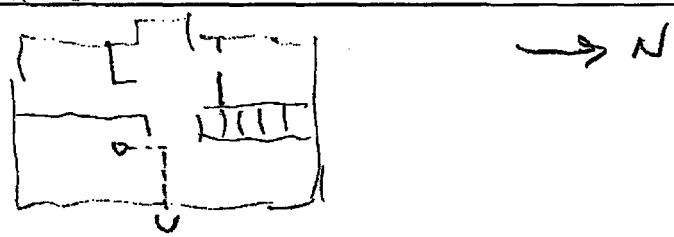
VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A
Vent pipe size/type and labeling			
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	X		
Vent pipe diameter is approximately 3-4".	X		
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	X		
Vent pipe location and installation			
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	X		
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.		X	
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	X		
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			X
Vent pipe system integrity			
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	X		
There are no visible openings or breaks in the pipe system.	X		
A pressure monitor is present, operating, and is in an accessible location.	X		
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)			
The sealing/caulking around the vent pipe in the basement floor is intact.	X		
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			X
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			X
Electrical			
Vent fan plugged cord connection appears to be no more than 6-feet long.			X
Vent fan plugged cord connection is visible, and not concealed within a wall.			X
If outside the building, the vent/mitigation fan is hard wired to the electrical panel.	X		
Vent fan appears to be wired into a non-switched circuit.	X		
The circuit/breaker controlling the vent fan is labeled "Vapor System".	X		
Vent or Mitigation Fan(s)			
If outside, the fan is not below ground (e.g., in a pit).	X		
Vent fan is mounted in a vertical (not horizontal) section of pipe.	X		
If inside, the fan is located in an unconditioned space, e.g., the attic.			X
Sump			
If the sump is sealed and sump pit serves as a floor drain, a trapped drain (or equivalent) should be present and located in the sump cover.			X

Comments exhaust centrally located between window & exhausted 3' above eave

Sketch:

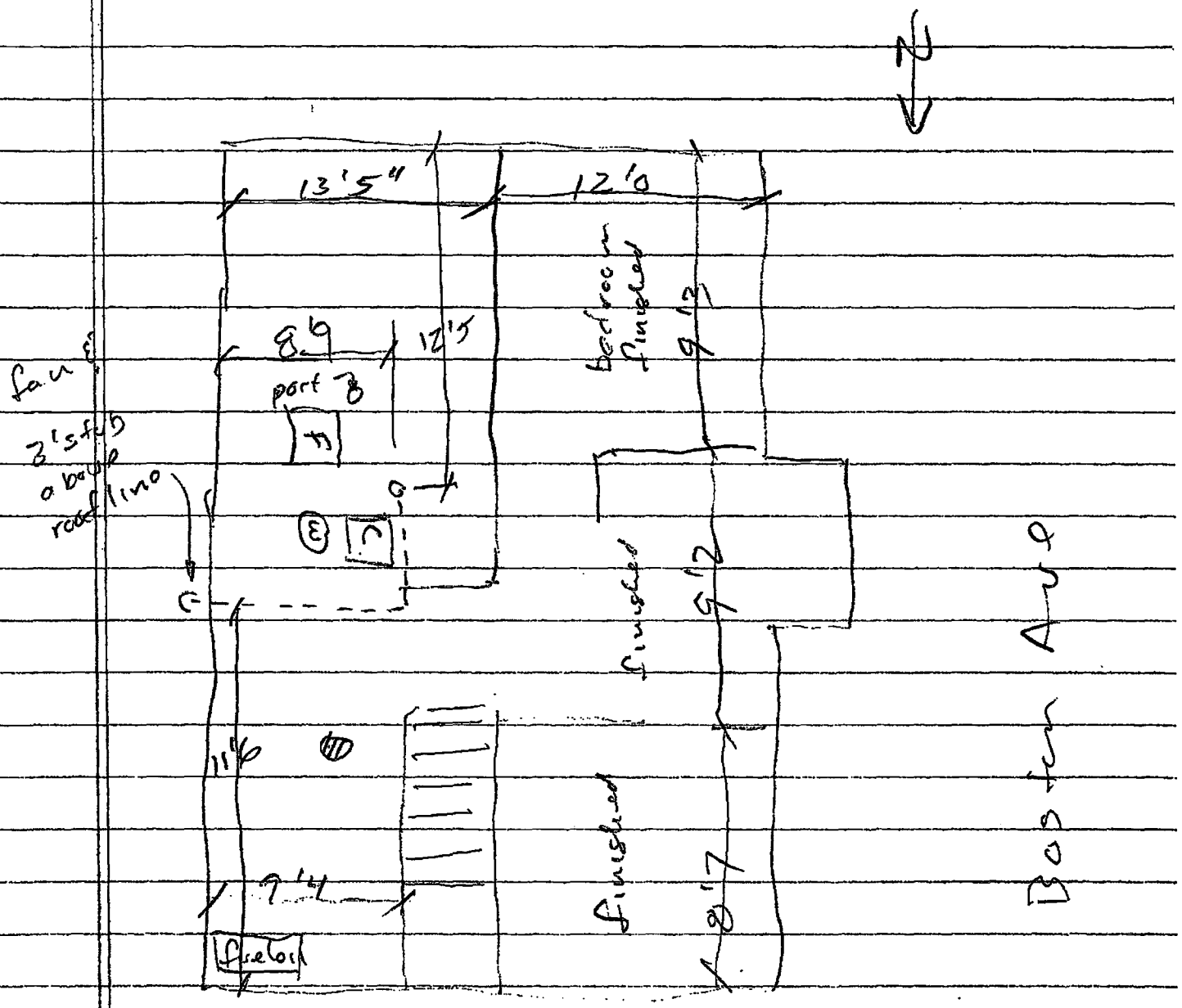


Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

System Installation Design

[redacted]

Residence No. 28



Brandon Krieger
Randy Kneedham

centrally located single extraction point due to finished area

Residence No. 37

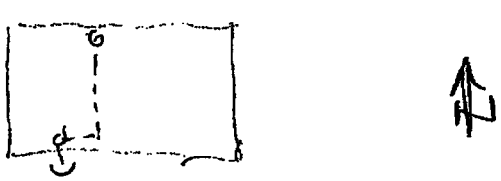
VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A
Vent pipe size/type and labeling			
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	✓		
Vent pipe diameter is approximately 3-4".	✓		
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	✓		
Vent pipe location and installation			
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	✓		
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.		✓	
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	✓		
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			✓
Vent pipe system integrity			
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	✓		
There are no visible openings or breaks in the pipe system.	✓		
A pressure monitor is present, operating, and is in an accessible location.	✓		
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)			
The sealing/caulking around the vent pipe in the basement floor is intact.	✓		
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			✓
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			✓
Electrical			
Vent fan plugged cord connection appears to be no more than 6-feet long.			✓
Vent fan plugged cord connection is visible, and not concealed within a wall.			✓
If outside the building, the vent/mitigation fan is hard wired to the electrical panel.	✓		
Vent fan appears to be wired into a non-switched circuit.	✓		
The circuit/breaker controlling the vent fan is labeled "Vapor System".	✓		
Vent or Mitigation Fan(s)			
If outside, the fan is not below ground (e.g., in a pit).	✓		
Vent fan is mounted in a vertical (not horizontal) section of pipe.	✓		
If inside, the fan is located in an unconditioned space, e.g., the attic.			✓
Sump			
If the sump is sealed and sump pit serves as a floor drain, a trapped drain (or equivalent) should be present and located in the sump cover.			✓

Comments Stack is centered between windows and extended 2-3' above eave

Sketch:



Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

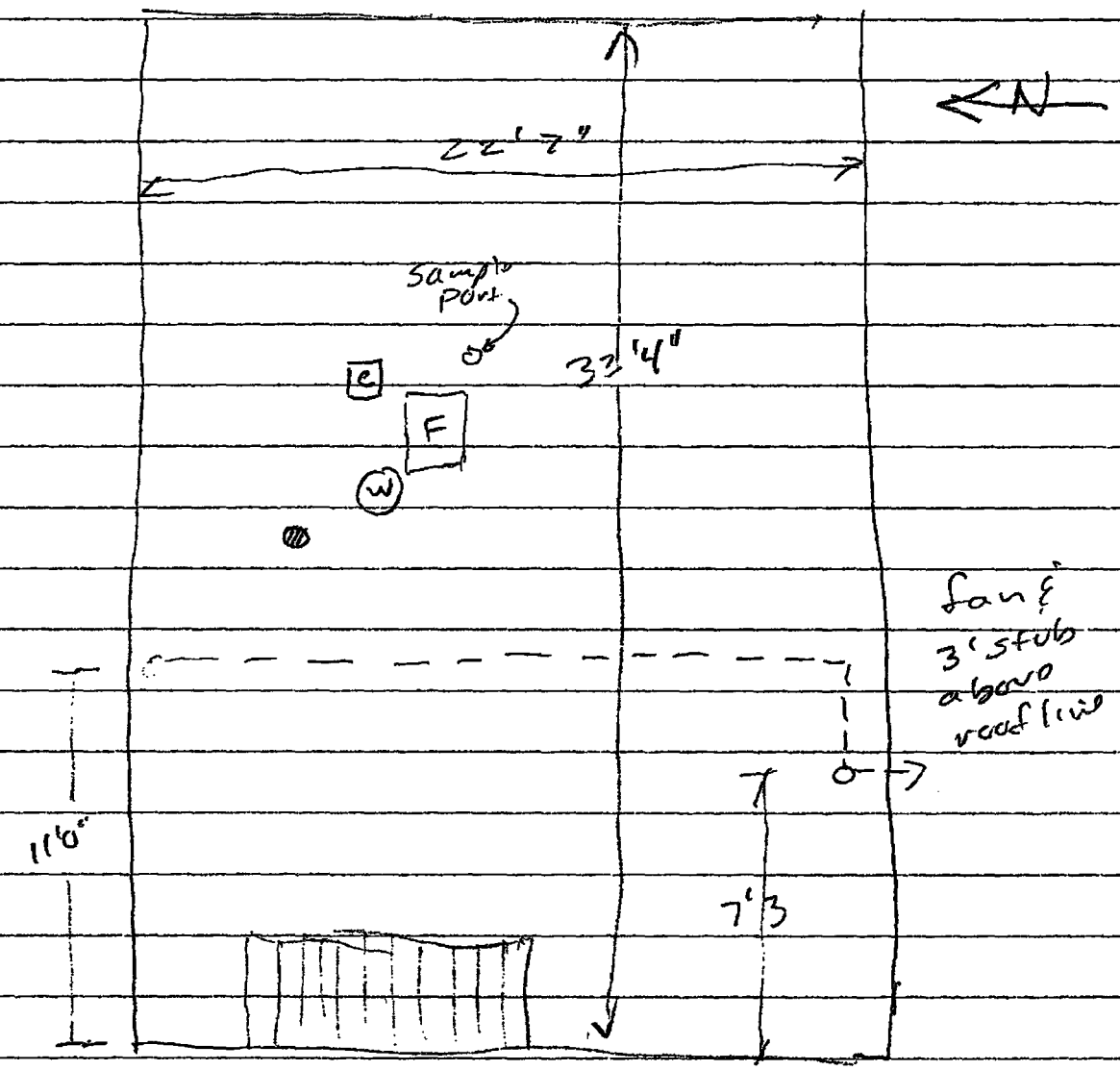
SYSTEM INSTALLATION DESIGN

Residence No. 37

[redacted]

9/13/11

E 4+6



Brandon Kruger

Mary C. Spears

Residence No. 38

VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

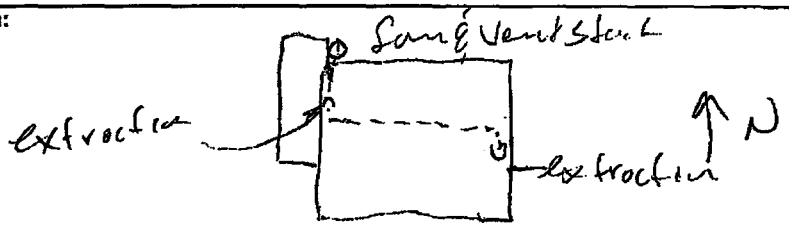
[redacted]

8/10/11

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A
Vent pipe size/type and labeling			
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	✓		
Vent pipe diameter is approximately 3-4".	✓		
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	✓		
Vent pipe location and installation			
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	✓		
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.	✓		
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	✓		
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			✓
Vent pipe system integrity			
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	✓		
There are no visible openings or breaks in the pipe system.	✓		
A pressure monitor is present, operating, and is in an accessible location.	✓		
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)			
The sealing/caulking around the vent pipe in the basement floor is intact.	✓		
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.		✓	
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".	✓		
Electrical			
Vent fan plugged cord connection appears to be no more than 6-feet long.			✓
Vent fan plugged cord connection is visible, and not concealed within a wall.			✓
If outside the building, the vent/mitigation fan is hard wired to the electrical panel.	✓		
Vent fan appears to be wired into a non-switched circuit.	✓		
The circuit/breaker controlling the vent fan is labeled "Vapor System".	✓		
Vent or Mitigation Fan(s)			
If outside, the fan is not below ground (e.g., in a pit).	✓		
Vent fan is mounted in a vertical (not horizontal) section of pipe.	✓		
If inside, the fan is located in an unconditioned space, e.g., the attic.			✓
Sump			
If the sump is sealed and sump pit serves as a floor drain, a trapped drain (or equivalent) should be present and located in the sump cover.			✓
Comments			

Sketch:

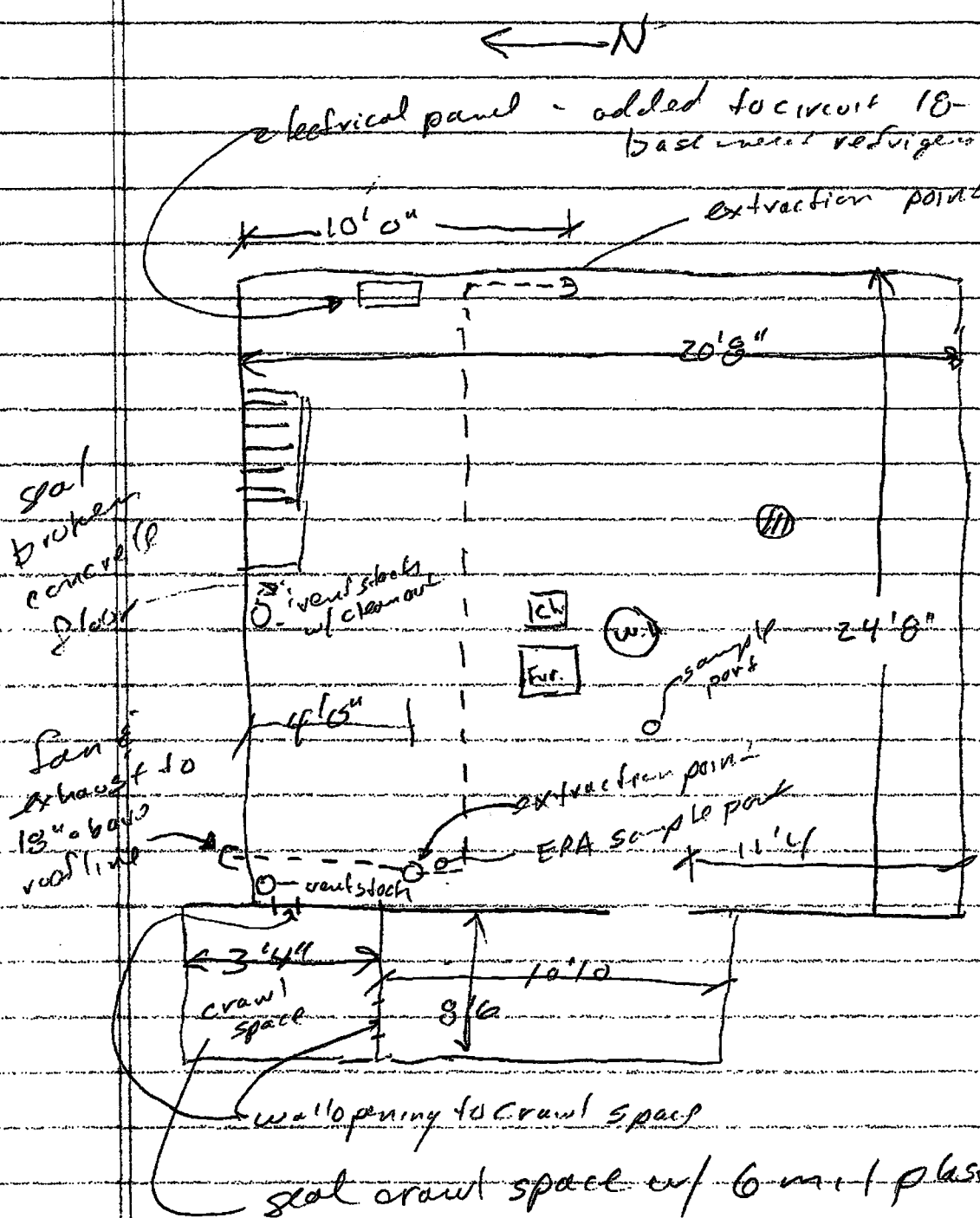


Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

Residence No. 38

VAPOR SYSTEM DESIGN

[redacted] 8/10/11



Brandon Kruppa
R. Turyen

Residence No. 45

VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A	
Vent pipe size/type and labeling				
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	X			
Vent pipe diameter is approximately 3-4". 4"	X			
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	X			
Vent pipe location and installation				
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	X			
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.		X		see note 1
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	X			
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			X	
Vent pipe system integrity				
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	X			
There are no visible openings or breaks in the pipe system.	X			
A pressure monitor is present, operating, and is in an accessible location.	X			
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)				
The sealing/caulking around the vent pipe in the basement floor is intact.	X			
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			X	
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			X	
Electrical				
Vent fan plugged cord connection appears to be no more than 6-feet long.			X	
Vent fan plugged cord connection is visible, and not concealed within a wall.			X	
If outside the building, the vent/mitigation fan is hard wired to a disconnect switch.		X		see note 2
Vent fan appears to be wired into a non-switched circuit.	X			
The circuit/breaker controlling the vent fan is labeled "~~Radon~~ Mitigation System".	X			
Vent or Mitigation Fan(s)				
If outside, the fan is not below ground (e.g., in a pit).	X			
Vent fan is mounted in a vertical (not horizontal) section of pipe.	X			
If inside, the fan is located in an unconditioned space, e.g., the attic.			X	
Sump				
If the sump is sealed, a trapped drain (or equivalent) should be present and located in the sump cover.		X		see note 3
Comments				

Sketch:

see Site Design Drawing

Note 1 - stack is centered between windows & extended maximum of 3' above gutter

Note 2 - per installer, exterior disconnect not recommended

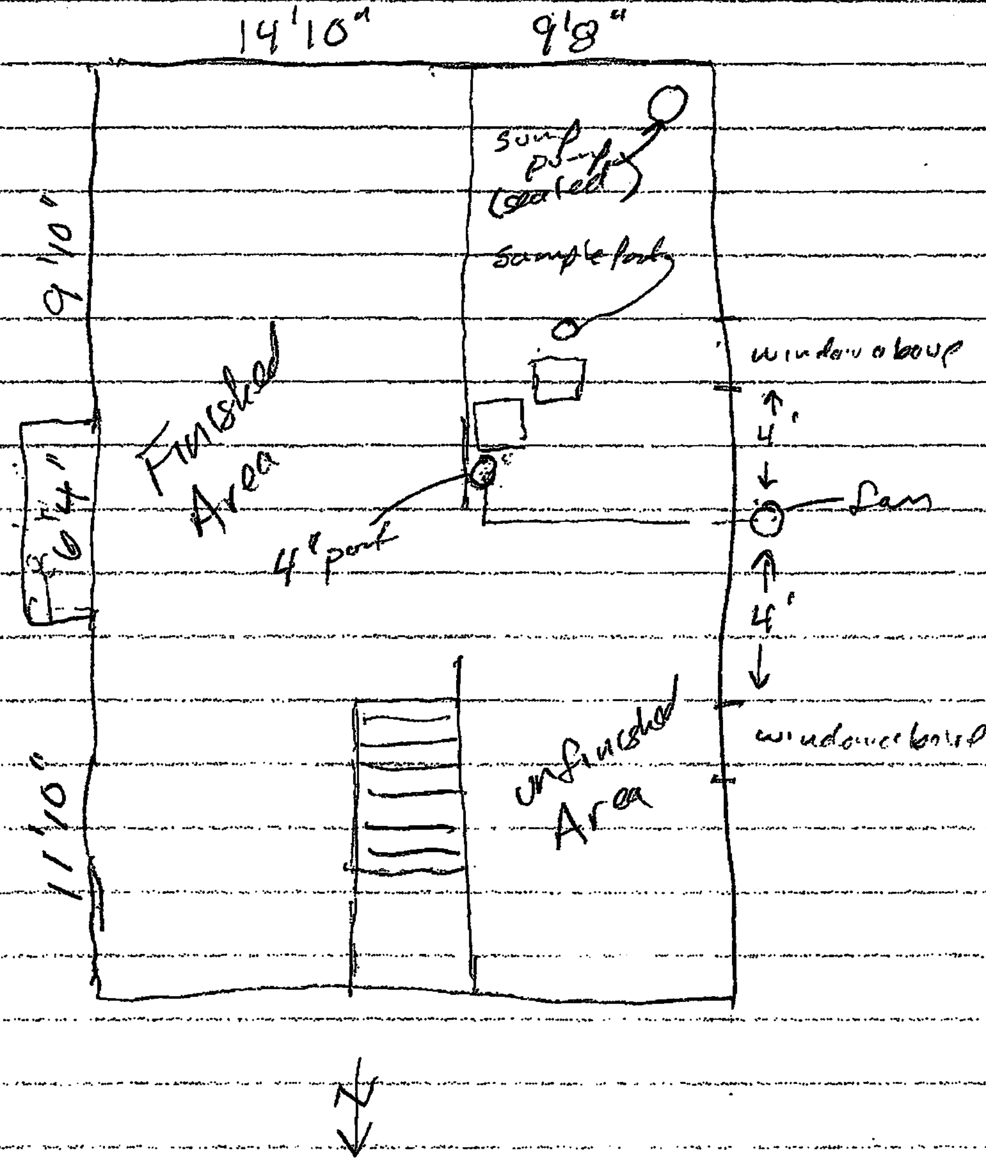
Note 3 - sump is not intended to serve as drain

Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

Residence No. 45

Site Design Drawing

[redacted]



Residence No. 46

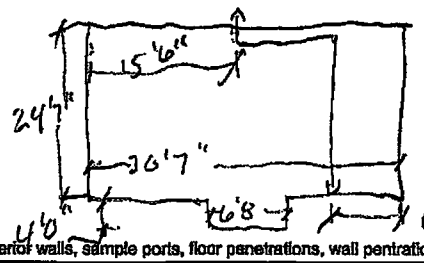
VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A	
Vent pipe size/type and labeling				
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	X			
Vent pipe diameter is approximately 3-4".	X			
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	X			
Vent pipe location and installation				
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	X			
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening. 7'		X		see note 1
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	X			
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			X	
Vent pipe system integrity				
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	X			
There are no visible openings or breaks in the pipe system.	X			
A pressure monitor is present, operating, and is in an accessible location.	X			
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)				
The sealing/caulking around the vent pipe in the basement floor is intact.	X			
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			X	
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			X	
Electrical				
Vent fan plugged cord connection appears to be no more than 6-feet long.			X	
Vent fan plugged cord connection is visible, and not concealed within a wall.			X	
If outside the building, the vent/mitigation fan is hard wired to a disconnect switch.		X		see note 2
Vent fan appears to be wired into a non-switched circuit.	X			
The circuit/breaker controlling the vent fan is labeled "~~Radon~~ Vapor System".	X			
Vent or Mitigation Fan(s)				
If outside, the fan is not below ground (e.g., in a pit).	X			
Vent fan is mounted in a vertical (not horizontal) section of pipe.	X			
If inside, the fan is located in an unconditioned space, e.g., the attic.			X	
Sump				
If the sump is sealed, a trapped drain (or equivalent) should be present and located in the sump cover.			X	

Comments 1- extended exhaust above roofline & away from window as practical
2 - hardwired to breaker to avoid intentional shut-off

Sketch:



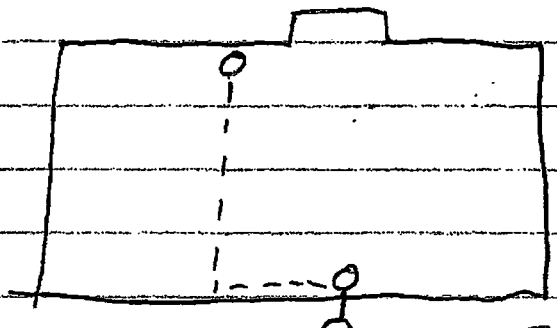
[redacted]
7/13/11

Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

Residence No. 46

Vapor System Design

[redacted]



Fan and Exhaust pipe to Above roof.

Brandon Knepper
Willie B Bailey

Residence No. 48

VAPOR INTRUSION CHARACTERIZATION WORK PLAN
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

[redacted]

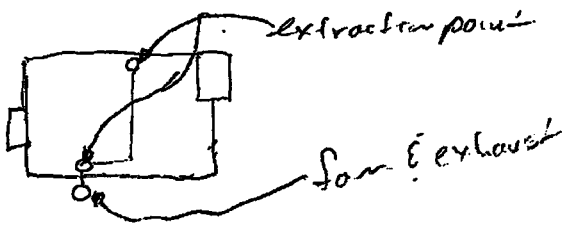
8/5/11

Installation and Operation Commissioning Checklist

Checklist Item	Yes	No	N/A	
Vent pipe size/type and labeling				
Vent pipe/fittings appear to be PVC, ABS, or equivalent.	✓			
Vent pipe diameter is approximately 3-4".	✓			
Vent pipe labeled as "vapor mitigation system"; on each level where pipe is visible.	✓			
Vent pipe location and installation				
Vent pipe appears to extend at least 10-feet above the ground with the exhaust point approximately 12-24"above the eave/roof.	✓			
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) or at least 2-feet above any such opening.		X		note 1
Vent pipe appears to end at least 10-feet from any opening into conditioned space (e.g., window or door) in an adjacent or nearby building.	X			
Fire collar/damper appears to be present if vent pipe penetrates fire rated wall.			X	
Vent pipe system integrity				
Pipe, fittings, and connections appear to be air tight and properly joined/sealed.	X			
There are no visible openings or breaks in the pipe system.	X			
A pressure monitor is present, operating, and is in an accessible location.	X			
Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)				
The sealing/caulking around the vent pipe in the basement floor is intact.	✓			
A vertical or horizontal vent pipe penetration is present in a (full or partial) crawl space.			X	
The crawl space vapor barrier (soil-gas-retarder, e.g., polyethylene) appears to extend to the foundation walls, and the seams appear to be overlapped by at least 12".			X	
Electrical				
Vent fan plugged cord connection appears to be no more than 6-feet long.			X	
Vent fan plugged cord connection is visible, and not concealed within a wall.			X	
If outside the building, the vent/mitigation fan is hard wired to the electrical panel.	X			
Vent fan appears to be wired into a non-switched circuit.	X			
The circuit/breaker controlling the vent fan is labeled "Vapor System".	X			
Vent or Mitigation Fan(s)				
If outside, the fan is not below ground (e.g., in a pit).	X			
Vent fan is mounted in a vertical (not horizontal) section of pipe.	X			
If inside, the fan is located in an unconditioned space, e.g., the attic.			X	
Sump				
If the sump is sealed and sump pit serves as a floor drain, a trapped drain (or equivalent) should be present and located in the sump cover.			✓	

Comments 1 location of windows does not allow 2' clear stack extended 3' above eave

Sketch:



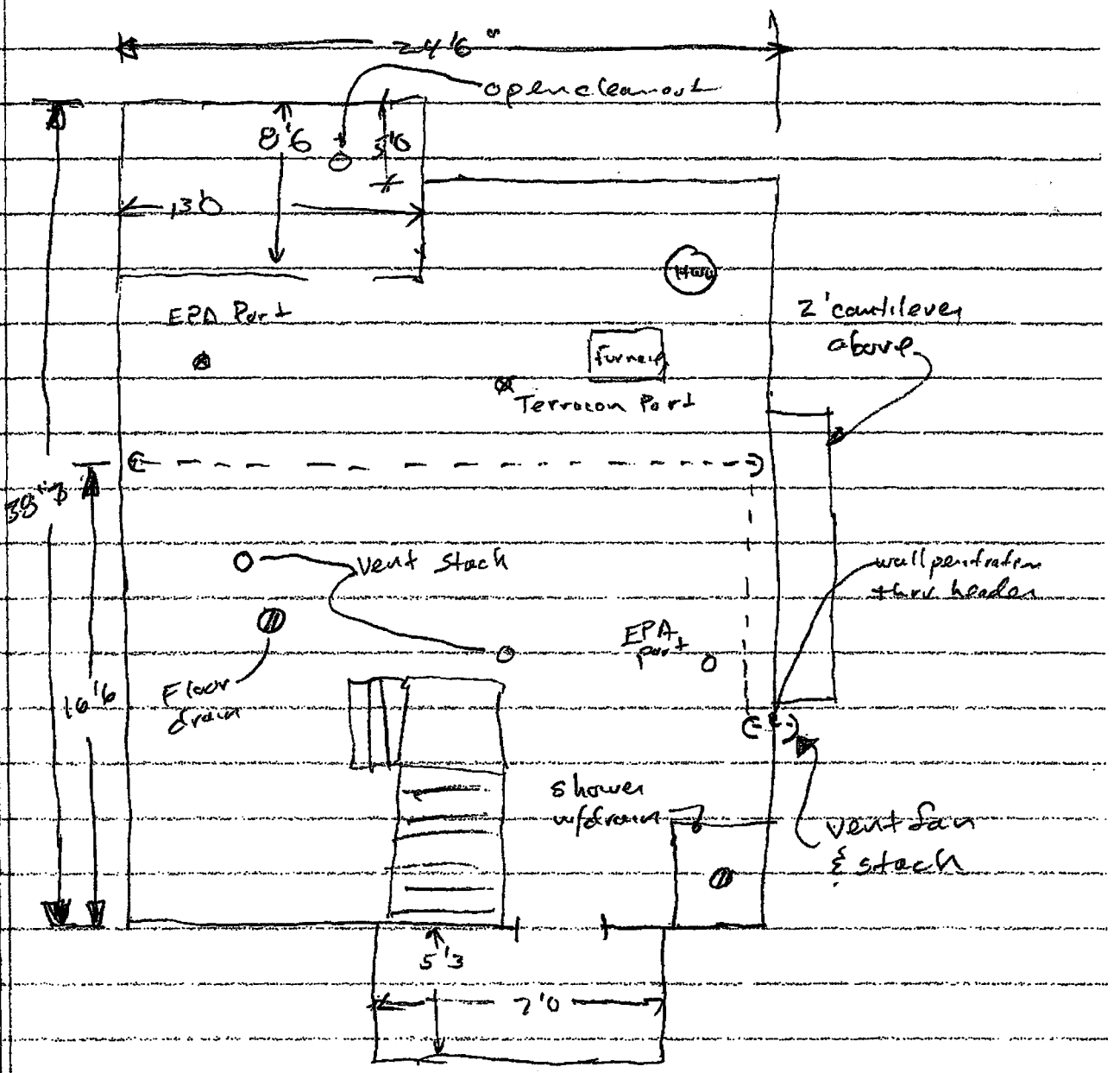
Identify general footprint, interior walls, sample ports, floor penetrations, wall pentrations, discharge point, and crawl spaces

VAPOR SYSTEM DESIGN

Residence No. 48

[redacted]

8/5/11



Brandon Knipper

Appendix D – Photographs

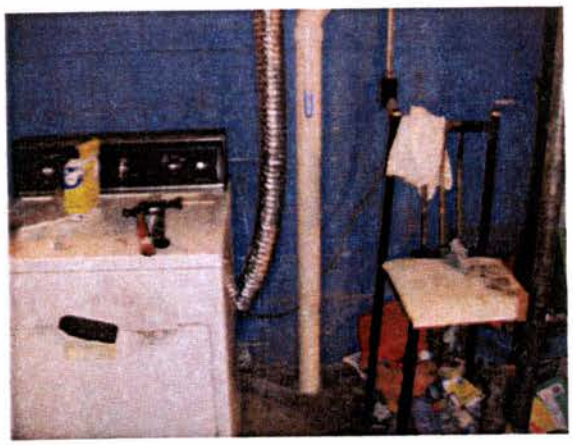


Photo #1 Residence No. 22 – Extraction point with manometer

Photo #2 Residence No. 22 – Extraction point without manometer

Photo #3 Residence No. 22 – Exhaust fan and stack

Photo #4 Residence No. 22 – Patched hole in floor

Photo #5 Residence No. 28 – Extraction point with manometer

Photo #6 Residence No. 28 – Sealed extraction point

Photo #7 Residence No. 28 – Exhaust fan and stack

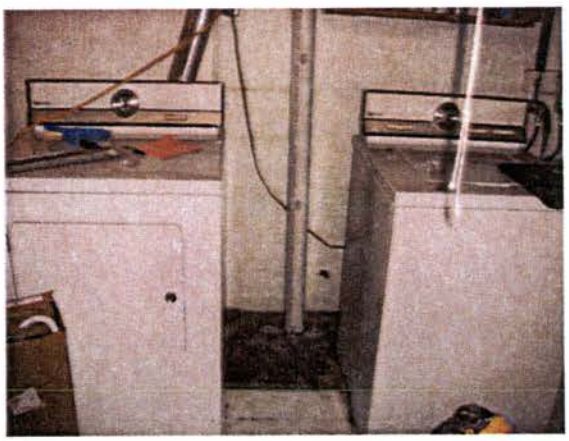


Photo #8 Residence No. 37 - Extraction point with manometer

Photo #9 Residence No. 37 – Sealed extraction point

Photo #10 Residence No. 37 – Exhaust fan and stack

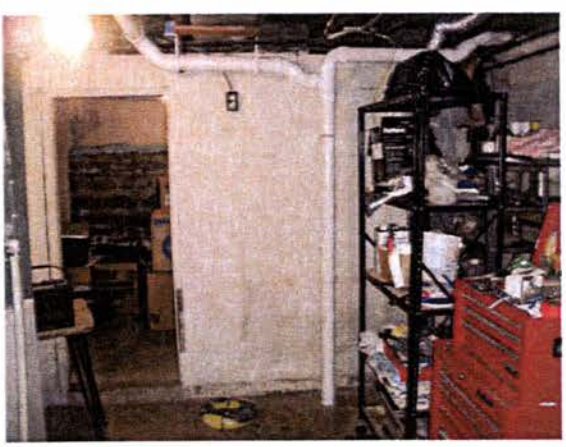


Photo #11 Residence No. 38 - Extraction point and piping

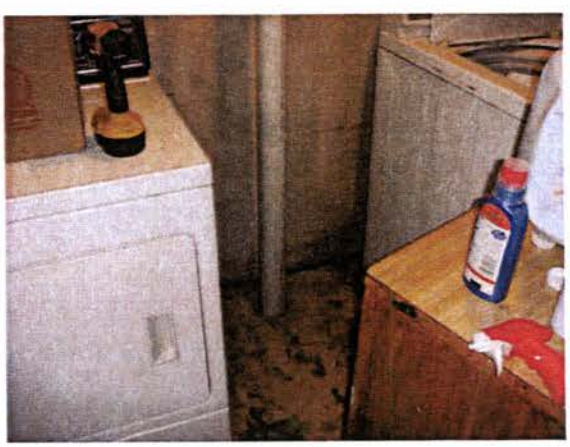


Photo #12 Residence No. 38 - Sealed extraction point

Photo #13 Residence No. 38 – Patched floor at cleanout

Photo #14 Residence No. 38 – Exhaust fan

Photo #15 Residence No. 38 – Sealed crawl space

Photo #16 Residence No. 45 – Sealed extraction point

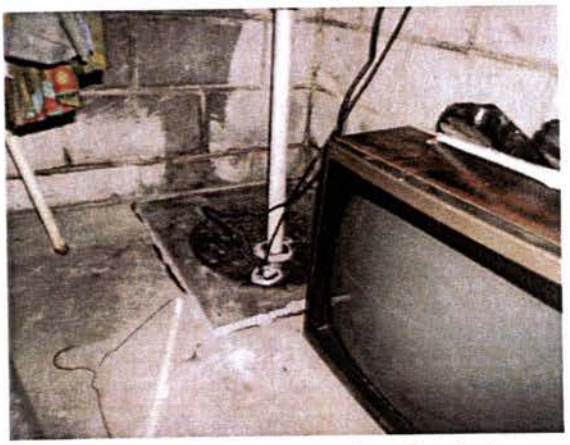


Photo #17 Residence No. 45 – Sealed sump pump cover

Photo #18 Residence No. 45 – Exhaust fan and stack

Photo #19 Residence No. 46 – Diagnostic testing

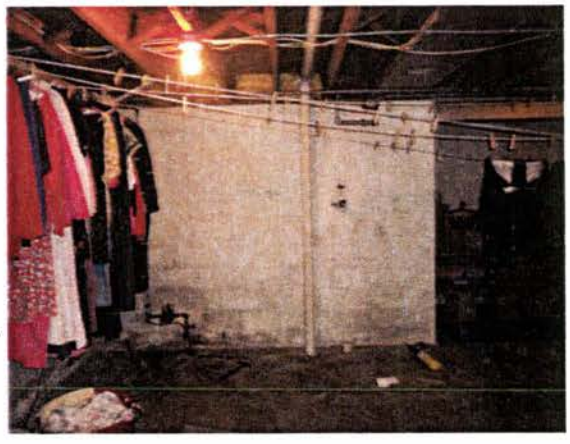


Photo #20 Residence No. 46 – Extraction point

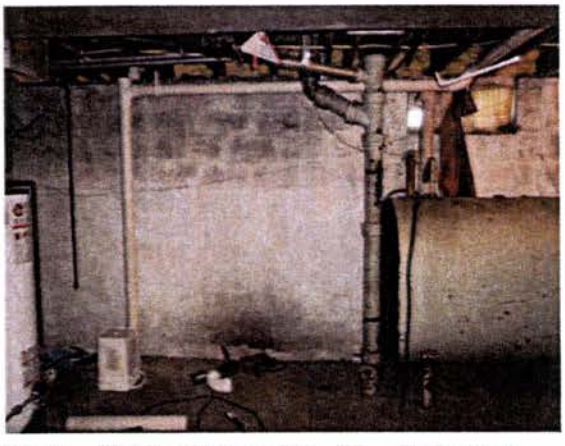


Photo #21 Residence No. 46 – Extraction point and piping

Photo #22 Residence No. 46 – Exhaust fan and stack

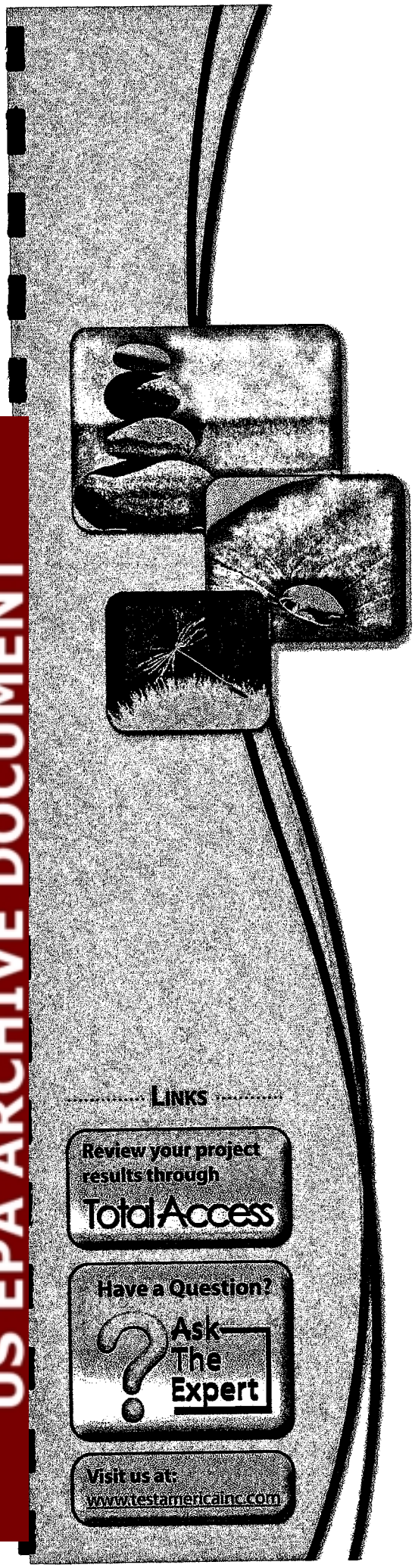
Photo #23 Residence No. 46 – Extraction point and manometer

Photo #24 Residence No. 48 – Exhaust fan and stack

Terracon Project No. 07107020
Vapor Intrusion Interim Measures Quarterly Report No. 1
System Installation

Terracon

Appendix E – Analytical Reports



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: 800-750-2401

TestAmerica Job ID: CUH0883
Client Project/Site: Chamberlain Vapor Sampling
Client Project Description: TO-15 Scans

For:
TERRACON - BETTENDORF
870 40th Avenue
Bettendorf, IA 52722

Attn: John Brimeyer

Authorized for release by:
08/30/2011 10:51:10 AM

Brian C. Graettinger
Operations Manager
brian.graettinger@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Job ID: CUH0883

Laboratory: TestAmerica Cedar Falls

Narrative

Analyzed by TestAmerica - Knoxville, TN.

Sample Summary

Client: TERRACON - BETTENDORF
Project/Site: Chamberlain Vapor Sampling

TestAmerica Job ID: CUH0883

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
CUH0883-01	IA-B-46-2	Air	08/12/11 09:38	08/12/11 14:40
CUH0883-02	IA-1-46-2	Air	08/12/11 09:35	08/12/11 14:40
CUH0883-03	IA-B-45-2	Air	08/12/11 14:15	08/12/11 14:40
CUH0883-04	IA-1-45-2	Air	08/12/11 14:16	08/12/11 14:40

Client Sample ID: IA-B-46-2 — **Lab Sample ID: CUH0883-01**
Date Collected: 08/12/11 09:38 — **Matrix: Air**
Date Received: 08/12/11 14:40
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	08/18/11 00:00	1.0

Client Sample ID: IA-1-46-2 — **Lab Sample ID: CUH0883-02**
Date Collected: 08/12/11 09:35 — **Matrix: Air**
Date Received: 08/12/11 14:40
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	08/18/11 00:00	1.0

Client Sample ID: IA-B-45-2 — **Lab Sample ID: CUH0883-03**
Date Collected: 08/12/11 14:15 — **Matrix: Air**
Date Received: 08/12/11 14:40
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	08/18/11 00:00	1.0

Client Sample ID: IA-1-45-2 — **Lab Sample ID: CUH0883-04**
Date Collected: 08/12/11 14:16 — **Matrix: Air**
Date Received: 08/12/11 14:40
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	08/18/11 00:00	1.0

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

PROJECT NO. CUH0883

Terracon

Lot #: H1H150406

Brian Graettinger

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613-0625

TESTAMERICA LABORATORIES, INC.

Jamie A. McKinney
Project Manager

August 25, 2011

ANALYTICAL METHODS SUMMARY

H1H150406

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999.

SAMPLE SUMMARY

H1H150406

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MLM3X	001	IA-B-46-2	08/12/11	09:38
MLM30	002	IA-1-46-2	08/12/11	09:35
MLM31	003	IA-B-45-2	08/12/11	14:15
MLM32	004	IA-1-45-2	08/12/11	14:16

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H1H150406

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

Custody seals were not present.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

EPA methods TO-14A and TO-15 specify the use of humidified "zero air" as the blank reagent for canister cleaning, instrument calibration and sample analysis. Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by TestAmerica Knoxville.

TestAmerica Cedar Falls

Client Sample ID: IA-B-46-2

GC/MS Volatiles

Lot-Sample # H1H150406 - 001 **Work Order #** MLM3X1AA **Matrix.....:** AIR

Date Sampled...:	08/12/2011	**Date Received..:**	08/15/2011
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011
Prep Batch #.....:	1230210	**Analysis Time....:**	20:04
Dilution Factor.:	1	**Method.....:**	TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
Trichloroethene	**0.030 J**	**0.040**	**0.014**	**0.16 J**	**0.21**	**0.075**
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079
Tetrachloroethene	**0.038 J**	**0.080**	**0.016**	**0.26 J**	**0.54**	**0.11**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	110	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TO-14 _rev5MDL_DOD.rpt version 5.002 02/07/2011

TestAmerica Cedar Falls

Client Sample ID: IA-1-46-2

GC/MS Volatiles

Lot-Sample #	H1H150406 - 002	**Work Order #**	MLM301AA	**Matrix.....:**	AIR
Date Sampled....:	08/12/2011	**Date Received..:**	08/15/2011		
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011		
Prep Batch #.....:	1230210	**Analysis Time....:**	20:56		
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Tetrachloroethene	**0.029 J**	**0.080**	**0.016**	**0.19 J**	**0.54**	**0.11**
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079
Trichloroethene	ND	0.040	0.014	ND	0.21	0.075
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	112	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TO-14 _rev5MDL_DOD.rpt version 5.002 02/07/2011

TestAmerica Cedar Falls

Client Sample ID: IA-B-45-2

GC/MS Volatiles

Lot-Sample #	H1H150406 - 003	**Work Order #**	MLM311AA	**Matrix.....:**	AIR
Date Sampled...:	08/12/2011	**Date Received..:**	08/15/2011		
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011		
Prep Batch #.....:	1230210	**Analysis Time....:**	21:50		
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
Trichloroethene	**0.026 J**	**0.040**	**0.014**	**0.14 J**	**0.21**	**0.075**
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079
Tetrachloroethene	**0.021 J**	**0.080**	**0.016**	**0.14 J**	**0.54**	**0.11**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	113	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TO-14 _rev5MDL_DOD.rpt version 5.002 02/07/2011

TestAmerica Cedar Falls

Client Sample ID: IA-1-45-2

GC/MS Volatiles

Lot-Sample #	H1H150406 - 004	**Work Order #**	MLM321AA	**Matrix.....:**	AIR
Date Sampled...:	08/12/2011	**Date Received..:**	08/15/2011		
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011		
Prep Batch #.....:	1230210	**Analysis Time....:**	22:43		
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Tetrachloroethene	**0.043 J**	**0.080**	**0.016**	**0.29 J**	**0.54**	**0.11**
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079
Trichloroethene	**0.022 J**	**0.040**	**0.014**	**0.12 J**	**0.21**	**0.075**
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	112	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TO-14 _rev5MDL_DOD.rpt version 5.002 02/07/2011

TestAmerica Cedar Falls

Client Sample ID: INTRA-LAB BLANK

GC/MS Volatiles

Lot-Sample #	H1H180000 - 210B	**Work Order #**	MLTGG1AA	**Matrix.....:**	AIR
	08/12/2011	**Date Received..:**	08/15/2011		
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011		
Prep Batch #....:	1230210	**Analysis Time....:**	12:13		
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
Trichloroethene	ND	0.040	0.014	ND	0.21	0.075
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079
Tetrachloroethene	ND	0.080	0.016	ND	0.54	0.11
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	106	60 - 140

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CHECK SAMPLE

GC/MS Volatiles

Lot-Sample # H1H180000 - 210C **Work Order #** MLTGG1AC **Matrix.....:** AIR

	08/12/2011	**Date Received..:**	08/15/2011
Prep Date.....:	08/18/2011	**Analysis Time....:**	08/18/2011
Prep Batch #.....:	1230210	**Analysis Time....:**	10:10
Dilution Factor.:	1	**Method.....:**	TO-15

PARAMETER	SPIKE AMOUNT (ppb(v/v))	MEASURED AMOUNT (ppb(v/v))	SPIKE AMOUNT (ug/m3)	MEASURED AMOUNT (ug/m3)	PERCENT RECOVERY	RECOVERY LIMITS
1,1,2-Trichloroethane	5.00	4.97	27.3	27.1	99	70 - 130
trans-1,2-Dichloroethene	5.00	5.04	19.8	20.0	101	70 - 130
Tetrachloroethene	5.00	4.80	33.9	32.5	96	70 - 130
1,1,1-Trichloroethane	5.00	5.79	27.3	31.6	116	70 - 130
Trichloroethene	5.00	4.62	26.9	24.8	92	70 - 130
cis-1,2-Dichloroethene	5.00	5.23	19.8	20.8	105	70 - 130
1,1-Dichloroethene	5.00	5.85	19.8	23.2	117	70 - 130
Vinyl chloride	5.00	6.14	12.8	15.7	123	70 - 130
1,1-Dichloroethane	5.00	5.53	20.2	22.4	111	70 - 130

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	110	60 - 140

Result (ug/m3) = Result (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

Reporting Limit (ug/m3) = Reporting Limit (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

MDL (ug/m3) = MDL (ppb(v/v))[unrounded] * (Molecular Weight/24.45)

TO-14 _rev5MDL_DOD.rpt version 5.002 02/07/2011

TAL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

H11H150406

Canister Samples Chain of Custody Record

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	**Project Manager:** John Brimeyer	**Sampled By:**	1 of 1 COCs
Company: Terracon	Phone:	Dave Cleary	
Address: 870 40th Avenue	Site Contact:		
City/State/Zip Bettendorf, IA 52722	TAL Contact:		
Phone: 563-355-0702			
FAX: 563-355-4789			
Project Name: Chamberlain	**Analysis Turnaround Time**		
Site/location: Waterloo, IA	Standard (Specify)		
PO # 07107020-1	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-46-2	8/11/11	10:48	9:38	-32	5	K236	6605	X							X				
IA-1-46-2	8/11/11	10:50	9:35	-32	2	K364	6128	X							X				
IA-B-45-2	8/11/11	2:20	2:15	-31	4	K378	6396	X							X				
IA-1-45-2	8/11/11	2:23	2:16	-29	4	K134	6662	X							X				

Sampled by : Dave Cleary

Temperature (Fahrenheit)	Interior	Ambient
Start	75	75
Stop	72	72

Pressure (inches of Hg)	Interior	Ambient
Start		
Stop		

1 Box Rec'd @ Ambient Temp. with out custody seal DMF 8/15/11

1 Box Fed Ex # 4278 2708 2925

4 cans / 4 Flow

Special Instructions/QC Requirements & Comments:
Started on 8/11/11
Stopped on 8/12/11
email to JFBRIMEYER@terracon.com

Canisters Shipped by:	Date/Time:	Canisters Received by:	
Samples Relinquished by: Dave Cleary	Date/Time: 8/12/11 12:37	Received by: Melissa Parsons	8/12/11 14:40
Relinquished by:	Date/Time:	Received by: [signature]	8/15/11 10:10

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: H1H1S0401

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	NA
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)	✓			☐ 2a Temp Blank = ____ ☐ 2b Cooler Temp = ____ ☐ 2c Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? ____	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓				

Quote #: ~~87210~~ 87209 PM Instructions: ____

WO 8-14-11

Sample Receiving Associate: George Blacklock Date: 8/15/11

QA026R22.doc, 012811

Test America - Knoxville ---- Air Canister Dilution Log

Lot Number: *H1H150406*

Initial Can Pressure							Subsequent Dilutions											
Analyst/Date	Tedlar Bag Time	Pbarr (in)	Sample ID	Can #	Pres. upon receipt (-in or + psig)	Adj. Initial Pres. (-in or + psig)	Analyst/Date	I / S	Pbarr (in)	Initial Pres. Pi (in)	Final Pres. Pf (psig)	First InCan Final Pres. Pf (psig)	Second In-can Final Pres. Pf (psig)	Third InCan Final Pres. Pf (psig)	Serial Dilution Can #	Vol (mL)	Final Pres. Pf (psig)	Comments
KM 8/17/4	NO	29.87	MLM3X	6605	-5.6	—												9336
↓	↓	↓	MLM30	6128	0.0	—												9338
			MLM31	6396	-1.2	—												9339
			MLM32	6662	-4.6	—												9340

ANALYTICAL REPORT

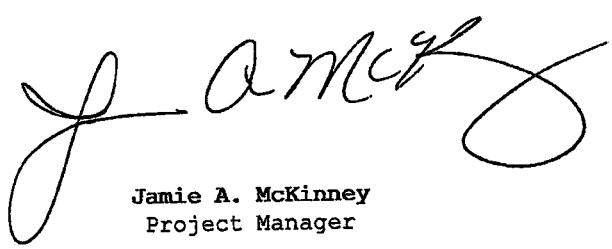
Terracon

Lot #: H1H110402

Brian Graettinger

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613-0625

TESTAMERICA LABORATORIES, INC.



Jamie A. McKinney
Project Manager

August 29, 2011

ANALYTICAL METHODS SUMMARY

H1H110402

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999.

SAMPLE SUMMARY

H1H110402

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MLJX7	001	CAN# 6605 / BATCH# 9336	07/14/11	08:00
MLJX8	002	CAN# 6128 / BATCH# 9338	07/15/11	08:00
MLJX9	003	CAN# 6396 / BATCH# 9339	07/15/11	08:00
MLJ0A	004	CAN# 6662 / BATCH# 9340	07/11/11	08:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H1H150406

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

EPA methods TO-14A and TO-15 specify the use of humidified "zero air" as the blank reagent for canister cleaning, instrument calibration and sample analysis. Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by TestAmerica Knoxville.

The daily standard recoveries for several analytes were above QC limits on 7/15/11 and 7/17/11. However, since the recoveries were high, and the analytes were not detected above the reporting limit in the associated samples, the validity of the data is unaffected.

TestAmerica Cedar Falls

Client Sample ID: CAN# 6605 / BATCH# 9336

GC/MS Volatiles

Lot-Sample #	H1H110402 - 001	**Work Order #**	MLJX71AC	**Matrix.....:**	AIR
Date Sampled...:	07/14/2011	**Date Received..:**	08/10/2011		
Prep Date.....:	07/14/2011	**Analysis Date...**	07/15/2011		
Prep Batch #.....:	1241095				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# 6128 / BATCH# 9338

GC/MS Volatiles

Lot-Sample #	H1H110402 - 002	**Work Order #**	MLJX81AC	**Matrix.....:**	AIR
Date Sampled...:	07/15/2011	**Date Received..:**	08/10/2011		
Prep Date.....:	07/15/2011	**Analysis Date...**	07/16/2011		
Prep Batch #.....:	1241095				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# 6396 / BATCH# 9339

GC/MS Volatiles

Lot-Sample # H1H110402 - 003 **Work Order #** MLJX91AC **Matrix.....:** AIR

Date Sampled...: 07/15/2011 **Date Received..:** 08/10/2011
Prep Date.....: 07/15/2011 **Analysis Date...** 07/15/2011
Prep Batch #.....: 1241095
Dilution Factor.: 1 **Method.....:** TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# 6662 / BATCH# 9340

GC/MS Volatiles

Lot-Sample #	H1H110402 - 004	**Work Order #**	MLJ0A1AC	**Matrix.....:**	AIR
Date Sampled...:	07/11/2011	**Date Received..:**	08/10/2011		
Prep Date.....:	07/14/2011	**Analysis Date...**	07/17/2011		
Prep Batch #.....:	1241095				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TAL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

H1H1SD406

Canister Samples Chain of Custody Record

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	Project Manager: John Brimeyer	Sampled By: Dave Cleary	1 of 1 COCs
Company: Terracon	Phone:		
Address: 870 40th Avenue	Site Contact:		
City/State/Zip Bettendorf, IA 52722	TAL Contact:		
Phone: 563-355-0702			
FAX: 563-355-4789			
Project Name: Chamberlain	Analysis Turnaround Time		
Site/location: Waterloo, IA	Standard (Specify)		
PO # 07107020-1	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type: Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-46-2	8/11/11	10:48	9:38	-32	-5	H236	6605	X						X				
IA-I-46-2	8/11/11	10:50	9:35	-32	-2	H364	6128	X						X				
IA-B-45-2	8/11/11	2:20	2:15	-31	-4	H378	6396	X						X				
IA-I-45-2	8/11/11	2:23	2:16	-29	-4	H134	6662	X						X				

Sampled by : Dave Cleary

Temperature (Fahrenheit)	Interior	Ambient
Start	75	75
Stop	72	72

Pressure (inches of Hg)	Interior	Ambient
Start		
Stop		

1 Box Rec'd @ Ambient Temp. with out custody Seal 8/12/11

1 Box Fed Ex # 4208 2708 2825

4 Canis / 4 Flow

Special Instructions/QC Requirements & Comments:
Started on 8/11/11
Stopped on 8/12/11
email to JFBRIMEYER@terracon.com

Canisters Shipped by:	Date/Time:	Canisters Received by:	
Samples Relinquished by: Dave Cleary	Date/Time: 8/12/11 12:37	Received by: Helen Cassiano	8/12/11 14:40
Relinquished by:	Date/Time:	Received by:	8/12/11 1010

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

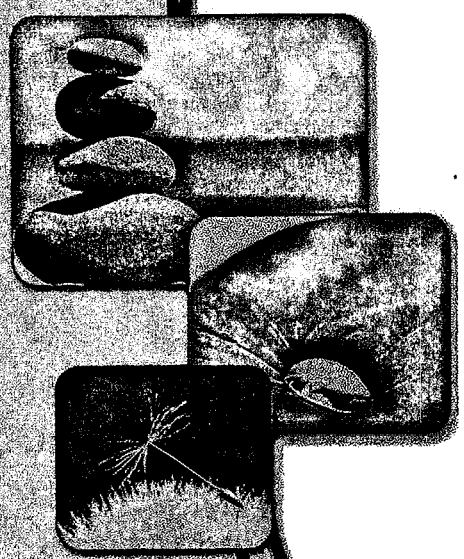
Lot Number: 411151401

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	NA
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)	✓			☐ 2a Temp Blank = ☐ 2b Cooler Temp = ☐ 2c Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid?	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓				

Quote #: 87209 PM Instructions:

Sample Receiving Associate: [signature] Date: 8/15/11

QA026R22.doc, 012811



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: 800-750-2401

TestAmerica Job ID: CUH1777
Client Project/Site: Chamberlain Vapor Sampling
Client Project Description: TO-15 Scans

For:
TERRACON - BETTENDORF
870 40th Avenue
Bettendorf, IA 52722

Attn: John Brimeyer

Authorized for release by:
09/14/2011 02:21:34 PM

Brian C. Graettinger
Operations Manager
brian.graettinger@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Client: TERRACON - BETTENDORF
Project/Site: Chamberlain Vapor Sampling

TestAmerica Job ID: CUH1777

Job ID: CUH1777

Laboratory: TestAmerica Cedar Falls

Narrative

Analyzed by TestAmerica - Knoxville, TN.

Sample Summary

Client: TERRACON - BETTENDORF
Project/Site: Chamberlain Vapor Sampling

TestAmerica Job ID: CUH1777

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
CUH1777-01	IA-B-48-2	Air	08/31/11 09:00	08/31/11 10:05
CUH1777-02	IA-1-48-2	Air	08/31/11 09:00	08/31/11 10:05
CUH1777-03	IA-B-38-2	Air	08/31/11 09:15	08/31/11 10:05
CUH1777-04	IA-1-38-2	Air	08/31/11 09:15	08/31/11 10:05

Client Sample Results

Client: TERRACON - BETTENDORF
Project/Site: Chamberlain Vapor Sampling

TestAmerica Job ID: CUH1777

Client Sample ID: IA-B-48-2

Lab Sample ID: CUH1777-01

Date Collected: 08/31/11 09:00
Matrix: Air
Date Received: 08/31/11 10:05
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	09/02/11 00:00	1.0

Client Sample ID: IA-1-48-2

Lab Sample ID: CUH1777-02

Date Collected: 08/31/11 09:00
Matrix: Air
Date Received: 08/31/11 10:05
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	09/02/11 00:00	1.0

Client Sample ID: IA-B-38-2

Lab Sample ID: CUH1777-03

Date Collected: 08/31/11 09:15
Matrix: Air
Date Received: 08/31/11 10:05
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	09/03/11 00:00	1.0

Client Sample ID: IA-1-38-2

Lab Sample ID: CUH1777-04

Date Collected: 08/31/11 09:15
Matrix: Air
Date Received: 08/31/11 10:05
Sample Container: Summa Canister

Method: EPA TO-15 - Air Sample Analysis - Subcontract

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyst	Analyzed	Dil Fac
Volatile Organic Compounds	See Attached Report.		0.10		mg		BCG	09/03/11 00:00	1.0

TestAmerica
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TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

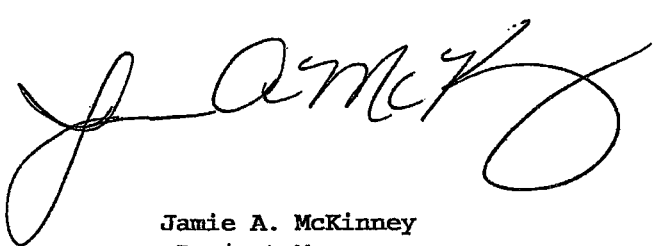
Terracon

Lot #: H1I010459

Brian Graettinger

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613-0625

TESTAMERICA LABORATORIES, INC.



Jamie A. McKinney
Project Manager

September 14, 2011

ANALYTICAL METHODS SUMMARY

H1I010459

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999.

SAMPLE SUMMARY

H1I010459

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
ML7AC	001	IA-B-48-2	08/30/11	09:00
ML7AG	002	IA-1-48-2	08/30/11	09:00
ML7AH	003	IA-B-38-2	08/30/11	09:15
ML7AJ	004	IA-1-38-2	08/30/11	09:15

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H1I010459

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

Sample IA-B-38-2 was received labeled as IA-1-38-2.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

EPA methods TO-14A and TO-15 specify the use of humidified "zero air" as the blank reagent for canister cleaning, instrument calibration and sample analysis. Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by TestAmerica Knoxville.

CERTIFICATION SUMMARY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	ACLASS	DoD ELAP		ADE-1434
TestAmerica Knoxville	Arkansas	State Program	6	88-0688
TestAmerica Knoxville	California	State Program	9	2423
TestAmerica Knoxville	Colorado	State Program	8	N/A
TestAmerica Knoxville	Connecticut	State Program	1	PH-0223
TestAmerica Knoxville	Florida	NELAC	4	E87177
TestAmerica Knoxville	Georgia	State Program	4	906
TestAmerica Knoxville	Hawaii	State Program	9	N/A
TestAmerica Knoxville	Indiana	State Program	5	C-TN-02
TestAmerica Knoxville	Iowa	State Program	7	375
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana	NELAC	6	LA110001
TestAmerica Knoxville	Louisiana	NELAC	6	83979
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Minnesota	NELAC	5	047-999-429
TestAmerica Knoxville	Nevada	State Program	9	TN00009
TestAmerica Knoxville	New Jersey	NELAC	2	TN001
TestAmerica Knoxville	New York	NELAC	2	10781
TestAmerica Knoxville	North Carolina	North Carolina DENR	4	64
TestAmerica Knoxville	North Carolina	North Carolina PHL	4	21705
TestAmerica Knoxville	Ohio	OVAP	5	CL0059
TestAmerica Knoxville	Oklahoma	State Program	6	9415
TestAmerica Knoxville	Pennsylvania	NELAC	3	68-00576
TestAmerica Knoxville	South Carolina	State Program	4	84001
TestAmerica Knoxville	Tennessee	State Program	4	2014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-TX
TestAmerica Knoxville	USDA	USDA		P330-11-00035
TestAmerica Knoxville	Utah	NELAC	8	QUAN3
TestAmerica Knoxville	Virginia	State Program	3	165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia	West Virginia DEP	3	345
TestAmerica Knoxville	West Virginia	West Virginia DHHR (DW)	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

TestAmerica Cedar Falls

Client Sample ID: IA-B-48-2

GC/MS Volatiles

Lot-Sample # H1I010459 - 001 **Work Order #** ML7AC1AA **Matrix.....:** AIR

Date Sampled...: 08/30/2011 **Date Received..:** 09/01/2011
Prep Date.....: 09/02/2011 **Analysis Date...** 09/02/2011
Prep Batch #.....: 1249024
Dilution Factor.: 1 **Method.....:** TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.12**	**0.080**	**0.016**	**0.81**	**0.54**	**0.11**
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.018**	**0.040**	**0.014**	**0.095 J**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	114	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14_rev3MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: IA-1-48-2

GC/MS Volatiles

Lot-Sample # H1I010459 - 002 **Work Order #** ML7AG1AA **Matrix.....:** AIR

Date Sampled...: 08/30/2011 **Date Received..:** 09/01/2011
Prep Date.....: 09/02/2011 **Analysis Date...** 09/02/2011
Prep Batch #.....: 1249024
Dilution Factor.: 1 **Method.....:** TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.13**	**0.080**	**0.016**	**0.91**	**0.54**	**0.11**
1,1,1-Trichloroethane	**0.013**	**0.080**	**0.012**	**0.069 J**	**0.44**	**0.065**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.051**	**0.040**	**0.014**	**0.27**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	112	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: IA-B-38-2

GC/MS Volatiles

Lot-Sample # H1I010459 - 003 **Work Order #** ML7AH1AA **Matrix.....:** AIR

Date Sampled...: 08/30/2011 **Date Received..:** 09/01/2011
Prep Date.....: 09/02/2011 **Analysis Date...** 09/03/2011
Prep Batch #.....: 1249024
Dilution Factor.: 1 **Method.....:** TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.038**	**0.080**	**0.016**	**0.26 J**	**0.54**	**0.11**
1,1,1-Trichloroethane	**0.040**	**0.080**	**0.012**	**0.22 J**	**0.44**	**0.065**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.017**	**0.040**	**0.014**	**0.094 J**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	111	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14_rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: IA-1-38-2

GC/MS Volatiles

Lot-Sample #	H1I010459 - 004	**Work Order #**	ML7AJ1AA	**Matrix.....:**	AIR
Date Sampled...:	08/30/2011	**Date Received..:**	09/01/2011		
Prep Date.....:	09/02/2011	**Analysis Date...**	09/03/2011		
Prep Batch #.....:	1249024				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.043**	**0.080**	**0.016**	**0.29 J**	**0.54**	**0.11**
1,1,1-Trichloroethane	**0.058**	**0.080**	**0.012**	**0.32 J**	**0.44**	**0.065**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.073**	**0.040**	**0.014**	**0.39**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	**0.017**	**0.080**	**0.010**	**0.068 J**	**0.32**	**0.040**
1,1-Dichloroethene	**0.033**	**0.080**	**0.013**	**0.13 J**	**0.32**	**0.052**
cis-1,2-Dichloroethene	**0.10**	**0.080**	**0.024**	**0.40**	**0.32**	**0.095**
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	112	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: INTRA-LAB BLANK

GC/MS Volatiles

Lot-Sample #	H1I060000 - 024B	**Work Order #**	ML8MN1AA	**Matrix.....:**	AIR
	08/30/2011	**Date Received..:**	09/01/2011		
Prep Date.....:	09/02/2011	**Analysis Date...**	09/02/2011		
Prep Batch #.....:	1249024				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	ND	0.080	0.016	ND	0.54	0.11
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	ND	0.040	0.014	ND	0.21	0.075
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.013	ND	0.32	0.052
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	112	60 - 140

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14_rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: CHECK SAMPLE

GC/MS Volatiles

Lot-Sample # H1I060000 - 024C **Work Order #** ML8MN1AC **Matrix.....:** AIR

	08/30/2011	**Date Received..:**	09/01/2011
Prep Date.....:	09/02/2011	**Analysis Date...**	09/02/2011
Prep Batch #.....:	1249024		
Dilution Factor.:	1	**Method.....:**	TO-15

PARAMETER	SPIKE AMOUNT (ppb(v/v))	MEASURED AMOUNT (ppb(v/v))	SPIKE AMOUNT (ug/m3)	MEASURED AMOUNT (ug/m3)	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloroethene	5.00	5.25	34	36	105	70 - 130
1,1,1-Trichloroethane	5.00	6.40	27	35	128	70 - 130
1,1,2-Trichloroethane	5.00	5.49	27	30	110	70 - 130
Trichloroethene	5.00	4.29	27	23	86	70 - 130
Vinyl chloride	5.00	5.12	13	13	102	70 - 130
1,1-Dichloroethane	5.00	5.44	20	22	109	70 - 130
1,1-Dichloroethene	5.00	5.74	20	23	115	70 - 130
cis-1,2-Dichloroethene	5.00	5.11	20	20	102	70 - 130
trans-1,2-Dichloroethene	5.00	5.28	20	21	106	70 - 130

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	113	60 - 140

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14_rev5MDL.rpt version 5.001 08/20/2010

DYP 9-1-11

H1I010459

TAL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

Canister Samples Chain of Custody Record

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

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Client Contact Information	
Company:	Terracon
Address:	6612 Chancellor Drive, Suite 102
City/State/Zip	Cedar Falls, IA 50613
Phone:	319-277-4016
FAX:	319-277-4320
Project Name:	Chamberlain
Site/location:	Waterloo, IA
PO #	

Project Manager: John Brimeyer
Phone:
Site Contact:
TAL Contact:

Sampled By: Dave Cleary

1 of 1 COCs

Analysis Turnaround Time
Standard (Specify) 5day
Rush (Specify)

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-48-Z	8/30/11	9:00	9:00	-30	/	K322	93244	X							X				
IA-1-48-Z	↓	9:00	9:00	-29	-4	K497	6119	X							X				
IA-B-38-Z		9:15	9:15	-28	-4	K255	5-1500	X							X				
IA-1-38-Z		9:15	9:15	-28	-4	K417	6-4926	X							X				

Sampled by :
Dave Cleary

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)	Interior	Ambient	
Start			
Stop			

1 Box with Custody Seal
Received @ Ambient Temp
R.H 9/1/11
1 Box FedEx 420827083486
4 Cans, 4 Flows

Special Instructions/QC Requirements & Comments:
Started on 8/30/11
Stopped on 8/31/11

Canisters Shipped by:	Date/Time:	Canisters Received by:
Samples Relinquished by: Dave C[illegible]	Date/Time: 8/31/11	Received by: Connie Holst 8-31-11 10:05am
Relinquished by: Connie Holst	Date/Time: 8-31-11 10:05Am	Received by: Rita Hancock 9/1/11 10:20

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: 410104S9

Review Items	Yes	No.	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)		X		☒ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	1A - 1A-B-38L, labeled AS 1A-1-38-2 MATCHED by CAN ID
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)			X	☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____ ☐ 2c Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			X	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	X			☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	X			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	X			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			X	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	X			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			X	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	X			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			X	☐ Incomplete information	
12. For 1613B water samples is pH<9?			X	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____	
13. Are the shipping containers intact?	X			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	X			☐ 14a Not relinquished	
15. Are tests/parameters listed for each sample?	X			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	X			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	X			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	X			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	X				

Quote #: 57209 PM Instructions: NA

Sample Receiving Associate: _____ Date: _____

QA026R22.doc, 012811

Test America - Knoxville ---- Air Canister Dilution Log

Lot Number: *H11010459*

Initial Can Pressure							Subsequent Dilutions											
Analyst/Date	Tedlar Bag Time	Pbarr (in)	Sample ID	Can #	Pres. upon receipt (-in or + psig)	Adj. Initial Pres. (-in or + psig)	Analyst/Date	I / S	Pbarr (in)	Initial Pres. Pi (in)	Final Pres. Pf (psig)	First InCan Final Pres. Pf (psig)	Second In-can Final Pres. Pf (psig)	Third InCan Final Pres. Pf (psig)	Serial Dilution Can #	Vol (mL)	Final Pres. Pf (psig)	Comments
DDF 9-1-11	NA	28.90	ML7AC	93244	0													9388
↓	↓	↓	ML7AG	6119	-5.6													↓
↓	↓	↓	ML7AH	S1500	-4.0													9392
↓	↓	↓	ML7AJ	L4426	-4.6													9393

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

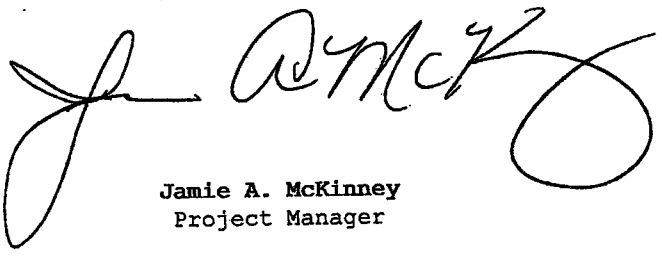
Terracon

Lot #: H1H210402

Brian Graettinger

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613-0625

TESTAMERICA LABORATORIES, INC.



Jamie A. McKinney
Project Manager

September 14, 2011

ANALYTICAL METHODS SUMMARY

H1H210402

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999.

SAMPLE SUMMARY

H1H210402

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MLVXJ	001	CAN# 93244 / BATCH# 9388	08/17/11	08:00
MLVXK	002	CAN# 6119 / BATCH# 9388	08/17/11	08:00
MLVXL	003	CAN# S1500 / BATCH# 9392	08/17/11	08:00
MLVXM	004	CAN# L4426 / BATCH# 9393	08/17/11	08:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H1H210402

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

EPA methods TO-14A and TO-15 specify the use of humidified "zero air" as the blank reagent for canister cleaning, instrument calibration and sample analysis. Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by TestAmerica Knoxville.

TestAmerica Cedar Falls

Client Sample ID: CAN# 93244 / BATCH# 9388

GC/MS Volatiles

Lot-Sample #	H1H210402 - 001	**Work Order #**	MLVXJ1AA	**Matrix.....:**	AIR
Date Sampled...:	08/17/2011	**Date Received..:**	08/19/2011		
Prep Date.....:	08/17/2011	**Analysis Date...**	08/18/2011		
Prep Batch #.....:	1234092				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# 6119 / BATCH# 9388

GC/MS Volatiles

Lot-Sample # H1H210402 - 002 **Work Order #** MLVXK1AA **Matrix.....:** AIR

Date Sampled...: 08/17/2011
Prep Date.....: 08/17/2011
Prep Batch #....: 1234092
Dilution Factor.: 1

Date Received..: 08/19/2011
Analysis Date... 08/18/2011
Method.....: TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# S1500 / BATCH# 9392

GC/MS Volatiles

Lot-Sample #	H1H210402 - 003	**Work Order #**	MLVXL1AA	**Matrix.....:**	AIR
Date Sampled...:	08/17/2011	**Date Received..:**	08/19/2011		
Prep Date.....:	08/17/2011	**Analysis Date...**	08/17/2011		
Prep Batch #.....:	1234092				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TestAmerica Cedar Falls

Client Sample ID: CAN# L4426 / BATCH# 9393

GC/MS Volatiles

Lot-Sample # H1H210402 - 004 **Work Order #** MLVXM1AA **Matrix.....:** AIR

Date Sampled...: 08/17/2011 **Date Received..:** 08/19/2011
Prep Date.....: 08/17/2011 **Analysis Date...** 08/18/2011
Prep Batch #.....: 1234092
Dilution Factor.: 1 **Method.....:** TO-15

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)
Tetrachloroethene	ND	0.080	ND	0.54
1,1,1-Trichloroethane	ND	0.080	ND	0.44
1,1,2-Trichloroethane	ND	0.080	ND	0.44
Trichloroethene	ND	0.040	ND	0.21
Vinyl chloride	ND	0.080	ND	0.20
1,1-Dichloroethane	ND	0.080	ND	0.32
1,1-Dichloroethene	ND	0.080	ND	0.32
cis-1,2-Dichloroethene	ND	0.080	ND	0.32
trans-1,2-Dichloroethene	ND	0.080	ND	0.32

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TAL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

Canister Samples Chain of Custody Record

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	**Project Manager:** John Brimeyer	**Sampled By:** Dave Cleary
Company: Terracon	Phone:	1 of 1 COCs
Address: 6612 Chancellor Drive, Suite 102	Site Contact:	
City/State/Zip Cedar Falls, IA 50613	TAL Contact:	
Phone: 319-277-4016		
FAX: 319-277-4320		
Project Name: Chamberlain	Analysis Turnaround Time (Dave Cleary)	
Site/location: Waterloo, IA	Standard (Specify) 5day - Client said 10 dayp was OK BCG 8/31/11	
PO #	Rush (Specify)	

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Matrix	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-48-2	8/30/11	9:00	9:00	-30	1	K322	93244	X							X				
IA-1-48-2	|	9:00	9:00	-29	-4	K497	6119	X							X				
IA-B-38-2	|	9:15	9:15	-28	-4	K255	5-1500	X							X				
IA-1-38-2	↓	9:15	9:15	-28	-4	K417	L-4426	X							X				

Sampled by : Dave Cleary

	Temperature (Fahrenheit)			
	Interior	Ambient		
Start				
Stop				

	Pressure (Inches of Hg)			
	Interior	Ambient		
Start				
Stop				

Special Instructions/QC Requirements & Comments:
Started on 8/30/11
Stopped on 8/31/11

Canisters Shipped by:	Date/Time:	Canisters Received by:
Samples Relinquished by:	Date/Time: 8/31/11	Received by: Connie Holst 8-31-11 10:05am
Relinquished by: Connie Holst	Date/Time: 8-31-11 10:05AM	Received by:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

704 ENTERPRISE DRIVE • CEDAR FALLS, IA 50613
800-750-2401 • 319-277-2425 FAX

Sample Receipt and Temperature Log Form

Client: Terracon Project: _____

City: CF

Date: 8-31-11 Receiver's Initials: CH Time (Delivered): 10:05

Temperature Record:

Cooler ID# (If Applicable)
in box

_____ °C / On Ice

Thermometer:

- ☐ IR - 111531565 'D'
- ☐ IR - 111531506 'E'
- ☐ IR - 61854108 'Front'
- ☐ 101681126

Courier:

- ☐ UPS
- ☐ FedEx
- ☐ FedEx Ground
- ☐ US Postal Service
- ☐ Spee-Dee
- ☐ TA Courier
- ☐ TA Field Services
- ☑ Client
- ☐ Other _____

☐ Temp Blank

☐ Temperature out of compliance

Custody seals present?
☐ Yes

Custody seals intact?
☐ Yes ☐ No

☐ Non-Conformance report started

Exceptions Noted

- ☑ Sample(s) not received in a cooler.
- ☐ Samples(s) received same day of sampling.
- ☐ Evidence of a chilling process
- ☐ No Temp. Blank. Inside temperature of cooler recorded.
- ☑ Temperature not taken:

_____

Ref:
Dep:
Date: 31Aug11
Wgt: 36.30 LBS
DV: 0.00
SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00
Svcs: ** 2DAY **
TRCK: 4208 2708 3464

*Refer to SOP CF-SS-01 for Temperature Criteria