

November 25, 2020

Ms. Tracey Michael
Indiana Brownfields Program
Indiana Department of Environmental Management
100 North Senate Avenue, IGCN 1275
Indianapolis, IN 46204

RE: Residential Indoor Air Sampling & SSDS Repair
Standard Register – Remediation and Abatement
1251 North Fruitridge Avenue
Terre Haute, Indiana
KERAMIDA Project No. 18626

Dear Ms. Michael:

KERAMIDA Inc. (KERAMIDA) completed indoor air sampling and repair of the sub-slab depressurization system (SSDS) at one of the residential properties (1119 N. 34th Street, Terre Haute, Indiana) downgradient of the Standard Register remediation and abatement site (the Site) located at the above referenced address. The field work was completed on November 9 and 10, 2020. This letter report summarizes the sampling results and details of SSDS repair.

BACKGROUND

An SSDS was historically installed at 1119 N. 34th Street, Terre Haute, Indiana, which is a residential property downgradient of the Site. The SSDS was installed to mitigate vapor intrusion potentially caused by elevated groundwater levels of chlorinated volatile organic compounds (cVOCs) associated with the Site. As indicated by the Indiana Department of Environmental Management (IDEM) and the home owner, the SSDS was not working properly, specifically, the fan was making noise. IDEM requested that the SSDS system be inspected, the fan unit be replaced (if applicable), and indoor air sampling be performed to evaluate if the SSDS is still required for the residential property.

FIELD ACTIVITIES

Prior to the sampling event, the pre-sampling Instructions for Building Occupants (included as Attachment 1) was provided to the home owner and communications were made to ensure sampling conditions were met at least two days prior to the sampling event.

A preliminary diagnosis and inspection of the SSDS was conducted on November 9, 2020. The preliminary diagnosis and inspection indicated that the suction point, pipes, and connections of the SSDS were in good condition. It was believed that the only problem with the SSDS was the blower/fan was worn out. The Model GP-501 blower/fan was therefore determined to be replaced by a new unit following the indoor air sampling. A photo log of the inspection is included as Attachment 2.

Immediately following the completion of the preliminary diagnosis and inspection on November 9, 2020, a 24-hour 6-liter indoor air sampling Summa canister was deployed in the basement of the residence. The Summa canister sampling device is consistent with current IDEM guidance based on the building configuration and

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occupancy usage. Sampling was conducted in accordance with IDEM's guidance and KERAMIDA's Standard Operating Procedures (SOPs) (included as Attachment 3).

The Summa canister was retrieved on November 10, 2020, after approximately 24 hours of indoor air collection. The sample was submitted to EnvisionAir in Indianapolis, Indiana for analysis of full-list volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15. A copy of the field sampling sheet is included as Attachment 4.

Immediately following completion and retrieving of the indoor air sample on November 10, 2020, Mr. Michael Devir, a vapor mitigation professional of KERAMIDA (credentials included as Attachment 5) performed an inspection of the SSDS and replaced the worn-out GP-501 blower/fan. A photo of the U-tube manometer showing pressure difference after the blower/fan replacement is included in Attachment 2.

INDOOR AIR SAMPLING RESULTS

The analytical results are summarized on Table 1. The IDEM Remediation Closure Guide (RCG) residential indoor air screening levels are provided on Table 1 for comparison with the analytical results. The results reported no VOCs detected in the indoor air sample. All laboratory reporting limits are below the corresponding IDEM RCG residential indoor air screening levels. Copies of the laboratory report is included in Attachment 6.

The indoor air sampling results indicate no unacceptable risk of vapor intrusion from cVOCs associated with the Site at the residential property located at 1119 N. 34th Street, Terre Haute, Indiana for the period of sampling. A second round of 'worst-case' indoor air sampling at the residential property in summer 2021 is planned to confirm these results.

If you have any questions or need additional information, please don't hesitate to contact us at (317) 685-6600.

Sincerely,
KERAMIDA Inc.



Xuqing Xiong
Project Engineer



Michael J. Devir, P.E.
Senior Engineer, Land Services

Attachments

**Residential Indoor Air Sampling & SSDS Repair
Standard Register – Remediation and Abatement
1251 North Fruitridge Avenue
Terre Haute, Indiana
KERAMIDA Project No. 18626**

TABLE

Table 1
Indoor Air ($\mu\text{g}/\text{m}^3$)
Standard Register - Remediation and Abatement
Terre Haute, Indiana
KERAMIDA Project No. 18626

Sample No.	RCG Indoor Air Vapor Exposure - Residential ⁽¹⁾	1119 N. 34th St.
Sample Type		1A
Date Sampled		11/9/2020
Lab Sample No.		20-2819
Acetone	32,000	<2380
Benzene	3.6	<1.60
Benzyl chloride	0.57	<0.41
Bromodichloromethane	0.76	<0.54
Bromoform	26	<10.3
Bromomethane (Methyl Bromide)	5.2	<3.88
1,3-Butadiene	0.94	<0.22
2-Butanone (MEK)	5,200	<2950
Carbon disulfide	730	<311
Carbon tetrachloride	4.7	<0.63
Chlorobenzene	52	<23
Chloroethane (Ethyl Chloride)	10,000	<13.2
Chloroform	1.2	<0.83
Chloromethane (Methyl Chloride)	94	<20.6
Cyclohexane	6,300	<5510
Dibromochloromethane	NA	<0.85
1,2-Dibromoethane	0.047	<0.03
1,2-Dichlorobenzene	210	<60.1
1,3-Dichlorobenzene	NA	<60.1
1,4-Dichlorobenzene	2.6	<0.60
Dichlorodifluoromethane	100	<49.5
1,1-Dichloroethane	18	<4.05
1,2-Dichloroethane	1.1	<0.40
1,1-Dichloroethene	210	<198
cis-1,2-Dichloroethene	NA	<19.8
trans-1,2-Dichloroethene	NA	<39.6
1,2-Dichloropropane	4.2	<0.46
cis-1,3-Dichloropropene	NA	<4.54
trans-1,3-Dichloropropene	NA	<4.54
1,4-Dioxane	5.6	<1.8
Ethyl acetate	73	<54.1
Ethylbenzene	11	<8.68
4-Ethyltoluene	NA	<492
n-Heptane	420	<410
2-Hexanone	31	<20.5
Hexachlorobutadiene	1.3	<1.07
n-Hexane	730	<176
Isooctane	NA	<467
Methylene chloride	630	<41.7
Methyl tert-butyl ether (MTBE)	110	<36.1
4-Methyl-2-pentanone (MIBK)	3,100	<2050
Naphthalene	0.83	<0.524
Propylene	3,100	<172
Styrene	1,000	<426
1,1,2,2-Tetrachloroethane	0.48	<0.34
Tetrachloroethene	42	<3.19
Tetrahydrofuran	2,100	<295
Toluene	5,200	<3770
1,2,4-Trichlorobenzene	2.1	<0.74
1,1,1-Trichloroethane	5,200	<546
1,1,2-Trichloroethane	0.21	<0.21
Trichloroethene	2.1	<1.07
Trichlorofluoromethane	NA	<562
1,2,4-Trimethylbenzene	63	<4.92
1,3,5-Trimethylbenzene	63	<4.92
Vinyl acetate	210	<176
Vinyl bromide	0.88	<0.44
Vinyl chloride	1.7	<1.28
Xylene, m&p	100	<43.4
Xylene, o-	100	<43.4

Samples analyzed using EPA Method TO-15

$\mu\text{g}/\text{m}^3$ = microgram per cubic meter

NA = Not Available

(1) Indiana Department of Environmental Management Remediation Closure Guide, Appendix A, Table A-6, Final, March 22, 2012, with updates through March 2020.

BOLD = Indicates Detection
Exceeds RCG Vapor Exposure - Indoor Air-Residential Screening Levels

**ATTACHMENT 1
Instructions for Building Occupants**

Instructions for Building Occupants
(to be followed starting at least 48 hours prior to and during the sampling event)

- If commercial/industrial building, operate as it is usually done.
- Do not open windows, fireplace openings or vents.
- Do not keep doors open.
- Do not operate ventilation fans or air conditioning.
- Do not use air fresheners or odor eliminators.
- Do not smoke in the house/structure.
- Do not use wood stoves, fireplace or auxiliary heating equipment (e.g., kerosene heater).
- Do not use paints or varnishes.
- Do not use cleaning products (e.g., bathroom cleaners, furniture polish, appliance cleaners, all-purpose cleaners, floor cleaners).
- Do not use cosmetics, including hair spray, nail polish remover, perfume, etc.
- Do not partake in indoor hobbies or work tasks that use solvents.
- Do not apply pesticides.
- Do not store containers of gasoline, oil or petroleum-based or other solvents within the house/structure or attached (except for fuel oil tanks).
- Do not operate or store gasoline/diesel powered equipment (i.e., automobiles, lawn mowers) in the house/structure or attached garage.

**ATTACHMENT 2
Photo Log**

Photo Date:	Project:	Project #
November 9, 2020	Standard Register – Remediation and Abatement	18626

Photo #1

Suction Point in the Basement of 1119 N. 34th St.



Photo #2

Pipe in the Basement and U-Tube Manometer Reading when SSDS is off (before blower/fan replacement)



Photo Date:	Project:	Project #
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Photo #3

Representative
Suction Point and
Pipe in Craw Space



Photo #5

Malfunctioning GP-
501 Blower/Fan

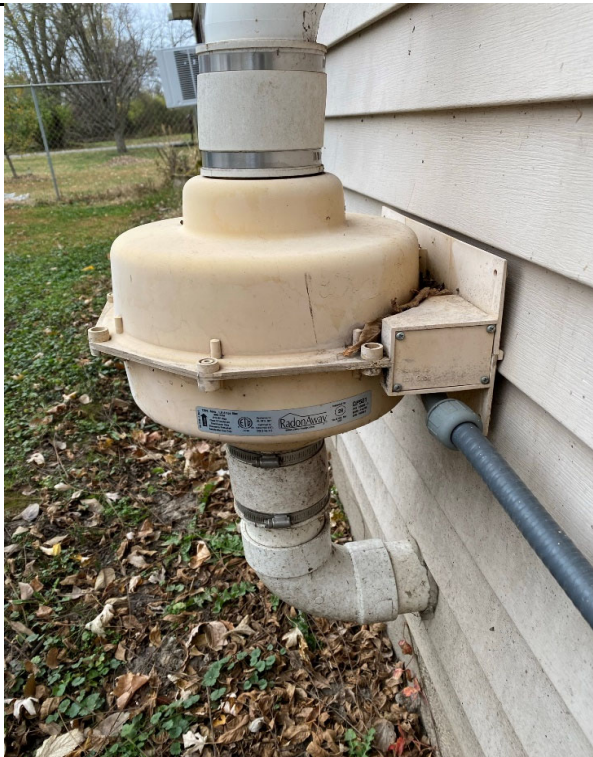


Photo Date:	Project:	Project #
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Photo #6

Exterior Pipe



Photo #7

U-Tube Manometer
Reading when SSDS
is on (after
blower/fan
replacement)

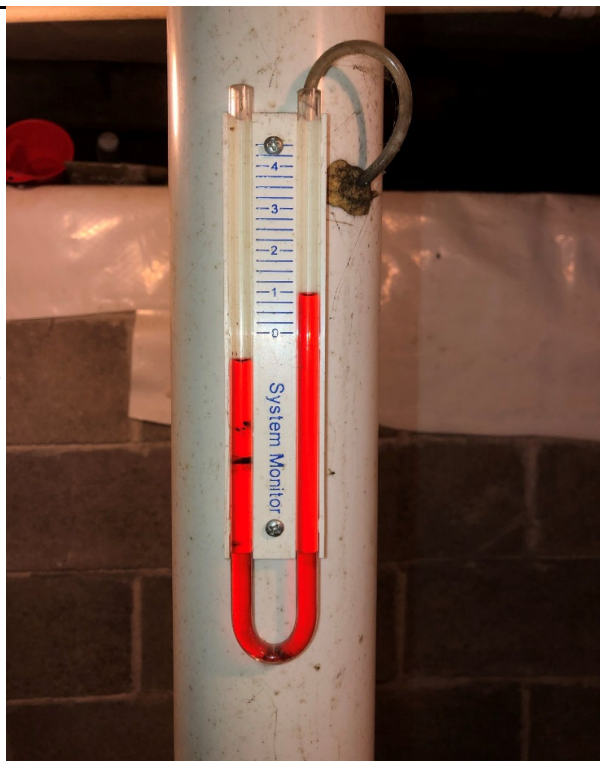


Photo Date:	Project:	Project #
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Photo #8

New Fan Installation
complete



**ATTACHMENT 3
KERAMIDA Standard Operating Procedures**

INDOOR AIR SAMPLING USING SUMMA CANISTERS

1.0 PURPOSE

- 1.1. The following procedure is to be used for the collection of indoor air quality samples using a Summa canister for off-Site laboratory analysis.

2.0 SCOPE

- 2.1. KERAMIDA technical work product pertaining to indoor air quality sampling is covered by this SOP.

3.0 MATERIALS

- Vapor intrusion pre-Sampling questionnaire
- Summa canister – available in 6-liter and 1-liter sizes
- Laboratory-supplied chain-of-custody forms
- KERAMIDA's Vapor Intrusion Field Sampling Log
- Valve – a valve is located at the top of the canister. The valve allows vacuum to be maintained in the canister prior to sampling and seals off the canister once the sample has been collected.
- Brass Cap – each canister comes with a brass cap secured to the inlet of the valve assembly
- Particulate Filter – Each canister comes with a particulate filter provided separately in the packing box. The filter prevents particulate matter from fouling the valve (or flow controller) and entering the canister.
- Vacuum Gauge and Flow Controller – when ordering canisters from the laboratory, specify the sampling interval (for example: 8 hours, 24 hours) so they can pre-set the flow controllers before shipping.
- Moisture Cane – each outdoor air canister should be equipped with a moisture cane to prevent moisture from entering the vacuum canister and compromising the flow regulator

4.0 RESPONSIBILITY

KERAMIDA staff or subcontractors under KERAMIDA direction engaging in indoor air sampling using a Summa Canister unit.

5.0 DEFINITIONS

An air sample collected over a few minutes of time is referred to as a grab sample and provides information on the concentrations of chemicals in the ambient air at that point in time. An air sample collected over more than a few minutes is referred to as an integrated sample and provides information on the average or composited concentrations of chemicals in the ambient air over the sampling interval. Summa canisters are used to collect integrated air samples. A Summa canister is a stainless steel container that has had the internal surfaces specially passivated using a "Summa" process. This process combines an electro-polishing

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step with a chemical deactivation step to produce a surface that is nearly chemically inert. A Summa surface has the appearance of a mirror: bright, shiny, and smooth.

6.0 PROCEDURE

Field Preparation

- 6.1 Prior to arriving on-Site, successfully complete the vapor intrusion Pre-Sampling Questionnaire with the available information provided by the Site contact or property owner/resident.
- 6.2 Know what criteria will apply to the Site samples in terms of detection limits. Ask the lab if they can meet them, if they cannot, speak with the client and the agency representative.
- 6.3 If the laboratory detection limits need to be, and can be lowered, check with the laboratory to see what additional fees may apply. Write the required criteria in the chain of custody sheet to ensure the laboratory applies the appropriate standards. Double check to ensure laboratory used appropriate standards when results arrive.
- 6.4 Verify all required equipment is included in the package received from the laboratory.
- 6.5 Verify initial vacuum of each canister:
- 6.6 Confirm that the valve is closed.
- 6.7 Remove the brass cap and attach the vacuum gauge.
- 6.8 Attach the brass cap to the gauge tee fitting.
- 6.9 Open and close the valve quickly (a few seconds). No more than a half turn by hand is required to open the valve. Do not over-tighten the valve or it may become damaged. A damaged valve can leak and possibly compromise the sample. The cap serves two purposes: It ensures that there is no loss of vacuum due to a leaky valve or valve that is accidentally opened during handling and it prevents dust and other particulate matter from fouling the valve. The cap is removed prior to sampling and replaced following sample collection. Always replace the brass cap following canister sampling.
- 6.10 Read vacuum on the gauge and record the reading on the "Initial Vacuum" column of the chain-of-custody form.
- 6.11 Check or compare the lab's recorded vacuum with the vacuum measurements taken before the canister is used. If the vacuum difference from the lab's recorded value exceeds 4 "Hg, the canister should not be used due to potential leaks.
- 6.12 Verify that the canister valve is closed and then remove the gauge and replace the brass cap.

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Sample Set Up and Collection

- 6.13 Outdoor air sample canisters should be placed upwind of the sample Site and are required for all indoor air sampling to provide a basis for ambient background air.
- 6.14 The sampling train should be set up in a location that is out of direct sunlight during sampling. There will be some flow rate drift if the temperature of the controllers is allowed to vary significantly.
- 6.15 Remove the brass cap from the canister.
- 6.16 Attach the flow controller.
- 6.17 Attach the particulate filter to the flow controller.
- 6.18 Attach the moisture cane if necessary.
- 6.19 Open the valve ½ turn.

Sample Monitoring

- 6.20 The volume of air sampled is a linear function of the canister vacuum. For example, halfway into an 8-hour sampling interval, the canister should be approximately half-filled and the gauge should read approximately 17 inches of mercury (in. Hg). More vacuum than 17 in. Hg indicates that the canister is filling too slowly; less than 17 in. Hg and the canister is filling too quickly. If the canister is filling too slowly, a valid sample can still be collected. If the canister is filling too quickly because of a leak or incorrect flow controller setting, corrective action can also be taken. Ensuring all connections are tight may eliminate a leak. It is possible to take an intermittent sample. The time interval need not be continuous. Eight 1-hour increments, taken by opening and closing the canister valve, will yield a valid sample.
- 6.21 An 8-hour sampling interval must complete the full 8 hours, or the sampling time must meet the tank limit. Summa canister should not go below 3 Hg negative pressure. An 8-hour sample may be collected for industrial exposure limits while a 24-hour sample may be collected for residential exposure limits.

Sample Retrieval

- 6.22 Verify and record the final vacuum of the canister on the canister tag and the chain-of-custody. There should be a partial vacuum left (generally 3 Hg) in the canisters at the end of sampling. If no vacuum exists, the sample should be marked on the chain of custody and the laboratory alerted.
- 6.23 The time recorded on field notes and chain of custody form must reflect action taken in the field, and meet regulatory requirements.
- 6.24 Close the valve by hand-tightening the knob clockwise. No more than a half turn by hand is required to open the valve. Do not over-tighten the valve after sampling or it may become damaged. A damaged valve can leak and possibly compromise the sample.
- 6.25 Replace the brass cap.

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- 6.26 Fill out the sample tag attached to the canister.
- 6.27 Return the canisters and all associated equipment to the laboratory in the boxes in which they were shipped.
- 6.28 The PM should review the field sheet the next day after sampling. If the collection was not done per regulatory requirements, it must be re-done.
- 6.29 Unless otherwise noted by the client, detection levels will be based on published U.S. EPA Regional Screening Levels and generally will use a target hazard quotient of 0.

7.0 REF. DOCUMENTS

Indiana Department of Environmental Management (IDEM) 2012. "Remediation Closure Guide (RCG)." Office of Land Quality. March 22. Updated with 2014 Screening Levels.

U.S. Environmental Protection Agency. 2006. "Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site Using Basement and Sub-Slab Air Samples." March.

U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. 2015. "Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air" June.

8.0 RECORDS

N/A

9.0 REVISION HISTORY

Revision Date	Nature of Change	Review and Approval (VP Level or Higher)	Review and Approval (President)*
8/20/15	Original Issue	KGB	N/A

*Reviewer and Approver at VP Level or Higher determines if SOP requires President's Review and Approval.

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CREATING AND FILLING OUT A CHAIN OF CUSTODY RECORD

1.0 PURPOSE

- 1.1. The Chain of Custody (COC) record is an appropriate format to record important data associated with each individual sample. Normally, a COC is used to record three types of information: field information, laboratory information, and the people who handle the sample.

2.0 SCOPE

- 2.1. KERAMIDA technical work product pertaining to field sampling to be sent for laboratory analysis.

3.0 MATERIALS

Chain of Custody Form
Writing Utensil

4.0 RESPONSIBILITY

KERAMIDA staff or subcontractors under KERAMIDA direction engaging in sampling in the field.

5.0 DEFINITIONS

Chain of Custody (COC) is a written legal document used to track the transfer of a sample(s) from person to person.

A sample number is a unique number given to a sample.

6.0 PROCEDURE

- 6.1 Creating the COC: A COC is created for each sampling event. A COC has three sections: field information, lab information, and the signatures of the people who handle the sample. The KERAMIDA COC is a two-page carbon less copy document, consisting of a white sheet and a yellow sheet.

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- 6.2 Field Information: The COC contains places to enter the following field information: project number, sample number, sampling date/time, sample matrix, preservatives, grab or composite sample. It is imperative that there be only one sample with a particular sample number per study number so as to prevent duplicates in EM Branch databases.
- 6.3 Laboratory Information: The COC contains places to enter the following information: selected laboratory, requested analysis, QA/QC level, detection level, requested turn-around-time, and comments to the laboratory. The laboratory will record the sample temperature on the COC at the time they take custody and sign the COC.
- 6.4 Signature: The COC contains places for all people who handle the sample(s) to sign his/her name. This is a record of persons who had custody of the sample(s) during all steps of the process from sample collection, sample storage and transport to the laboratory. There are signature lines to relinquish custody of the sample and to receive custody of the sample.
- 6.5 Filling out the chain of custody: The person collecting the sample and preparing the COC signs the COC to relinquish the sample(s) either to other KERAMIDA personnel, a courier, or when it is delivered to the laboratory. The person who transports the sample to the laboratory signs the COC last. In case there are additional steps in the process requiring another person or persons to take custody of the sample, the form has additional lines for signatures. All signatures must be in ballpoint pen and are followed by a date and time that the COC was signed. The line at the bottom of the page is provided for personnel from the laboratory to sign for receiving the sample. No erroneous information may be erased on the COC. Errors must be lined out and initialed, and the correction written in.
- 6.6 Sample Collection: The COC is initiated at the commencement of sample collection activities. If a team is involved in the collection of samples, the senior team member will assume custody responsibility including signing the COC.
- 6.7 Sample Delivery: Once the samples are delivered to the laboratory, the laboratory personnel will sign and date the next blank "received by" line located at the bottom of the COC. The laboratory will retain the white original and KERAMIDA will retain the yellow carbonless copy. The white original will be returned to KERAMIDA with the certificate of analysis.

7.0 REF. DOCUMENTS

N/A

8.0 RECORDS

N/A

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9.0 REVISION HISTORY

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Standard Register – Remediation and Abatement
1251 North Fruitridge Avenue
Terre Haute, Indiana
KERAMIDA Project No. 18626**

**ATTACHMENT 4
KERAMIDA Field Sampling Sheet**

Comments:

[illegible]

**Residential Indoor Air Sampling & SSDS Repair
Standard Register – Remediation and Abatement
1251 North Fruitridge Avenue
Terre Haute, Indiana
KERAMIDA Project No. 18626**

**ATTACHMENT 5
NRPP and Indiana Mitigation Credentials**



Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-4423

Radon Mitigator License

Certificate Number	Status	Expire Date
RTM00924	Active	12/31/2020

Michael Devir

Kristina Box, MD, FACOG
Kristina Box, MD, FACOG
State Health Commissioner
Indiana State Department of Health

STATE FORM 49122 (9-98)



Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-4423

Primary Radon Tester License

Certificate Number	Status	Expire Date
RTP00923	Active	12/31/2020

Michael Devir

Kristina Box, MD, FACOG
Kristina Box, MD, FACOG
State Health Commissioner
Indiana State Department of Health

STATE FORM 49122 (9-98)



Michael J Devir

Has satisfactorily fulfilled the requirements set forth by the
National Radon Proficiency Program and is therefore certified as a:

Residential Mitigation Provider

NRPP ID 109955 RMT
Expires 07/31/2020

Valid for specific activities or
measurement devices, which can be
verified with NRPP. State and local
agencies may have additional
requirements.



In witness Whereof,
I have subscribed my name as a
Representative of NRPP

Janna Sinclair

Janna Sinclair
NRPP Credentialing Coordinator

**ATTACHMENT 6
Laboratory Analytical Report**



EnvisionAir
1441 Sadler Circle West Drive
Indianapolis, IN 46239
Ph: 317-351-0885
Fax: 317-351-0882
www.envision-air.com

Ms. Xuqing Xiong
Keramida, Inc.
401 North College Avenue
Indianapolis, IN 46202

November 16, 2020

EnvisionAir Project Number: 2020-614
Client Project Name: Standard Register

Dear Ms. Xiong,

Please find the attached analytical report for the samples received November 10, 2020. All test methods performed were fully compliant with local, state, and federal EPA methods unless otherwise noted. The project was analyzed as requested on the enclosed chain of custody record. Please review the comments section for additional information about your results or Quality Control data.

Feel free to contact me if you have any questions or comments regarding your analytical report or service.

Thank you for your business. EnvisionAir looks forward to working with you on your next project.

Yours Sincerely,

A handwritten signature in black ink that reads "Stanley A. Hunnicutt".

Stan Hunnicutt

Project Manager
EnvisionAir, LLC



EnvisionAir

1441 Sadlier Circle West Drive
Indianapolis, IN 46239
Ph: 317-351-0885
Fax: 317-351-0882
www.envision-air.com

Client Name: KERAMIDA ENVIRONMENTAL

Project ID: STANDARD REGISTER

Client Project Manager: XUQING XIONG

EnvisionAir Project Number: 2020-614

Sample Summary

Canister Pressure / Vacuum

		<u>START</u>		<u>START</u>						<u>Lab</u>	
		<u>Date</u>	<u>Time</u>	<u>End Date</u>	<u>End Time</u>	<u>Date</u>	<u>Time</u>	<u>Initial Field</u>	<u>Final Field</u>	<u>Received</u>	
<u>Laboratory Sample Number:</u>	<u>Sample Description:</u>	<u>Matrix:</u>	<u>Collected:</u>	<u>Collected:</u>	<u>Collected:</u>	<u>Collected:</u>	<u>Received:</u>	<u>Received</u>	<u>(in. Hg)</u>	<u>(in. Hg)</u>	<u>(in. Hg)</u>
20-2819	14124	A	11/9/20	10:48	11/10/20		11/10/20	14:50			0



EnvisionAir
1441 Sadler Circle West Drive
Indianapolis, IN 46239
Ph: 317-351-0885
Fax: 317-351-0882
www.envision-air.com

Client Name: KERAMIDA ENVIRONMENTAL

Project ID: STANDARD REGISTER

Client Project Manager: XUQING XIONG

EnvisionAir Project Number: 2020-614

Analytical Method: TO-15
Analytical Batch: 111120AIR

Client Sample ID: 14124

Sample Collection START Date/Time: 11/9/20 10:48

Sample Collection END Date/Time: 11/10/20

EnvisionAir Sample Number: 20-2819

Sample Received Date/Time: 11/10/20 14:50

Sample Matrix: AIR

<u>Compounds</u>	<u>Sample Results ug/m³</u>	<u>Reporting Limit ug/m³</u>	<u>Flag</u>
4-Ethyltoluene	< 492	492	
4-Methyl-2-pentanone (MIBK)	< 2050	2050	
1,1,1-Trichloroethane	< 546	546	
1,1,2,2-Tetrachloroethane	< 0.34	0.34	1
1,1,2-Trichloroethane	< 0.21	0.21	1
1,1-Dichloroethane	< 4.05	4.05	
1,1-Dichloroethene	< 198	198	
1,2,4-Trichlorobenzene	< 0.74	0.74	
1,2,4-Trimethylbenzene	< 4.92	4.92	
1,2-dibromoethane (EDB)	< 0.03	0.03	1
1,2-Dichlorobenzene	< 60.1	60.1	
1,2-Dichloroethane	< 0.40	0.40	
1,2-Dichloropropane	< 0.46	0.46	
1,3,5-Trimethylbenzene	< 4.92	4.92	
1,3-Butadiene	< 0.22	0.22	
1,3-Dichlorobenzene	< 60.1	60.1	
1,4-Dichlorobenzene	< 0.60	0.60	
1,4-Dioxane	< 1.80	1.80	
2-Butanone (MEK)	< 2950	2950	
2-Hexanone	< 20.5	20.5	
Acetone	< 2380	2380	
Benzene	< 1.60	1.60	
Benzyl Chloride	< 0.41	0.41	1
Bromodichloromethane	< 0.54	0.54	1
Bromoform	< 10.3	10.3	
Bromomethane	< 3.88	3.88	
Carbon Disulfide	< 311	311	
Carbon Tetrachloride	< 0.63	0.63	
Chlorobenzene	< 23.0	23.0	
Chloroethane	< 13.2	13.2	



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<u>Compounds</u>	<u>Sample Results ug/m³</u>	<u>Reporting Limit ug/m³</u>	<u>Flag</u>
Chloroform	< 0.83	0.83	
Chloromethane	< 20.6	20.6	
cis-1,2-Dichloroethene	< 19.8	19.8	
cis-1,3-Dichloropropene	< 4.54	4.54	
Cyclohexane	< 5510	5510	
Dibromochloromethane	< 0.85	0.85	
Dichlorodifluoromethane	< 49.5	49.5	
Ethyl Acetate	< 54.1	54.1	
Ethylbenzene	< 8.68	8.68	
Hexachloro-1,3-butadiene	< 1.07	1.07	
Isooctane	< 467	467	
m,p-Xylene	< 43.4	43.4	
Methylene Chloride	< 41.7	41.7	
Methyl-tert-butyl ether	< 36.1	36.1	
N-Heptane	< 410	410	
N-Hexane	< 176	176	
Naphthalene	< 0.524	0.524	
o-Xylene	< 43.4	43.4	
Propylene	< 172	172	
Styrene	< 426	426	
Tetrachloroethene	< 3.19	3.19	
Tetrahydrofuran	< 295	295	
Toluene	< 3770	3770	
trans-1,2-Dichloroethene	< 39.6	39.6	
trans-1,3-Dichloropropene	< 4.54	4.54	
Trichloroethene	< 1.07	1.07	
Trichlorofluoromethane	< 562	562	
Vinyl Acetate	< 176	176	
Vinyl Bromide	< 0.44	0.44	
Vinyl Chloride	< 1.28	1.28	

4-bromofluorobenzene (surrogate) 100%
Analysis Date/Time: 11-11-20/22:03
Analyst Initials tjg

TO-15 Quality Control Data
EnvisionAir Batch Number: 111120AIR

Method Blank (MB):	MB Results (ppbv)	Reporting Limit (ppbv)	Flags
4-Ethyltoluene	< 100	100	
4-Methyl-2-pentanone (MIBK)	< 500	500	
1,1,1-Trichloroethane	< 100	100	
1,1,2,2-Tetrachloroethane	< 0.049	0.049	1
1,1,2-Trichloroethane	< 0.038	0.038	1
1,1-Dichloroethane	< 1	1	
1,1-Dichloroethene	< 50	50	
1,2,4-Trichlorobenzene	< 0.1	0.1	
1,2,4-Trimethylbenzene	< 1	1	
1,2-dibromoethane (EDB)	< 0.0041	0.0041	1
1,2-Dichlorobenzene	< 10	10	
1,2-Dichloroethane	< 0.1	0.1	
1,2-Dichloropropane	< 0.1	0.1	
1,3,5-Trimethylbenzene	< 1	1	
1,3-Butadiene	< 0.1	0.1	
1,3-Dichlorobenzene	< 10	10	
1,4-Dichlorobenzene	< 0.1	0.1	
1,4-Dioxane	< 0.5	0.5	
2-Butanone (MEK)	< 1000	1000	
2-Hexanone	< 5	5	
Acetone	< 1000	1000	
Benzene	< 0.5	0.5	
Benzyl Chloride	< 0.08	0.08	1
Bromodichloromethane	< 0.08	0.08	1
Bromoform	< 1	1	
Bromomethane	< 1	1	
Carbon Disulfide	< 100	100	
Carbon Tetrachloride	< 0.1	0.1	
Chlorobenzene	< 5	5	
Chloroethane	< 5	5	
Chloroform	< 0.17	0.17	
Chloromethane	< 10	10	
cis-1,2-Dichloroethene	< 5	5	
cis-1,3-Dichloropropene	< 1	1	
Cyclohexane	< 1600	1600	
Dibromochloromethane	< 0.1	0.1	
Dichlorodifluoromethane	< 10	10	
Ethyl Acetate	< 15	15	
Ethylbenzene	< 2	2	
Hexachloro-1,3-butadiene	< 0.1	0.1	
Isooctane	< 100	100	
m,p-Xylene	< 10	10	
Methylene Chloride	< 12	12	
Methyl-tert-butyl ether	< 10	10	
N-Heptane	< 100	100	
N-Hexane	< 50	50	
Naphthalene	< 0.1	0.1	
o-Xylene	< 10	10	
Propylene	< 100	100	
Styrene	< 100	100	
Tetrachloroethene	< 0.47	0.47	
Tetrahydrofuran	< 100	100	

Analytical Report

<u>Method Blank (MB):</u>	<u>MB Results (ppbv)</u>	<u>Reporting Limit (ppbv)</u>	<u>Flags</u>
Toluene	< 1000	1000	
trans-1,2-Dichloroethene	< 10	10	
trans-1,3-Dichloropropene	< 1	1	
Trichloroethene	< 0.2	0.2	
Trichlorofluoromethane	< 100	100	
Vinyl Acetate	< 50	50	
Vinyl Bromide	< 0.1	0.1	
Vinyl Chloride	< 0.5	0.5	
4-bromofluorobenzene (surrogate)	103%		
Analysis Date/Time:	11-11-20/17:36		
Analyst Initials	tjg		

<u>LCS/LCSD</u>	<u>LCS Results (ppbv)</u>	<u>LCSD Results (ppbv)</u>	<u>LCS/D</u> <u>Conc(ppbv)</u>	<u>LCS</u> <u>Rec.</u>	<u>LCSD</u> <u>Rec.</u>	<u>RPD</u>	<u>Flag</u>
Propylene	10.6	10.1	10	106%	101%	4.8%	
Dichlorodifluoromethane	10.9	11.5	10	109%	115%	5.4%	
Chloromethane	10.5	11	10	105%	110%	4.7%	
Vinyl Chloride	10.1	11.1	10	101%	111%	9.4%	
1,3-Butadiene	10.4	11.5	10	104%	115%	10.0%	
Bromomethane	9.75	10.2	10	98%	102%	4.5%	
Chloroethane	10.1	10.5	10	101%	105%	3.9%	
Vinyl Bromide	9.96	10.5	10	100%	105%	5.3%	
Trichlorofluoromethane	10.5	11.1	10	105%	111%	5.6%	
Acetone	11.2	11.3	10	112%	113%	0.9%	
1,1-Dichloroethene	10.8	11.3	10	108%	113%	4.5%	
Methylene Chloride	9.83	9.48	10	98%	95%	3.6%	
Carbon Disulfide	9.28	9.96	10	93%	100%	7.1%	
trans-1,2-Dichloroethene	9.54	8.79	10	95%	88%	8.2%	
Methyl-tert-butyl ether	10.9	11.1	10	109%	111%	1.8%	
1,1-Dichloroethane	10.4	10.7	10	104%	107%	2.8%	
Vinyl Acetate	10	10	10	100%	100%	0.0%	
N-Hexane	10.6	10.9	10	106%	109%	2.8%	
2-Butanone (MEK)	11.2	11.7	10	112%	117%	4.4%	
cis-1,2-Dichloroethene	10.1	10.2	10	101%	102%	1.0%	
Ethyl Acetate	11.5	11.6	10	115%	116%	0.9%	
Chloroform	10.8	10.8	10	108%	108%	0.0%	
Tetrahydrofuran	10	10.4	10	100%	104%	3.9%	
1,2-Dichloroethane	9.36	9.33	10	94%	93%	0.3%	
1,1,1-Trichloroethane	8.91	9.05	10	89%	91%	1.6%	
Carbon Tetrachloride	9.11	9.31	10	91%	93%	2.2%	
Benzene	9.82	10.2	10	98%	102%	3.8%	
Cyclohexane	10.2	10.3	10	102%	103%	1.0%	
1,2-Dichloropropane	10.3	10.4	10	103%	104%	1.0%	
Trichloroethene	9.4	9.62	10	94%	96%	2.3%	
Bromodichloromethane	9.76	9.82	10	98%	98%	0.6%	
1,4-Dioxane	10.7	10.4	10	107%	104%	2.8%	
Isooctane	10.4	10.7	10	104%	107%	2.8%	
N-Heptane	11.2	11.1	10	112%	111%	0.9%	
cis-1,3-Dichloropropene	9.62	9.72	10	96%	97%	1.0%	
4-Methyl-2-pentanone (MIBK)	10.5	11	10	105%	110%	4.7%	
trans-1,3-Dichloropropene	9.04	9.04	10	90%	90%	0.0%	
1,1,2-Trichloroethane	9.54	9.35	10	95%	94%	2.0%	
Toluene	10.2	10	10	102%	100%	2.0%	
2-Hexanone	10.2	10.8	10	102%	108%	5.7%	
Dibromochloromethane	10.7	9.57	10	107%	96%	11.1%	
1,2-dibromoethane (EDB)	10.9	9.45	10	109%	95%	14.3%	
Tetrachloroethene	11.7	10.6	10	117%	106%	9.9%	
Chlorobenzene	11.3	8.97	10	113%	90%	23.0%	2
Ethylbenzene	11.5	11	10	115%	110%	4.4%	
m,p-Xylene	21.2	20.3	20	106%	102%	4.3%	
Bromoform	10.4	9.21	10	104%	92%	12.1%	



Analytical Report

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<u>LCS/LCSD</u>	<u>LCS Results (ppbv)</u>	<u>LCSD Results (ppbv)</u>	<u>LCS/D</u> <u>Conc(ppbv)</u>	<u>LCS</u> <u>Rec.</u>	<u>LCSD</u> <u>Rec.</u>	<u>RPD</u>	<u>Flag</u>
Styrene	11.4	10.2	10	114%	102%	11.1%	
1,1,2,2-Tetrachloroethane	11.7	10.4	10	117%	104%	11.8%	
o-Xylene	10.4	11.2	10	104%	112%	7.4%	
4-Ethyltoluene	10.8	11	10	108%	110%	1.8%	
1,3,5-Trimethylbenzene	9.4	11.3	10	94%	113%	18.4%	
1,2,4-Trimethylbenzene	11	11	10	110%	110%	0.0%	
1,3-Dichlorobenzene	8.71	10	10	87%	100%	13.8%	
Benzyl Chloride	9.22	9.83	10	92%	98%	6.4%	
1,4-Dichlorobenzene	8.52	9.69	10	85%	97%	12.9%	
1,2-Dichlorobenzene	10.4	9.3	10	104%	93%	11.2%	
1,2,4-Trichlorobenzene	10.2	8.85	10	102%	89%	14.2%	
Hexachloro-1,3-butadiene	9.96	8.82	10	100%	88%	12.1%	
Naphthalene	9.49	8.06	10	95%	81%	16.3%	
4-bromofluorobenzene (surrogate)	99%	94%					
Analysis Date/Time:	11-11-20/15:49	11-11-20/16:26					
Analyst Initials	tjg	tjg					



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Flag Number

Comments

- | | |
|---|---|
| 1 | Reporting limit is supported by MDL. TJG |
| 2 | RPD is biased high, but recoveries are within control. TJG 11/13/20 |

CHAIN OF CUSTODY RECORD

EnvisionAir | 1441 Sadlier Circle West Drive | Indianapolis, IN 46239 | Phone: (317) 351-0885 | Fax: (317) 351-0882

Client:	Standard Register	P.O. Number:	18626
Report Address:		Project Name or Number:	
Report To:		Sampled by:	
Phone:		QA/QC Required: (circle if applicable)	Level III Level IV
Invoice Address:		Reporting Units needed: (circle)	ug/m ³ mg/m ³ PPBV PPMV
Desired TAT: (Please Circle One) 1 day 2 days 3 days Std (5 bus. days)		Media type:	1LC = 1 Liter Canister 6LC = 6 Liter Canister TB = Tedlar Bag TD = Thermal Desorption Tube

REQUESTED PARAMETERS

Sampling Type:

Soil-Gas: ☐Sub-Slab: ☐

Indoor-Air: [

www.envision-air.com

Canister Pressure / Vacuum

[illegible]

Comments:

Relinquished by:	Date	Time	Received by:	Date	Time
XUGNS 502	11/10/20	14:50	[Signature]	11/10/20	14:50