

Tony Evers
Governor



DIVISION OF PUBLIC HEALTH
SOUTHERN REGIONAL OFFICE
1 WEST WILSON STREET ROOM 250
MADISON WI 53703-3445

Kirsten L. Johnson
Secretary

State of Wisconsin
Department of Health Services

Fax: 608-267-2832
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August 1, 2023

Celeste Hemphill-Welter
Douglas County Department of Health and Human Services
1316 North 14th Street, Suite #324
Superior, WI 54880
Re: Letsos Property (BRRTS# 02-16-560359) Indoor Air Quality Assessment

Dear Ms. Hemphill-Welter:

This letter summarizes our findings from the investigation of trichloroethylene (TCE) in indoor air at an office and two Airbnb units related to an ongoing vapor intrusion concern at the property referenced above. **DHS recommends TCE indoor air sampling events continue periodically at this location to ensure the vapor mitigation system maintains indoor air TCE levels in the two Airbnb units below the Wisconsin Department of Natural Resources (DNR) residential Vapor Action Level (VAL) of 2.1 $\mu\text{g}/\text{m}^3$ and office area below the DNR small commercial VAL of 8.8 $\mu\text{g}/\text{m}^3$.**

Background: A 2022 investigation of indoor air quality was initiated based upon previous results indicating the presence of TCE in indoor air above the WI DNR VAL at this property. In consultation with our office, it was decided that passive organic vapor monitor (OVM) air samples should be collected by public health staff and that DHS staff should evaluate the vapor mitigation system (VMS).

Investigation:

DHS staff accompanied Department of Health and Human Services staff for a site visit on Monday January 30, 2023. The investigation also consisted of deployment of passive OVMs during warm weather (June 30- July 3). Temperatures were between a low of 59° F and 85° F¹. Assay Technology TraceAir® II 525 (AT 525) OVM's were used to assess for indoor air VOCs. One OVM was deployed inside the basement, one OVM was deployed in the main floor office area, and one OVM was deployed in each of the upstairs Airbnb units. An additional OVM was deployed outdoors to assess the ambient air background TCE concentration. The OVMs were picked up after four days of sampling and submitted to the Wisconsin State Laboratory of Hygiene (WSLH) for analysis. The laboratory analyzed the air samples using a modified OSHA method to evaluate for TCE.

Results and Discussion: Results from the AT 525 OVM laboratory analysis are summarized in **Table 1** below. Results indicate that TCE was below the limit of detection at all sampling locations except for in the basement. The basement sample was below DNR's small commercial VAL² of 8.8 $\mu\text{g}/\text{m}^3$. Previous suggestions from DHS included the use of carbon impregnated HVAC filters and maintaining indoor air

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spaces under positive air pressure with the HVAC system. DHS staff noted that heating was provided by electric baseboard heaters, therefore, HVAC related recommendations are not feasible. DHS observed the VMS exhausts in the back of the building. The exhaust stack of the building is higher than the first roofline but lower than the second. Depending on weather conditions, the exhausted VOCs could be potentially flow along the first roofline, a deck for the Airbnb units, and periodically be brought into the Airbnb units through those walls/windows.

Table 1. TCE Air Concentration Measurements

Location	TCE Concentration ($\mu\text{g}/\text{m}^3$)
Office	<0.70
Basement	4.6
Unit A	<0.70
Unit B	<0.70
Outside	<0.70

Site Visit Limitations: The results from this investigation represent only the conditions during the time sampled. OVMs require some air flow for effective sample collection, so there is a small possibility that they could under report VOC concentrations when deployed in a very still area.

Human Health Concerns: The primary target for TCE toxicity is the central nervous system, and exposure to moderate amounts may cause headaches, dizziness, and sleepiness³. Exposure to higher levels of TCE can also cause heart rhythm changes and damage to the liver and kidney. DHS staff noted that some of the employees were female and of childbearing age. Human epidemiology and animal toxicology studies show that TCE may cause developmental effects such as spontaneous abortion, congenital heart defects, central nervous system defects, and lowered birth weight. DHS recommended pregnant staff avoid TCE exposure. There is also strong evidence that TCE exposure over long periods can cause kidney cancer and some evidence for TCE to increase risk for liver cancer and malignant lymphoma.

Conclusions: TCE was found to be less than the limit of detection and below the levels of human health concern in the regularly occupied areas of the building (office and Airbnb units).

Recommendations: DHS recommends TCE indoor air sampling events continue periodically at this location to ensure the vapor mitigation system maintains indoor air TCE levels in the two Airbnb units below the Wisconsin Department of Natural Resources (DNR) residential Vapor Action Level (VAL) of $2.1 \mu\text{g}/\text{m}^3$ and office area below the DNR small commercial VAL of $8.8 \mu\text{g}/\text{m}^3$, and that efforts be taken to keep TCE in indoor air concentrations below respective DNR VALs when exceeded. Efforts may include, but are not limited to, use of a portable carbon air purifying unit (APU) when appropriate and occupants

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limiting time spent in the basement area of the building. DHS also suggests increasing the stack height of the VMS exhaust to avoid the potential for periodic re-entrainment of VOCs back into the building.

Please contact me at 608-266-6677 or curtis.hedman@dhs.wisconsin.gov if you have any questions about the health recommendations made in this letter.

Sincerely,

Handwritten signature of Jeremiah Yee.

Jeremiah Yee, PhD
Toxicologist – Hazard Assessment Section

Handwritten signature of Curtis Hedman.

Curtis Hedman, PhD
Toxicologist – Hazard Assessment Section

Cc: Grant Neitzel, Hydrogeologist – Senior, Wisconsin DNR
James Walden, Hydrogeologist, P.G. – Vapor Intrusion Expert, Wisconsin DNR

Enclosed: WSLH Lab Results Report

Note: This publication was made possible by a cooperative agreement [Agency for Toxic Substances and Disease Registry's (ATSDR's) Program to Promote Localized Efforts to Reduce Environmental Exposure (APPLETREE) Program in Wisconsin #TS-23-2001]. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the ATSDR, or the U.S. Department of Health and Human Services.

References:

¹ Weather underground historical data for Superior, Wisconsin. Accessed online at:
<https://www.wunderground.com/history/daily/us/wi/superior/KSUW/date/>.

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² WI DNR Vapor Intrusion Vapor Action Levels (VALs), Wisconsin Vapor Quick Look up Table, Based on November 2022 EPA Regional Screening Levels. Accessed online at:
<https://dnr.wi.gov/DocLink/RR/RR0136.pdf>.

³ Agency for Toxic Substances and Disease Registry (ATSDR). 2019. Toxicological Profile for Trichloroethylene. Accessed online at: <https://www.atsdr.cdc.gov/toxprofiles/tp19.pdf>.

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AIHA LAP, LLC Laboratory ID: LAP-101070

CURTIS HEDMAN
WI DEPT OF HEALTH SERVICES DPH-
BEOH
1 W. WILSON ST
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MADISON, WI 53701

Lab Workorder ID 686822
Visit/Project ID LESTOS TEC
PO DH 060
Received July 5, 2023
Reported July 25, 2023
Report ID 11014265

Previous Report IDs

Dear CURTIS HEDMAN:

Enclosed are the analytical results for sample(s) received by the laboratory on July 5, 2023. All samples/specimens received by the laboratory were acceptable for testing. Sample results were not blank corrected, and all quality control met laboratory standards unless otherwise noted in the report narrative. All results apply to the samples as received and reported concentrations were calculated with information supplied by the sample submitter.

Please contact the lab if you have any questions concerning this report.

Sincerely,

Steve Strebels, Laboratory Director

Analyst - SARAH OEMIG

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AIHA LAP, LLC Laboratory ID: LAP-101070

Final Report

Lab ID: 686822001	Sample ID: OFFICE	Media: 3M 3501+ or Assay 525 OVM
Sampling Date: 6/30/2023	Matrix: Air	Sampled Time: 5710 M

Analyte	Method	Analysis Date	Air Volume	Reporting Limit	RESULTS		Total	Air Concentration	TWA
					Front	Rear			
Trichloroethene	OSHA 1001, 1002, 1004, 1005	7/20/2023	416 L	0.29 ug			<0.29 ug	<0.00070 mg/m3	<0.00013 ppm

Lab ID: 686822002	Sample ID: BASEMENT	Media: 3M 3501+ or Assay 525 OVM
Sampling Date: 6/30/2023	Matrix: Air	Sampled Time: 5708 M

Analyte	Method	Analysis Date	Air Volume	Reporting Limit	RESULTS		Total	Air Concentration	TWA
					Front	Rear			
Trichloroethene	OSHA 1001, 1002, 1004, 1005	7/20/2023	416 L	0.29 ug			1.9 ug	0.0046 mg/m3	0.00085 ppm

Lab ID: 686822003	Sample ID: UNIT A	Media: 3M 3501+ or Assay 525 OVM
Sampling Date: 6/30/2023	Matrix: Air	Sampled Time: 5708 M

Analyte	Method	Analysis Date	Air Volume	Reporting Limit	RESULTS		Total	Air Concentration	TWA
					Front	Rear			
Trichloroethene	OSHA 1001, 1002, 1004, 1005	7/20/2023	416 L	0.29 ug			<0.29 ug	<0.00070 mg/m3	<0.00013 ppm

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Final Report

Lab ID: 686822004	Sample ID: UNIT B	Media: 3M 3501+ or Assay 525 OVM
Sampling Date: 6/30/2023	Matrix: Air	Sampled Time: 5706 M

Analyte	Method	Analysis Date	Air Volume	Reporting Limit	RESULTS			TWA	
					Front	Rear	Total		
Trichloroethene	OSHA 1001, 1002, 1004, 1005	7/20/2023	416 L	0.29 ug			<0.29 ug	<0.00070 mg/m3	<0.00013 ppm

Lab ID: 686822005	Sample ID: OUTSIDE	Media: 3M 3501+ or Assay 525 OVM
Sampling Date: 6/30/2023	Matrix: Air	Sampled Time: 5704 M

Analyte	Method	Analysis Date	Air Volume	Reporting Limit	RESULTS			TWA	
					Front	Rear	Total		
Trichloroethene	OSHA 1001, 1002, 1004, 1005	7/20/2023	416 L	0.29 ug			<0.29 ug	<0.00070 mg/m3	<0.00013 ppm

Abbreviations:
mg = milligrams ppm or ppmv = parts per million /m3 = per cubic meter
ug = micrograms ppb or ppbv = parts per billion ng = nanograms
< Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used

Displayed values on report have been rounded to 2 significant figures. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

The results in this report apply only to the samples, specifically listed above, and tested at the Wisconsin Occupational Health Laboratory

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End of Analytical Report

Tuesday, July 25, 2023 10:09:34 AM

Report ID: 11014265