Letter Health Consultation

Evaluation of Indoor Air Sampling Events

FORMER WALKER MACHINE PRODUCTS

COLLIERVILLE, SHELBY COUNTY, TENNESSEE

Prepared by
Tennessee Department of Health

JULY 11, 2016

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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TN Department of Health

July 7, 2016

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RE: Former Walker Machine Products Site
Letter Health Consultation Update
Evaluation of Indoor Air Sampling Events, Former Walker Machine Products Site, and Evaluation of Sub-Slab Soil-Gas Sampling, Witt International Building, 459 and 435 Washington Street, Collierville, Shelby County, Tennessee 37017

This letter is to provide you with our health conclusions and recommendations based on evaluating indoor air and sub-slab air sample results for this site. Tennessee Department of Health's (TDH) Environmental Epidemiology Program (EEP) evaluated:

- indoor air results from the sampling event conducted in October 2015 at the former Walker Machine Products (WMP) Site in Collierville, Tennessee, 37017.

- soil-gas results from beneath concrete slabs at the edge of the adjacent Witt International (WI) building from a sampling event conducted in December 2015.

EEP reached two conclusions:

- EEP concludes that contaminants in the air of the former WMP building are below levels of health concern for workers. This is based on the October 2015 data and following the installation of a sub-slab vapor mitigation system. The system has continued to reduce indoor air levels of TCE and PCE inside the building. However, a section of the manufacturing area continues to have TCE levels slightly above its chronic ATSDR

indoor air screening level (See Table 1, Attachment 2, Location SG402 east central area). It is worth noting that the business has closed and no workers are currently in the building. If the building is occupied in the future, additional monitoring is necessary to ensure adequate functioning of the mitigation system.

- EEP cannot conclude whether exposures to chemicals in indoor air inside the WI building could harm people's health. In the absence of indoor air data, a health evaluation for the people that currently use the building cannot be conducted. The December 2015 soil-gas data screening indicates that 1,4-dioxane is a concern for vapor intrusion and timely, additional investigation is needed. As 1,4-dioxane is highly soluble in water, it is possible that its presence in soil-gas samples indicates the leading edge of the groundwater plume may be approaching the WI building that is currently occupied by workers and children. A complete indoor air investigation of the WI is necessary to evaluate the potential for current exposures.

EEP strongly recommends EPA:

- Operate the sub-slab mitigation system in the WMP building if it becomes occupied again. The system appears to be operating as designed and has nearly reduced levels of TCE and PCE and other soil-gas contaminants to below health concerns.

- Continue to collect concurrent indoor air and sub-slab soil-gas samples at the WMP building if it becomes inhabited again.

- Obtain access and perform concurrent collection of both indoor air and sub-slab soil-gas samples in the adjacent WI building in occupied areas where adults are working and children are exercising to provide the data necessary to evaluate potential indoor air exposures.

The remainder of this letter presents background information as well as the evaluation of the indoor air and soil gas data to support the conclusions and recommendations for the WMP Site and WI building.

There have been only three indoor air sampling events in the WMP building and none in the WI building. The groundwater plume at the site has been delineated and there remains a concern for migration of the plume beneath the WI building. Thus, there remains a potential for additional vapor intrusion concerns for the adjacent WI building. EEP evaluated the health impacts of exposure to chemicals in groundwater in a separate public health assessment.

Background and Statement of Issues

The former WMP Site is 5 acres in size. The site is almost square in shape and is situated on the south side of Washington Street east of downtown Collierville, Tennessee 37017 (Figure 1, Attachment 1). A business called Langley Wire Cloth occupied the former WMP property since 2005, ending in March 2016. More details about the site can be found in the EEP's July 28, 2015 Letter Health Consultation *Former Walker Machine Products, Evaluation of Indoor Air Sampling Events.* The WI property is adjacent to the WMP to the west. It is shown on Figure 1 in Attachment 1 as the building with the children's gymnastics center.

Environmental investigations have been conducted on the former WMP Site since 2007 and the WI building since 2009.

WMP Building

The initial October 10, 2014, WMP indoor air sampling identified vapor intrusion occurring in the WMP building and led to an emergency action to reduce chemical vapors in the indoor air. EPA installed a sub-slab mitigation system beneath the WMP building in March 2015. A second indoor air sampling occurred in March 27, 2015, approximately three weeks after the sub-slab mitigation system had been operating. Follow-up indoor air samples were collected in October 2015, approximately six months after the sub-slab mitigation system was operating, to verify the mitigation system continued to reduce levels of both TCE and PCE in indoor air.

In March 2016, Langley was sold, the business was moved, and the former WMP building became vacant. It is unknown if the former WMP property will be sold, used again, or redeveloped.

Exposed Population (Past)

There were 21 employees that worked within the former WMP building until March 2016. Langley operated ten hours a day for four days per week. Both male and female employees worked in the building. At the time of the investigation, none of the females were reported to be of child-bearing age. The WMP building is currently vacant.

Environmental Data

The initial Letter Health Consultation for the WMP Site, prepared July 28, 2015, documented reduced concentrations of TCE and PCE in indoor air after system installation (Table 1). The consultation concluded that the mitigation system should continue to be operated and maintained to reduce indoor air concentrations, that another air sampling event be conducted in the WMP building, and indoor air should be tested in the adjacent WI building. EPA's contractor performed another indoor air test in the WMP building in October 2015 and performed soil-gas tests outside the WI building in December 2015.

For the October 2015 results, one of seven indoor air TCE samples exceeded EPA's RfC/ATSDR's EMEG of 2 micrograms per cubic meter ($\mu g/m^3$). All seven indoor air TCE samples exceeded ATSDR's CREG of 0.24 $\mu g/m^3$. For PCE, none of the seven samples exceeded ATSDR's chronic EMEG of 40 $\mu g/m^3$. One PCE sample result was greater than ATSDR's CREG for PCE of 3.9 $\mu g/m^3$.

Health Evaluation

To evaluate exposure to the levels of TCE and PCE that workers may have been exposed to when the building was occupied based on October 2015 post-mitigation sampling, EEP adjusted the measured maximum TCE level to account for the employees shift

duration and number of days worked each week. The adjusted maximum concentrations are shown below.

Calculation - Adjusted Maximum Concentration – October 2015 – Post–Mitigation:

Maximum TCE or PCE Concentration$_{adjusted}$ = Maximum TCE or PCE Concentration x ET x EF

where:
ET = exposure time (hours [hrs]/day); and
EF = exposure frequency (days/week)

Maximum TCE Conc.$_{adjusted}$=8.3 µg/m^{3}x10 hrs/24 hr dayx4 days/7 day week=**2 µg/m^3**
Maximum PCE Conc.$_{adjusted}$=4 µg/m^{3}x10 hrs/24 hr dayx4 days/7 day week=**1 µg/m^3**

Based on the evaluation of October 2015 indoor air sampling results during this very brief period of exposure to low levels of chemicals after installation of the mitigation system), workers were not exposed to TCE and PCE that exceeded health guidelines for non-cancer effects and the increased cancer risk is considered to be very low. Worker exposures are below levels of health concern.

WI (Off-site Building) Environmental Data

The WI building, which is the closest commercial building to the former WMP Site, has a youth gymnastics academy where children and workers are present, a children's dance studio, a party rental business, a building supply, a specialty fastener business, and a newspaper distribution location. There are sensitive receptors (exercising children) and workers with elevated breathing rates in the gym and dance facilities.

As part of this latest investigation, sub-slab soil-gas samples were also collected from outside of the WI building at four locations.

Soil-gas sample results from beneath concrete slabs at the edge of the WI building are shown in Table 2. TCE soil-gas levels were non-detect with a detection level of 2.7 µg/m^3 at all four locations tested. PCE results were low and were estimated at the four sampling locations. Estimated levels ranged from 0.81 J to 2.4 J µg/m^3. Additionally, maximum levels of 1,4-dioxane at 88 µg/m^3, ethyl acetate at 74 µg/m^3, and styrene at 7,100 µg/m^3 were found in WI sample WISG500, the WI soil-gas sample location closest to the WMP building. It is noted that the maximum concentration detected in soil gas at the Walker Machine property was 3.4 µg/m^3 of ethyl acetate and less than 1 µg/m^3 of styrene, respectively. Styrene has not been detected in groundwater monitoring wells at either the Walker Machine Products property or the WI property. For the three other sampling locations, levels of these three chemicals were below their respective non-cancer screening levels. Only levels of 1,4-dioxane were above its ATSDR CREG.

WI building soil-gas data was screened to determine if there was a potential for vapor intrusion to occur. To screen the data received, a sub-slab to indoor air attenuation factor of 0.03 (EPA 2015) was applied to the 1,4-dioxane, TCE and PCE CREGs, and styrene EMEG. The screening results are shown in Table 2.

As stated earlier in this letter, EEP is not comfortable with the sub-slab soil-gas event's four location data set being extrapolated to the entire building. The WI building is several thousand square feet in area. The WMP groundwater plume travels beneath the northern half of the WI building. No near-slab or interior sub-slab samples were collected beneath that portion of the building. For this reason EEP feels building interior sub-slab and indoor air data, collected concurrently and in areas occupied by adults and children, are necessary to fully evaluate the potential for vapor intrusion in the WI building. Concurrent outdoor air is also recommended to detect background contributions coming from outside the building.

Two nearby off-site locations have the potential for contaminant exposure from vapor intrusion from the WMP site. One is a commercial building, and the other is a small neighborhood of single family homes:

Commercial: There is a commercial building to the north (Figure 1 – Attachment 1) of the former WMP building. The latter is an active business that employs between 50 and 100 workers.

Residential: A small group of homes are located southwest of the site, on Friendship Cove (Figure 1 – Attachment 1), south of the railroad tracks located south of the WMP Site.

Additional Resources and Assistance

EEP can provide fact sheets about exposure for persons wanting to better understand risk. Workers, gymnastics academy personnel, students, and parents wishing to discuss health concerns related to TCE or PCE exposure may contact their personal care physician. Their physician can refer them to the Tennessee Poison Center at 800-222-1222 and the American College of Occupational and Environmental Medicine (www.acoem.org). The Tennessee Poison Center has physicians specializing in environmental and occupational medicine.

EEP is available to review any additional data at the request of TDEC or EPA and are able to provide further guidance as appropriate. EEP and ATSDR are available to assist the TDEC and EPA in communicating the health risks to WMP Site and WI building owners, workers, students, parents, and the community. If you have any questions regarding the findings presented in this letter, please contact me at 615-741-7247 or by email at joseph.george@tn.gov.

Respectfully,

Joseph P. George, PG
Environmental Health Assessor
Tennessee Department of Health
Environmental Epidemiology Program

cc: Tamal Chakaverty, Shelby County Health Department

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REPORT PREPARATION

This Letter Health Consultation for the former Walker Machine Products NPL Site (Langley Wire Products facility), Shelby County, Tennessee, was prepared by the Tennessee Department of Health's Environmental Epidemiology Program under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with the approved agency methods, policies, and procedures existing at the date of publication. Editorial review was completed by the cooperative agreement partner. ATSDR has reviewed this document and concurs with its findings based on the information presented. ATSDR's approval of this document has been captured in an electronic database, and the approving agency reviewers are listed below.

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Attachment 1 – Figures

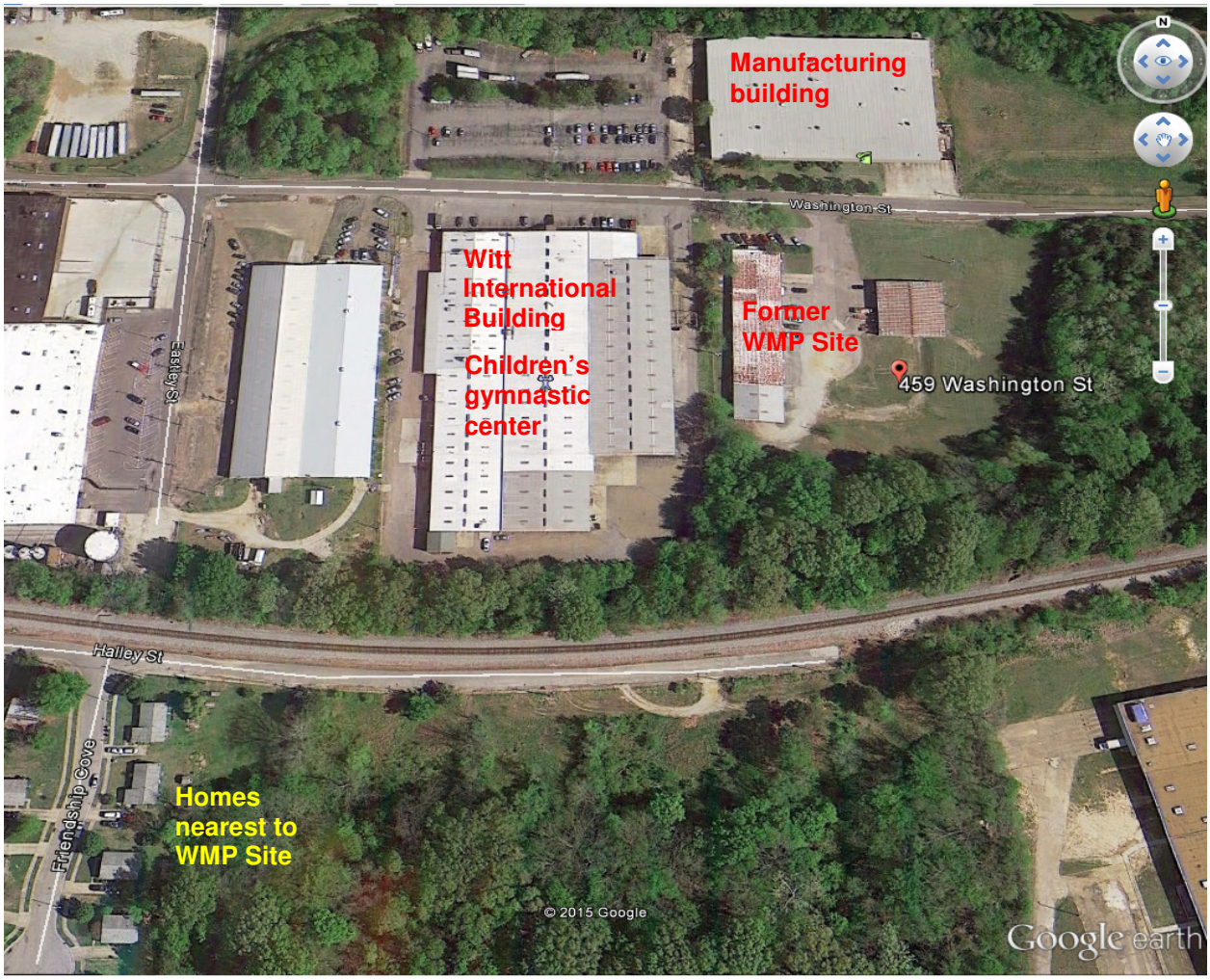

Figure 1. Walker Machine Products (WMP) Site Map. The former WMP Site property is noted, along with the children's gymnastic center which occupies a portion of the Witt International building to the west, the nearest homes to the southwest, and a manufacturing building to the north. Source: Google Earth 2015.

Figure 2. Witt International building to the left and the WMP Site is to the right. Blue stars show approximate locations of EPA contractor sub-slab soil-gas samples collected at the WI building in December 2015. Numbers in red indicate sample designation. Source: EPA 2016.

Attachment 2 – Data Tables

Table 1. Measured indoor air sampling results (10-hour) for PCE and TCE for the manufacturing building, former Walker Machine Products Site. All results reported in micrograms per cubic meter (µg/m^3). Black & Veatch (EPA contractor) performed all sampling events.

Location	Initial Sampling October 10, 2014		Confirmation Sampling March 27, 2015		Confirmation Sampling October 23, 2015	
	TCE	PCE	TCE	PCE	TCE	PCE
SG400 (southeast corner)	**29**	**320**	**0.43 J**	0.56 J	**1 J**	0.63 J
SG401 (southwest corner)	**20**	**32**	<2.7	0.51 J	**1.5 J**	1.1 J
SG402 (east central area)	**340**	<3.4	**1 J**	1 J	**8.3**	**4**
SG403 (west central area)	**25**	<3.4	**0.61 J**	1 J	**1.6 J**	3.4
SG404 (northwest area)	**20**	<3.4	**0.46 J**	0.52 J	**1.4 J**	3.8
SG405 (north central area)	**30**	<3.4	**28**	1.1 J	**0.96 J**	1.8 J
SG406 (northwest corner – office area)	**11**	<3.4	**<2.7**	0.9 J	**0.6 J**	1.6 J
SG407 (ambient air sample)	**<2.7**	<3.4	**<2.7**	<3.4	**<2.7**	<3.4
SG407 DUP (ambient air sample duplicate)	**<2.7**	<3.4	**<2.7**	<3.4	**0.89 J**	3.2 J
SG408 (ambient air sample)	NS	NS	NS	NS	**0.97 J**	3.6
SG409 (ambient air sample)	NS	NS	NS	NS	**0.43 J**	0.71 J
ATSDR CREG	0.24	3.9	0.24	3.9	0.24	3.9
ATSDR EMEG	2	40	2	40	2	40

Notes:

Sub-slab mitigation system installed March 2015
<2.7 = Chemical not detected above the posted detection limit of the analysis.
J = estimated concentration that is below the method detection level for the analysis.
BOLD result = measured level of chemical exceeds ATSDR's Cancer Risk Evaluation Guide (CREG) for one additional cancer in 1 million people.
NS = Not Sampled on specific date

Table 2. Measured soil-gas sampling results (8-hour) for PCE and TCE for the Witt International (WI) building. All results reported in micrograms per cubic meter (µg/m^3). Black & Veatch (EPA contractor) performed the soil-gas sampling.

Location	Soil-gas Test Results December 5, 2015				
	TCE	PCE	1,4-Dioxane	Ethyl acetate	Styrene
WISG500	< 2.7	2.4 J	**88**	74	7,100
WISG501	< 2.7	1.8 J	<9	10 J	4.3 J
WISG502	< 2.7	0.81 J	5.6 J	<36	4.1 J
WISG503	< 2.7	2.2 J	**10**	<36	130
ATSDR Indoor Air Comparison Value (CV)	0.24(CREG)	3.9(CREG)	0.20 (CREG)	73 (EPA RSL)	850 (EMEG)
ATSDR SVI Soil-Gas Screening Level =ATSDR Indoor Air CV /0.03 attenuation	8 (CREG)	130 (CREG)	6.7	2,400	28,000

Notes:

<2.7 = Chemical not detected above the posted detection limit of the analysis.
J = estimated concentration that is below the method detection level for the analysis.

NA = Not Applicable
ngv = No Guidance Value available

BOLD result = measured level of chemical exceeds ATSDR SVI Soil-Gas Screening Level

CREG = cancer risk evaluation guide (screening level)