LETTER HEALTH CONSULTATION

EVALUATION OF INDOOR AIR AND SUBSLAB RESULTS FROM HOMES NEAR GOOD OIL HOFF SITE

NEW HANOVER TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

May 30, 2014

Prepared by:

Pennsylvania Department of Health
Division of Environmental Health Epidemiology

Health Consultation: A Disclaimer

The Pennsylvania Department of Health (PADOH) Health Assessment Program (HAP) collaborates with the Agency for Toxic Substances and Disease Registry (ATSDR), the lead federal public health agency, to prepare health consultation documents which determine if exposure to contaminants can harm people's health as well as prevent and reduce exposures and illnesses. A health consultation is a written response to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material, and considers the levels of hazardous substances at a site, whether people might be exposed to contaminants, by what pathways, and what potential harm the substances might cause to them. In order to prevent or mitigate exposures, a consultation may lead to specific actions and recommendations, 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; conducting health studies; characterizing demographics; recommending changes/additions to related Commonwealth of Pennsylvania policies/regulations, improving quality of life; and/or providing health education for health care providers and community members.

ATSDR provides technical assistance and funding to PADOH to help identify and evaluate environmental health threats to communities using the best science, taking responsive public health actions, and providing trusted health information. While this health consultation was supported by funds from a cooperative agreement with the ATSDR, it was not published by ATSDR. More information about ATSDR is available online at www.atsdr.cdc.gov.

The conclusions and recommendations presented in this health consultation document are based on an analysis of the environmental sampling data and information made available to the PADOH within a limited time frame. The availability of additional sampling data, new information and/or changes in site conditions could affect the conclusions and recommendations presented in this document. PADOH will consider reviewing additional future data related to the site, if made available and deemed appropriate.

pennsylvania
DEPARTMENT OF HEALTH

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From: Farhad Ahmed, Epidemiologist/Program Manager Health Assessment Program
Pennsylvania Department of Health (PADOH)

Subject: Review of Indoor Air and Subslab Data from Properties near Good Oil Hoff Site
New Hanover Township, Montgomery County, PA

The Pennsylvania Department of Health (PADOH) has prepared this letter health consultation (LHC) evaluating the Vapor Intrusion sampling results from soil gas and indoor air data collected by the Pennsylvania Department of Environmental Protection (PADEP) in December 2012 and April 2013 (subslab), and January 2014 (subslab and indoor) and April 2014 (indoor air), respectively, at 3 properties (2 homes and one apartment complex) near Good Oil Hoff site in New Hanover Township, Montgomery Township, Pennsylvania. This evaluation was done at the request of the PADEP Southeast Region to determine if exposure to the levels of volatile organic compounds (VOCs) found in these samples poses a public health threat.

The Agency for Toxic Substance and Disease Registry (ATSDR) provides technical assistance and funding, through a cooperative agreement with PADOH, to help identify and evaluate environmental health threats to communities by using the best available science, taking responsive public health actions, and providing trusted health information. While this LHC was supported by this cooperative agreement, it has not been reviewed and cleared by ATSDR. The conclusions and recommendations presented in this LHC document are based on an analysis of the data and information made available to the PADOH within a limited time frame. The availability of additional sampling data, new information and/or changes in site conditions could affect the conclusions and recommendations. More information about ATSDR is available online at www.atsdr.cdc.gov.

Background and Statement of Issues

In June, 2011, the Montgomery County Health Department tested well water from two homes because of a reported spill of home heating oil. These homes are adjacent to the Good Oil Inc property in New Hanover Township, Montgomery County, Pennsylvania. The test results from the well water indicated the presence of several VOCs including trichloroethylene (TCE) and vinyl chloride. The Montgomery Health Department notified the PADEP of the contamination. In July of 2011, PADEP began an investigation of the ground water contamination along Layfield Road and Hoffmansville Road, where these homes are located next to the Good Oil site. PADEP found that several private groundwater wells were impacted by VOC contamination. PADEP provided bottled water to residents with well water contamination above the current safe drinking water standards and installed carbon filters at the apartment building and four nearest residential properties in November 2012. PADEP requested ATSDR's and PADOH's assistance in evaluating indoor air and subslab data as it relates to potential exposure to VOCs in air and make a public health determination for three properties on Layfield Road and Hoffmansville Road adjacent to the Good Oil site.

Subslab and Indoor Air Sampling Results

PADEP collected three (Table 1) rounds of subslab air samples for VOCs: in December 2012 April 2013, and January 2014. These samples were collected by using summa canisters for 1 hour period from subslabs . Also, an ambient air sample was collected from the front yard of the homes that served as a background air VOC sample. The December 2012 air sampling results, that was shared with PADOH, were collected from 322 Layfield Road and the April 2013 VOCs was collected from 322 Layfield Road and also from 324 Layfield Road. The 324-330 Layfield are a collection of 5 separate apartments. According to PADEP these are the locations with the highest levels of VOCs in groundwater.

The levels of chemicals detected in the subslab air at 324 Layfield Road (apartments) are well below the PADEP Residential Site-Specific Standard Vapor Intrusion Screening Criteria but have exceeded ATSDR's comparison values (CVs) for benzene, naphthalene and TCE (e.g. Benzene above chronic EMEG 9.6 µg/m3). However, the subslab air sampling data do not provide actual exposure levels to chemicals by the residents. For this evaluation, PADOH used EPA's recommended vapor attenuation of 0.1 to screen the subslab air data. An attenuation factor is a method of estimating potential indoor air levels based on levels observed in the subslab data. To evaluate the potential for subslab gases to migrate, PADOH multiplied the ATSDR's CVs by 10 to arrive at a subslab screening level that takes into account of EPA's 0.1 attenuation factor.

Based on the review of the December 2012 **subslab** sampling results for 322 Layfield Road home, the highest concentration of naphthalene only (29 µg/m3) was below the adjusted

ATSDR's comparison value for attenuation (37 µg/m^{3}ATSDR chronic MRL). However, naphthalene was also detected at a concentration of 13µg/m^3 in the ambient air. Also, benzene was detected at a concentration of 8µg/m^3 in the ambient air. The highest concentration of benzene detected (12 µg/m^3) in the subslab air was below the ATSDR's comparison value adjusted for attenuation (96 µg/m^3) but exceeded ATSDR's CREG value (1.3 µg/m^3).

In reviewing the April 2013 **subslab** sampling results for the same address, 322 Layfield Road, for naphthalene the highest concentration detected in April 2013 (11 µg/m^3) was below the ATSDR's adjusted comparison value (37 µg/m^3) for naphthalene.

In 2014 DEP collected two rounds of **indoor air** samples, one round in January 2014 and one in April 2014 (Table 2). In January 2014, indoor air samples were collected for 24 hours from 01/30/2014 through 01/31/2014. These were collected at 318 Layfield and 324 – 332 Layfield (apartments).

Based on the review of data for **indoor air** collected January 2014, for 318 Layfield, only benzene (1.1 µg/m^3) was detected above the DEP indoor air screening value (0.31 µg/m^3) and ATSDR CREG 0.13 µg/m^3. For the same address, when sampled in April 2014, the indoor air concentration for benzene was 0.86 µg/m^3. For 324 Layfield, when indoor air screening was done in January 2014 and again in April 2014, the benzene values were 1.2 µg/m^3 and 0.73 µg/m^3 , respectively.

The only data that is significant for the two sets of **indoor air** sampling is the naphthalene data collected in January 2014 and that is 7.4 µg/m^3 for 324-332 Layfield while the sample collected in April 2014 is non-detect. For benzene, the only data significant among the two sets of indoor air, was 1.1 µg/m^3 for 318 Layfield in January 2014 and 0.86 µg/m^3 in April 2014 for the same address.

Indoor air samplings were not collected from 322 Layfield in April 2014 since the basement was smelling strongly of petroleum as their home heating tank was filled this winter.

The April 2014 sampling event is the last planned for this site by PADEP for the foreseeable future.

Discussion of subslab and indoor air sampling results

Based on the latest results for subslab air (January 2014 and April 2013), of the VOCs sampled, only naphthalene (maximum concentration 18 µg/m^3) was above the screening values of PADEP (7.2 µg/m^3) in Table 1. However, the ambient air level (12 µg/m^3) was also above the screening value.

Based on the maximum concentration of benzene detected (1.2 µg/m^3) in the indoor air at 324 – 332 Layfield, using EPA's inhalation unit risk of 7.8 E-06, the calculated cancer risk is about 9 x 10^{-6} (assumptions used in estimating cancer risk: exposure frequency 365 days/year; exposure time 24 hrs/day; exposure duration 70 years). The estimated cancer risk is very low considering

the conservative assumptions (e.g., continuous exposure to maximum detected indoor level) used. It should be noted that the ambient air for benzene for the same address was 1.1 µg/m^3.

Naphthalene was detected above ATSDR's chronic MRL of 3.7 µg/m^3 in indoor air at 7.4 ug/m3. However, it has not been detected in any of the residential well samples according to PADEP.

PADEP currently has no active vapor mitigation system installed in the homes impacted. It is likely that since the oils spill happened long ago and there has not been any recent incidents the VOC levels are decreasing naturally over time.

Currently, PADEP is providing bottled water to all the property owners. Also, PADEP has installed carbon filters for those homes which had VOCs above respective MCLs. These action steps taken by DEP have minimized exposure to chemicals by the residents.

PADEP is installing a water line this year to connect all the homes near the Good Oil Hoff site. Construction of the main waterline has started, but no homes have been connected yet. This will mitigate ingestion and household use exposures but not vapor intrusion. However, as the subslab data shows exposure to the levels of chemicals detected in the subslab pose no apparent health hazards to the residents through the vapor intrusion route.

Conclusions and Recommendations

There is no exposure from drinking water since all properties with impacted GW above the MCL have been provided bottle water by PADEP. Based on PADEP data, the whole-house carbon filters are effectively removing contaminants from the groundwater at the apartment building and two nearest residential properties. Therefore exposure from household use (bathing, shower or general water use) has been effectively eliminated.

PADOH concludes that the potential for health effects from exposure to VOCs in groundwater are very low, since all of the VOCs, except naphthalene and benzene, found in the indoor air are below the ATSDR air comparison values (ATSDR SEQUOIA Database March 2013) as well as below the PADEP Residential Site-Specific Standard Vapor Intrusion Screening Criteria for sub slab results.

PADOH reviewed sub-slab, indoor air and ambient air sampling data collected at three properties (2 homes and one apartment unit) near Good Oil Hoff site. However, these conclusions are based on limited data (two rounds of sub-slab sampling and two rounds of indoor air sampling) in a limited number of homes.

Based on the four rounds of data collected by PADEP (two rounds of indoor air data and two rounds of sub slab data) it is the opinion of PADOH that, exposure to the levels of chemicals detected pose no apparent health hazards to the residents at 318 Layfield, 322 Layfield and 324-332 Layfield at this time. Although contaminants can fluctuate daily and seasonally due to

several factors, PADOH does not recommend further sampling be conducted at this time based on the sampling results and effectiveness of the carbon filtration units.

Installing a water line to all homes in the proximity of Good Oil Hoof site, as planned for 2014 by PADEP, which has already begun and will likely be completed by Fall/Winter 2014, would certainly protect residents living close to the Good Oil Hoff site from exposure to impacted groundwater. This would mitigate exposure to groundwater via ingestion and household use for a total of 27 currently existing properties with private wells in Good Oil Hoff site area. The private wells will be properly closed by DEP after the homes are connected to the public water line.

Sincerely,

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Table 1: Sub Slab Results for three Properties near the Good Oil/Hoff VC site, ambient air results and comparison values

	Chemicals	Sub Slab Air Levels (µg/m^3)	Dup (µg/m^3)	Average (µg/m^3)	Ambient Air (µg/m^3)	Residential soil gas screening levels (PADEP)* (µg/m^3)
318 Layfield						
01/31/2014	Benzene	0.95J	NA		1.1	31.0
	Naphthalene	**18**	NA		**12**	7.2
	TCE	1.7J	NA		ND	8.1
322 Layfield						
12/20/2012	Benzene	11	12	11.5	8.0	31.0
	Naphthalene	**29**	ND		**13**	7.2
	TCE	**12**	3.4	7.7	ND	8.1
04/04/2013	Benzene	ND	ND		ND	31.0
	Naphthalene	**11**	3.8 J	**7.4**	ND	7.2
	TCE	4.2 J	5.1 J	4.6	ND	8.1
324-332 Layfield						
04/04/2013	Benzene	ND	NA		ND	31.0
	Naphthalene	2.2 J	NA		ND	7.2
	TCE	1.3 J	NA		ND	8.1

Dup = duplicate sample
ND = nondetect
NA= not applicable (0 duplicate was collected)

Table 2: Indoor Air Sample Results for three Properties near the Good Oil/Hoff VC site (24 hour SUMMA canisters), ambient air results and comparison values.

	Chemical	Indoor Air (µg/m^3)	Ambient Air near property sampled (µg/m^3)	ATSDR CVs**: Chronic EMEG/MRL (µg/m^3)	Residential indoor air screening levels (PADEP)* (µg/m^3)
318 Layfield					
01/30/2014 – 01/31/2014	Benzene	1.1	0.92 J	9.6	0.31
	Naphthalene	ND	ND	3.7	0.072
	TCE	ND	ND	2	0.21
04/02/2014 – 04/03/2014	Benzene	0.86 J	0.81 J	9.6	0.31
	Naphthalene	ND	ND	3.7	0.072
	TCE	ND	ND	2	0.21
324-332 Layfield					
01/30/2014 – 01/31/2014	Benzene	**1.2**	1.1 J	9.6	0.31
	Naphthalene	**7.4**	**12**	3.7	0.072
	TCE	ND	ND	2	0.21
324 Layfield					
04/02/2014 – 04/03/2014	Benzene	0.73 J	0.81 J	9.6	0.31
	Naphthalene	ND	ND	3.7	0.072
	TCE	ND	ND	2	0.21

J = estimate
ND = Non Detect

Source: *PA DEP Residential Site-Specific Standard Vapor Intrusion Screening Criteria

**ATSDR CVs: From ATSDR's Sequoia Database March 2013