Letter Health Consultation

TEDFORD ROAD LANDFILL

KNOXVILLE, KNOX COUNTY, TENNESSEE

JUNE 9, 2008

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
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

TEDFORD ROAD LANDFILL

KNOXVILLE, KNOX COUNTY, TENNESSEE

Prepared By:

Tennessee Department of Health
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

STATE OF TENNESSEE
DEPARTMENT OF HEALTH
ENVIRONMENTAL EPIDEMIOLOGY PROGRAM
1st FLOOR CORDELL HULL BUILDING
425 5TH AVENUE NORTH
NASHVILLE, TENNESSEE 37243

March 18, 2008

Mr. Al Iannacone, Environmental Epidemiologist
Knoxville-Knox County Health Department
140 Dameron Avenue
Knoxville, Tennessee 37919

Dear Mr. Iannacone:

Thank you so much for keeping us up-to-date on the issues surrounding the Tedford Road Landfill fire. I have attempted to answer your questions about air exposures to nearby residents and to workers to air toxics emitting from the landfill fire in the following paragraphs.
As I understand it, the following provides background to your questions and my answers. An unpermitted demolition and wood waste landfill that contains wood, brush, plastic pipe and sheeting, and other construction materials is located at 9025 Tedford Lane, Knoxville, Tennessee. On December 24, 2007, the material in the landfill began to burn. The Knox County Health Department (KCHD) was notified of high carbon monoxide concentrations in the area on December 28, 2007. KCHD visited the site and found thick smoke coming from the landfill.

Since December 28, 2007, Rural Metro Fire Department, Knox County Engineering, and contractors have been excavating the landfill and spraying the fires with water. Since January 21, 2008, much of the landfill has been excavated, but some smoke is still rising from material covered with soil. Access to the site is not restricted. There is nothing to prevent nearby residents from wandering onto the site. Holes from excavation and other physical hazards from heavy equipment are evident on the site. Sampling and analysis near the site did not detect any site-related metals or organic compounds in groundwater.

The Tennessee Department of Environment and Conservation (TDEC) provided sampling of residential well water in homes near the landfill. TDEC found no contamination in the well water samples.

Knox County Health Department Air Quality Management requested EPA Region 4 assistance in determining if hazardous air contaminants were being emitted from the fire. EPA provided sampling canisters, sampling instructions, and analyzed the samples. Tennessee Department of Environment and Conservation, Division of Air Pollution Control provided technical advice.
The Knox County Health Department was concerned about residents who live near the site

breathing site related chemicals that might be emitted. As we all discussed the situation, it became evident that worker health also needed to be considered.

To determine whether persons are, have been, or are likely to be exposed to chemicals, Environmental Epidemiology evaluates mechanisms that could lead to human exposure. An exposure pathway contains five parts: 1) a source of contamination, 2) contaminant transport through an environmental medium, 3) a point of exposure, 4) a route of human exposure, and 5) a receptor population An exposure pathway is considered complete if there is evidence that all five of these elements are, have been, or will be present at the site. The pathway is considered either a potential or an incomplete exposure pathway if there is no evidence that at least one of the five elements listed is, has been, or will be present at the site, or if there is a lower probability of exposure. At the Tedford Road Landfill fire, two routes of exposure are possible: drinking contaminated well water and breathing pollutants emitted from the fire. Water sampling by TDEC eliminated contaminated groundwater as a current completed exposure route.

Most air sampling results for organic compounds were below the minimum reporting limit; these chemicals will not be considered further. Air sampling results for those chemicals reported above the minimum detection limit are listed in Table 1, with ATSDR comparison values. Acetone, chloromethane, styrene, and toluene measured values were well below any health comparison values and will not be discussed further. Dichlorodifluoromethane and trichlorofluoromethane concentrations were essentially the same on site and off site; these chemicals do not seem to be site-related.

Propene (usually called propylene in the U.S.) is used in polymer form to form plastics. It is also a combustion product found in vehicle exhaust. The concentrations found in urban settings generally range from 7 to 29 $\mu g/m^3$ [HSDB]. All samples were below or within this range, except for sampling point E. Sampling point E was chosen because it is on the landfill at a point where an organic chemical type odor was noticed. No health comparison values or U.S. occupational limits were found for propylene, although Russia has a short-term exposure limit of 100,000 $\mu g/m^3$ [HSDB].

Benzene was below the ATSDR chronic environmental media evaluation guide (EMEG) for all off site locations and at sampling point D, up wind of the fire. It is slightly over the intermediate EMEG at sampling point F, near the fire, and over the acute EMEG at sampling point E, where a chemical odor was noted. The National Institute of Occupational Safety and Health (NIOSH) time-weighted average (TWA) recommended exposure limit is 0.1 ppm (319 $\mu g/m^3$), compared to the highest concentration on-site of 250 $\mu g/m^3$.

ATSDR EMEGs are derived to protect the general public from continuous exposure to the chemical in question for specified time periods. Chronic EMEGs are protective for exposures lasting for one year or more. Intermediate EMEGs are protective for exposures lasting from two weeks up to a year. Acute EMEGs are protective for exposures lasting up to two weeks. Occupational limits are set to protect workers during a 40-hour work week. In this case, the fire started in late December, 2007, and was brought under control quickly. At the time of this report, the activity was on-going at the site, although the fire was almost out. Any exposures would be of intermediate length.

It is unclear if the contractor doing the on site work has a health and safety plan in place.

I conclude that:

1. There is no current apparent public health hazard from off site exposures to chemicals detected through air sampling. There was an indeterminate public health hazard before sampling, although the fire was brought under control quickly and sampling off-site showed much lower concentrations of chemicals than on site.
2. Access to the site is not limited by any warning signs or barriers. If non-workers trespassed on site, a public health hazard could exist due to physical hazards.
3. There was no apparent health threat to workers on site at the time of sampling.
4. There was an indeterminate health threat to workers on site before sampling.
5. There will be no apparent future health threat to on site workers or off site to the general public if the fire continues to be contained.

I recommend that:

1. The Knox County Health Department and the contractor should prevent trespassers from going onto the site.
2. The contractor should ensure that an adequate site safety and health plan is in place and understood by the site workers.

I know that the Knox County Health Department is already making sure that the recommendations are followed.

Toxicological information was taken from the following references:

[HSDB] Hazardous Substances Data Bank (HSDB) [Available from URL: http://toxnet.nlm.hih.gov/]. Washington DC: US National Library of Medicine, 2008.

[ATSDR] Agency for Toxic Substances and Disease Registry Toxicological Profiles for acetone, benzene, 1,3-butadiene, chloromethane, styrene, and toluene. Atlanta: US Department of Health and Human Services.

Please let me know if you need anything else from Environmental Epidemiology and if you have questions about this consultation.

Sincerely,

Bonnie S. Bashor, Director
Environmental Epidemiology
Communicable and Environmental Disease Services

Table 1. Air sampling results, Tedford Lane Landfill, Knox County, Tennessee. January 21, 2008. All results in $\mu g/m^3$.

Chemical	Sample Location						ATSDR chronic EMEG, $\mu g/m^3$	ATSDR intermediate EMEG, $\mu g/m^3$	ATSDR acute EMEG, $\mu g/m^3$
		B	C	D	E	F			
Acetone	1.4	1.4	ND [a]	2.8	26	ND	30,000	30,000	60,000
Benzene	0.66	0.75	2.2	1.5	250	21	10	20	30
1,3-Butadiene	ND	ND	0.31	ND	30	2.8	NA [b]	2 [b]	NA
Chloromethane	1.4	1.4	1.5	1.4	7.9	1.5	100	400	1,000
Dichlorodifluoromethane A	3.1	3.2	2.9	3.0	2.9	3.0	NA	NA	NA
Propene	1.0	1.2	0.21	1.70	160	12	NA	NA	NA
Styrene	0.48 [d]	NA	0.50 [d]	0.70 [d]	22	0.32 [d]	300	1,000 [c]	NA
Toluene	0.58	0.60	1.4	1.3	120	4.9	300	5,000	4,000
Trichlorofluoromethane	1.6	1.6	1.6	1.6	1.5	1.5	NA	NA	NA

[a] ND = not detected
[b] NA = not available
[c] EPA Reference Concentration
[d] measured value is above the method detection limit but below the minimum reporting limit
Sampling point A and B were from a residential yard and represent urban background samples.
Sampling point C was from a residential yard about 100 yards from the fire, neither down wind nor up wind of the fire.
Sampling point D was on the landfill upwind of the fire about 30 feet off Tedford Lane.
Sampling point E was on the site at a point where an organic odor was detected, on top of the slope toward the east of the property.
Sampling point F was on top of the slope just above the easternmost part of the fire.

Certification

The Letter Health Consultation: Tedford Lane Landfill was prepared by the Tennessee Department of Health, Environmental Epidemiology under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was prepared in accordance with the approved methodology and procedures that existed at the time the health consultation was begun. Editorial review of this document was performed by the Cooperative Agreement partner.

Technical Project Officer, CAT, CAPEB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR has reviewed this public health consultation and concurs with the findings.

for Alan Yarbrough

Team Leader, CAT, CAPEB, DHAC, ATSDR