Health Consultation

WHITE WAY CLEANERS

NASHVILLE, DAVIDSON COUNTY, TENNESSEE

EPA FACILITY ID: TND063739445

MARCH 29, 2005

Prepared by:

The Tennessee Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry
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 previously issued conclusions.

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Background and Statement of Issues

White Way Cleaners was a large-scale drycleaner from 1947 to 2002 located at 1201 Villa Place, Nashville, Davidson County, Tennessee, 37212. The White Way Cleaners site has been undergoing environmental cleanup of drycleaner solvent and breakdown chemicals as a participant in the Tennessee Department of Environment and Conservation (TDEC) Drycleaner Environmental Response Program (DCERP).

Pollution from past drycleaning activity was previously identified in shallow groundwater and soil. No new source of drycleaner solvent is present. The White Way Cleaners property is now a cleaning drop-off business and a proposed new mixed-use retail/residential development. As the White Way Cleaners site is within the Edgefield Community, homes are located nearby. DCERP requested Environmental Epidemiology (EEP) of the Tennessee Department of Health (TDH) ensure that the community health is not adversely affected from drycleaner solvents.

In November of 2003, DCERP ordered indoor air samples in six homes that were nearby the White Way Cleaners site. The samples were collected using the industry standard Summa canisters in basements or crawlspaces where vapor intrusion would most likely occur. The ATSDR *Health Consultation: White Way Cleaners, Nashville, Davidson County, TN*, dated January 13, 2004, details the environmental public health investigation that detected tetrachloroethylene (PCE), the most common drycleaning solvent, in one of the six houses tested. A concentration of 4.1 parts of PCE per billion parts of air (ppb) was measured in the basement of House 6 in November 2003. As the concentration of PCE measured was below health screening guides, no apparent public health hazard was reported.

As a safeguard for the occupants of House 6, DCERP ordered additional indoor air samples in November of 2004, and then requested EEP review the data to ensure that there are no indoor air levels of health concern.

Discussion

Introduction to Chemical Exposure

To determine whether persons are, have been, or are likely to be exposed to chemicals, Environmental Epidemiology of the Tennessee Department of Health 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 potential or incomplete if there is no evidence that at least one of the five elements listed is, has been, or will be present at the site. A pathway may be potential or incomplete if there is a low likelihood of exposure.

A completed exposure pathway exists for occupants of houses near the White Way Cleaners site. Drycleaner solvent and breakdown products are chemicals of concern. If this contamination, in the shallow groundwater or soil, evaporates underneath a nearby home, chemical vapors may become trapped within the home and lead to an inhalation exposure.

Furthermore, physical contact alone with a potentially harmful chemical in the environment by itself does not necessarily mean that a person will develop adverse health effects. A chemical's ability to affect public health is also controlled by a number of other factors, including:

- the amount of the chemical that a person is exposed to (dose)
- the length of time that a person is exposed to the chemical (duration)
- the number of times a person is exposed to the chemical (frequency)
- the person's age and health status
- the person's diet and nutritional habits.

The *Health Consultation: White Way Cleaners*, dated January 13, 2004, reported 4.1 ppb PCE was measured in the basement air of House 6 in November 2003. The scientific literature states that this trace amount of PCE is not considered enough to cause adverse human health effects even over a long period of time (ATSDR 1997; 2004). Since there was a trace amount of PCE measured, it was concluded that no apparent health hazard existed.

Environmental Sampling - Indoor Air

In November 2004, TVG Environmental, Inc. (TVG 2005), under the direction of the DCERP, used two types of air sampling devices in the basement area of House 6. These environmental samples were to ensure that the indoor air in House 6 had not become problematic. The first air sampling device was a Summa canister, an industry standard vacuum sample collecting apparatus. The same kind of testing performed in House 6 previously. Table 1 illustrates that no drycleaner solvent or breakdown products were detected in the basement of House 6. The smallest amount that the analytical laboratory could detect is included.

TABLE 1. Summa canister indoor air analytical data of drycleaner solvent and breakdown chemicals for the basement of House 6 collected November 2004. All measurements reported in parts per billion (ppb) (TVG 2005).

Chemical	Analytical Detection Minimum	Measured Analytical Result
tetrachloroethylene	3.7	not detected
trichloroethylene	4.7	not detected
cis-1,2-dichloroethylene	6.4	not detected
trans-1,2-dichloroethylene	-	not reported
vinyl chloride	9.9	not detected

The 4.1 ppb PCE measured in November 2003 in the basement of House 6 is indeed greater than the analytical detection minimum of 3.7 ppb. Therefore, if the same amount was present a year later, the Summa canister would have detected it. As the drycleaner pollution was a historical event and additional remediation has taken place at the White Way Cleaners site; theoretically, the amount of vapors should be less now than in 2003. The data supports this hypothesis.

Table 2 lists the results of the indoor air monitoring performed with a Gore-Sorber device. The Gore-Sorber technology has a lower analytical detection limit than the Summa canister. It should be noted that the Gore-Sorber is not currently an industry standard, but a developing measurement tool. Two Gore products were used. The first was for air sampling and the second was a trip blank. Reviewing the datasheets provided in TVG's (2005) report, the trip blank and laboratory method blank correctly never detected any chemical. In the basement air sample, the Gore-Sorber measured 1.39 ppb PCE.

TABLE 2. Gore-Sorber indoor air analytical data of drycleaner solvent and breakdown chemicals for the basement of House 6 collected November 2004. All measurements reported in parts per billion (ppb) (TVG 2005).

Chemical	Analytical Detection Minimum	Measured Analytical Result
tetrachloroethylene	0.10	1.39*
trichloroethylene	0.045	below detection
cis- 1,2- dichloroethylene	0.07	below detection
trans- 1,2- dichloroethylene	-	not reported
vinyl chloride	0.966	not detected

* ATSDR Environmental Media Evaluation Guide (EMEG) health screening value for PCE is 40 parts per billion (ppb)

Comparing the measured 1.39 ppb PCE in Gore-Sorber Sample 1 to the 3.7 ppb analytical detection minimum used in the Summa canister analysis, validates why the Summa canister would not have detected any amount of drycleaner solvent. Using the usual assumption of ½ the analytical detection minimum value for non-detects, all data listed in Tables 1 and 2 provided a theoretical average of 1.6 ppb PCE. The ATSDR Environmental Media Evaluation Guide (EMEG) health screening value is 40 ppb for PCE. Therefore, there is 25 times less PCE present in the basement of House 6 than what scientific literature suggests needs to be present to possibly lead to adverse health effects. Therefore, there is no current health risk for occupants in House 6.

Since there has been remediation of drycleaner and solvent breakdown products at the White Way Cleaners site, the amount of source material available to possibly become chemical vapors has been reduced. Given that past and present conditions are not a health hazard, future health concerns are unlikely.

Other vapors

The indoor air environmental sampling data does list other chemical vapors that were measured. These other vapors are not related to drycleaner solvent or its breakdown products. Some of the chemical vapors identified, such as acetone and MEK, are often components of household products. Some of the chemical vapors, such as benzene and xylene, are common byproducts components of automobile emissions.

Children's Health Considerations

The many physical differences between children and adults demand special emphasis. Children could be at greater risk than adults from certain kinds of exposure to hazardous substances. Children often play indoors on the floor and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. Children are shorter than adults; this means they breathe dust and vapors close to the ground. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, nourishment, medical care, and risk identification. No chemicals vapors related to drycleaner solvent or its breakdown products were measured during the indoor air sampling of House 6 that would adversely affect children.

Conclusion

No public health hazard exists for the occupants of House 6 from old drycleaner solvent or its breakdown products.

Following the DCERP remediation, there is no reason to suspect future exposure.

Recommendation

Continue participation in the DCERP until the White Way Cleaners site cleanup is complete.

Public Health Action Plan

Environmental Epidemiology will provide this document to the occupants of House 6. EEP will be available to House 6 to provide clarification or to answer any questions. In addition, this document will be provided to DCERP, the Nashville Davidson County Public Health Department, and the White Way Cleaners property owner.

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 2004. Public Health Consultation: White Way Cleaners, Nashville, Davidson County, TN. Atlanta: GA, January 13, 2004.

[ATSDR] Agency for Toxic Substances and Disease Registry. 1997. Toxicological profile for tetrachloroethylene (PCE). Atlanta: GA, September 1997.

[TVG] TVG Environmental, Inc. 2005. Report on Former White Way Cleaners – DCERP ID # D-19-150. Nashville: TN, January 19, 2005.

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Certification

This Health Consultation: White Way Cleaners 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. The editorial review was completed by the cooperative agreement partner.

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

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