

Letter Health Consultation

HELENA CHEMICAL COMPANY

MISSION, TEXAS

EPA FACILITY ID: TXD980625008

MAY 5, 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

HELENA CHEMICAL COMPANY

MISSION, TEXAS

EPA FACILITY ID: TXD980625008

Prepared By:

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



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

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April 15, 2008

William M. Rhotenberry
On-Scene Coordinator
USEPA Region 6
1445 Ross Avenue
Suite 1200
Mail Code: 6SFPE
Dallas, TX 75202-2733

RE: Review of post-excavation soil analysis
Review of backfill and topsoil analysis
Helena Chemical Company
602 Holland Avenue
Mission, Hidalgo County, Texas

Dear Mr. Rhotenberry:

On February 25, 2008, a regional representative for the Agency for Toxic Substances and Disease Registry (ATSDR) forwarded your request to review data from post-excavation soil sample analysis for the above referenced site. The intent of the review is to determine if exposure to onsite soils could cause adverse health effects.

Background and Statement of Issues

The Helena Chemical Company facility, located in a predominantly residential area, operated from 1950 to 1972 as a pesticide formulation plant. In 1982, under corrective action by the United States Environmental Protection Agency (USEPA), the responsible parties conducted remedial actions onsite which included placement of engineering controls to prevent exposure and migration of soil contaminants. The Texas Commission on Environmental Quality (TCEQ) conducted remediation efforts on offsite properties in 2002 and 2003. Due to deterioration of the asphalt cap and the concern about potential health impacts, a site investigation was conducted in August 2005. USEPA decided to remove and dispose of the affected soils [1].

The Texas Department of State Health Services (DSHS), a cooperative agreement partner of

ATSDR, has reviewed the surface soil sample data provided by USEPA. The site has been subsequently covered or “capped” with clean backfill and top soil.

Discussion

Surface Soil Contaminant Evaluation

To assess the potential health risks associated with exposure to the contaminants found in the soil, the geometric means of sample concentrations were compared to health-based screening values [3]. These screening values represent contaminant specific levels in the soil that are considered safe for human contact with respect to identified health endpoints. Screening values are used to determine which contaminants need further evaluation. There are screening values for non-cancer and cancer health effects.

Non-cancer screening values are generally based on ATSDR minimal risk levels (MRLs). These MRLs are developed for each route of exposure: skin absorption, ingestion, and inhalation. They also are developed for various lengths of exposure: acute (less than 14 days), intermediate (15 to 364 days), and chronic (greater than 365 days). The MRLs are then presented in ATSDR chemical-specific toxicological profiles. These profiles provide information on health effects, environmental transport, human exposure, and regulatory status. When an ATSDR MRL is not available, EPA’s Reference Dose (RfD) is used. This is an estimate of daily human exposure that is unlikely to cause non-cancer adverse health effects over a lifetime of exposure. Both MRLs and RfDs are based on the assumption that there is an identifiable exposure threshold (for individuals and populations) below which there are no observable adverse health effects.

When chemical compounds have been classified as human carcinogens, probable human carcinogens, or possible human carcinogens, cancer-screening values (when available) are used to determine if these chemicals warrant a closer look. Cancer screening values are based on EPA’s chemical specific cancer slope factors (CSF) and an estimated excess lifetime cancer risk of one-in-one-million persons exposed for a lifetime.

Exceeding either a non-cancer or a cancer screening value does not necessarily mean that the contaminant will cause harm; however, it does suggest that potential exposure to the contaminant warrants further consideration. Factors that influence whether exposure to a contaminant could or would result in adverse health effects include: how much of the contaminant an individual is exposed to, how often and how long they are exposed, and the manner in which the contaminant enters or contacts the body. Once exposure occurs, characteristics such as age, sex, nutritional status, genetics, lifestyle, and health status all may influence how well the individual absorbs, distributes, metabolizes, and excretes the contaminant. The public health significance of contaminants that exceed screening values may be assessed by reviewing and integrating relevant toxicological information with plausible exposure scenarios. When possible, for non-cancer endpoints, estimated exposures are compared to known effect levels in humans or to documented No Observed Adverse Effect Levels (NOAEL) and/or Lowest Observed Adverse Effect Levels (LOAEL) in humans or animals. Weight-of-evidence is used to determine the public health significance of the contaminants that exceed the screening values.

Soil pica behavior (ingestion of more than 1.0 gram¹ of soil per day) may occur in a sizable portion of children [2]. While an individual child may exhibit pica behavior infrequently, the behavior is not limited to a small subset of the population. It has been estimated that about 62% of children will ingest >1.0 gram of soil on 1-2 days/year. Additionally, 42% of children will ingest >5 grams of soil and 33% will ingest >10 grams of soil on 1-2 days per year. Generally speaking and for some contaminants, periodic pica episodes potentially could result in acute intoxication [2].

Environmental Data

Post-excavation Soil Analysis

Based on our phone conversations, onsite soils were excavated in two phases, using the TCEQ's Texas Risk Reduction Program (TRRP) Protective Concentration Levels (PCLs) for commercial and industrial properties as an initial screening value to help determine which areas required further excavation.

DSHS received data for all soil samples. Only data representative of existing surface soil conditions prior to "capping" were considered in the analysis, and 143 soil samples were evaluated.

To insure complete characterization, the EPA contractor divided the site into discrete areas for excavation and grids were used for sampling. A composite sample was collected from each area within the grid. Samples were laboratory analyzed for a suite of pesticides, including the following: 4, 4'-DDE; 4, 4'-DDD; 4, 4'-DDT; aldrin; alpha-BHC (hexachlorocyclohexane); alpha-chlordane; beta-BHC; delta-BHC; dieldrin; endosulfan I; endosulfan II; endosulfan sulfate; endrin; endrin aldehyde; endrin ketone; gamma-BHC (lindane); gamma-chlordane; heptachlor; heptachlor epoxide; methoxychlor; and toxaphene.

Geometric mean concentrations of these pesticides were compared to ATSDR health-based screening values, mentioned above, where available [3]. ATSDR screening values are not available for delta-BHC, endosulfan II, endosulfan sulfate, endrin aldehyde, endrin ketone, or gamma-chlordane. For those compounds with no ATSDR health-based screening values, the USEPA's Integrated Risk Information System (IRIS) was consulted to identify an alternative screening value. No alternatives were found.

Table 1 shows a summary of the health-based screening levels and on-site geometric mean concentrations for post-excavation samples collected from surface soils after remediation. For chlordane, the geometric means of alpha-chlordane and beta-chlordane were added together.

Backfill and Topsoil Analysis

Data were also reviewed for the backfill material and new topsoil. Backfill material, consisting of gravel and calcium carbonate "caliche," was obtained from a local source. Both the backfill material and the topsoil were sampled for pesticides and metals prior to placement on site. Analytical results were compared to the health assessment screening values. None of the data exceeded any health-based screening value. Metal concentrations were orders of magnitude

¹ 1 gram is equal to 1,000 milligrams (about the same amount as the contents of a packet of artificial sweetener)

lower than the most stringent health-based screening values.

Table 1: Comparison of Post-Excavation Soil Pesticide Concentrations to Health-based Screening Values

Name	Soil Sample Results			Chronic EMEG		CREG	Intermediate EMEG		Pica Child	
	Post-Excavation ppm	Backfill ppm	Topsoil ppm	Child ppm	Adult ppm	ppm	Child ppm	Adult ppm	Acute EMEG ppm	Int EMEG ppm
Aldrin	0.0010	0.0001	0.000085	2	20	0.04			4	
Alpha-BHC	0.0023	0.0650	0.000075	400	6,000	0.1				
Beta-BHC	0.0166	0.0170	0.000095			0.4	30	400	100	1
Chlordane	0.0041	0.0002	0.0002	30	400	2	30	400	2	1
DDD, p,p'	0.0011	0.0001	0.000145			3				
DDE, p,p'	0.0252	0.0150	0.0001			2				
DDT, p,p'	0.0358	0.0093	0.000085			2	30	400	1	1
Dieldrin	0.0023	0.0001	0.0001	3	40	0.04	5	70		0.2
Endosulfan	0.0007	0.0001	0.0001	100	1,000		300	4,000		10
Endrin	0.0021	0.0140	0.000305	20	200		100	1,000		4
Gamma-BHC	0.0011	0.0170	0.000085				0.5	7	6	0.02
Heptachlor	0.0015	0.0001	0.00008			0.2	5	70	1	0.2
Heptachlor epoxide	0.0008	0.0001	0.0001			0.08				
Methoxychlor	0.0009	0.0001	0.000115				300	4,000		10
Toxaphene	0.0050	0.0019	0.0019			0.6	50	700	10	2

Child Health Considerations

The unique vulnerabilities of children demand special attention. Critical periods exist during development, particularly during early gestation, but also throughout pregnancy, infancy, childhood, and adolescence periods when toxicants may permanently impair or alter structure and function [4]. Unique childhood vulnerabilities may be present because, at birth, many organs and body systems (including the lungs and the immune, endocrine, reproductive, and nervous systems) have not yet achieved structural or functional maturity. These organ systems continue to develop throughout childhood and adolescence.

Children may exhibit differences in absorption, metabolism, storage, and excretion of toxicants, resulting in higher biologically effective doses to target tissues. Depending on the affected media and because of behavior patterns specific to children, they may be exposed to contaminants more than adults. In an effort to account for children's unique vulnerabilities, and in accordance with ATSDR's Child Health Initiative [5] and EPA's National Agenda to Protect Children's Health from Environmental Threats [6], the potential exposure of children to the contaminants found in the soil was used as a guide in assessing the potential public health risks associated with this site. Specifically, pica behavior in children was considered as a possible exposure route.

Conclusions

Soil data were reviewed from the following sources: post-excavation soils, backfill material, and

new topsoil. The geometric mean was calculated to evaluate the post-excavation soils for individual pesticides. The backfill and topsoil results were directly compared to the health-screening values. None of the concentrations exceeded the health-based screening values. The installation of the “cap” was not necessary to protect public health. Based on this information, the pesticide concentrations in soil pose no apparent public health hazard.

Recommendations

There are no recommendations at this time.

Please contact me at 512.458.7269 or michelle.bost@dshs.state.tx.us if you have questions or additional information pertinent to these findings.

Sincerely,

Michelle N. Bost, MS, CHMM
Environmental Specialist

cc: Jennifer Lyke, Division of Regional Operations, Agency for Toxic Substances and Disease Registry - Region 6
Jeff Kellam, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry

References

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