

August 2008

U.S. EPA REGION 3



Former Mohr Orchard North Whitehall Township Lehigh County, Pennsylvania

Sampling Program to Start

At the request of the Agency for Toxic Substances and Disease Registry (ATSDR) and the Pennsylvania Department of Environmental Protection (PADEP), the United States Environmental Protection Agency (USEPA) is performing an initial investigation of elevated concentrations of arsenic in a former orchard located in North Whitehall Township, Lehigh County, Pennsylvania. There is a history of arsenic type pesticides being used in the fruit orchard industry for control of insects. Using historical data provided by the township, the site area is estimated to be approximately 1.5 square miles.

Site Discovery

The site was brought to the attention of the agencies after a private citizen sampled soil on their residential property. Subsequent laboratory analysis of the sample showed elevated arsenic concentrations. The resident contacted an ATSDR toxicologist in their Atlanta office. Next the Regional ATSDR Representative in Philadelphia contacted Region 3 USEPA to request assistance in investigating this issue.

Sampling Plan Developed

Area-wide testing will be performed to determine whether human-health arsenic exposures are an issue or not at this site. USEPA has developed a sampling protocol for the site. Working with ATSDR a soil screening concentration for arsenic, the specific methodology of composite sampling, and the depths of sampling and analysis were determined. Property owners will first be contacted so that permission for sampling can be gained. A access form spelling out the access request must be signed by the property owner. Once the access agreements are granted, sampling is expected to begin by early September.

	x				x		
			x			x	
x		x					
				x			x
		x				x	
				x			x
	x		x				
x					x		

Figure 1. - Gridding and Random Selection

This phase of the investigation will not include sampling at all residential or public use locations in the site area. Further sampling design decisions will be made based upon the results of this sampling. The investigation area is defined as areas within North Whitehall Township which are currently being used for residential or public use and have formerly been used for growing orchard trees and the commercial harvest of fruit. Figure 1 illustrates a typical grid that will used to define a sampling area. Using a computer program, 25% of these grids will be selected by random (x) for soil and private well sampling. The investigation area is divided by 200 foot square grids. There are 1435 grids of this size. The grids may contain several properties.

	x				x		
		o	x				x
x	o	X	o				
		o		x		o	x
		x			o	X	o
				x		o	x
	x		x				
x						x	

Figure 2. - Adaptive Cluster Sampling

The soil in each randomly selected grid (x) will be

sampled in up to 10 locations. Those samples will be combined as a composite sample and analyzed on-site. If the concentration of arsenic in the composite sample at the randomly selected grids (X) is above the established screening value, a composite sample will be taken from the adjacent 4 grids (o) as shown in Figure 2. This process will be completed until the concentrations are below the screening value or 50% of the total grids have been sampled. Ten percent of these composite samples will be sent to an off-site laboratory. Any private water wells in the grids selected will also be sampled and analyzed for arsenic. To help determine if there is any naturally occurring arsenic in the area, background samples are also being evaluated.

Reporting Sampling Results

Once the results of the testing have been validated, the data will be distributed to individual property owners. In addition, the general results will be posted on USEPA Region 3 web site www.epaosc.org/former_mohr_orchard. EPA is required to maintain the privacy of data for residential sampling results so no identifying information will be included on the web site.

What is Arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and

hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

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Former Mohr Orchard Site

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