United States
Environmental Protection
Agency

EPA Answers Your Questions about Health Risks from Polluted Ground Water

ChevronTexaco Cincinnati Facility
Hooven, Ohio October 2004

Need information?

Visit the site information repository:
Cincinnati Public Library
Miami Township Branch
8 Miami Ave., Cleves

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EPA toll free:
(800) 621-8431
weekdays 10 a.m. - 5:30 p.m.

Attend a CAP meeting:
Anyone can attend a Chevron community advisory panel meeting. The CAP typically meets the first Wednesday of every month at the Whitewater Senior Center and Township Hall at 6125 Dry Fork Road. You can ask questions at the end of each meeting.

Contact meeting facilitator Monte McKillip at (402) 327-9498 or monte@mckillipassociates.com for the meeting schedule or more information.

U.S. Environmental Protection Agency continues to oversee ChevronTexaco Environmental Management Co.'s environmental study and cleanup of the former refinery and nearby property located in Hooven. Over the past year, some of you as well as Chevron community advisory panel members have asked EPA questions about health risks and the human health risk assessment done in 2000. This assessment looked at the possibilities of people being exposed to polluted vapors (gases) coming from water deep underground, beneath Hooven homes. The assessment found health risks to people from vapors to be at levels EPA considers safe. EPA provides more detail in answers to frequently asked questions below. See the back page for a summary of the refinery's history and environmental study.

Questions and answers

What's the problem with the old refinery? As a result of past refinery operations, a large amount of petroleum products are floating in the water deep underground. This water, called ground water, lies beneath the former facility. It has flowed under portions of neighboring residential areas. Chevron, under EPA supervision, is studying this pollution to identify the best way to reduce harm to residents.

How can the polluted ground water cause harm to residents? Some of the chemicals within the polluted area of water, called a plume, could pose a health risk to people who are in contact with the chemicals over a long period of time. EPA is most concerned about the risk from a process called vapor intrusion. Vapor intrusion is a way that chemicals in soil or ground water can get into indoor air. This happens because some chemicals can travel as vapors (gases) through spaces and cracks between soil, gravel and rock. These vapors can move up through the soil into outside air or basements. Vapors venting directly to the outside are usually harmless because of the low concentrations and dilution in air. Vapors can enter basements through cracks in the foundation where residents can breath them in. Fortunately, at most sites, risk posed by vapor intrusion is quite low. However, each site needs to be evaluated when vapor intrusion is a possibility.

To better understand the possible risk to Hooven residents from vapors, Chevron conducted a risk assessment in September 2000.

What is ground water?

Ground water is the water that collects deep underground in the spaces between dirt, gravel and rock.

What is a human health risk assessment? A risk assessment is the process of estimating how dangerous a polluted site is – now and in the future – to people that live and work nearby. The goal of a risk assessment is to understand what levels of cleanup are necessary to protect peoples' health. To understand the results, it is important to know what a human health risk assessment is and what it is not. Unlike health studies, risk assessments do not show whether or not people have *actually* been exposed to site contaminants or whether they have *actually* suffered health effects from these exposures. Instead, scientists look at the *possibility* of people coming in contact with pollutants and being harmed by them. Three outcomes can happen following the completion of a risk assessment:

- risk is within levels EPA considers safe and no further action is taken;
- risk is higher than the levels EPA considers safe and action needs to be taken to lower the risk to exposed individuals;
- risk is uncertain and more information needs to be collected.

To determine the health risk, risk assessors need to have information about how toxic specific chemicals are (the hazard) and to what extent people are exposed to the hazards (the exposure). See the figure below for more.

How was the Chevron risk assessment done and what did it show? The Chevron risk assessment looked at the risk posed by vapors moving up from the ground water plume. To study the health risk, Chevron collected samples of vapors from boreholes at the site and in residential areas. Also, the company identified categories of people (residents, school students, school employees) that could potentially come in contact with these chemicals and studied the ways this contact could occur. Along with this information, they took what was known (in 2000) about the toxicity (harmfulness) of site chemicals and calculated the human health risk.

The risk assessment found that health risks from the ground water plume and vapors to Hooven residents is low, well within EPA's guidelines for safety, with one exception discussed below.

Here's what the risk assessment found:

- The most direct way for people to be exposed to vapors would be by breathing vapors entering the home. The most likely place for vapors to enter the home would be through the basement. People at most risk are those living in basements. The risk assessment showed that a basement dweller (someone in the basement 16 hours each day for 30 years) had an 8 in 100,000 chance of getting cancer from exposure to site contaminants. Although this risk is higher than for residents that don't live in the basement, the risk still falls within the range EPA considers safe. It is important to keep in mind that *for the purposes of the study*, it was assumed that vapors entered the basement. We don't really know if this is the case.

- The assessment also showed that basement dwellers are at higher risk for other health problems, but the data was not reliable. Chevron will have to explore this in more detail.

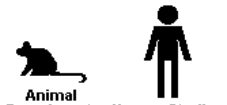
- Residents do not ingest (drink) polluted ground water. Water to Hooven residents is supplied by a municipal water supply from Cleves, a neighboring community. The wellfield supply water to the Cleves municipal system is not affected by the ground water plume.

Health Risk = Hazard x Exposure

Health Risk

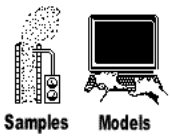
Health risk is the chance that exposure to a hazard (such as a hazardous substance) will harm you. Typically, risk from cancer is expressed as a probability, or chance. For example, a 1 in 10,000 chance means that for every 10,000 people exposed, one **extra** cancer may occur beyond what would be expected from all other causes.

Hazard



A hazard is a potential source of harm, from contact with a chemical, for example. Animal experiments or human studies provide information about how hazardous a chemical is. Scientists use this research to estimate the likelihood of illness at different levels of exposure or contact with the chemical.

Exposure



Information on the ways (breathing, touching, drinking and eating) people are exposed to site chemicals comes from samples taken from ground water, soil and air. Mathematical models are then used to estimate exposure based on the amounts of chemicals in the ground water, soil and air.

- Residents are not in direct skin contact with polluted soil and gravel because polluted materials are deep

(35 - 65 feet below the surface).

- Research of toxicity found that cancer-causing chemicals exist in the vapors. Again, for people to be harmed by the vapors, they would need to come in contact with the vapors for a long period of time. The chemical that causes the most concern is benzene, a solvent found in gasoline and other petroleum products.

- Cancer risk posed by site pollutants to students and employees at the Hooven Elementary School is low and well within EPA's safety guidelines available in 2000.

If risk to health is low, why does the human health risk assessment have to be redone?
EPA recently made changes to the national standards for calculating hazards. Two of the changed standards were for chemicals found in the Hooven ground water plume. In addition, EPA wants Chevron to revise the assessment to address concerns made by Hooven residents about some of the assumptions used in the assessment, such as the percentage of cracks in the typical Hooven crawl space or basement floor. (Most of these areas have dirt floors.) In light of these developments, EPA asked Chevron to update the 2000 risk assessment, and Chevron has agreed to do so. Chevron is evaluating the information collected about crawl spaces and basements collected during a recent door-to-door survey. They will factor information gained into the revision. It may be necessary to collect crawl space or basement air samples to learn more.

When will the revised risk assessment be done?
Chevron has agreed to submit a revised risk assessment to EPA in the fall of 2004. EPA will review the assessment and prepare comments requesting revisions or approve the assessment as is.

How will the results be used?
Results will help determine the need to sample indoor air. It will also be used in months to come to identify additional cleanup options for polluted ground water and vapors.

Why bother doing a risk assessment? Why not just sample the air to see if vapors are entering basements?
A number of factors can greatly affect results of indoor air sampling, making it difficult to determine if site-related vapors are present or not. Indoor air quality changes a lot from day to day. Also, chemicals in household products such as paints, paint strippers and thinners, aerosol sprays, moth balls, air fresheners, new carpeting or furniture, hobby supplies (glue and solvents), stored fuels, dry cleaned clothing and cigarette smoke can confuse the results of indoor air sampling, particularly when concentrations of site-related vapors are very low. In fact, studies have found that the health risks from site-related vapors is often lower than that posed by the chemicals found in household products.

A contractor prepares a soil boring for laboratory analysis.

A cleanup plan came out last summer for sludges and polluted soil on the Chevron property. When will EPA propose a final cleanup plan for polluted ground water?
EPA is reviewing a draft "corrective measures study" prepared by Chevron. This study outlines various options for addressing polluted ground water and vapors. EPA has requested that Chevron make revisions to the document to address EPA comments. Chevron will revise the study based on these revisions. Then, EPA will propose a final cleanup plan based on these findings and results from the revised human health risk assessment. Before making a decision on the cleanup plan, EPA will mail its proposal to residents as well as make it available for review at the library. EPA will also hold a public meeting to present the proposal and hear residents' views.

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About the ChevronTexaco Cincinnati facility . . .

The ChevronTexaco Cincinnati Facility site, located on State Route 128 just north of the junction of U.S. Route 50 in Hooven, dates back to 1931 when Gulf Oil Co. produced gasoline, jet and diesel fuel, home-heating oil and sulfur. It was acquired by Chevron in 1985 and ceased operation in 1986.

Environmental investigation began in 1985 as a result of fuel seepage into the Great Miami River. Chevron initiated a "corrective action" investigation and cleanup under EPA oversight in 1993 when Chevron signed a legal agreement with the Agency. Investigations have since revealed a large area of polluted ground water – called a plume – of floating hydrocarbons (mostly gasoline). The hydrocarbon released lies beneath the facility at approximately 10 - 25 feet below the surface and extends west beneath the village of Hooven at 35 - 65 feet below ground. Sixteen wells on the facility property have pumped out and treated more than 1 billion gallons of polluted ground water and recovered 3.5 million gallons of hydrocarbon product since the initial pumps began operating in 1985. Early this year, EPA approved a plan for Chevron to complete cleanup of sludges and polluted soils on the ChevronTexaco property. This work began in June 2004. Now, EPA is reviewing a plan prepared by Chevron to further address polluted ground water. The plan will be available for public review and comment once completed. EPA will notify residents when it is available.

For answers to questions commonly asked by residents, look inside.