Focus on

Cadet Manufacturing Site

from Department of Ecology Toxics Cleanup Program, April 15, 2004

An update for residents of the Fruit Valley Neighborhood

This is an update about the cleanup of ground water and solvent vapors in soil at Cadet Manufacturing (Cadet) and the status of efforts used to improve ground water and indoor-air quality in the Fruit Valley Neighborhood (FVN).

As you may recall, the Washington departments of Ecology (Ecology) and Health (DOH), along with Cadet Manufacturing of Vancouver, and its consultant, AMEC Earth and Environmental, Inc., are working together to assess environmental and public health effects associated with solvents (for example, trichloroethylene [TCE]) released at the Cadet Manufacturing site at 2500 W. Fourth Plain Boulevard in Vancouver.

Solvent-contaminated ground water has been detected under the Cadet property and has migrated below the nearby FVN. Solvent vapors from the ground water move into soil and in some cases, can move up through the soil and into the indoor air of residences in the FVN. This Focus Sheet is a summary of the remedy activity since November 2003.

Summary

- The contaminated ground water is treatable, and is being treated. Under Ecology and DOH guidance, Cadet Manufacturing is making progress to improve ground water and residential air quality.
- All residents of the Fruit Valley Neighborhood are encouraged to make sure their foundation vents are open and clear from obstructions year around. This allows natural ventilation.
- We are continuing to define the extent of groundwater contamination and where and how solvent vapors move.
- Operation of the soil vapor vacuum systems is successful in decreasing levels of solvent vapors in residences.

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- Pilot testing of ground water cleanup technology in the neighborhood shows it is effective in decreasing solvent levels.

- Ground water cleanup is underway on the Cadet property.

Overview of the contamination and cleanup

AMEC has been actively sampling using several techniques to evaluate the extent of contamination at the Cadet facility and in the FVN.

- Indoor air samples are collected from residence basements, crawlspaces and living spaces. These samples are used to evaluate if solvent vapors are moving from the ground into indoor air and to evaluate indoor air concentration levels.

- Groundwater samples are collected from wells screened across the water table surface at approximately 20 to 30 feet below ground surface to 230 feet in depth.

- Soil vapor samples are collected from wells installed above the ground water but below the ground surface. These samples are used to evaluate how contamination moves in the subsurface.

- Sub-slab air samples are collected from below basement floors in FVN residences with operating soil vapor vacuum systems. These samples are used to estimate the amount of solvent vapors being removed by the soil vapor vacuum systems.

- Outdoor air samples are collected in areas where groundwater contamination has been confirmed and also in areas where groundwater contamination does not exist.

In January 2004, AMEC sampled ground water, soil gas, indoor air, outdoor air and sub-slab locations. This information will be used to try to predict how solvent contamination moves from ground water to soil gas to indoor air.

Three different clean-up technologies are being are used.

- At six residences, AMEC has installed soil-vapor vacuum systems to remove solvent vapors from below basement floors and from crawlspaces before they can move into indoor air.

- To clean ground water in the neighborhood, AMEC recently installed a “recirculating ground water remediation well” to treat ground water in-place. This is done by pumping contaminated water so an oxidizing compound can be injected that breaks the solvent down into harmless compounds. The water and oxidant are returned to the ground where the oxidant continues to work. Testing indicates this technology successfully reduces solvent levels in ground water, and two more of these wells are being installed in the neighborhood in mid-April.

- To clean ground water at the Cadet facility, “air sparging” and “soil vapor extraction” systems are being used. These systems move the solvent contamination from the ground

water into a vapor that is removed by a vacuum applied to the subsurface. These systems are designed to contain and clean contaminated groundwater at the Cadet facility so additional contaminated groundwater will not spread from the Cadet property.

Indoor air sampling and clean-up activity

Indoor air sampling was done in January and September of 2002, in September and October of 2003 and in January of 2004. The total number of residences sampled to date is 72.

Past indoor-air testing has shown that solvent vapors have moved from the ground water up into the ground and into indoor air in some of the residences in the FVN. DOH has determined from indoor air sampling results that no immediate health hazard exists at these residences. However, data collected in 2002 indicated that three of the tested residences had solvent levels greater than what is normally expected. While it is unlikely that people living in these residences would become ill, DOH recommended that measures be taken at the three residences to eliminate these exposures. Ecology decided that measures were also necessary at three additional residences that had slightly lower solvent levels in indoor air.

In September of 2003, six soil vapor vacuum systems were installed in individual residences to prevent solvent vapor migration into indoor air. These systems are presently operating. January 2004 indoor air data indicates that only one additional residence showed detections of solvents in indoor air that would require measures to eliminate the exposure. This resident was contacted by Ecology about the need for the installation of a system in that residence. AMEC visited the residence to conduct an evaluation for foundation sealing work and system installation. For system installation, AMEC will follow procedures and design plans previously used for foundation sealing and system installation and operation.

Indoor-air sampling of residences with operating soil vapor vacuum systems has shown the systems are successful in decreasing solvent vapor concentration levels in the residences. Where indoor air sampling indicates that any system has not been as successful in removing solvent vapors, other system configurations are being considered.

Additional indoor-air sampling is required to evaluate soil-vapor vacuum system performance and to identify residences where solvent vapor movement may be occurring. A comprehensive plan is being prepared to address future indoor and outdoor air, soil gas and sub-slab air sampling schedule and locations.

Cleaning up groundwater below the Fruit Valley Neighborhood

Pilot testing of the “recirculating groundwater remediation well” in the FVN has begun and the system has been used for groundwater treatment since March 10. To verify system performance, ground water samples were collected from wells 45, 60 and 80 feet deep and analytical data indicates successful treatment with a 95 percent reduction in solvent concentration levels.

Ground water being influenced by the pumping and treatment is approximately 50 to 60 feet out from the well. This well is located at the intersection of West 28th Street and Weigel Avenue.

The recirculating technology has been successful enough that two more of these wells are planned for installation and operation along West 28th Street and Unander Avenue. Drilling for

these wells is scheduled to start on April 19. Well locations for the 2nd and 3rd recirculating wells are in West 28th in front of 2112 West 28th and in Unander Avenue east of 2708 Unander. Two residents have agreed to allow construction of the well treatment system control sheds on their properties. Reducing the solvent concentration levels in ground water would correspondingly reduce the potential for solvent vapor migration into indoor air.

This "pump and treat" system works by drawing ground water through a screen on the well bottom at 75 to 80 feet below ground surface, and then pumping water up to the surface where an oxidizing compound (sodium permanganate) will be injected into the pumped water. The water and oxidant are then pumped back into the well pipe where they re-enter the formation through a screen at 32 to 47 feet below ground surface, which is just below the depth of the water table. The oxidant begins to break down the dissolved solvent upon contact with the water. The oxidizing compound eventually breaks down the solvent into carbon dioxide, water, and dissolved chloride anions (like sodium chloride or table salt). The reaction is slow and steady and will not generate any harmful gases or solvent related by-products. The ground water recirculates and stays under the ground during its treatment. The system is controlled remotely by AMEC via a telephone modem connection.

Groundwater monitoring

To evaluate the extent of groundwater contamination, 73 monitoring wells have been installed at the Cadet property and in the FVN. Approximately 55 of these wells are included in the present groundwater monitoring program and samples are collected every three months.

The monitoring well network continues to expand to define the full extent of groundwater contamination. New well sets are installed as sampling data becomes available from newly installed wells.

Soil gas wells

In January of 2004, 34 soil-gas monitoring wells were installed in roadway right-of-ways in the FVN. Data from these wells is used in conjunction with ground water and indoor air sample data to help identify potential vapor movement patterns.

Cleaning up ground water below the Cadet property

The "air sparging" and "soil-vapor extraction" systems are designed to contain and clean up ground water on the Cadet property. These have been in operation since October of 2003. To date these systems have removed approximately 95 pounds (about 13 gallons) of solvent contamination from the ground water and soil vapor.

These treatment systems have 73 "air sparging" points and 41 "soil-vapor extraction" wells. The "air sparging" points are used to inject air into the ground water. Here, bubbling action transfers dissolved solvent contamination from the ground water into vapor. The "soil-vapor extraction" wells then vacuum the vapor from the soil, sending it to canisters containing activated charcoal where the solvent is absorbed and contained. Air samples are collected from system discharge to verify that no solvent vapors make it through the carbon canisters into outdoor air.

AMEC is monitoring these systems and soil vacuum levels every two weeks to evaluate performance.

What you can do to reduce your chances of exposure?

There are a few things to be aware of regarding solvent vapors in and around your residence. Solvent vapors in soil rise to the ground surface and can move into a crawlspace or a basement. Solvent-vapor movement from soil can also enter an open soil excavation.

Keep residence foundation vents open and clear from obstructions. This allows natural ventilation in your crawlspace. Also, be aware that construction-depth soil excavations (greater than 4 feet deep) may increase your chances for solvent vapor exposure.

Contacts for more information

For project-related questions, contact Craig Rankine at the Department of Ecology at 360-690-4795, or by e-mail cran461@ecy.wa.gov .

For health-related questions, contact Barbara Trejo at the Department of Health at 360-236-3373 or by e-mail at barbara.trejo@doh.wa.gov .

Other previous site summary information can be obtained on Ecology's Web site at: http://www.ecy.wa.gov/programs/tcp/sites/sites_information.html (click "C" for Clark County and go to Cadet Manufacturing.)

If you have special accommodation needs, please call 360-407-6300, 360-407-6306 (TDD), 711, or 1-800-833-6388 (TTY).