FACT SHEET
Vapor Intrusion, Gaffney Road Area

June 2007

What is vapor intrusion?

Many chemicals give off fumes. Those "volatile" parts of chemicals enter the air, even the small air spaces within soil. Contaminants in soil and groundwater can cause vapor intrusion as the volatile compounds seep through cracks in concrete slab foundations, basements, and possibly crawl spaces, entering the air inside buildings. People in the buildings can sometimes smell a chemical, but often the chemicals are odorless or too faint to smell.

What's the problem at Gaffney Rd.?

DEC recently sampled air inside three businesses in this part of downtown Fairbanks and found that two of the three have a low-level, but noteworthy, problem with indoor air quality. From samples taken in February, we found tetrachloroethylene (also called PCE, or PERC) at levels which are higher than our levels calculated to prevent risk to workers from long-term exposure.

Indoor air was sampled at the James S. Magoffin, Jr. law firm, the Good News Bible and Book Store, and Meyeres Real Estate, all on Gaffney Road. Samples at the law firm and book store are slightly over DEC's limits.

Customers of these businesses are not at risk while visiting these buildings. The chemicals detected in the indoor air are occurring in very small amounts, too faint to smell and just over the state's levels. The concern is with workers who are exposed over much time, as in all day for a period approaching 25 years.

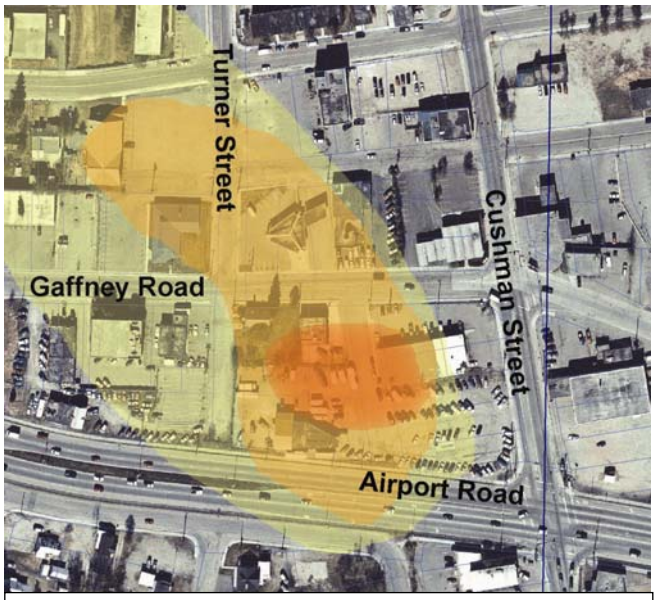
What caused the problem?

Drycleaning operations over decades in the Gaffney Road area have resulted in a large area of groundwater contaminated by chlorinated hydrocarbons, primarily PCE and products produced during its breakdown – trichloroethene (TCE) and the dichoroethenes (DCE). PCE is a manufactured chemical used for dry cleaning and metal degreasing.

How serious is the problem?

The levels of indoor air contamination are not high enough to pose an immediate danger to people who live or work in the affected buildings. The science of vapor intrusion is new and evolving, having changed a lot even in the last year in the way it is evaluated. The PCE levels found at the Fairbanks businesses were considered acceptable several years ago. But now, according to DEC's current approach for setting commercial limits to protect human health, the PCE levels are slightly above the acceptable levels. TCE levels were not found above DEC's limits.

DEC has developed risk-based limits, protective



This photo shows a rough estimate of the area where groundwater contamination has spread, likely from at least one former dry cleaner. Concentrations of PCE over 200 times the state standard have been found in groundwater in the small area of darker orange. In the lighter orange and yellow areas, groundwater concentrations are much more reduced, but above state standards. Vapors from this contamination have affected indoor air in two businesses in the dark orange area. We think that the cause of the vapor intrusion is more likely from sewer system leaks or an undiscovered area of high contamination, as opposed to coming from the groundwater in general. We're continuing to check these assumptions.

See map of 2006 groundwater results on page 4.

of human health, for these contaminants in indoor air. Factored into the limits are details of exposure and the toxicity of the chemical. We have one limit for residential exposure and a different one for workers in commercial settings. DEC arrives at these limits using methods extensively reviewed and respected throughout the scientific community, typically from the U.S. Environmental Protection Agency or other sources.

Note: the contamination in groundwater was first noted in 1997, and DEC then notified the community to not use any private wells for drinking water. The area is served by a public water system.

What are the potential health impacts of PCE exposure?

The health effects of breathing air or drinking water with low levels of PCE are not clearly known. PCE primarily targets the nervous system and kidney. Exposure to ***very high*** concentrations of PCE can cause dizziness, headache, nausea, coordination problems, and possibly kidney damage.

The U.S. Department of Health and Human Services has found PCE to be a likely carcinogen (cancer-causing). PCE has been shown to cause tumors in mice and rats. More information on PCE is available at the website of the U.S. Agency for Toxic Substances & Disease Registry, at http://www.atsdr.cdc.gov/tfacts18.html.

DEC is working with the Environmental Public Health Program (EPHP) of the Alaska Department of Health and Social Services to better understand and evaluate the possible health risks to people who may be exposed to this indoor air problem. EPHP will be conducting a public health consultation to evaluate whether exposure to PCE and related drycleaning solvents might cause harm to people. EPHP looks at all the information available at the time, seeks ongoing community input, and writes a final report recommending actions needed to protect public health.

What about other homes and businesses in the neighborhood that were not tested?

DEC is developing a comprehensive strategy to identify additional places in the neighborhood that may need testing. We think that the highest levels of contamination are found in the area around the former drycleaner, where these businesses now are. We also think that the indoor air problems are caused by some specific, fairly small areas of high concentrations of contamination in soil, fairly close to the former cleaners. as opposed to the contaminated groundwater, which exists in a larger area in much lower concentrations. We will take more samples this summer and again this winter to test our understanding of the situation. These tests will also help answer questions such as: are the immediate neighbors affected, does the kind of building foundation make a difference, and is there is difference in indoor air quality between summer and winter.

Who's responsible for this?

Legal responsibility has not yet been determined. Since 1997, DEC has led an investigation of low-level, area-wide groundwater contamination. If we find areas of concentrated contamination, we will remove them, if possible and if we think it would make a difference. Landowners are responsible for taking care of any indoor air problems in their buildings.

The likely source of the underground "plume" of contamination which has spread west of Cushman Street is the former Royal Masters Launderette, on Gaffney Road between Noble and Turner Streets. There may be other sources. For example, there is evidence that PCE was discharged to the local wood-stave sewer line, where it has leaked into several nearby locations. The building now houses the Good News Bible and Book Store and other businesses.

What can landowners do about vapor intrusion?

Cleaning the air inside a building with intrusion of contaminated vapors can be done in ways similar to preventing naturally-occurring radon gas contamination. Radon is an indoor air problem common in Fairbanks, and the Cooperative Extension Service of the University of Alaska, Fairbanks, has a number of publications and recommendations on techniques and services. DEC recommends landowners who are concerned about indoor air contamination contact a local radon specialist. EPA also has recommendations about radon mitigation standards on the following website:
http://www.epa.gov/radon/pubs/mitstds.html

One more note

Vapor intrusion can be difficult to identify with certainty. The contaminant levels we're looking for can be quite low, and other sources of contamination unrelated to soil and groundwater contamination (such as paint or solvent cans stored in the building and regional background levels in the environment) can also contribute to poor indoor air quality. New methods used in this investigation give us more certainty that the indoor air problems are coming from the contamination near or under the buildings.

Next Steps

DEC is developing a comprehensive strategy to identify additional places in the neighborhood that may need testing of indoor air. We plan to sample indoor air in at least five more sites in the Summer and Winter 2007 to help us learn more about the problem.

We will continue to sample the groundwater as well to help determine the full extent of the contamination. If at any point we find areas of concentrated contamination, we will remove them, if possible and if we think it would make a difference.

More information:

Cooperative Extension Service, University of Alaska Fairbanks: "Radon in the homes – the Alaska Experience" http://www.uaf.edu/ces/publications/freepubs/RAD-01250.pdf

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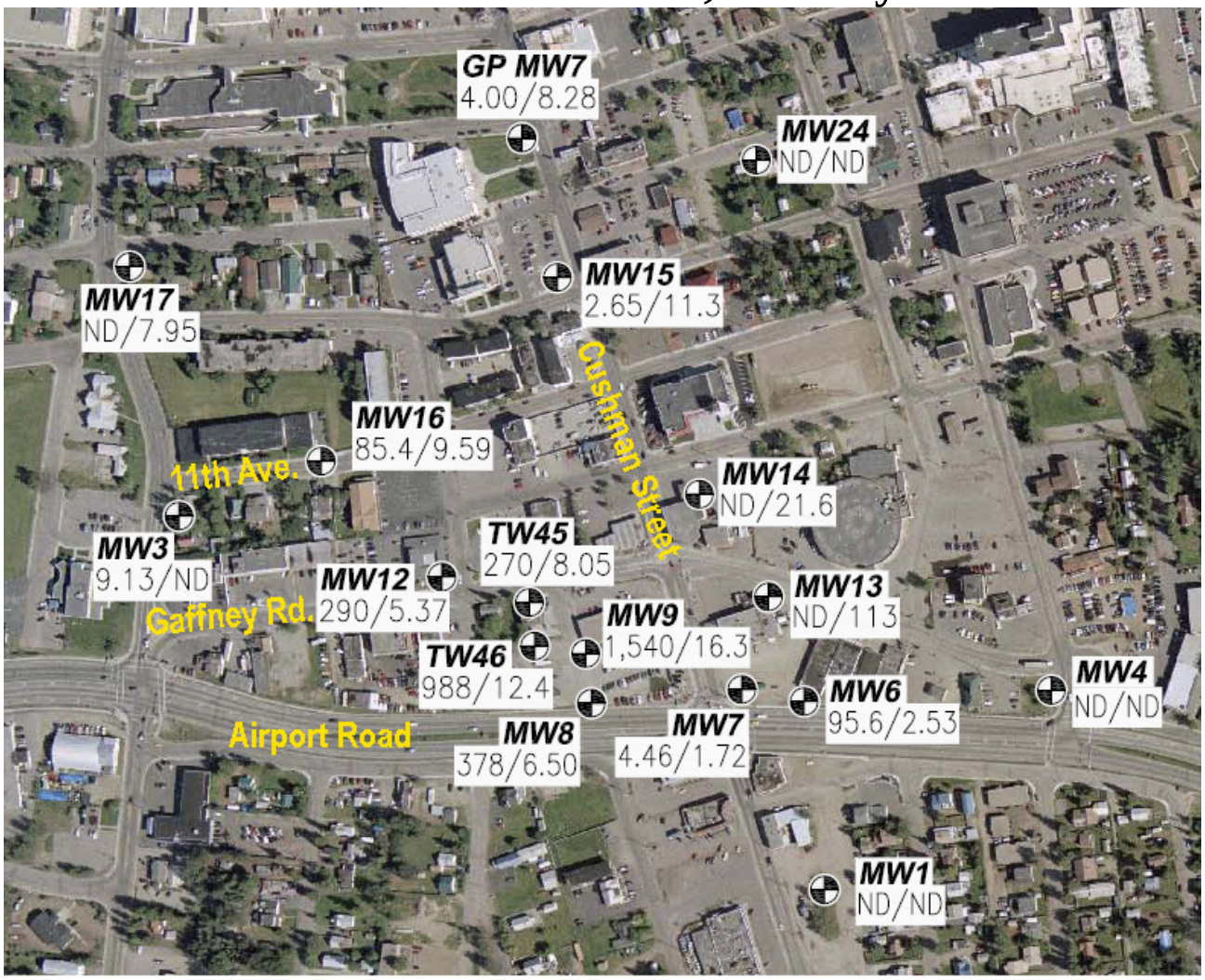
See a map with 2006 groundwater sampling results on page 4.

Groundwater test results 2006, Gaffney Road Area



SOURCE: AERIAL PHOTO RCHRDSN_HWY7-20-06_16-3_1'PIX.JPG
DATED 7/20/06 PROVIDED BY AERO-METRIC ANCHORAGE.

Map prepared by OASIS Environmental, for ADEC.

Note: Groundwater contamination does not necessarily mean that contaminants are entering indoor air. We have so far discovered indoor air problems slightly above DEC's risk-based limits for commercial use of buildings, and these are in the areas where groundwater concentrations are quite high. We are hopeful that the problem is limited to this small area, near the old dry cleaners, but we are continuing to expand our investigation to a wider area to make sure.