State of Illinois
Pat Quinn, Governor

Illinois Environmental Protection Agency
Lisa Bonnett, Interim Director

Illinois EPA UPDATE #2

Wood River Refinery West Fence Line Environmental Investigations

Roxana, Illinois

Background:

Illinois Environmental Protection Agency (Illinois EPA) is requiring Shell Oil Products US (Shell) to investigate and adequately remediate hydrocarbon contamination along the western property boundary of the ConocoPhillips Wood River Refinery (WRR) and a benzene release which occurred near the intersection of Rand Ave. and Central St. The potentially affected area of Roxana is bounded to the north by First St., to the south by Rand Ave., to the west by Central St., and to the east by Chaffer St. Shell owned the refinery for many years and is responsible for addressing certain historical environmental issues there.

Shell has been conducting environmental investigations in this area and has recently found high concentrations of certain hydrocarbons, including benzene, as vapors in subsurface soils near the refinery boundary and under the Roxana Public Works buildings, south of Eighth St. Dissolved hydrocarbons and free petroleum product have been found in groundwater both at the refinery and off-site near the western fence line. These volatile chemicals have the potential to migrate through soils as vapors and enter buildings through earthen crawlspaces, cracked floor slabs, or cracks in basement walls. This migration of contaminant vapors into buildings is referred to as "vapor intrusion." Because of the potential for vapor intrusion, the Illinois EPA has required Shell to investigate whether hydrocarbon vapors have entered buildings in the eastern part of this area and remedy any cases they find.

Residential Vapor Intrusion Investigation Results:

To determine if vapors are entering buildings from the soils below, Shell is sampling the Roxana Public Works facilities and several homes close to the fence line and near where soil and/or groundwater contaminant concentrations are highest. Shell collects three soil gas samples from below each building (these samples are referred to as "sub-slab" samples), as well as indoor air samples from the basement and first floor at all participating homes and buildings. An outdoor air sample is also collected during each sampling event.

This sampling began in April and is continuing. No indoor air problems have been found at most of the homes. However, the sub-slab air samples at three homes contained significant concentrations of benzene or other hydrocarbon vapors (mainly methane). So far, low concentrations of hydrocarbons have also been found in the basement air of one of these three homes; this is suggestive of vapor intrusion and re-sampling of this home is planned. Shell is required to take steps to reduce the relatively high levels of contaminants detected as vapors in the soils beneath these homes and is also required to sample neighboring homes, if possible, to determine if additional homes are potentially affected.

To date, the concentrations of hydrocarbon vapors detected indoors at these homes would not be expected to cause immediate adverse health effects. However, when high concentrations of hydrocarbon vapors are found in soils below a home, there is potential for vapor intrusion and subsequent safety and health hazards. This concern led the Illinois Department of Public Health (IDPH) to recommend that residents of homes with relatively high levels of contaminants detected in sub-slab samples not sleep in their basement bedrooms until sample results indicate sub-slab vapor concentrations have been adequately reduced. Shell has been offering alternative housing to those residents. If, during future sampling, petroleum vapors are found to be intruding into a home at levels that pose a risk to human health, Shell will extend the offer of temporary alternative housing to the home's residents until an adequate remedy is in place.

What happens now that Shell has found vapors in the residential area?

Because hydrocarbon vapor concentrations in soils under certain homes have been found above levels of concern, Illinois EPA, in consultation with IDPH, has required Shell to take immediate and appropriate action to address the situation. In addition to providing alternative housing for those who sleep in potentially affected basements, Shell has installed three vapor extraction wells near these homes in order to remove the contaminant vapors from subsurface soils. These vapor extraction wells are designed to be connected to an Internal Combustion Engine (ICE) which burns the vapors. The ICE unit is temporarily located on the street until it can be installed on the WRR property. As of May 24, 2011, vapors are being extracted from only one of these wells; Shell's goal is to extract vapor from more wells when additional equipment is available.

Shell must also take appropriate action to address the apparent vapor intrusion into the basement of one home. This effort will begin with additional sampling; subsequent steps may include adding more vapor extraction wells to the three already installed in the residential neighborhood or providing an in-home remedy, as needed.

Illinois EPA and IDPH are overseeing the effectiveness of the efforts being carried out by Shell to address the elevated level of contaminant vapors found. In addition to operating the vapor extraction well, Shell continues to monitor the quality of the air within and beneath these homes. Illinois EPA will require Shell to continue these efforts, as well as any others deemed necessary, until the contaminant levels have been adequately reduced.

What else are Shell and the refinery doing to address this contamination?

In addition to the vapor extraction wells near homes with high sub-slab vapors, additional groundwater wells and vapor monitoring points have been installed by Shell in the residential neighborhood to help further delineate the horizontal extent of hydrocarbons vapor contamination and to more fully characterize the extent of groundwater contamination in the area.

Beyond investigating, characterizing and addressing any residential vapor intrusion problems, Shell is also required to take steps to address the original hydrocarbon releases. These steps, subject to Illinois EPA review and approval, include: increasing the removal of free product floating on groundwater; increasing the removal of contaminated groundwater along the western property boundary of the refinery; and designing and installing a soil vapor extraction system along the fence line on WRR property. All of these efforts will help to reduce or remove the petroleum vapors and prevent them from migrating toward homes.

Illinois EPA has also required Shell and ConocoPhillips' Wood River Refinery to increase pumping of groundwater at the refinery to better control groundwater flow at the facility and to prevent additional petroleum contamination from moving westward and off-site. Shell has established a groundwater quality monitoring network within Roxana and has been reporting environmental investigations and groundwater sampling results to the Illinois EPA since 2008.

Where can I find out more about the investigation and sample results?

Although sample results will not be identifiable by address in order to protect the privacy of residents who participated in the vapor intrusion investigation, they will be included in the vapor intrusion investigation report Shell will submit to the Illinois EPA. The report will also be posted at the web site developed to keep the community up-to-date on the status of the project: http://roxanainvestigation.urs-stl.net/ Individual residents whose homes are being sampled are provided the analytical results with IDPH's explanation of the data.

For more information, please contact:

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