



# EPA Wants Extraction Wells As Partial Cleanup

**Occidental Chemical Corp.**

Montague Township, Michigan

February 2010

## Public participation

EPA will open a 45-day public comment period from February 26 to April 12 for the community to state their opinions about the alternate cleanup strategy for contaminated ground water and source areas at the OCC facility. If enough interest is shown, EPA will also schedule a public meeting to present the cleanup alternatives, proposed cleanup plan, answer questions and accept oral comments.

After consideration of public comments, EPA will select a final cleanup plan and discuss the selection in a document called "final decision and response to comments." Public comments will be summarized and responses provided as part of the decision.

If you have any comments or would like to request additional information on the OCC facility, please contact:

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## Documents available

Official documents about this site can be viewed at the Montague Branch Muskegon County Library, 8778 Ferry St., Montague, and at White Lake Community Library, 3900 White Lake Drive, Whitehall.

Under a proposed cleanup plan, U.S. Environmental Protection Agency would oversee the installation of six new extraction wells on the southern portion of the former Occidental Chemical Corp. (OCC) facility to help clean up contaminated ground water between Old Channel Trail and White Lake. (*see figure 1*). The Agency says several potential cleanup technologies were tested but they could not effectively reduce contamination levels in four areas on the northern portion of the property. Those four areas are the source of the contamination in ground water. "Ground water" is the environmental term for underground supplies of fresh water. EPA officials say the proposed extraction wells working together with a current well system should reduce ground water contamination to safe levels in the southern portion within 18 years.

A "plume" of contaminated ground water is found underneath the OCC facility. It is 2,000-foot wide and has moved south of the original contaminated area 6,500 feet. The majority of the plume is under property owned and controlled by OCC. EPA's proposed cleanup plan would ultimately reduce contaminants to safe levels in the southern third of the plume, south of Old Channel Trail and extending to White Lake.

The cleanup would be conducted under the legal authority of the federal Resource Conservation and Recovery Act (RCRA). RCRA requires public participation in the cleanup process so EPA will be holding a public comment period where your opinions will be considered. (*see left-hand box for more details*). This fact sheet was written to describe the proposed cleanup plan, other options considered and EPA's reasons for undertaking the project.

## Site History

The OCC facility was located on Old Channel Trail and Whitbeck Road west of Montague, Michigan. OCC began producing chlorine, sodium hydroxide, hydrogen gas and hexachlorocyclopentadiene or C-56 in 1954. The plant shut down in 1983. Byproducts and derivatives of these chemicals contaminated soil on the plant site and sediment (mud) in White Lake, and soaked into the ground water underneath the property. State and federal environmental regulators have been overseeing cleanup work on the property since 1979. Under a 2001 RCRA cleanup plan, polluted soil and sediment were removed and disposed of off-site. Before that, OCC agreed to install the first set of extraction wells and since 1979 those wells have removed and treated billions of gallons of ground water and prevented the flow of contaminants into White Lake.

However, contamination remains trapped in subsurface soil on the northern portion, and those chemicals continue to seep into the ground water. No workable technology has been found to remove those chemicals that include carbon tetrachloride, chloroform, tetrachloroethylene, C-56, and octachlorocyclopentene or C-58. EPA estimates the source areas may

contain 568 tons of these chemicals. If nothing further is done the Agency says contaminated ground water could remain throughout the plume for more than 10,000 years.

### **Cleanup Goals and Proposed Plan**

Several cleanup technologies (discussed below) were considered or tested without success on the source areas in the northern portion of the OCC site. But EPA experts believe an alternate cleanup strategy is still needed to contain and reduce the area of contaminated ground water as much as possible. For that reason the Agency picked ground water extraction and treatment as the best option for the site.

OCC opposes EPA's proposed plan. OCC believes there is minimal environmental benefit to speeding ground water cleanup in this southern area because the ground water is not currently used for drinking. Future use would be restricted by the placement of ground water prohibitions on the property deed.

The objectives of EPA's proposed plan are to clean up ground water in the southern portion to better protect White Lake in the long-term and allow for the eventual beneficial use of the ground water and unrestricted use of OCC property south of Old Channel Trail. Specifics of the proposed cleanup plan include:

**Install and operate six extraction wells** immediately south of the source areas and north of Old Channel Trail, in the southern portion of the plume location. (see figure 1). The northern portion of the property is proposed to be designated as a "Technical Impracticability Zone" that cannot meet Michigan ground water cleanup standards.

**Conduct technical reviews every five years** and assess technologies that can effectively treat the source areas. Implement any feasible technology capable of expediting cleanup of ground water in the northern portion of the property.

**Continue collection and treatment** of contaminated ground water using the eight extraction wells previously installed at White Lake until cleanup levels are met.

**Continue monitoring** that ensures the latest cleanup plan provides long-term protection of human health and the environment.

**Record institutional controls** on the property deed that restrict land and ground water use.

**Require OCC to provide financial assurance** for the cost to install the six new wells, treat collected ground water, and conduct operation, maintenance and monitoring (OM&M) for the life of the remedy. The

cost estimate for the six-well extraction system is \$1.9 million. The annual OM&M cost for the existing purge well system is \$1.2 million.

### **Summary of Other Cleanup Methods**

Other technologies evaluated for treating the northern portion source areas and the reasons for their rejection are presented below. Only the ground water extraction and treatment technology as proposed by EPA was found to be feasible at this time.

**In-Situ Chemical Oxidation** uses strong oxidizing agents to convert hazardous contaminants into less dangerous forms. Several agents were tested, but they failed to reduce certain contaminants such as carbon tetrachloride, C-56 and C-58.

**Zero Valent Iron Reductive Dechlorination** uses an emulsion of oil and water with nanoscale iron particles contained within the emulsion droplets. A bench study found that C-56 and C-58 were only partially degraded.

**Biological Enhanced Reductive Dechlorination** involves providing favorable conditions for pollution-eating micro-organisms by supplying oxygen or nutrients. Tests showed full dechlorination of carbon tetrachloride and tetrachloroethylene could not be achieved.

**Surfactant Enhanced Aquifer Remediation** uses surfactants to dissolve and then flush contaminants to a recovery system. This method did little to reduce C-56 and C-58.

**In-Situ Thermal Desorption** applies heat to the soil and the vaporized contaminants are recovered by a soil vapor extraction system. Unfortunately, heating C-56 produces dangerous hydrochloric gas and a dewatering system would also be needed.

**Source Area Extraction and Pump and Treat.** Under this method, contaminants are held in place with barrier walls, sheet piling and slurry walls, but the barriers were found to be either impractical or the cause of additional problems such as widening the plume or mobilizing additional chemicals from the source areas.

**Excavation and Off-Site Disposal.** OCC evaluated removing contaminated soil extending 25 feet below the water table from the four source areas. Dewatering and temporary sheet piling would be used along with an air-tight structure to reduce exposure and movement of contaminants. But this option was not cost-effective.

Construction would take two years and cost \$145 million and if 90 percent of the source material could be removed it would still take hundreds of years to meet ground water cleanup levels at the OCC facility.

**In-Situ Solidification.** Soil would be mixed with material such as Portland cement to reduce the permeability of the source areas, but while this will slow down chemicals pollutants seeping into ground water it will not stop them completely.