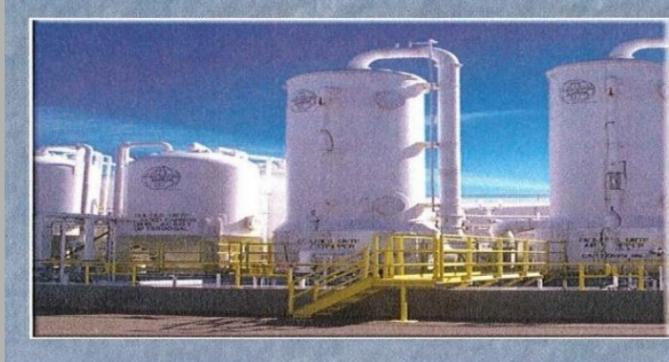


# Motorola 52<sup>nd</sup> St. Superfund Site

## Motorola 52nd St. Superfund Site Facts:

- Contamination was first discovered in 1982 at the former Motorola facility on 52<sup>nd</sup> St.
- Dozens of wells were installed to investigate the extent of contamination, and in 1989 the site was listed as a Superfund site.
- The main contaminants were volatile organic chemicals (VOCs) such as trichloroethene (TCE), tetrachloroethene (PCE), and trichloroethane (TCA). Chemicals were used in industry as solvents and cleaners beginning in the 50s, when their disposal was not regulated.
- The site consisted of soil and groundwater contamination.
- Most soil contamination that was acting as a source was cleaned up.
- Groundwater contamination remains, as it is challenging to clean up the chemicals that have sunken to the bottom of the aquifer.

## Interim remedies: Treatment plants



OU1 pump and treat plant: 1992



OU2 pump and treat plant: 2001

Pump and treat systems are the primary technology available to treat and contain such large plumes of groundwater contamination. However they are not efficient at eliminating the high concentration source areas that exist at this site.

## What has resulted?

### Operable Unit 1 (OU1):

As of August 2009, 20,000 pounds of total VOCs have been removed.

### Operable Unit 2:

Removed over 11,500 pounds of VOCs since the system began operation in December 2001.

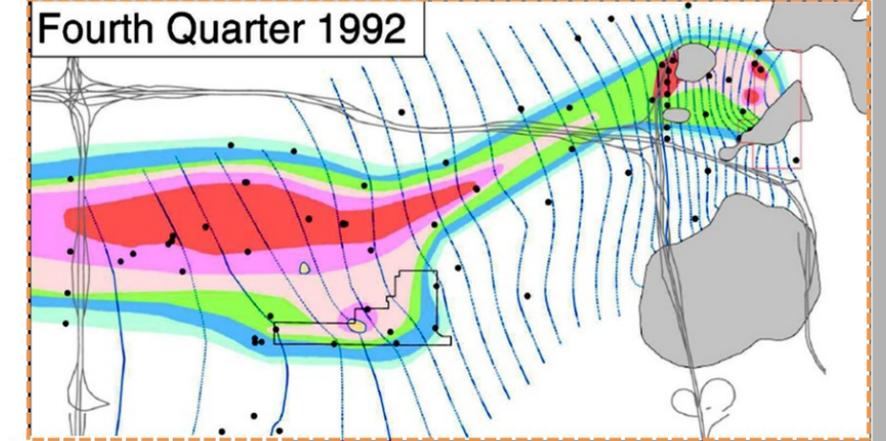
### Operable Unit 3:

OU3 is “downstream” and concentrations have been going down consistently as a result of clean-up efforts.

Treated water is then put to beneficial use, such as manufacturing processes or irrigation. It is not being used for drinking water in this area.

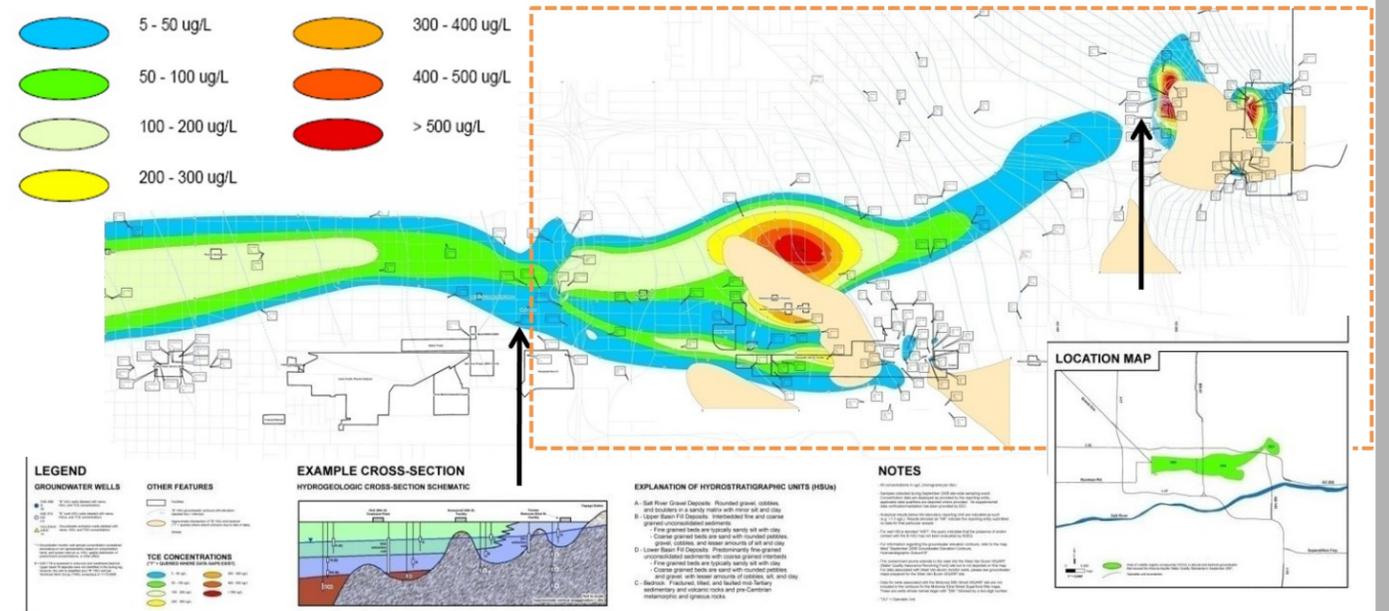
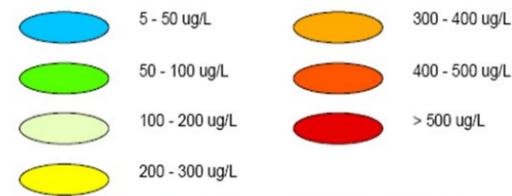
## Progress: Reductions in TCE in overall plume

### TCE Contours (Queried (?) where uncertain)



## September 2008

### TCE concentrations in Hydrostratigraphic subunit B



**LEGEND**  
GROUNDWATER WELLS  
OTHER FEATURES  
TCE CONCENTRATIONS

**EXAMPLE CROSS-SECTION**  
HYDROGEOLOGIC CROSS-SECTION SCHEMATIC

**EXPLANATION OF HYDROSTRATIGRAPHIC UNITS (HSU)**  
A. Alluvial River Gravel Deposits...  
B. Upper River Fluvial Deposits...  
C. Lower River Fluvial Deposits...  
D. Bedrock

**NOTES**

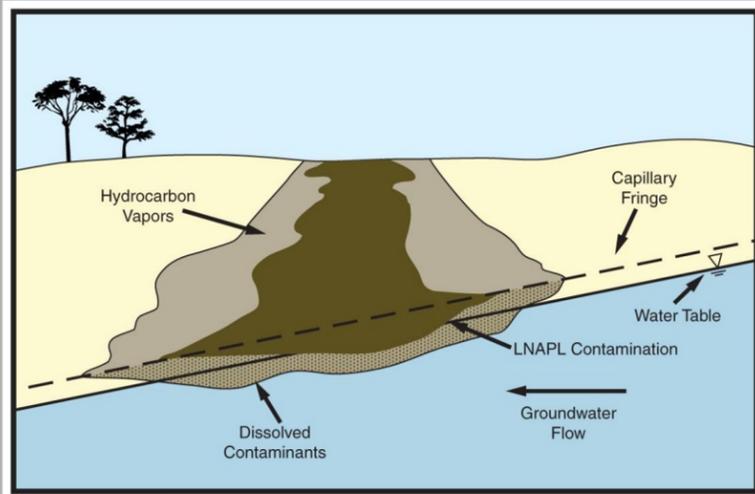
This is the plume in the “middle” layer of the aquifer. The high concentrated areas (dark red) are being contained by OU1 and OU2 treatment plans but remain concentrated around bedrock where the chemicals have seeped into the cracks of the bedrock and it is more difficult to extract the contamination from the bedrock.

Community Informational Group (CIG) Meeting  
Motorola 52<sup>nd</sup> St. Superfund Site  
For more information about the site visit:  
[www.epa.gov/region09/motorola52ndst](http://www.epa.gov/region09/motorola52ndst)  
<http://www.azdeq.gov/enviro/waste/sps/phxsites.html#mot52a>



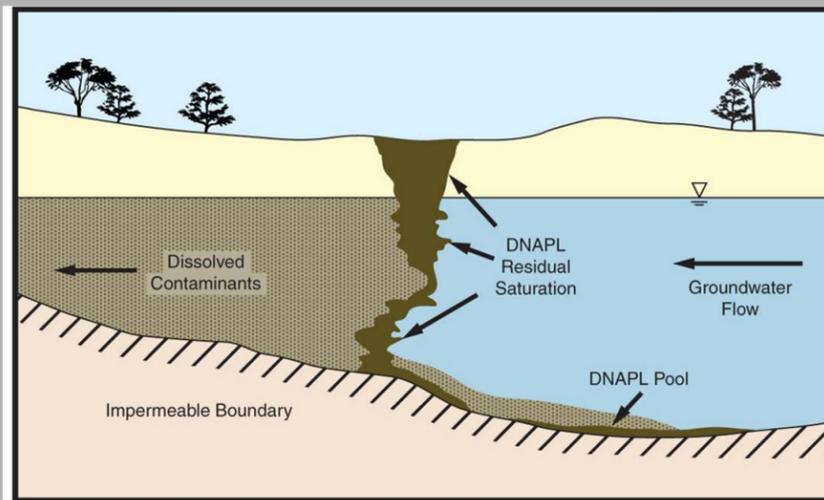
# More about the contaminants...

Pure solvents can come in the form of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL)—semi-soluble liquids that either float or sink in water. At the Motorola 52nd St. Superfund Site the VOCs are in the form of DNAPL, which has sunk to the bottom of where there is bedrock. The chemicals sink into the cracks and pores in the bedrock and stay there, but the chemicals slowly dissolve into the overlying groundwater over time.



## LNAPL

LNAPL stays in the upper soil and is easier to clean. Hydrocarbons (fuels) are a LNAPL. This type of contamination is present in OU2.



## DNAPL

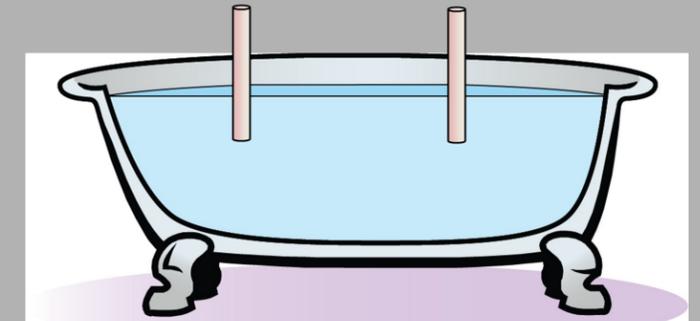
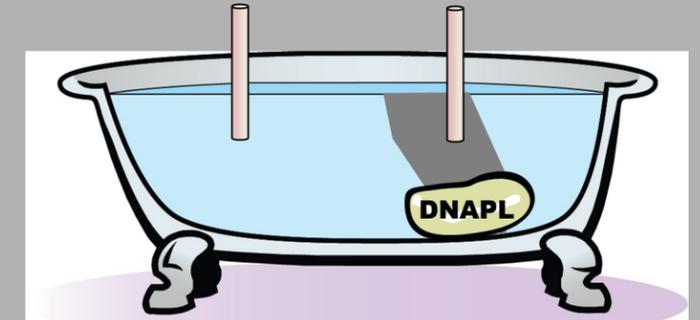
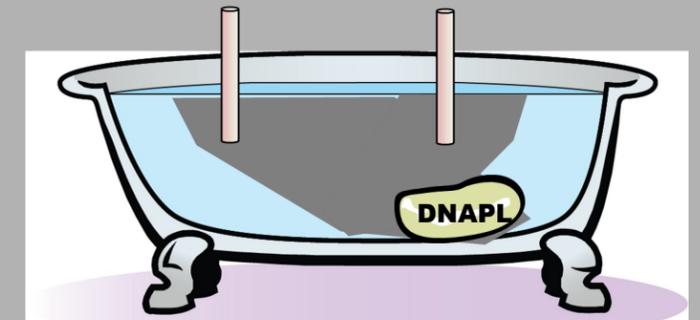
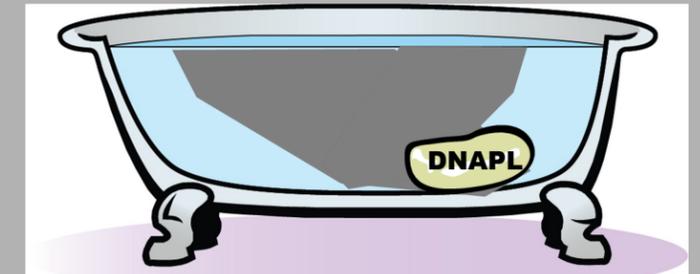
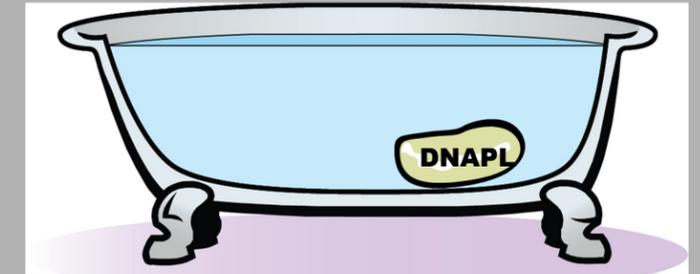
DNAPL is dense and sinks to the bottom, the chemicals seep into the rock making this type of contamination very difficult to clean.

The DNAPL can be thought of like a bar of soap at the bottom of a bathtub, gradually dissolving and releasing substances into the water above it indefinitely. The straws represent the treatment plants in OU1 and OU2.

Although pumping and treating can contain the area and keep it from affecting the water that is down gradient, it will never completely reduce concentrations above the source because the chemicals will continually be released from the “bar of soap” in the bedrock.

Currently there is no easy way to remove the DNAPL from the cracks in the bedrock. Different ways to extract DNAPL from the bedrock are under study—called the “Bedrock Pilot Study.”

## DNAPL in bedrock analogy



Community Informational Group (CIG) Meeting  
Motorola 52<sup>nd</sup> St. Superfund Site

For more information about the site visit:

[www.epa.gov/region09/motorola52ndst](http://www.epa.gov/region09/motorola52ndst)

<http://www.azdeq.gov/environ/waste/sps/phxsites.html#mot52a>