

SITE SUMMARY AS OF AUGUST 25, 2016
ELLISVILLE SUPERFUND SITE – STRECKER FOREST
WILDWOOD, MISSOURI

- 1) **2014 Removal Action was based on ‘dioxin only’ criteria** – Indications of other detectable VOCs, SVOCs, PCBs and lead concentrations of concern are present in certain areas of the site based on past sampling and other concerns. For example, the analytical testing results reporting limits for U.S. EPA investigations in many instances exceeded the U.S. EPA project Level of Concern (LOC) and Maximum Contaminant Levels (MCLs) for selected chemicals, including:
- a. PCBs (Aroclor 1221 and 1232 in groundwater);
 - b. Heavy metals (arsenic, hexavalent chromium and lead in groundwater);
 - c. Semivolatile organic chemicals (SVOCs) (benzo(a)pyrene, dibenz(a,h) anthracene, and n-nitroso-di-n-propylamine for soil, and 4,6-dinitro-2-methylphenol, benzo(a) pyrene, bis(2-chloroethyl)ether, dibenz(a,h)anthracene and n-nitroso-di-n-propylamine for groundwater); and
 - d. Volatile organic chemicals (VOCs) (1,2-di-bromo-3-chloropropane, 1,2-dibromoethane, and vinyl chloride for soil).

As such, no confirmation sampling occurred during the 2014 Removal Action to document the remaining levels of other chemicals of concern along excavation perimeters and in other areas where wastes are still present. No post-removal action geophysical surveys were completed to document the removal of anomalous materials within the areas of concern.

- 2) **2014 ‘dioxin only’ Removal Action Level (RAL) criteria were based on recreational occupational exposures and associated assumptions that are inadequate to protect any future residents** – The U.S. EPA’s dioxin levels of 820 ppt for ‘near surface’ (less than 12 inch depth) and 2,460 ppt for deeper soils (depths of greater than 12 inches) were inadequate relative to any future residential exposure conditions.
- a. The target cancer risk (1×10^{-4}) selected was set too high, in comparison to other similar contaminated residential sites.
 - b. The default assumption for the exposure period was inconsistent with the possibility of residential development.
 - c. Soil excavations associated with any residential development or soil erosion from stormwater runoff would result in exposing deeper soils (i.e., from depths of greater than 12 inches) at the surface, thereby resulting in dioxin levels higher than 820 ppt.
- 3) **Groundwater/surface water assessment and monitoring has been incomplete and inadequate** - no detailed assessment of groundwater flow and chemical transport in the obvious flow directions from the site (i.e., northeast and northwest) has been completed.

- a. No consideration was given for the potential of present and future vapor intrusion into nearby residences from shallow groundwater contamination. No assessment was completed of the potential for deeper groundwater contamination to move off-site.
- b. No off-site monitoring wells to the northeast or northwest directions from the site were installed at suitable depths to groundwater (shallow/deep) within the karst (bedrock) system.
- c. No evaluations of bedrock karst development or the potential for preferential flow pathways through it were undertaken.

RECOMMENDATIONS

1) *Removal of Existing Solid Wastes (i.e., miscellaneous construction and surficial debris) from the site* – to facilitate a more efficient further site evaluation.

2) *Completion of Post-Removal of Solid Waste Geophysical Surveys*

a. *Surface Electromagnetic/Terrain Conductivity Survey – Area of Entire Property*

The purpose of this is to confirm that no other harmful buried waste/metallic debris/drum fill areas are present that have not yet been explored, or, where necessary, removed. This is necessary because of the presence of existing solid waste materials and debris that could have masked other buried wastes.

b. *Two-Dimensional Electrical Resistivity Imaging (2D-ERI) – Selected Areas toward the Northeast and Northwest from the site in the Direction of Groundwater Flow*

The purpose of this is to accurately map the soil thickness/bedrock interface and to provide the locations of potential “karst development” groundwater features in the bedrock, such as fractures, solution-channels, and voids through which contaminated groundwater would likely pass on the way an off-site and near possible residents. This would allow the selection of appropriate locations and depths of an off-site groundwater monitoring network to determine if leaching of chemicals exists. It is estimated that between five to seven 2D-ERI profile lines would be needed.

c. *Post-Removal (Final) Electromagnetic/Terrain Conductivity Survey*

The purpose of this is to provide definitive confirmation that all harmful waste/metallic debris/drum fill areas have been removed across the site. This will be completed in the areas of any future removal areas.

3) *Additional Soil Borings for Sample Collection* – around 2014 Removal Action Excavations and into any Other “Anomalous Areas’ identified by Recommendation (2)(a) above or at previous exceedance locations.

a. *2014 Removal Action Excavation Perimeters*

The purpose of this is to sample soils along the shallow and deep excavation perimeters to determine the actual residual concentrations. Soil samples will be screened with a

PID in the field. Borings will be drilled down to the soil-bedrock interface until refusal, and samples taken and tested for VOCs, SVOCs, heavy metals, dioxin and PCBs.

b. Any “Anomalous Areas” Identified by Recommendation (2)(a) above or at Previous Exceedance Locations

The purpose of this is to sample those locations that are identified by the geophysical survey in Recommendation (2)(a) above that indicate non-native materials are present, or at previous locations indicating elevated concentrations. Borings will be drilled down to the soil bedrock interface, soil samples screened with a PID, and samples taken and tested for VOCs, SVOCs, heavy metals, dioxin and PCBs. Any areas with potential health level impacts should be targeted for additional removal action.

4) Off-site Monitoring Well Network (as indicated by Recommendation (2)(b) above)

The purpose of this is to fully evaluate whether groundwater impacts are present in the areas off-site to the northeast and northwest. These wells will be located at the locations and depths of identified groundwater flow pathway features from Recommendation (2)(b) above, either at the soil/bedrock interface or within the bedrock if karst features have been identified. It is expected that monitoring wells would be installed at approximately five to seven locations, and be monitored on a quarterly basis for a period of at least two years.