

West Virginia Chemical Spill: NTP Research Project Plan Summary

In January 2014, a liquid used to wash coal was spilled into the Elk River, a municipal water source that serves about 300,000 people in the Charleston, West Virginia area. The spilled liquid was primarily the chemical 4-methylcyclohexanemethanol (MCHM). Other chemicals, including dipropylene glycol phenyl ether (DiPPH) and propylene glycol phenyl ether (PPH), were present in lower amounts. There were very limited data on which to determine whether exposure to these chemicals might harm humans or animals. Using available data at the time, the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) determined that water containing less than 1 part per million (ppm) for MCHM and 1.2 ppm for PPH was not likely to be associated with any adverse health effects.

Shortly after the chemical spill in January, the National Toxicology Program (NTP) evaluated the potential toxicity of the chemicals based on the toxicities of similar but more extensively studied chemicals. Based on this analysis and the short duration of the potential exposures to people in the Charleston area, NTP had limited concerns for significant or lasting health effects.

In July, CDC/ATSDR nominated the spilled chemicals to NTP to obtain additional toxicology data.¹ In response, NTP formulated plans to conduct a number of studies to provide more information about the chemicals and their potential health effects. The studies will use a variety of experimental approaches including studies in rodents, toxicity tests in other lower animal species and cells, and computer modeling to predict toxicity.

NTP will evaluate the effects of MCHM on fetal and early life development in rats and of MCHM and other spilled chemicals on growth and development over the lifespan of other lower animal species, including fish and worms. In addition, NTP will examine in mice the ability of MCHM to cause skin irritation and hypersensitivity. NTP will also study the spilled chemicals using cells or cellular components to identify biological and molecular processes that are sensitive to their effects. NTP will continue to use special computer software and computational tools to predict potential hazards.

The data from these studies will help us better understand whether any biological systems are affected by these chemicals and at what concentrations these effects might occur. Combining this information with the measurements of the spilled chemicals in the Charleston water distribution systems should allow public health scientists to evaluate the potential for lasting health effects in Charleston residents that may warrant additional investigation. NTP plans to periodically release findings from these studies as the various portions are completed. Findings will be posted on the NTP website.²

¹ NTP is a federal, interagency program whose goal is to safeguard the public by identifying substances in the environment that may affect human health. NTP is headquartered at the National Institute of Environmental Health Sciences, which is part of the National Institutes of Health. For more information about NTP and its programs, visit <http://ntp.niehs.nih.gov/>

² The NTP Website is <http://ntp.niehs.nih.gov/go/wvspill>