Executive Summary

Drinking water sampling was performed to support an environmental exposure assessment for the Clyde childhood cancer investigation being conducted by the Ohio Department of Health. Eleven drinking water samples were collected in January and February 2009 from two public water systems, city of Clyde and Northern Ohio Rural Water (NORW), and domestic water wells. Three samples were collected from the city of Clyde public water system, four samples were collected from NORW public water system and four domestic water wells were sampled.

The drinking water samples were analyzed for a broad scan of carcinogenic and non-carcinogenic chemical compounds. These included inorganic compounds, volatile organic compounds, semi-volatile organic compounds, pesticides/ herbicides, petroleum compounds and radiological parameters. In order to broaden the scope of analysis, a suite of less common organic compounds was requested for analysis. These organic compounds, collectively called tentatively identified compounds (TICs), appear in the results only when their presence is highly probable, but not absolutely confirmed.

The results of the sampling did not identify any components of drinking water that suggest significant carcinogenic health concerns. A few naturally occurring substances were identified at elevated concentrations in the water well samples. These substances occur naturally in carbonate bedrock aquifers, such as the bedrock aquifer underlying the local area. The naturally occurring substances that exceed a U.S. EPA secondary maximum contaminant level (MCL) or health advisory level do not have carcinogenic health implications.

Significant findings are as follows:

- No U.S. EPA primary health standard MCL was exceeded for any of the compounds detected. Most values were well below the standard.

- Strontium was identified at elevated levels (16,600 to 47,700 ppb) in samples collected from the domestic water wells. One ppb (part per billion) is equivalent to one drop of water in 50,000 one-liter bottles of water (13,000 gallons). U.S. EPA has not established an MCL for strontium. U.S. EPA's health advisory levels for this substance are 25,000 ppb for children and 4,000 ppb for a lifetime exposure level. Strontium is naturally occurring in the carbonate bedrock aquifer in northwest Ohio.

  There are no known harmful effects of stable strontium for humans at the levels typically found in the environment. Problems with bone growth may occur in children eating or drinking unusually high levels of strontium, especially if the diet is low in calcium and protein.

- Secondary MCLs (established for cosmetic or aesthetic effects such as taste, odor or color) were exceeded for three substances (iron, sulfate and total dissolved solids) in the domestic water well samples. This is common for the bedrock carbonate aquifer.

- A recommended health-based value for sodium (sodium restricted diet) was exceeded in two domestic water well samples and one NORW sample.

- Only 11 of the 183 targeted organic compounds were detected (98 percent non-detect, 2013 analyses with 44 detections). This detection frequency is consistent with those found in other Ohio communities.

- Trihalomethanes (byproducts of the water disinfection process) were detected in all samples collected at both public water systems. All detections were below the MCL of 80 ppb which is based on the total trihalomethanes value. Trihalomethane chemicals were not detected in the domestic water well samples.

- As part of the effort to expand the suite of target organic compounds, the analysis revealed 21 TICs in one or more of all samples. Only 13 values were estimated to be greater than 1 ppb for eight of the provisionally identified compounds. These TICs were identified from a library of approximately 160,000 compounds. There is no U.S. EPA established primary or secondary health standard or advisory health level for any the tentatively identified compounds.

- Herbicides (atrazine, simazine and Dalapon) and an insecticide (BHC) were detected at low concentrations, all below MCLs, in the public water system samples. These chemicals were not detected in the domestic water well samples. The presence of herbicides in surface water streams in northwest Ohio is principally associated with agricultural, residential and commercial weed control.

- To evaluate additional pesticides/herbicides of concern, Ohio EPA will collaborate with the Ohio Department of Agriculture (ODA) to perform additional drinking water sampling during May or June 2009.

- Gross alpha and gamma radiation were detected only at low activity levels in three of the eleven samples. None of the radiological substances were detected above U.S. EPA MCLs.