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WV TAP

WEST VIRGINIA TESTING ASSESSMENT PROJECT



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SUBJECT: Two New WV TAP Reports Posted, Progress on Three Final Reports

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Scituate, MA, May 16, 2014—Two new WV TAP reports are now available for download under the “TEST RESULTS” tab. The documents are listed and described below. The remaining WV TAP reports include the 10 Home Study Tentatively Identified Compound Report, Sampling Plan Design, and Final Project Report. These documents will be finalized in the coming month. The posted dates for these reports have not yet been finalized.

Final reports posted today:

- *Technical Memorandum: Oxidation Studies with Crude 4-methylcyclohexanemethanol in Water*
- *Report of Expert Panel Review of Screening Levels for Exposure to Chemicals from the January 2014 Elk River Spill*

The Health Effects Expert Panel was organized by Toxicology Excellence for Risk Assessment (TERA). The oxidation study document was executed by Michael J. McGuire, Inc. Some, but not all, of the results presented in these files were presented during the March 28 and April 1 public meetings. For example, the oxidation study document authored by Dr. McGuire contains new information not presented during the March 28 public meeting.

Oxidation Studies with Crude MCHM

On January 9, 2014, “Crude” 4-methylcyclohexanemethanol (MCHM) spilled into the Elk River in West Virginia, which contaminated the water supply treated by West Virginia American Water and resulted in licorice odor complaints by residents. A Screening-level evaluation of Crude 4-methylcyclohexanemethanol (MCHM) was conducted using free chlorine and potassium permanganate (KMnO₄).

Ten parts per billion of Crude MCHM were spiked into Arrowhead spring water. Based on the concentrations used in the water treatment plant, 3.5 mg/L of free chlorine and 1.3 mg/L were dosed into the spiked water samples and held for one and three days and three hours, respectively. An additional dosing with 4.0 mg/L KMnO_4 was conducted to see if there was any oxidative effect at a higher concentration.

Free chlorine did not appear to cause any reduction of the MCHM. The 1.3 mg/L of KMnO_4 appeared to reduce the MCHM concentration by approximately 20 percent. However, the 4.0 dose did not reduce the MCHM concentration. It is not clear if KMnO_4 really oxidizes MCHM.

A trained panel conducted the flavor profile analysis of the oxidized, spiked samples. No difference in the odor characteristic or intensity was detected with chlorine oxidation. KMnO_4 at a dose of 1.3 mg/L appeared to cause slight reductions in odor intensity of the 10 ppb spiked sample. The 4.0 mg/L dose did not appear to affect the characteristic licorice odor or its intensity. No breakdown product of the MCHM was identified most likely due to the fact that, if it was present, the concentration was too low to detect using the current analytical methodology.

A screening level evaluation of MCHM oxidation indicated that there was a possible minimal effect of KMnO_4 oxidation of the compound and there was no effect with chlorine. More work is needed to confirm these findings.

Health Effects Expert Panel

The Health Effects Expert Panel reviewed available data for MCHM, PPH, and DiPPH and developed short-term health advisories for public health use with the 2014 Elk River spill and the subsequent contamination of the local water supply. Each of the screening values was intended to protect all portions of the population, including infants, children, and pregnant women. Each value is meant to protect for exposures to the water through direct ingestion, inhalation from showering and household water use, skin exposure, and incidental exposures.

Preliminary conclusions from the panel's discussions were reported at the April 1, 2014 public meeting. The panel's final recommendations for toxicity values differ slightly from the preliminary reporting due to rounding to an appropriate level of precision during the calculation steps. The panel's **final recommendation** was for the following short-term health advisory levels:

- 120 ppb (120 $\mu\text{g/L}$) for MCHM.
- 880 ppb (880 $\mu\text{g/L}$) for PPH.
- 260 ppb (260 $\mu\text{g/L}$) for DiPPH.

The MCHM advisory is based upon a 28-day rodent study and with the appropriate uncertainty factors is appropriate to use for human exposure situations of one day up to approximately three months. The PPH and DiPPH advisories are based upon a 90-day rodent study and a formula-fed infant scenario, and therefore they are also appropriate to use in situations from one day up three months.

The panel reviewed the US Centers for Disease Control and Prevention (CDC) screening values and concluded that the CDC used traditional methods and reasonable assumptions of

the US Environmental Protection Agency Health Advisory program to develop their screening levels. The expert panel's conclusions are not incompatible with the CDC values; the panel used more refined methods to calculate their short-term advisories, including an adjustment to account for additional routes of exposure (dermal and inhalation) and the use of a bottle fed infant as the most sensitive member of the population.

The final report is a summary of the panel's discussions and conclusions and also includes the panel's opinions on questions received from the public at the March 28, 2014 WV TAP public meeting.

The reports can be found at <http://www.wvtaprogram.com>.