RJ Lee Monthly Report Summary for February 2017

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In support of the ongoing Chemical Vapor Initiative undertaken by the U.S. Department of Energy (DOE) contractor, Washington River Protection Solutions, LLC (WRPS), RJ Lee Group's Mobile Organic Monitoring Laboratory (hereafter referred to as the Mobile Laboratory or ML) conducted monitoring over several days at the Hanford Site over the two-week period between January 27, 2017, and February 13, 2017. The Mobile Laboratory was used to measure levels of airborne concentrations of potential waste vapors within the Hanford site.

The ML sample collection lines are designed to sample air from either of two locations:

- A sample collection line located above the wind shear zone of the van for on-the-road, real-time collection and analysis of emission excursion, and
- A sampling interface located on the side of the van used for stationary measurements only, where air samples are pulled into the sampling system by an oil-free diaphragm pump.

Measurements for this monthly report utilize only the collection line located above the wind shear zone of the van. Both mobile and stationary monitoring were performed in the measurements for this monthly period.

The PTR-MS TOF-4000 is used to quantify chemicals of potential concern (COPCs) from the sampled air. The sampled air enters the PTR drift tube. In the drift tube, volatile organic compounds (VOCs) with proton affinities greater than water undergo chemical ionization via a fast proton transfer reaction using the reagent ion, hydronium. The hydronium is produced from water vapor through a series of reactions in the hollow cathode PTR ion source. This is a soft ionization method and VOC fragmentation is minimized. These ionized compounds and hydronium then travel through the drift tube to the transfer lens system, subsequently entering the time-of-flight mass spectrometer (TOF-MS) where they are separated by mass and monitored. The signal from the TOF-MS is used to identify the VOCs based on their mass, as well as to calculate individual compound concentration based on the ratio of compound signal to hydronium signal.

Descriptions of tests that were conducted include:

- Monitoring focused on AY-102 transfer to AP-102 which was performed only during day shifts. (Week 2.1)
- Monitoring focused on AP-103 to AY-101 transfer. All monitoring was performed during day-shift hours except for February 9, 2017, which was monitored during the night shift. (Week 2.2)

The main task during this monthly period was to monitor the status of chemical vapors in the transfer area as well as other areas of interest. Additional tasks during this period included continuing to define the protocol, and training a new-hire analyst. To perform these tasks, the Mobile Laboratory was mobilized during AY-102 and AP-103 transfer operations.

Each monitoring period started in the 200 East Area with a stop at the shift office to pick up a radio for the purpose of relaying pertinent information regarding tank farm operations and potential vapor events. The period of monitoring was chosen based on waste disturbing activities. The location monitored was primarily around the AY and AP Tank Farms in the 200 East Area. The routes were determined by personnel in the mobile laboratory as well as the daily stationary monitoring sites. Monitoring was directed around the Waste Transfer activities.

At the completion of this report, WRPS' Data Quality Objective (DQO) Group and a Fugitive Emissions/Source Apportionment Sub-team had not yet developed a process for the Mobile Laboratory to sample and monitor certain sources for analysis or vapor composition. Because of this, vapor source identification and quantitative analysis of vapor composition could not be completed for this report. Source identification processes are under development by WRPS' DQO Team and the Fugitive Emissions/Source Apportionment Sub-team with input from RJ Lee Group and will be documented in the FY2017 Test Plan. Follow this link to view the complete report.