

DHSS Review of Air Sample Data from the July 2015 and October 2015 Comprehensive Air Sampling at Bridgeton Landfill

The Missouri Department of Health and Senior Services (DHSS) has reviewed the air sample data from the July 28-31, 2015 comprehensive sampling event at Bridgeton Landfill. The complete data package was received by DHSS on March 22, 2016, and included a total of 83 ambient air samples collected from 12 sampling locations. DHSS evaluated ambient air samples collected from three onsite locations, from a landfill flare station, and from three locations upwind and five locations downwind from the site. DHSS reviewed the data for evaluation of potential public health concerns of short-term (acute) health effects. Source gas samples were also collected in July and October 2015, but were not evaluated for direct exposure.

Samples were collected for a total of 173 chemicals including aldehydes, amines, ammonia, carboxylic acids, hydrogen cyanide, mercury (elemental), dioxins/furans, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and reduced sulfur compounds. Of these, only aldehydes, carboxylic acids, dioxins/furans, PAHs, and VOCs were detected in the ambient air samples.

Aldehydes

Aldehydes were detected on-site, in the landfill flare sample, and upwind, and downwind of the landfill. All concentrations were below levels of public health concern, except for formaldehyde.

- Of the 12 aldehydes sampled for, 5 were detected in the downwind sampling locations. All of these detections were below available health-based screening levels for acute exposure, except for formaldehyde (discussed further below). Some of the specific compounds detected do not have health-based screening levels available; however, only very low concentrations were detected and these detections are not expected to pose a public health risk.
- Formaldehyde was detected in every sample collected. On July 28, the detections of formaldehyde onsite, from the onsite flare station, upwind, and downwind of the landfill ranged from 9.4 to 11 ppb and exceed the lowest acute screening level of 7 ppb (protective for repeated 8-hour exposures). Exposures above this concentration may cause nasal obstruction and discomfort, lower airway discomfort, and eye irritation however, it should be noted that concentrations above a screening level do not necessarily identify a public health risk is present, but that further assessment is warranted. The samples were collected on the landfill and/or near the landfill property line and dispersion is expected to reduce exposure downwind of the sample locations. It should be noted that the concentrations detected do not exceed other available acute screening levels. Additionally, detections of formaldehyde the very next day (July 29) were below levels of public health concern and concentrations have not exceeded acute screening levels in past comprehensive sampling events, so this may be an isolated occurrence. For the onsite samples, it is also noteworthy that the concentrations detected were well below the federal occupational exposure level of 750 ppb.

Carboxylic Acids

Carboxylic acids were detected on-site, upwind, and downwind of the landfill; however, concentrations were below levels of public health concern.

- Of the 17 carboxylic acids sampled for, 1 was detected in a downwind sampling location; however, this concentration was low and did not exceed available health-based screening levels for acute exposure.

Dioxins/Furans

Dioxins and furans were detected in the landfill flare sample, and upwind and downwind of the landfill; however, the concentrations were below levels of public health concern.

- Due to the absence of health-based screening levels for acute exposures, data were compared to a chronic screening level for dioxins/furans using the standard approach for evaluating human health risks from dioxin-like compounds. This provides a very health protective evaluation.
- Of the 17 dioxins and furans sampled for, 5 were detected in a downwind sampling location; however, these concentrations were low and did not exceed available health-based screening levels (for chronic exposure).

PAHs

PAHs were detected in the landfill flare sample, and upwind and downwind of the landfill; however, the concentrations were below levels of public health concern.

- Of the 16 PAHs sampled for, 6 were detected in a downwind sampling location; however, these concentrations were low and did not exceed available health-based screening levels for acute exposure. Some of the specific compounds detected do not have health-based screening levels available; however, only very low concentrations were detected and these detections are not expected to pose a public health risk.

VOCs

VOCs were detected on-site, in the landfill flare sample, and upwind and downwind of the landfill. All concentrations of VOCs were below the lowest available health-based screening level for short-term exposure, except for a detection of acrolein in the flare sample and a detection in an upwind location.

- Of the 75 VOCs sampled for, 27 were detected in the downwind sampling locations; however, these concentrations were low and did not exceed available health-based screening levels for acute exposure. Only a few of the specific compounds detected do not have health-based screening levels available; however, only very low concentrations were detected and these detections are not expected to pose a public health risk.
- The air sample data includes an acrolein concentration of 0.74 ppb collected on 7-28 from the onsite flare station and a concentration of 0.31 collected on 7-29 from an upwind sampling location that exceeded the lowest acute screening level of 0.3 ppb (protective for repeated 8-hour exposures). The upwind sample only slightly exceeds the lowest acute screening level and concentrations of acrolein do not exceed health-based screening levels for acute exposure in downwind locations. Also, for the flare sample collected onsite, it is noteworthy that the concentration detected was well below the federal occupational exposure level of 100 ppb. For these reasons, these detections of acrolein are not expected to pose a public health risk.