

DHSS Review of Air Sample Data from the July 2014 Comprehensive Air Sampling at Bridgeton Landfill

The Missouri Department of Health and Senior Services (DHSS) has reviewed the air sample data from the July 29-31, 2014 comprehensive sampling event at Bridgeton Landfill. The complete data package was received by DHSS on December 17, 2014, and included a total of 86 ambient air samples collected from 11 sampling locations. DHSS evaluated ambient air samples collected from three onsite locations, from a landfill flare station, and from two 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.

Samples were analyzed 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, ammonia, carboxylic acids, dioxins/furans, PAHs, and VOCs were detected in the samples.

Aldehydes

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

- Of the 12 aldehydes sampled for, 4 were detected in the downwind sampling locations; however, these concentrations were low and did not exceed available health-based screening levels for acute exposure. One of the specific compounds detected does 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.

Ammonia

Ammonia was detected in the landfill flare sample; however, concentrations were below levels of public health concern and were not detected in ambient air downwind of the landfill.

Carboxylic Acids

Carboxylic acids were detected in one downwind sample, but were not detected in any other samples. The concentrations detected in the downwind sample were below levels of public health concern.

- Of the 17 carboxylic acids sampled for, 2 were detected in a downwind sampling location; however, these concentrations were 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, all 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, 3 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 low and are not expected to pose a public health risk.

- 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 one detection of benzene in a downwind sample and one detection of acrolein in an onsite location.

- Of the 75 VOCs sampled for, 37 were detected in the downwind sampling locations. All of these detections were below available health-based screening levels for acute exposure except for one benzene detection. The air sample data included a benzene concentration of 120 ppb from one discrete (grab) sample collected downwind (southeast) of the landfill on July 29 that exceeded the lowest acute screening level of 9 ppb (protective for exposures lasting up to two weeks). However, concentrations above a screening level do not necessarily identify a public health risk is present, but that further assessment is warranted. While this concentration of benzene was above the most conservative acute screening level, it did not exceed the acute screening level for benzene of 400 ppb (protective for exposures lasting up to six hours). Additionally, the sample was collected near the landfill property line and dispersion is expected to reduce exposure downwind of the sample location. The other downwind air sample collected on this date did not show a concentration of benzene above acute screening levels and benzene was not detected in nearby locations during routine surveillance with a meter that is highly sensitive and specific to benzene. For these reasons, this one benzene detection is not expected to pose a public health risk.
- The air sample data included an acrolein concentration of 0.35 ppb from one onsite air sample collected from the south quarry on July 30 that slightly exceeded the lowest acute screening level of 0.3 ppb (protective for exposures lasting up to eight hours). Since this sample was collected onsite, it is noteworthy that the concentration detected was well below the federal occupational exposure level of 100 ppb. Concentrations of acrolein in downwind sample locations did not exceed the health-based screening level for acute exposure. For these reasons, this one acrolein detection is not expected to pose a public health risk.