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Protocol for Health and Safety Review of Volatile and Semivolatile Data

by
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In 1993 we published a GC-MSD method for the analysis of volatile and semivolatile compounds in hazardous waste that continues to be referenced throughout the hazardous waste management industry, especially in the use of hazardous waste as fuels in cement kilns. As part of a series of GCI Tech Notes we will be presenting details of how this testing protocol can be implemented, used and improved upon. This - the second of these articles - will provide an idea of how the data from this testing can be used to develop a program for better control of worker exposure to toxic chemicals found in organic hazardous waste.

1. Based on the prequalification data from individual waste streams as well as new compounds identified in individual shipments all compounds identified will be placed on one of three lists:

   a. List 1 - Compounds acceptable at any concentration. Based on health and safety review of each compound these compounds are found to be acceptable at any concentration based on normal handling procedures, normal PPE for the facility operations, and anticipated worst-case exposure scenarios.

   b. List 2 – Compounds acceptable at limited concentrations or based on special handling procedures. Based on health and safety review of each compound these compounds are found to be acceptable at limited concentrations based on normal handling procedures and anticipated worst-case exposure scenarios, or may be handled at higher than the limited concentration based on case specific additional handling procedures.

   c. List 3 – Compounds that are unacceptable at the facility and if found to constitute 0.1% or greater of the shipment/waste stream the shipment/waste stream shall be rejected.

2. Based on typical organic hazardous waste management procedures at TSDFs in the US all compounds with an oral rat LD50 of less than or equal to 50 mg/kg shall be considered List 3 compounds. All compounds with a TLV or PEL of less than or equal to 0.1 ppm shall be considered List 3 compounds. Other similar health and safety data shall be used in the absence of oral rat LD50, TLV and/or PEL data. Further, even when this data is available, other information such as chemical reactivity or carcinogenicity may be used to place compounds on this list. If worker exposure analysis warrants it, these criteria may be increased but may not be decreased. For example an oral rat LD50 threshold of 100 mg/kg could be set for determining the List 3 compounds.

3. Any employee exposed to waste via sampling, testing or other potential activities involving the waste that are determined to contain List 3 compounds (or List 2 compounds outside of the established limits)

should be notified of their exposure as soon as practical after the information becomes available. Based on the activity an evaluation should be made to determine if any follow up health or exposure monitoring is warranted.

4. Special handling procedures may include but are not limited to additional PPE requirements, special training, or shipment isolation procedures. All employees working with shipments containing List 2 compounds shall be alerted in advance regarding the compounds in the shipment and any special handling procedures that are needed.

5. Criteria and thresholds for List 2 determinations shall be based on worker exposure analysis that looks at both normal exposures as well as anticipated worst-case exposure scenarios. For example if hose ruptures or flange gasket failures have happened in the past and an employee has been sprayed with waste then that would be considered an example of an anticipated worst-case exposure scenario. The worker exposure analysis should also closely examine the materials used in PPE such as gloves and protective outerwear and, if said material have a breakthrough time or are otherwise permeable to the compound or compound mixtures being handled, these factors would also need to be taken into account.