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PUBLIC MEETING ON WASTE LEACHING
Session I - Introduction and Overview**

EPA Science Advisory Board (SAB) Reviews of Waste Leachability - Dr. Ishwar Murarka

Dr. Ishwar Murarka, of ISH Inc., is a soil scientist who served on EPA's Science Advisory Board (SAB) Environmental Engineering Committee during the time that the SAB reviewed the status of leachability estimation methodology. He provided a summary of the SAB's findings and recommendations. A copy of Dr. Murarka's presentation materials is available through the following link: [murarka1.pdf](#).

In 1992, the SAB released the report "Leachability Phenomena - Recommendations and Rationale for Analysis of Contaminant Release", recommending that the Agency conduct a review of its waste leachability procedures. Specifically, the SAB recommended that the Agency study and better understand the mechanisms controlling leachability; and develop better conceptual models for waste management scenarios with special emphasis on:

- redox potential
- leaching fluid composition and properties
- matrix in which waste resides
- type of management unit (pile, landfill)
- contact conditions (cover, cap, liner, effects;)

The SAB report also recommended that the Agency :

- study the effect of long term stresses on the waste and management unit and how they will affect waste properties and leachate release;
- develop a variety of contaminant release tests and test conditions to assess potential release of contaminants from different types of sources of concern,
- improve mathematical models to complement laboratory tests of leachability,
- field validate leach tests before broadly applying them.
- define the controlling mechanism prior to developing or applying any leaching tests or models.
- understand how the controlling mechanisms influence, either directly or indirectly, the release and environmental fate.
- refrain from applying any extrapolation of a set of conditions or stresses appropriate for one purpose to another without reasonable verification of relevance.

The latest SAB Environmental Engineering Committee (EEC) commentary "Waste Leachability: The Need for Review of Current Agency Procedures" (EPA-SAB-EEC-COM-99-002, available at www.epa.gov/sab/reports) was aimed at drawing the Administrator's attention to the need for review and improvement of the TCLP, because:

- the TCLP is broadly applied;
- leach tests can be improved by accounting for additional parameters; and
- the Agency's reliance on a single mismanagement scenario has caused difficulties.

The difficulties cited in the commentary include the issues raised in *Edison Electric vs. EPA* (1993), where the Court ruled that the Toxicity Characteristic rule must bear "some rational relationship to mineral wastes in order for the Agency to justify the application of the toxicity test to those wastes" as well as *Columbia Falls Aluminum Co. vs. EPA* (1998), where the Court ruling cited the language in the earlier *Edison Electric* case and vacated the application of the TCLP to the characterization of aluminum smelter wastes. In this case, the court believed that the high alkalinity of the waste, monofilling of waste, and very low liquid-to-solid ratios were important variables not accounted for in the TCLP. The SAB/EEC recommended that EPA:

- improve leach test procedures and conduct a field validation before implementing new procedures;
- study the various applications of the TCLP, and then generate improved leach test procedures.

Dr. Murarka closed by noting that the SAB/EEC anticipates that multiple leaching tests may be needed to meet the multiple uses to which the TCLP is currently being applied.