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Potential Applicability of Assembled Chemical Weapons Assessment Technologies to RCRA Waste Streams and Contaminated Media

Fact Sheet and Order Information

Introduction

Under the Assembled Chemical Weapons Assessment (ACWA) program, the U.S. Department of Defense (DoD) has established a process for identifying and demonstrating alternatives to incineration for the demilitarization of chemical weapons. Seven technologies used to treat chemical weapon wastes have been identified by DoD under this program (see next column). The U.S. Environmental Protection Agency (EPA) prepared the report ***Potential Applicability of Assembled Chemical Weapons Assessment Technologies to RCRA Waste Streams and Contaminated Media (EPA 542-R-00-004)*** to provide site managers, technology users (including industry), technology developers, and other interested parties with a better understanding of the potential uses and markets for ACWA and similar technologies.

Contents of Report

The report provides information about:

- The seven ACWA technologies, including available information about technology performance and cost to treat RCRA waste streams and contaminated media; technology availability; the technologies' capability to treat materials in solid, liquid, or gaseous phases; the types of preprocessing that may be required; and general information about the cost for use of the technologies.
- RCRA waste streams and contaminated media which have constituents with chemical structures similar to ACWA chemicals, and wastes currently treated by incineration, as a potential market for the ACWA technologies.
- Performance data on wastes that have been treated using these technologies, including soil and groundwater contaminated with a wide range of organic compounds such as chlorinated solvents, PCBs, and pesticides; PCB-contaminated oils; hydraulic fluids; and fuels.

Key findings of the report include:

- Two ACWA technologies currently are being used for full-scale, commercial operations (Commodore's SET™ and Eco Logic's GPCR), and the others are under development for use on a full-scale basis.
- The ACWA technologies have the capability to treat a wide range of organic compounds, including chlorinated solvents, PCBs, and pesticides in the liquid phase. Several of the technologies also are capable of treating materials in a solid or gaseous phase.
- The potential market for the ACWA technologies includes a relatively large amount of wastes from hazardous waste sites.

ACWA Technologies

The seven ACWA technologies are:

- AEA Technology PLC's SILVER II™ - electrochemical oxidation - uses reactive silver that is created by applying an electric current to a solution of nitric acid and silver nitrate.
- AlliedSignal (now Honeywell) Inc.'s Immobilized Cell Bioreactor™ - biological degradation - combines a high surface area media with a support matrix in a bioreactor.
- Commodore Advanced Sciences, Inc.'s Solvated Electron Technology™ - chemical reduction - uses solvated electron solutions that consist of alkali or alkaline earth metals such as sodium or calcium dissolved in liquid anhydrous ammonia.
- Eco Logic Inc.'s Gas Phase Chemical Reduction Technology - chemical reduction - uses hydrogen gas and steam at elevated temperatures to reduce organic compounds to lighter hydrocarbons such as methane.
- Foster Wheeler Development Corporation's Supercritical Water Oxidation Technology - hydrothermal oxidation - treats organic wastes at a combination of temperature and pressure higher than the critical point of water, where the wastes become highly soluble and function as a fuel.
- General Atomics' Supercritical Water Oxidation Technology - hydrothermal oxidation - treats organic wastes at a combination of temperature and pressure higher than the critical point of water, where the wastes become highly soluble and function as a fuel.
- Startech Environmental Corporation's Plasma Waste Converter™ - thermal plasma - uses plasma gas which is discharged within a chamber to produce very high temperatures.
- A list of vendors with technologies similar to those identified above is also included in the report, along with summary information about the technology.

Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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Order Form

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