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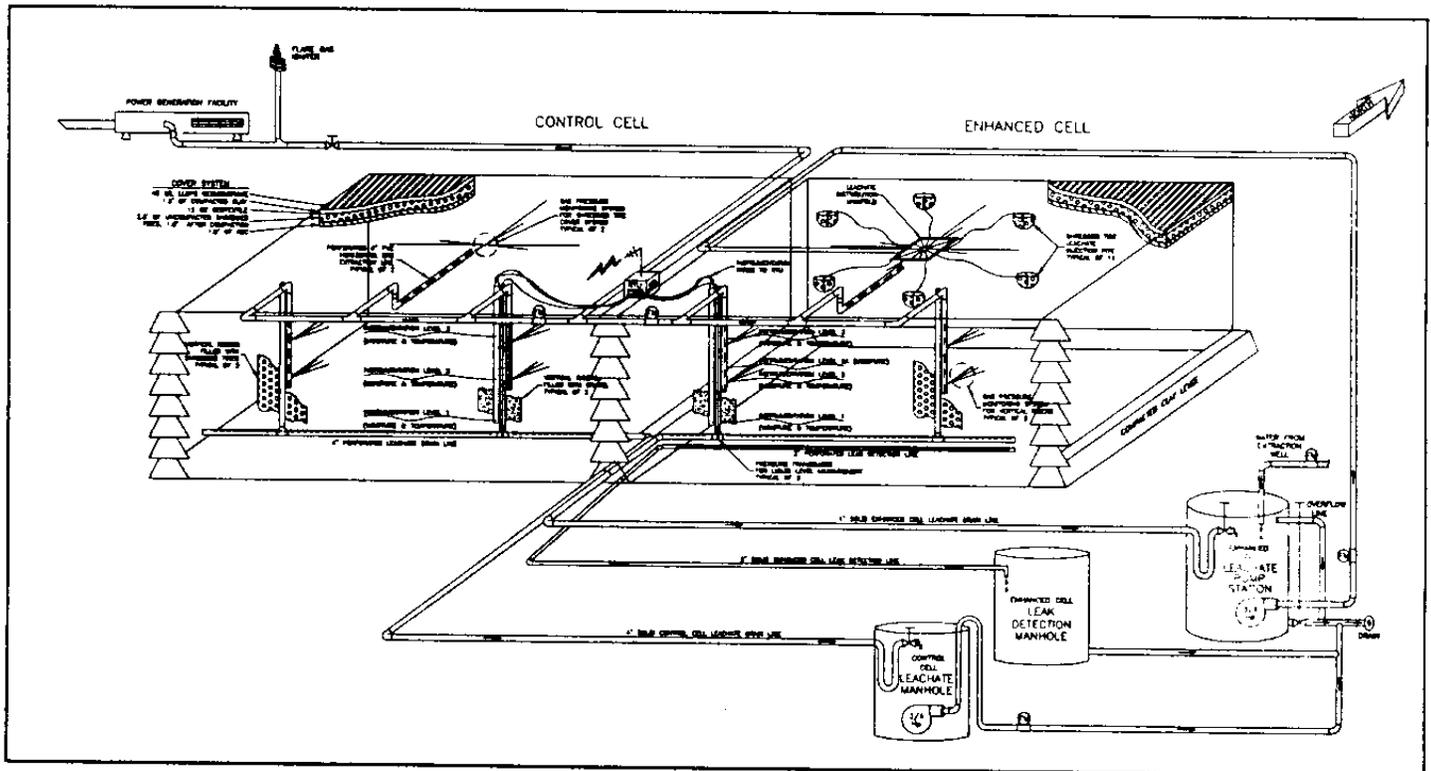
# FINAL REPORT

## METHANE ENHANCEMENT BY ACCELERATED ANAEROBIC COMPOSTING AT THE YOLO COUNTY CENTRAL LANDFILL

Initial Test Cell Design, Engineering, Construction and Startup

California Energy Commission  
Energy Technologies Advancement Program  
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By  
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## ABSTRACT

The Yolo County Department of Public Works, at its Central Landfill outside Davis, California, is demonstrating new enhanced landfilling technology to manage solid waste landfills for rapid completion of total gas generation and maximum gas capture. Methane generation is accelerated by improving conditions for biological processes in the landfill through moisture management while gas capture is maximized through cell containment with clay side walls and bottom and top composite liner system. Compared to conventional operation, enhanced landfilling can more than double recovery of landfill gas for electricity generation or other energy applications. Enhanced landfilling also minimizes undesirable gas emissions over many years, including methane, which has been implicated in climate change.

The two demonstration cells incorporate the following features:

- Each cell contains approximately 9,000 tons of waste.
- Biological reactions are facilitated by optimized additions of water and leachate.
- Cells are covered with gas-impermeable membranes to contain methane.
- Permeable layers serve to conduct gas to collection points.
- The cells are instrumented to determine performance.

Gas generation, waste volume reduction, and a range of other parameters will be monitored for several years, until methane generation is complete. This enhanced landfilling technology is expected to offer an important advance in landfill operation, enabling low-cost mitigation of methane emissions, maximization of beneficial energy capture, reduction of landfill volume, and reduction of long term waste management costs. Larger full-scale applications are expected to follow the demonstration.

An economic analysis is presented for enhanced landfilling applied at the Yolo County Central Landfill. There is considerable uncertainty involved in this analysis; economic projections 30-50 years into the future can only be considered to be very approximate. However, given the assumptions used in this analysis, enhanced landfilling can be accomplished with a benefit to cost ratio equal to one at a selling price for electricity of 3.5 - 4.5 cents per kWh if a double composite liner system is not required. Requiring the use of a double liner system would render enhanced landfilling uneconomical.

## ACKNOWLEDGMENTS

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The technical guidance and advice of John Pacey of FHC Corporation during the design and planning phase of the project is appreciated.

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The on-going financial and staff support of Sacramento County have been instrumental to the success of this project during the design and construction phases, and deserves special mention here.

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The ongoing support of the Yolo County Board of Supervisors has been essential to the success of the project.

The success of the Project to date is due, in large part, to the dedication, hard work, and creativity of all Yolo County staff members, especially the design and operation team.

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