

US EPA ARCHIVE DOCUMENT

SESSION 3 - BIOREACTOR DESIGN and OPERATION

Landfill Design & Operation

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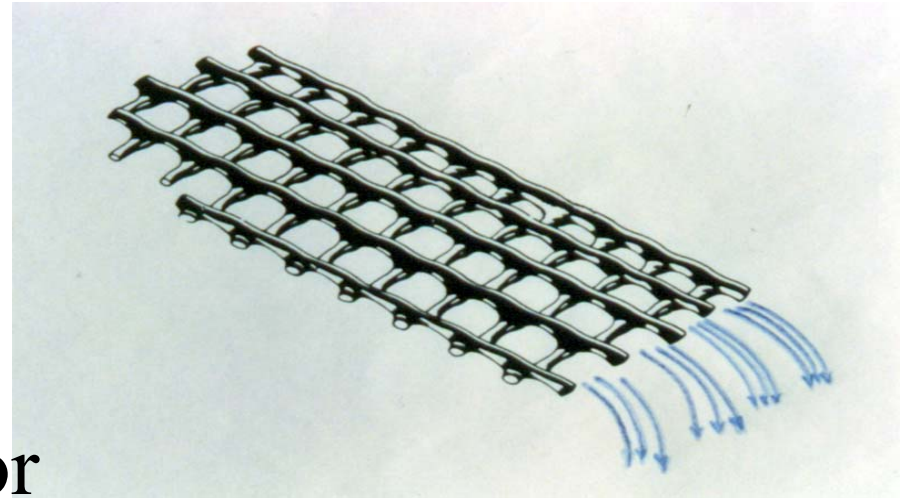
US EPA WORKSHOP ON BIOREACTORS

FEBRUARY 27-28, 2003

Landfill Design & Operation

- Design Considerations
 - liquid collection
 - impact of liquid on stability
 - geometry of cell
 - integration with final closure
 - integration with LFG collection

Design Considerations - liquid collection



- Increased potential for clogging (no fabric, sands or soil in flow path)
- Suggest designing for reduced head to provide increased factor of safety

Design Considerations - impact of liquid on stability

- Evaluate impact of elevated head on stability
- revision of operations manual to reduce potential
- limited designer control



Design Considerations - integration with final closure

- Closure costs exceed \$100k/acre
- 180-days after final waste placement
- Drive for “today's airspace”



Design Considerations - integration with LFG collection

- Significant cover penetrations
- Impact on “recoverable air space”
- Need for final cover?
- Ability to expand vertically?



Landfill Design & Operation

- Operational Considerations
 - leachate availability
 - leachate recirculation methods
 - degree of automation
 - liquids balance

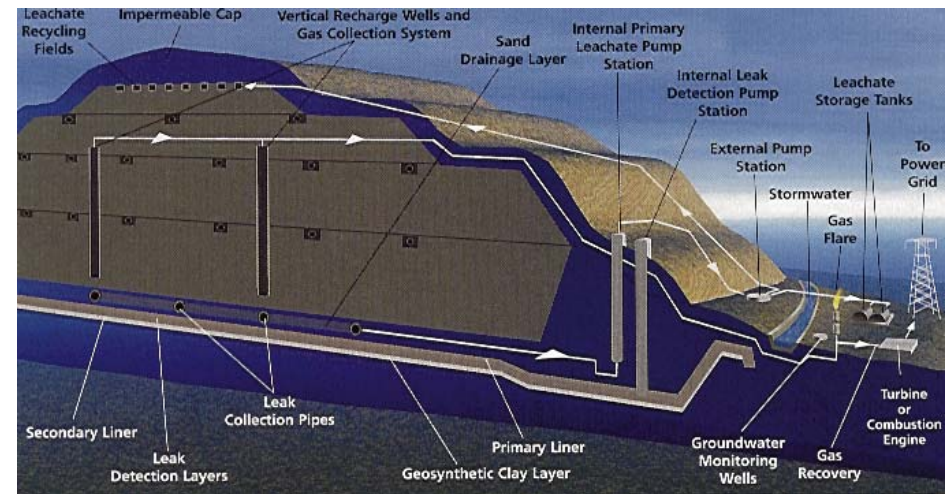
Operational Considerations - leachate availability

- Larger facilities will actually run out of leachate to recirculate
- Need to allow permitted use of waste water treatment liquids



Operational Considerations - leachate recirculation methods

- Ponding
- Spray on working face
- Vertical wells
- Horizontal wells



Operational Considerations - degree of automation

- Dramatic range of systems - fully automated to manual



Operational Considerations - liquids balance

- Need to maintain water balance records
- No current requirements

Start Date (Day 1): _____

Day	Rain (Inch)	Max. Temp.	Leachate Generated	Leachate Recirculated	Injection Galleries Used	Problems/Weather (Use Extra Sheet if Required)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
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Recommended Changes to Subtitle D for Bioreactors

- Increase design requirements for leachate collection systems - suggest design for maximum head of 50 cm.
- Allow for long-term interim closure
- Allow for acceptance of municipal waste water liquids (not sludge)