Buncombe County, NC/CDM

Monitoring Issues for Bioreactors

Intercontinental Landfill Research Symposium
Asheville, NC

October 15, 2002

Environmental Mysteries

- USA TODAY September 24, 2002:

  "…..a report issued this week…..said that the USA lacks scientific measures to gauge the state of the environment….."

Reasons for Monitoring

- Protection of the Environment
- Gauging System Performance
- Improving System Performance
- Greater Understanding of the Processes

Environmental Protection

- Fugitive Gas Emissions
- Leachate Seeps
- Liner Leakage
- Slope Failures

Gauging System Performance

- Is waste stabilizing?
- How much gas is being generated?
- Is leachate strength decreasing?
- How much capacity is being recouped?

Improving System Performance

- Will a new pipe perforation pattern improve dispersion?
- What are the effects of adding nitrate leachate?
- Does a different cover material control gas emissions better?
- Does incorporating aerobic and anaerobic decomposition increase the rate of stabilization?

Greater Understanding of the Processes

- How much leachate passes through to the collection system?
- What biological processes are taking place?
- What is the rate of settlement?
- What are the effects of winter weather or adding cold water?

Buncombe County Subtitle D Landfill Bioreactor EPA Project XL

Proposed Monitoring for the Buncombe County Bioreactor

- Leachate Quality and Quantity
- Gas Quality, Quantity, and Rate
- Leak Detection
- Waste Temperature and Moisture
- Hydraulic Head on the Liner
- Settlement

Leachate Quality

- Monthly Monitoring (until stable)
- Test for pH, BOD, COD, and Ammonia
- Indication of Decomposition Phase

Leachate Quantity

- Ongoing for Wetting Process and Leachate Removal
- Flow Meters at Each Pump Station
- Needed to Obtain Optimum Moisture Content and Avoid Oversaturation

Gas Composition, Volume, and Flow Rate

- Quarterly Surface Sweeps
- Ongoing Volume Monitoring
- Monthly Flow Monitoring and Composition at the Wellheads
- Determine Impact of Bioreactor on Gas Production

Leak Detection

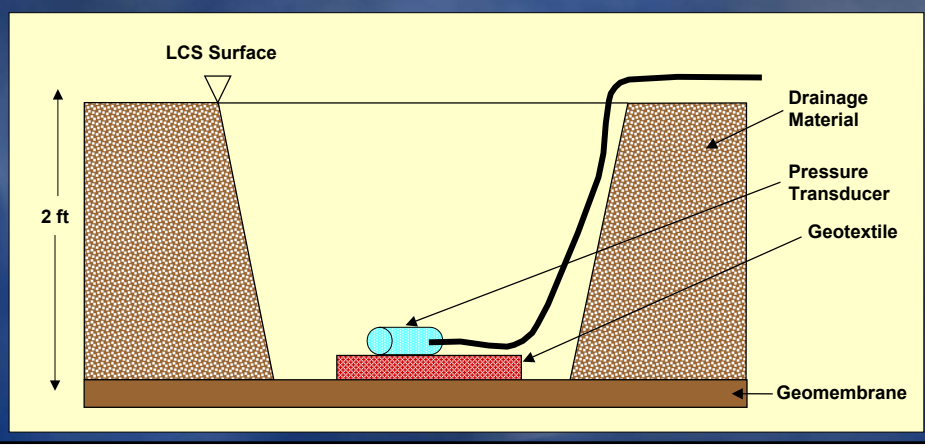
- Monthly Sampling and Testing
- Determine Performance of Alternative Liner System

Waste Temperature and Moisture

- Monthly Readings
- MTG Gauge - Combined Thermocouple and Electrical Resistance
- Maintain Optimal Temperature Zone
- Monitor Wetting Process
- Avoid Oversaturation

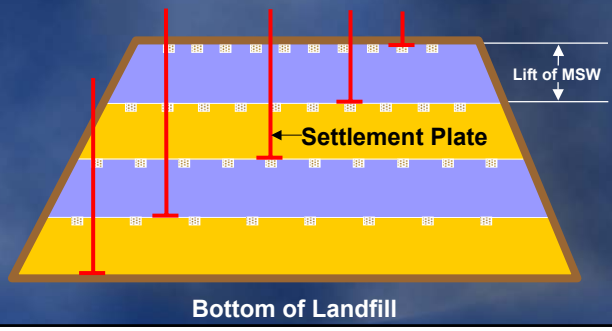
Hydraulic Head on the Liner

- Monthly Readings
- Pressure Transducers
- Maintain Less than 12-inches of Head

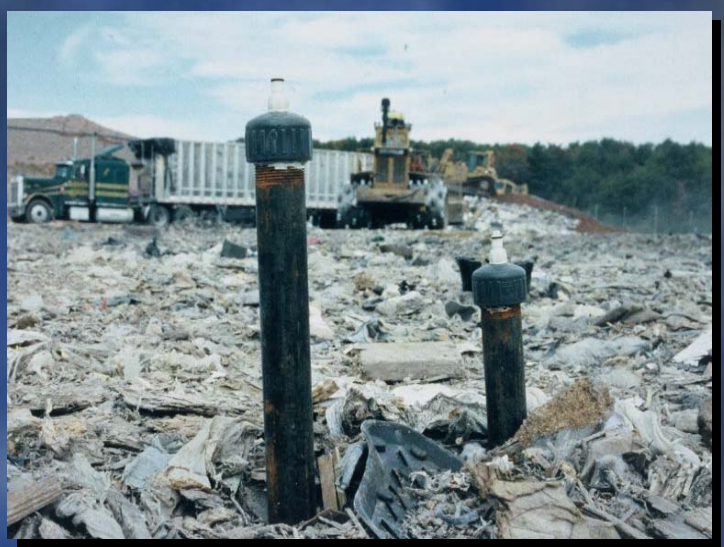


Settlement

- Quarterly Survey of Plates and GPS Spot Checks
- Annual Aerial Topographic Survey
- Monitor Rate of Settlement and Total Capacity Gained



Sample Probes for Temperature and Gas



Monitoring Temperature at Shallow Depths

Pressure Gauge Used to Monitor Injection

Concluding Thoughts

- Develop a Detailed Monitoring Plan
- Follow Established Guidelines for Sampling and Testing
- Credible Data is Needed by EPA