

*The Importance of Wellfield
Maintenance on Financial
Performance*



No Gas....No Gas Recovery



Landfill Gas Collection System Critical Points

- Design
- Construction
- Wellfield Management

Landfill Gas Collection System Design

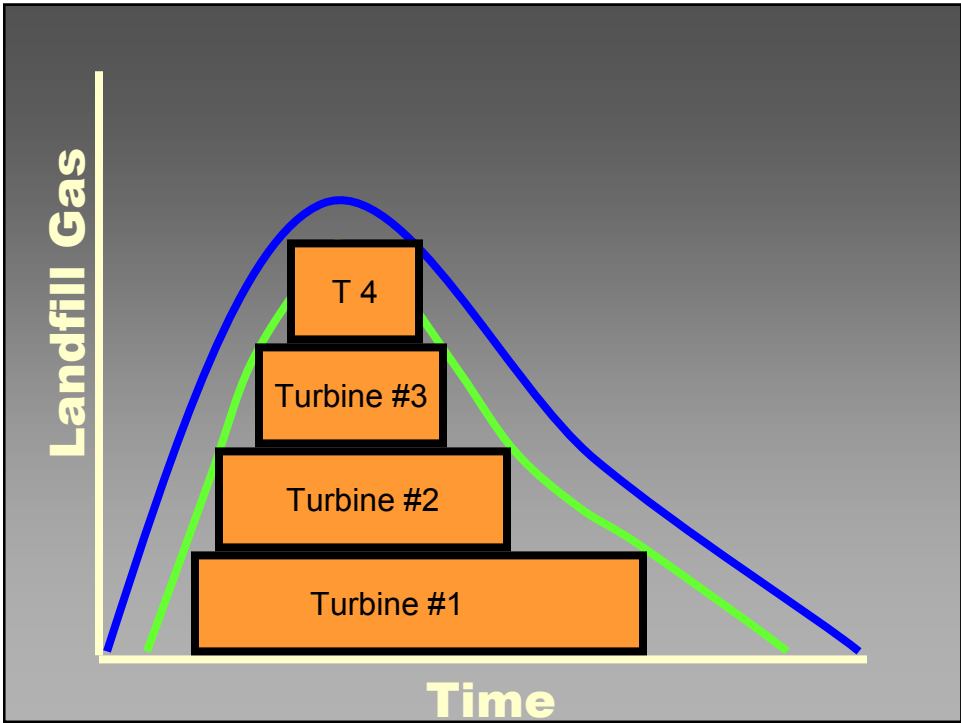
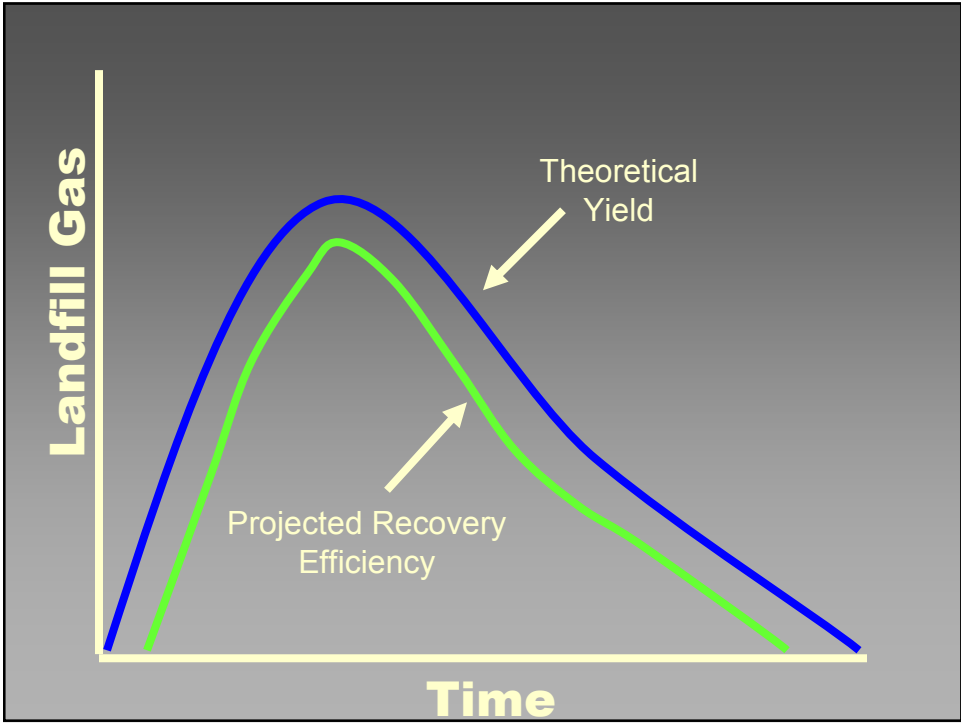
- Landfill Gas Production Estimate
- Estimated Recovery Efficiency
- Engineered Design

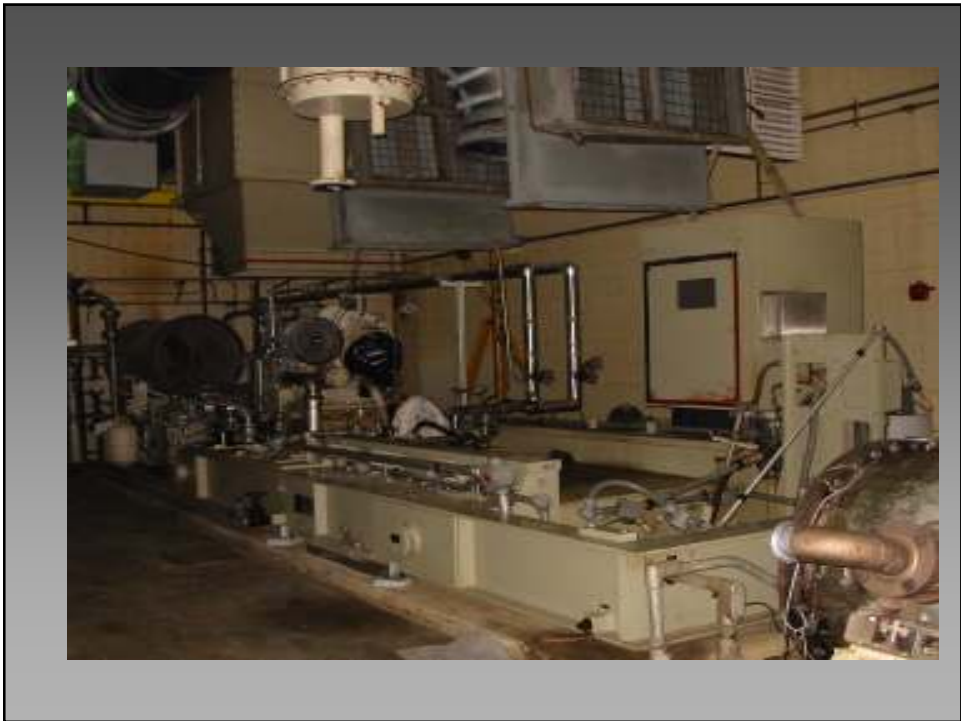
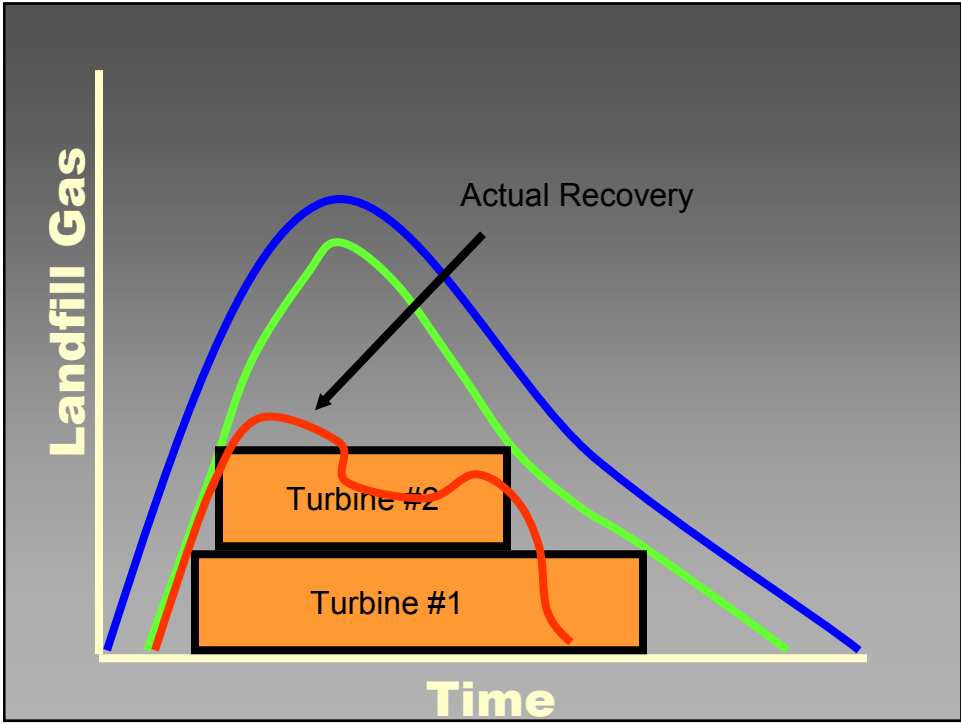
Landfill Gas Collection System Construction

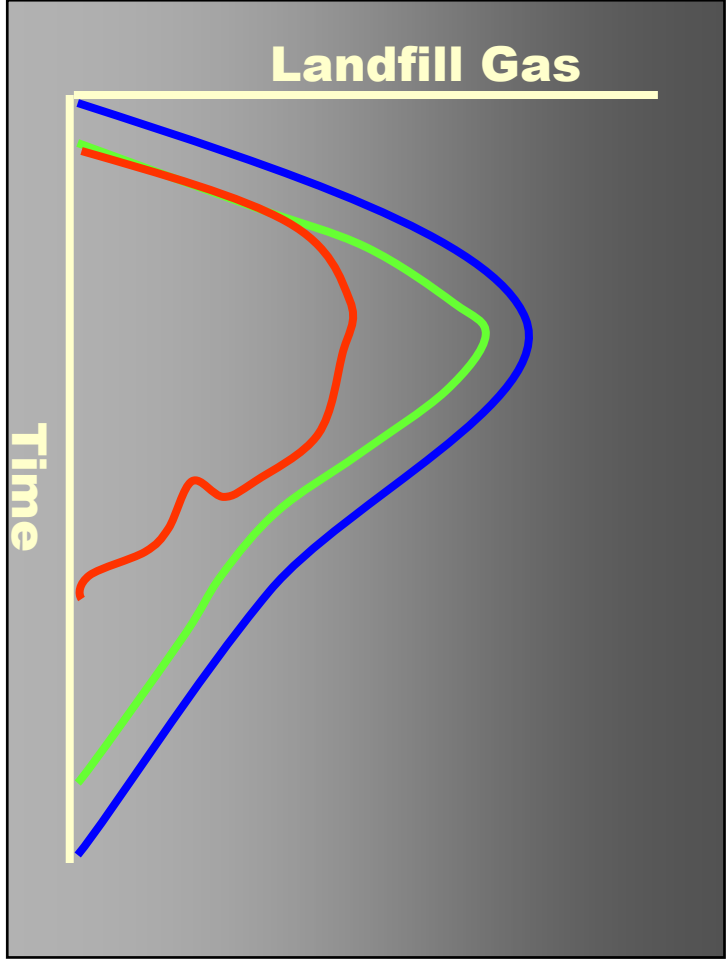
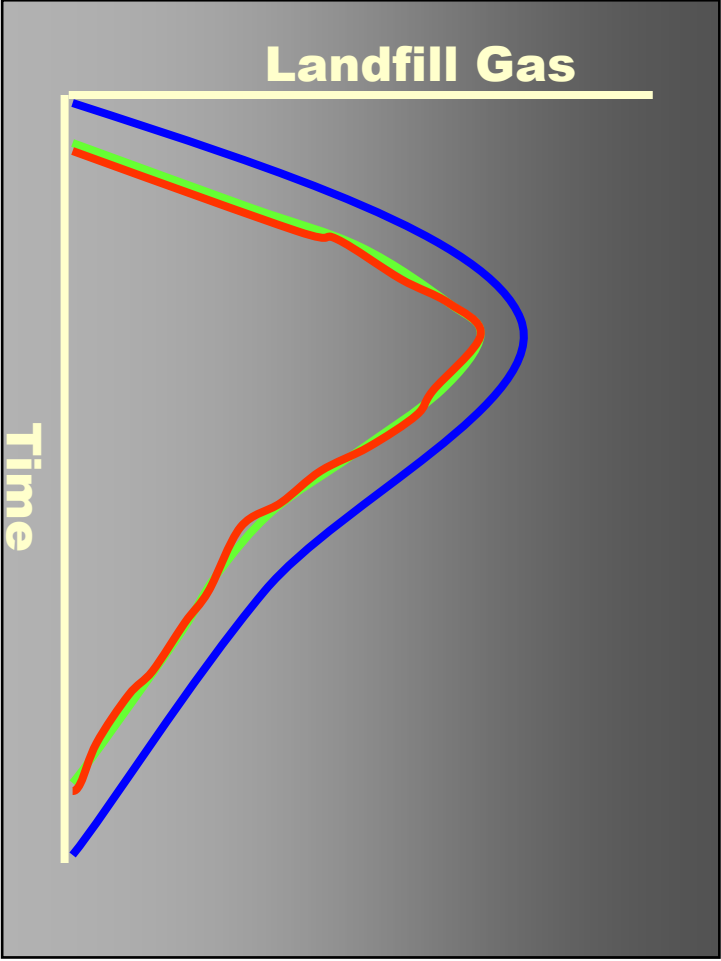
- Quality System Installation
- Manage Field Changes
- Maintain As-Built Documentation











*Landfill Gas Collection System
Wellfield Management*

- Monitoring
- Tuning
- Maintenance

*Landfill Gas Collection System
Wellfield Management*

- **Monitoring**
- Tuning
- Maintenance

NSPS Compliance

- Wellfield monitored monthly
- Vacuum at each extraction point
- Gas temperature < 131 °F
- Oxygen content < 5 % (or Nitrogen < 20 %)
- Quarterly surface emission scan < 500 ppm

Field Instrumentation

The right meter for the right
application



???



GasTech Land Surveyor



- Accurately measures combustible gas, oxygen
- Trace component analysis
- Relatively cheap
- User friendly
- Field repairs



Landtec Gem 2000

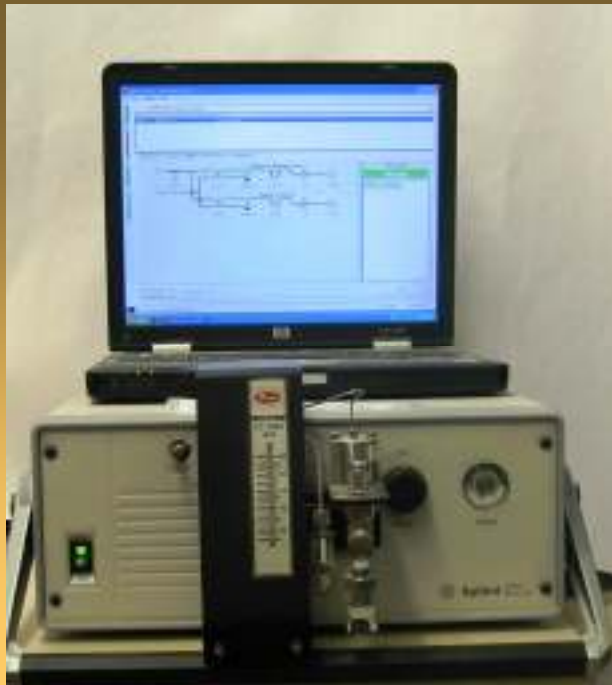


- Accurately measures combustible gas, oxygen & CO₂
- Calculates balance gas
- Pressure Transducers
- Data Processor
- Relatively expensive
- Smart user friendly
- No field repairs

Gas Chromatograph



- Accurately measures all major components of LFG
- Expensive
- Not user friendly
- Not field friendly





Best



Better



Good

Cost ?



\$25,000



\$10,000



\$2,500

Accuracy ?



Best



Better ?









Landfill Gas Collection System Wellfield Management

- Monitoring
- **Tuning**
- Maintenance



Trend Analysis

- Total System Parameters
- Extraction Points

Well Tuning

- Set quality threshold
- Apply vacuum
- Recover flow

Quality vs Flow

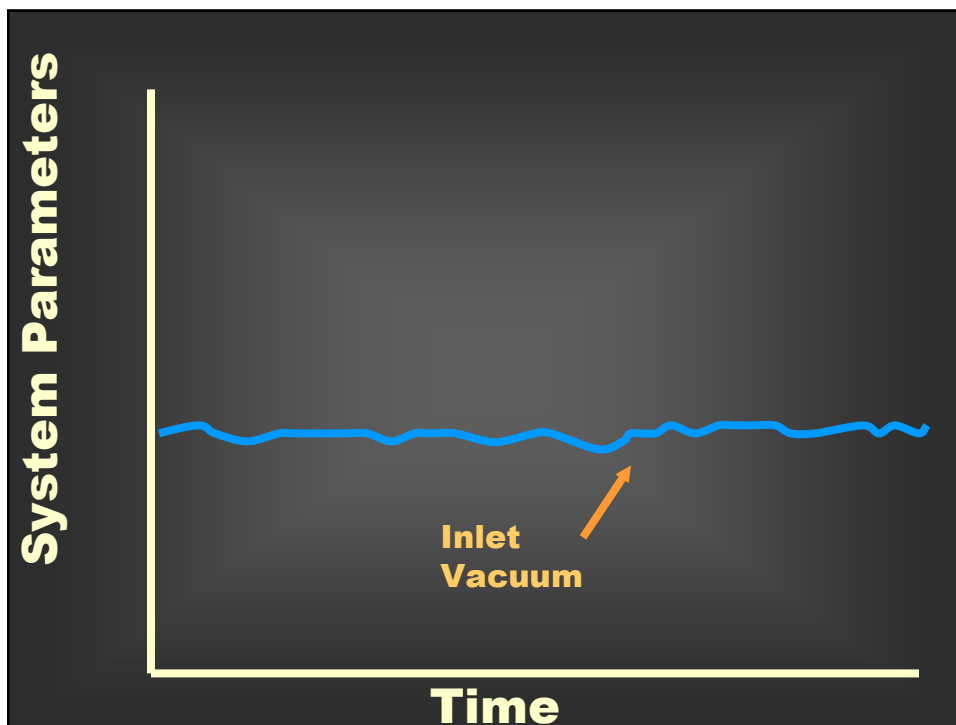
1 Centaur Turbine needs 41 MMBtu/Hr

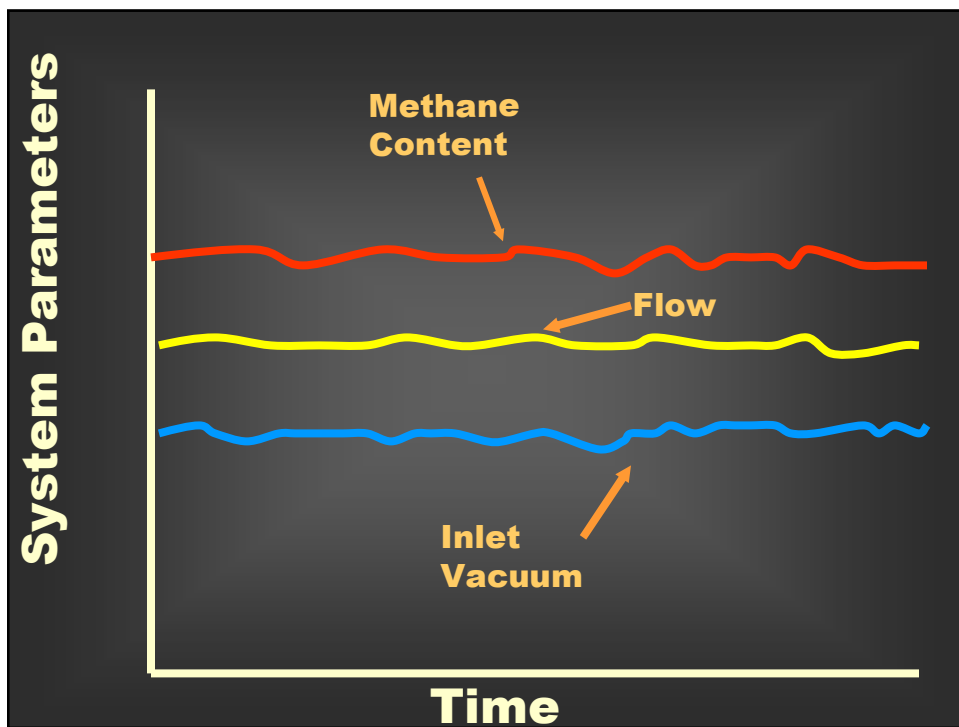
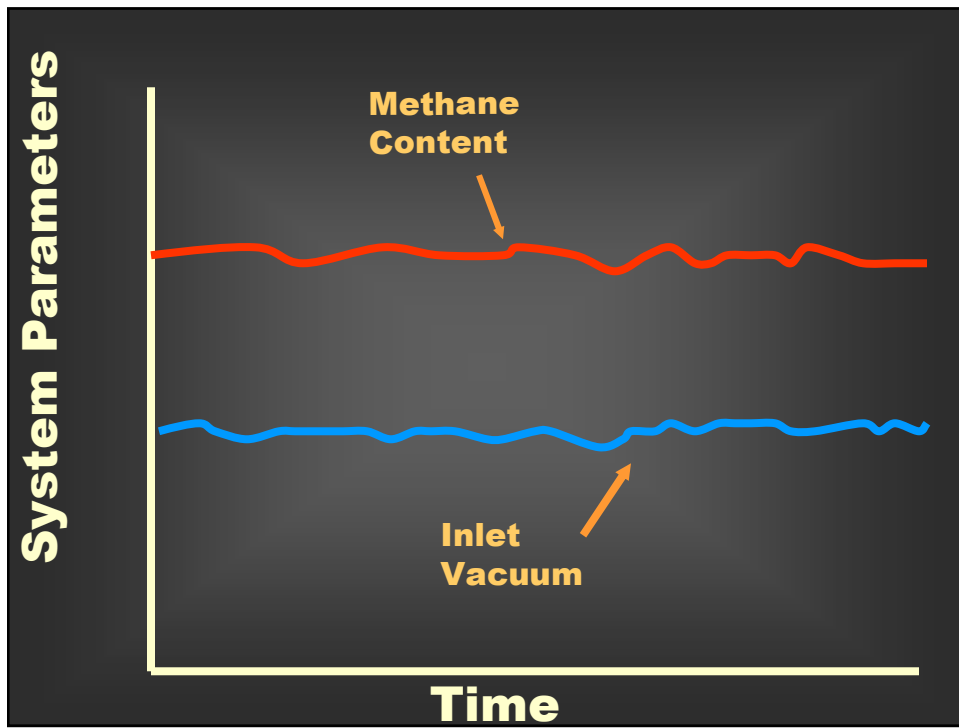
- @ 58 % methane content – 1292 scfm
- @ 54 % methane content – 1388 scfm
- @ 50 % methane content – 1500 scfm
- @ 45 % methane content – 1705 scfm

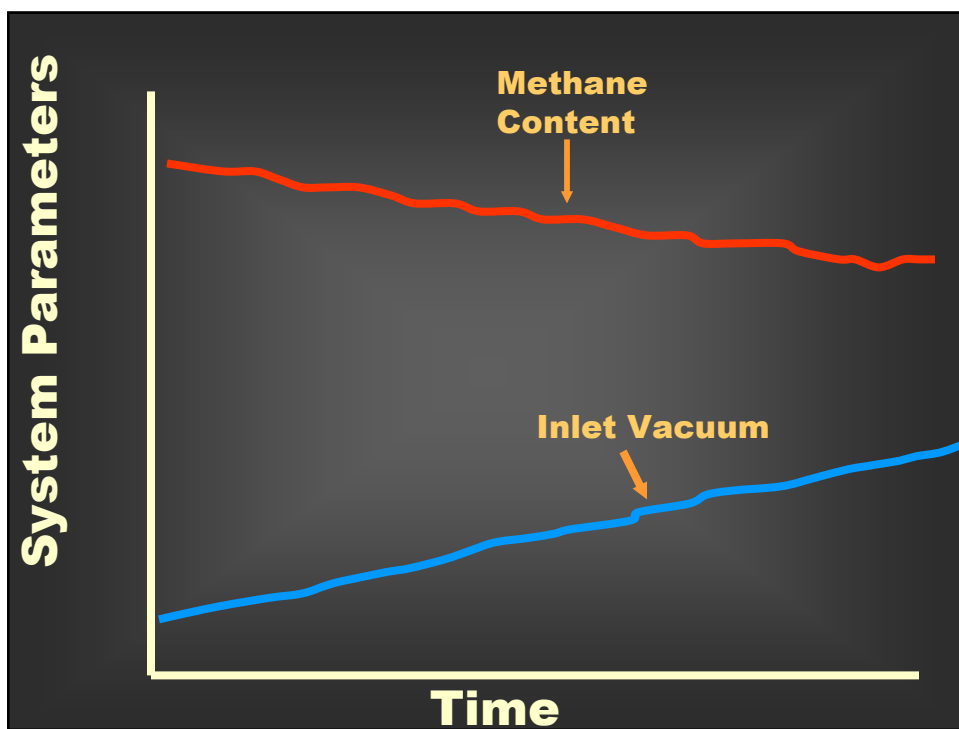
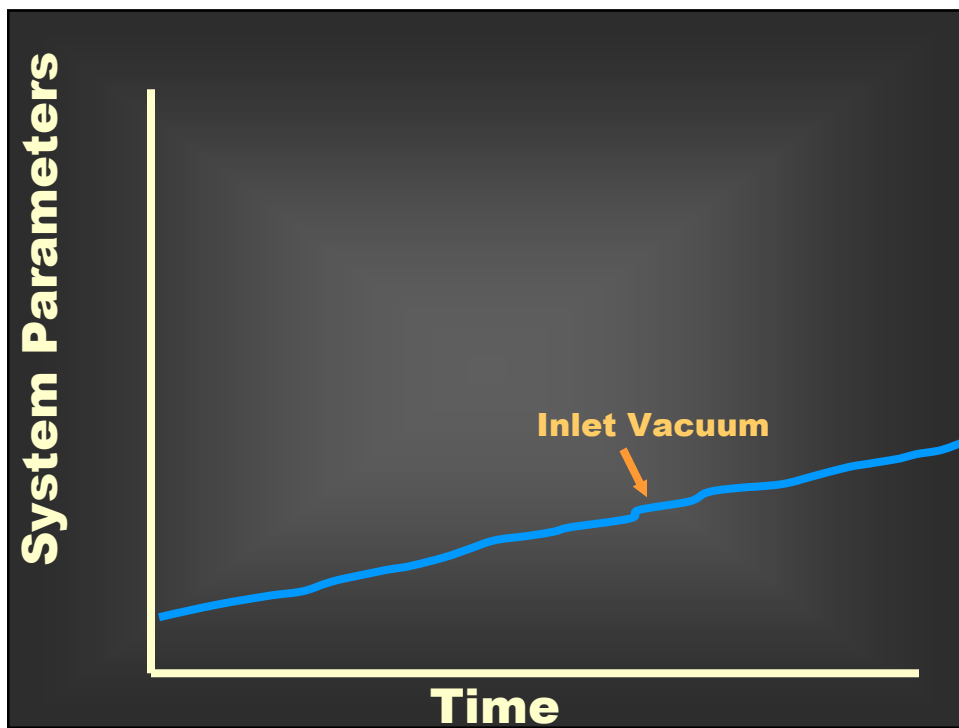
Quality vs Flow

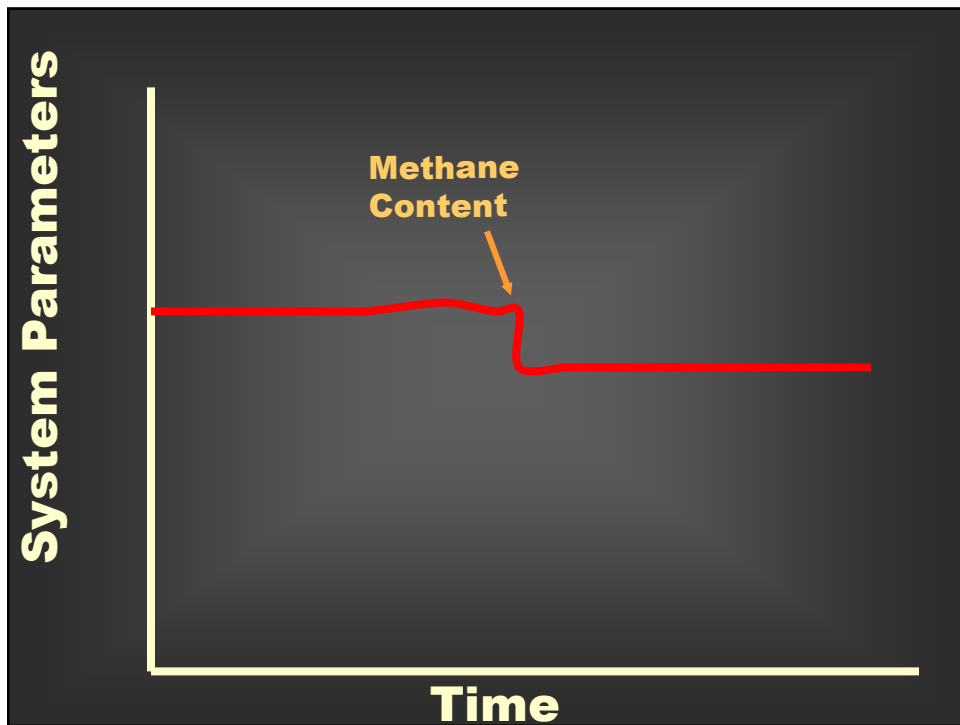
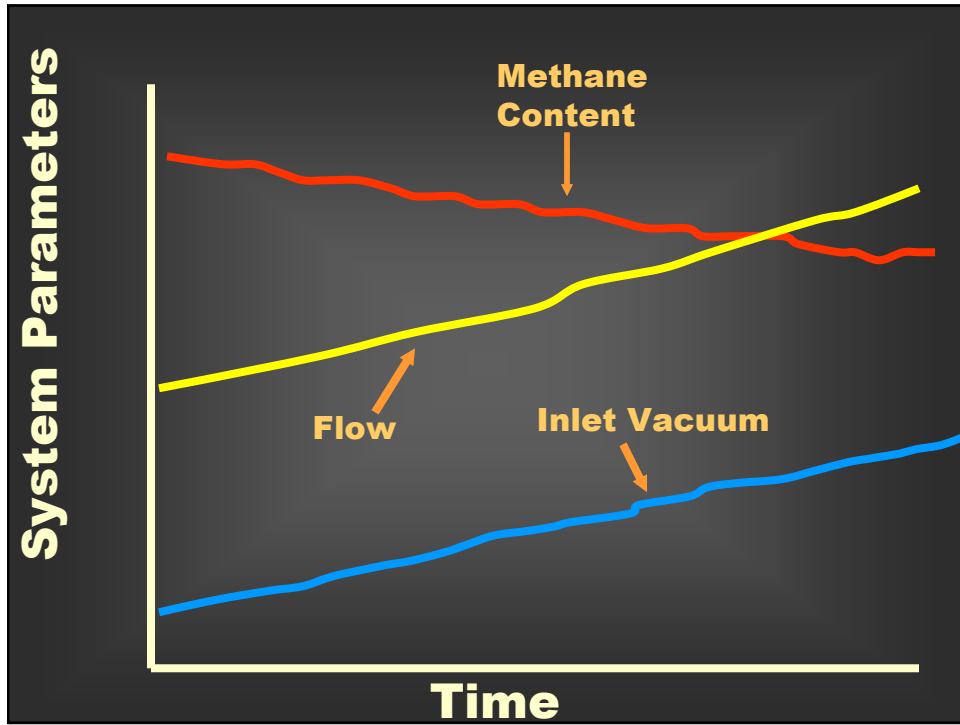
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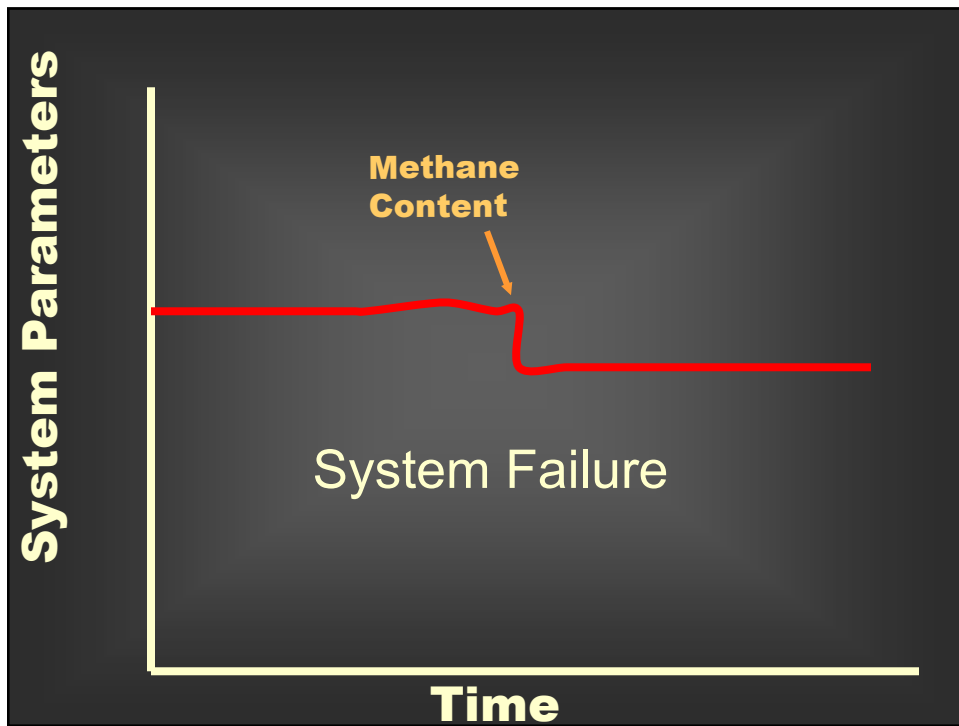
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*Wellheads
...the good, the bad, and
the ugly*















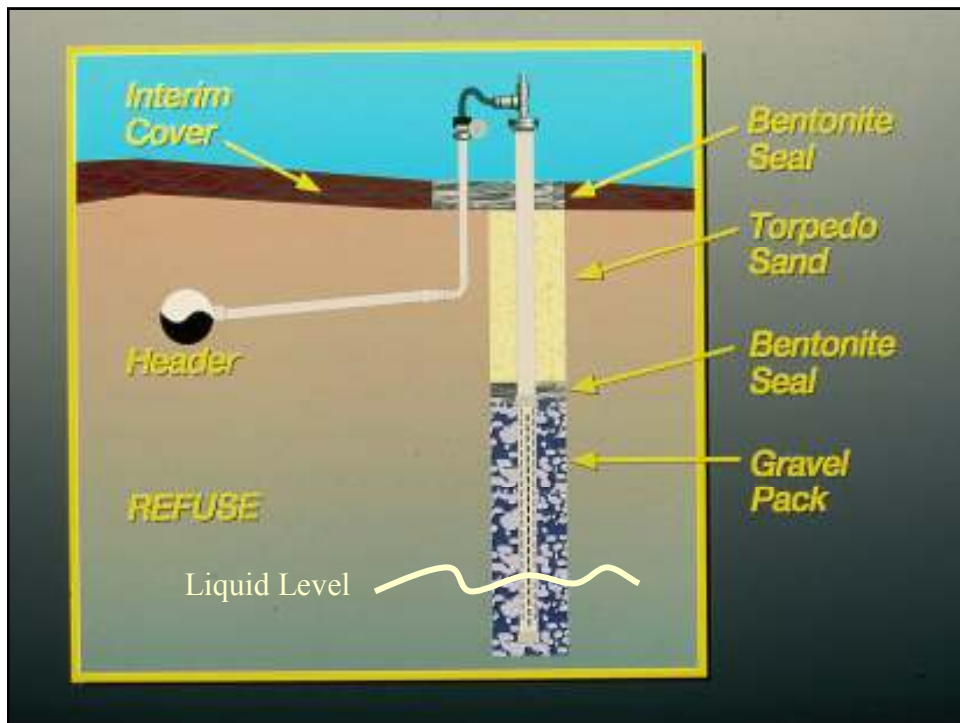
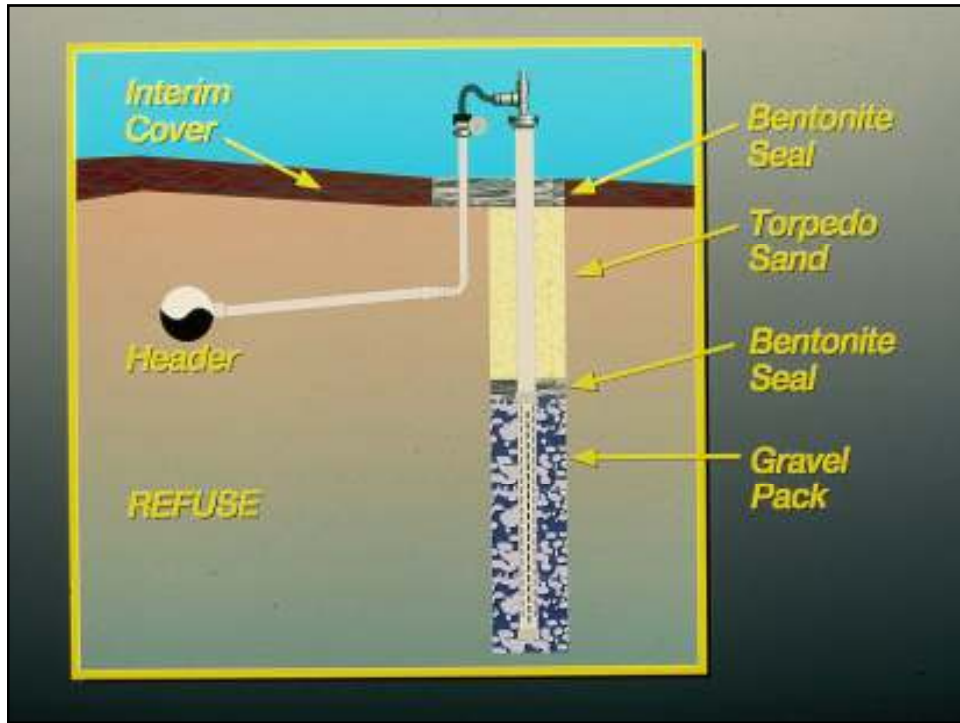
Landfill Gas Collection System Wellfield Management

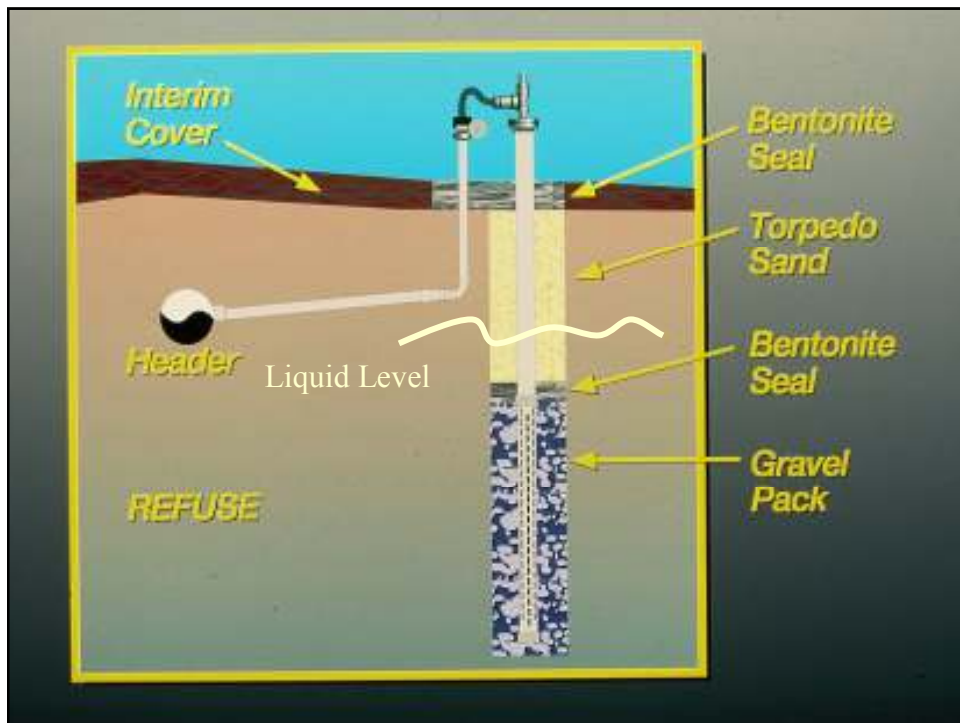
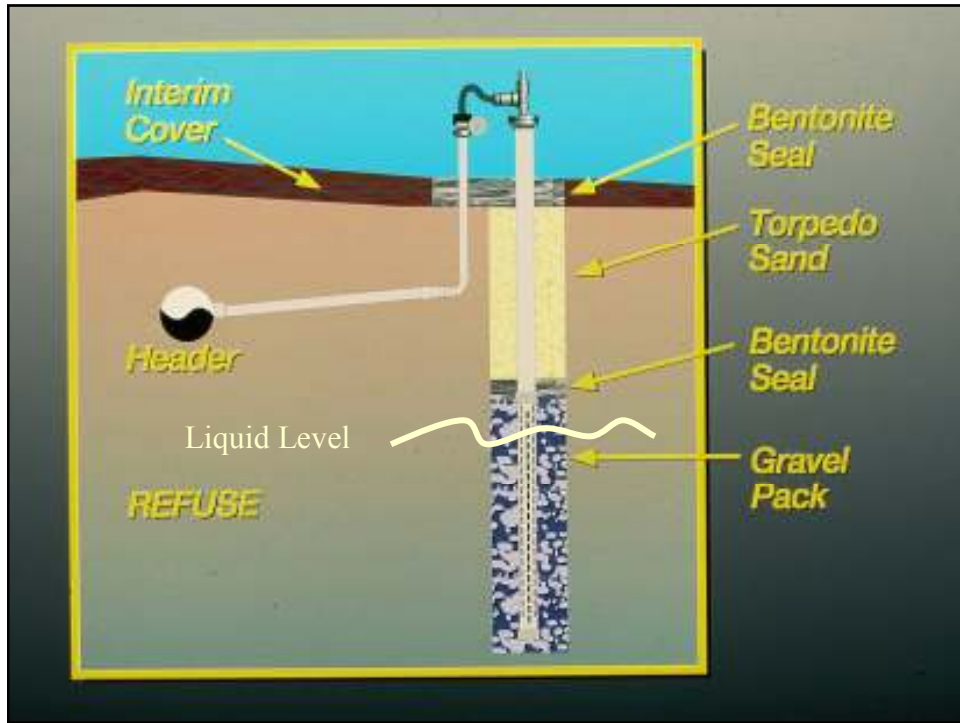
- Monitoring
- Tuning
- **Maintenance**

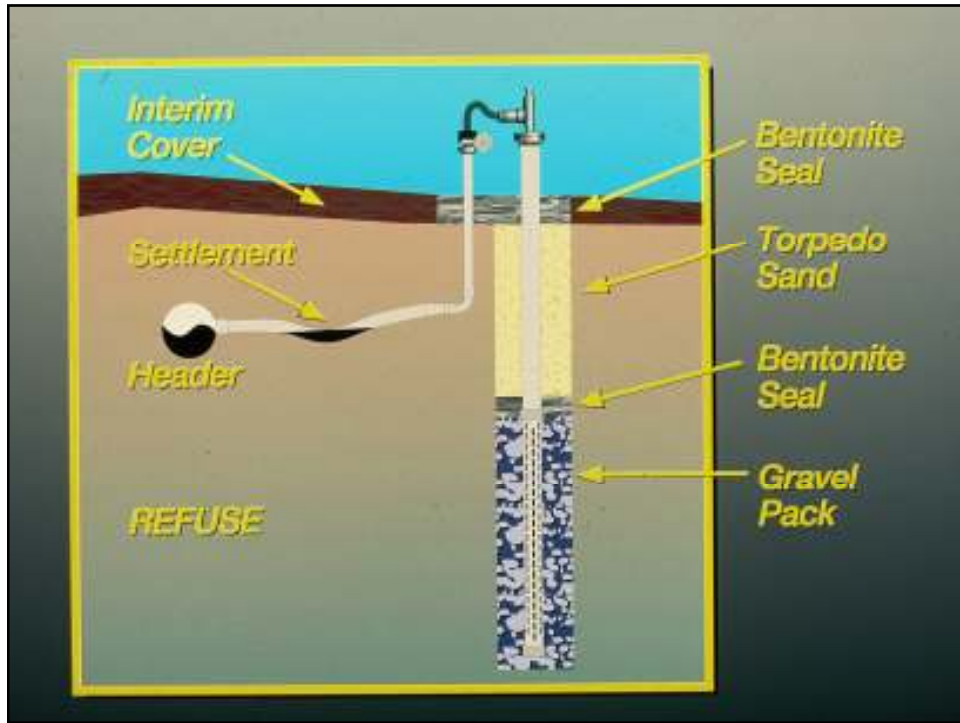
LFG Collection System Components

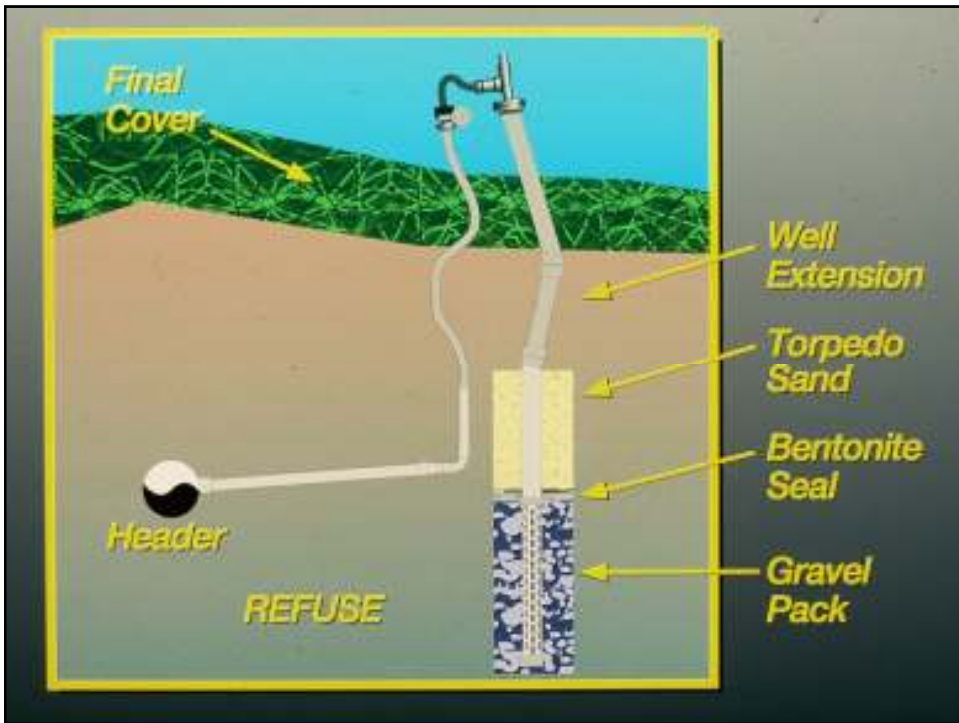
- Extraction points
- Header system
- Condensate system

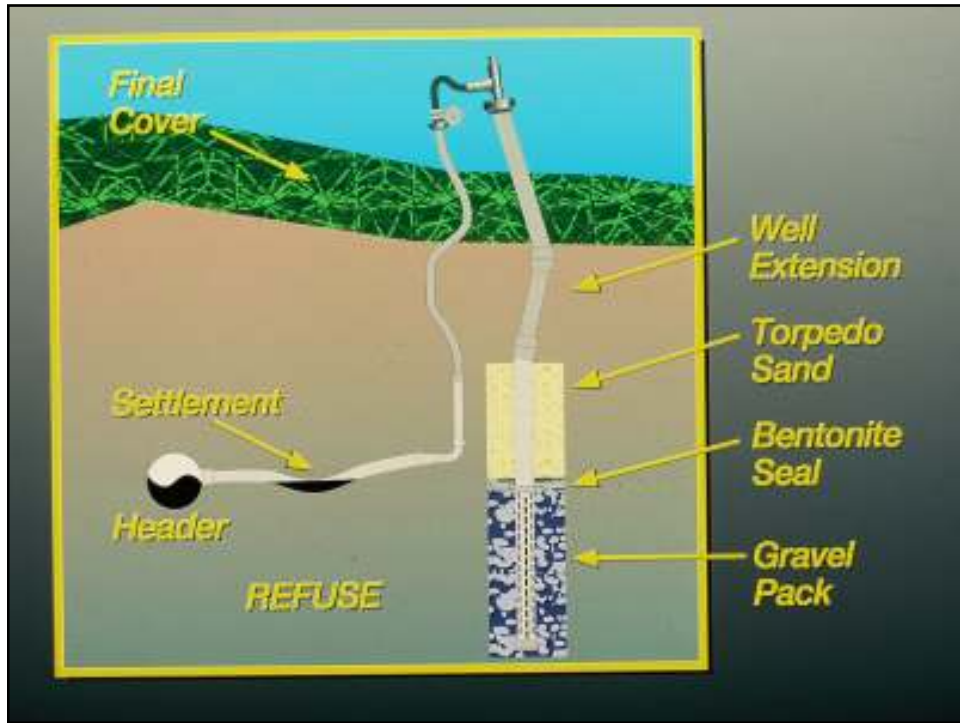














LFG Collection System Components

- Extraction points
- Header system
- **Condensate system**







Lots of Gas....Lots of Gas Recovery




Contact Information:

Scott Fowler

JSFowler@FredWeberInc.com

Fred Weber Landfill

- Started as a quarry in the mid 1950's.
- Began accepting waste mid-70's.
- A total of 232 permitted acres.
- Refuse depth approaching 300 feet.
- Site life projected beyond 2055.



End users

- Two Asphalt Plants
- Concrete Facility
- High School
- Oil Burner
- Greenhouse

CONTROL

- Two Enclosed Flares
- Utility Flare

The image consists of an aerial photograph of an industrial facility, with a black outline highlighting a specific area in the center. To the right of the photograph is a list of end users and control measures. The list is organized into two sections: 'End users' and 'CONTROL'. The 'End users' section includes: Two Asphalt Plants, Concrete Facility, High School, Oil Burner, and Greenhouse. The 'CONTROL' section includes: Two Enclosed Flares and Utility Flare.



