

US EPA ARCHIVE DOCUMENT

ANAEROBIC BIOREACTOR LANDFILL POTENTIAL GOALS AND BENEFITS

LANDFILL SPACE CAPACITY REUSE AS RESULT OF RAPID SETTLEMENT

- During operational period allows the placement of more tonnage into the permitted landfill airspace
 - During operational period allows significant increase in landfill life; this leads to defraying capital cost of acquiring new landfill during the life extension period
 - Significant increase in realized waste disposal revenues as result of additional waste placed during the extended landfill life
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ANAEROBIC BIOREACTOR LANDFILL POTENTIAL GOALS AND BENEFITS

POST-CLOSURE CARE AND MAINTENANCE REDUCTION

(almost complete stabilization of gas and settlement within 5 to 10 years of closure; almost complete stabilization of leachate within 3 to 5 years of closure)

- After reaching stabilization, minimizes future environmental risk and liability related to gas, settlement and leachate
 - After reaching stabilization, significant reduction in landfill operation and maintenance activities
 - After reaching stabilization, significant reduction in landfill monitoring activities.
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LANDFILL GAS GENERATION FROM MUNICIPAL SOLID WASTE

| MSW Organic | Wet Weight % of MSW | Biodegradability | Gas Generation % (Barlaz) | Biodegradation Time of LFG Generation yrs |
|----------------|-------------------------------|------------------|-------------------------------------|--|
| Food | 9 | fast | 9 to 12 | 1 to 5 |
| Vegetation | 19 | fast to moderate | 9 to 11 | 1 to 80 |
| Paper | 33 | moderate | 71 to 76 | 5 to 80 |
| Subtotal | <u>61</u> | | | |
| Wood | 7 | slow | 5 to 6 | 5 to >100 |
| Subtotal | <u>7</u> | | | |
| Plastic | | refractory | | |
| Rubber | 5 | refractory | | |
| Textiles | 3 | refractory | | |
| Subtotal | <u>15</u> | | | |
| TOTAL | <u>83</u> | | | |

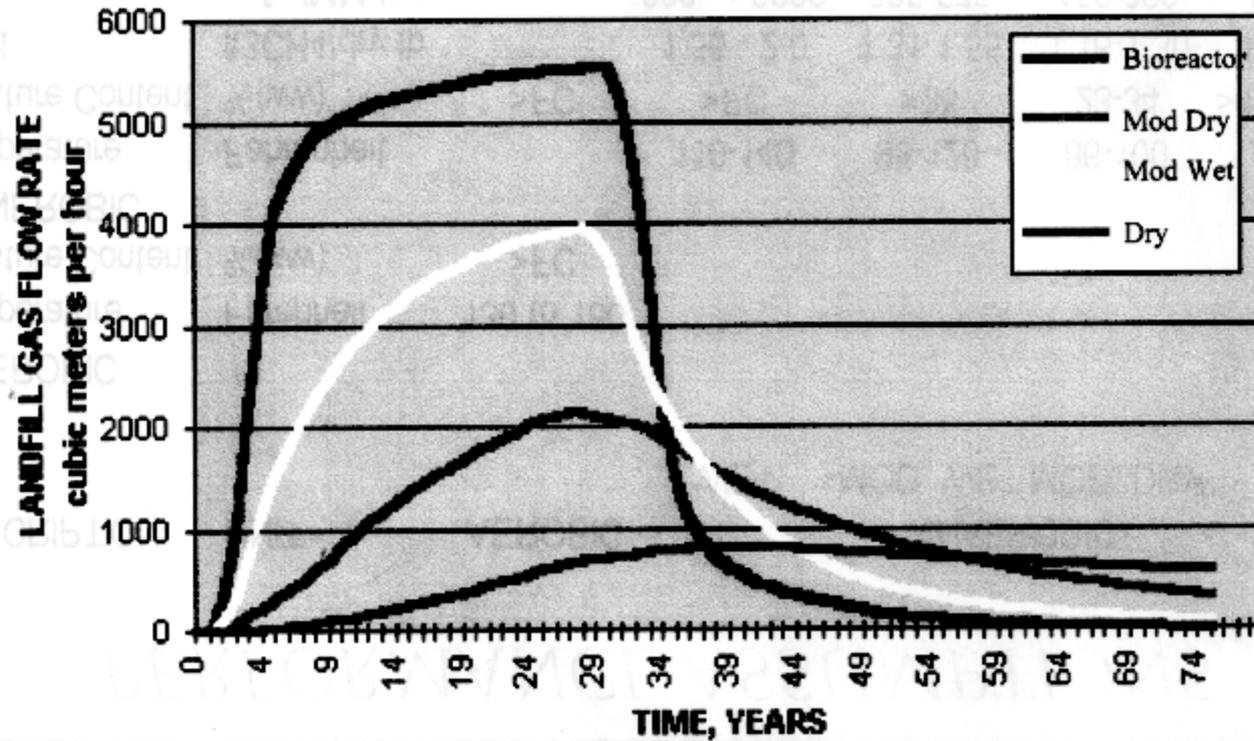
PERFORMANCE RESULTS

| DESCRIPTION | UNIT | ANAEROBIC | | | |
|-------------------|---|-----------|---------|---------|------|
| | | WET | MOD.WET | MOD.DRY | DRY |
| LFG Yield | | | | | |
| Food | ft ³ CH ₄ /dry lb | 0.18 | 0.13 | 0.11 | 0.09 |
| Vegetation | ft ³ CH ₄ /dry lb | 0.41 | 0.32 | 0.25 | 0.21 |
| Paper | ft ³ CH ₄ /dry lb | 1.41 | 1.07 | 0.86 | 0.73 |
| Other | ft ³ CH ₄ /dry lb | 0.03 | 0.02 | 0.02 | 0.02 |
| Total | ft ³ CH ₄ /dry lb | 2.03 | 1.54 | 1.24 | 1.05 |
| LFG Energy | | | | | |
| Rapid | ft ³ CH ₄ /dry lb | 0.33 | 0.24 | 0.20 | 0.17 |
| Moderate | ft ³ CH ₄ /dry lb | 1.60 | 1.23 | 0.98 | 0.83 |
| Slow | ft ³ CH ₄ /dry lb | 0.10 | 0.07 | 0.06 | 0.05 |
| Total | ft ³ CH ₄ /dry lb | 2.03 | 1.54 | 1.24 | 1.05 |
| LFG Energy | | | | | |
| Total Yield | % | 100 | 75 | 61 | 52 |
| Energy Project | % | 100 | | 40 | |

PERFORMANCE ASSUMPTIONS

| DESCRIPTION | UNIT | AEROBIC | ANAEROBIC | | | |
|--------------------|---|------------|-------------|-----------|-----------|------------|
| | | | WET | MOD. WET | MOD. DRY | DRY |
| LFG | | | | | | |
| AEROBIC | | | | | | |
| Temperature | Farenheit | 130 to 150 | | | | |
| Moisture Content | %(ww) | >FC | | | | |
| ANEROBIC | | | | | | |
| Temperature | Fahrenheit | | 110-140 | 95-120 | 86-100 | <86 |
| Moisture Content | %(ww) | >FC | >FC | >35 | 23-34 | >15 to <22 |
| Yield | ft ³ CH ₄ /dry lb | | 1.56 - 2.0 | 1.31-1.55 | 1.16-1.30 | 1.0-1.15 |
| Rate | scfm/MM tons | | 600 - >3000 | 325-575 | 150-320 | 50-145 |
| Stabilization Time | yrs | 1 to 2 | 5 to 10 | 15-25 | 30-45 | >50 |
| Waste settlement | % | 22-27 | 20-25 | 15-19 | 14-10 | <10 |

LANDFILL GAS GENERATION VS TIME



POTENTIAL ENERGY PROJECT

