Hospital Beneficial Use of LFG – Rockingham County VA Case Study

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Outline

- Site background
- Feasibility study
- Design/build
- O&M findings
- Other LFG activities
Landfill Profile

- Total site is 215 acres
- 51 acres permitted for disposal
- Opened in 1972
- Over 2,500,000 tons of waste in place today
- ~250 tpd
What’s Received at the Landfill by Sector

- Municipal Solid Waste: 75%
- Agricultural, commercial or industrial: 25%
Phase III & IV – “Filling the Valley”

PHASE I
Closed 2000

PHASE II
Closed 2010

PHASE III & IV
Currently open
Prior LFG Management

- Active collection from Phases I & II
- LFG flared
Project Interests

- Rockingham County attends the LMOP conference in January of 2006
- The Rockingham County landfill is featured as a prospective gas utilization project candidate
LFG Recovery Projection
Rockingham County Landfill, Harrisonburg, Virginia

- Recovery Potential
- Estimated Recovery from Existing/Planned System

4/12/2010
Direct Use Option

- Direct use involves burning the LFG directly in a boiler to produce steam
- This is the lowest capital cost option
- Boilers require less gas treatment
- Energy conversion is relatively efficient
## Final Comparison: CHP versus Direct Use

<table>
<thead>
<tr>
<th>Financial Parameter</th>
<th>CHP</th>
<th>Direct Use Option</th>
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<tbody>
<tr>
<td>Total Capital Costs</td>
<td>$4,222,482</td>
<td>$2,496,800</td>
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<tr>
<td>Net Present Value</td>
<td>$1,758,543</td>
<td>$3,557,772</td>
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<tr>
<td>NPV Payback Period</td>
<td>10 years</td>
<td>6 years</td>
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<tr>
<td>Internal Rate of Return</td>
<td>12%</td>
<td>18%</td>
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Meanwhile……

- Rockingham Memorial Hospital (RMH) is building a new hospital
- Seeks to construct an environmentally friendly energy efficient facility
Industrial Boilers Proposed at Hospital

- Used to produce steam or hot water
- 3 boilers planned
- Each uses 680 scfm of LFG
Operations

• Project operational Spring 2010-only one boiler
• Oct. 2010 inspected LFG boiler
  – Siloxanes
• Boiler loads lower than anticipated
• Siloxane buildup less in winter months
• Flare instability during winter operation
Other LFG Activities

- Grant in 2010 to modify remaining two boilers
- SCS/Blue Source monetize carbon credits
- Hospital considering utilizing LFG – directed-fired absorption chillers
Questions?

Thank You
&
Please Contact us with Questions

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