Cost Recovery for Waste Processing at Los Alamos

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Technical Area-54, Material Disposal Area G
TA-54, Area G is the primary disposal site at Los Alamos for radioactive wastes. Complete closure is scheduled for early FY2016.
Low-Level Waste is buried in pits at Tech Area-54, Material Disposal Area G
Inside a TRU Waste Storage Dome
Loading TRU drums into TRUPACT II containers for transport to WIPP
WIPP truck leaving TA-54 on its way to WIPP in Carlsbad, NM
The WIPP route follows Highway 285 from Santa Fe to Carlsbad, NM (300 miles).
Waste Management at Los Alamos in FY2008 (fully burdened costs)

Focus of Cost Recovery Team: $25M

- Waste Management Facilities: $21.8M
- Legacy TRU Waste Disposition: $40M
- Cleanup Projects Waste Disposal: $1.8M
- Waste Processing: $19.2M
  - Waste Processing, Specialized Projects: $3.2M
- Pollution Prevention: $1.3M
- Generator Set Aside Fund: $1.2M
- Facilities Warm Standby Waste Processing: $1.4M
  - Legacy TRU Waste Disposition Total = $40M
  - Cleanup Projects Waste Disposal Total = $1.8M
Waste Processing Cost Basis:
Definition of Fixed and Variable Cost

WBS | Fixed Cost (FC) | Variable Cost (VC)
--- | --- | ---
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
Xxx | $$$$ |  
... |  |  

**FC**: Support and establish processing capability (insensitive to volume)

**VC**: Processing waste (sensitive to volume)
The Team Considered Six Alternative Cost Recovery Models

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Implementation</th>
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<tbody>
<tr>
<td>Low</td>
<td>Easy</td>
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<tr>
<td>High</td>
<td>Difficult</td>
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- **Alternative 1:** Share/yr (FC & VC)
- **Alternative 2:** Large Generators Pay Invoice/mo, Instit. Pays FC for Small Generators (FC & VC)
- **Alternative 3:** Invoice/mo (VC), Instit. Pays FC
- **Alternative 4:** Invoice/mo (VC), Share/yr (FC)
- **Alternative 5:** Invoice/mo (FC & VC), plus Package Fee (some FC)
- **Alternative 6:** Invoice/mo (FC & VC)

Selected Alternative: **Alternative 4:** Invoice/mo (VC), Share/yr (FC)
The Two Components of Alternative 4: Annual Cost Shares and Monthly Invoices

\[ Share_{x,i} = FC_i \times \frac{Vol_{Forecast}^i}{Vol_i^i} \]

\[ UnitCost4_i = \frac{VC_i}{Vol_i^i} \]

\[ TotalCost_i = \sum_{x=1}^{X} Share_{x,i} + \sum_{x=1}^{X} UnitCost4_i \times Vol_{Actual}^{x,i} \]

where
- \( Share_{x,i} \) = annual waste processing fee paid by generator \( x \) for waste \( i \),
- \( FC_i \) = annual fixed cost for processing waste \( i \),
- \( Vol_{Forecast}^{x,i} \) = annual volume forecast of waste \( i \) for generator \( x \),
- \( Vol_i^i \) = annual volume forecast of waste \( i \) over all programs,
- \( UnitCost4_i \) = Alternative 4 cost per unit volume for processing waste \( i \),
- \( VC_i \) = annual variable cost for processing waste \( i \),
- \( Vol_{Actual}^{x,i} \) = actual annual volume of waste \( i \) generated by generator \( x \), and
- \( TotalCost_i \) = annual cost to process all Los Alamos waste \( i \),
- \( i \) = waste type by stream (LLW, MLLW, haz/chem, RLW, TRU) and category (1 to 8 depending on waste stream),
- \( x \) = waste generator, (e.g., pit manufacturing, RTBF, etc.), and
- \( X \) = total number of waste generators.
Implementation Issues: Annual Cost Shares

1. Need incentives to reduce FC

\[
Share_{x,i} = FC_i \times \frac{Vol_{x,i}^{Forecast}}{Vol_i^{Forecast}}
\]

2. Need accurate volume forecasts - ready by middle of prior year - prevent cheating

\[
TotalCost_i = \sum_{x=1}^{X} Share_{x,i} + \sum_{x=1}^{X} UnitCost_{4,i} \times Vol_{x,i}^{Actual}
\]

3. Who must pay a share? (e.g., small, variable generators)

4. Can a new generator “join” mid-year?
Implementation Issues: Monthly Invoices

\[ UnitCost_{4_i} = \frac{VC_i}{Vol_{i}^{\text{Forecast}}} \]

\[ TotalCost_i = \sum_{x=1}^{X} \text{Share}_{x,i} + \sum_{x=1}^{X} UnitCost_{4_i} \times Vol_{x,i}^{\text{Actual}} \]

1. Need accurate waste tracking system
2. Need strong cost accounting verification
3. How to handle over- or under-collection?
4. Disruptive to adjust unit cost mid-year
Conclusion: Implementation Realities from Idaho and Sandia

\[ Share_{x,i} = FC_i \times \frac{Vol_{x,i}^{\text{Forecast}}}{Vol_i^{\text{Forecast}}} \]

\[ UnitCost4_i = \frac{VC_i}{Vol_i^{\text{Forecast}}} \]

\[ TotalCost_i = \sum_{x=1}^{X} Share_{x,i} + \sum_{x=1}^{X} UnitCost4_i \times Vol_{x,i}^{\text{Actual}} \]

1. Need accurate volume forecasts

2. Need accurate waste tracking system

3. Need strong cost accounting verification

4. Use a large pool of generators (SNL)

5. Balance data fidelity with ease of implementation (INEL)