

# Cost Recovery for Waste Processing at Los Alamos

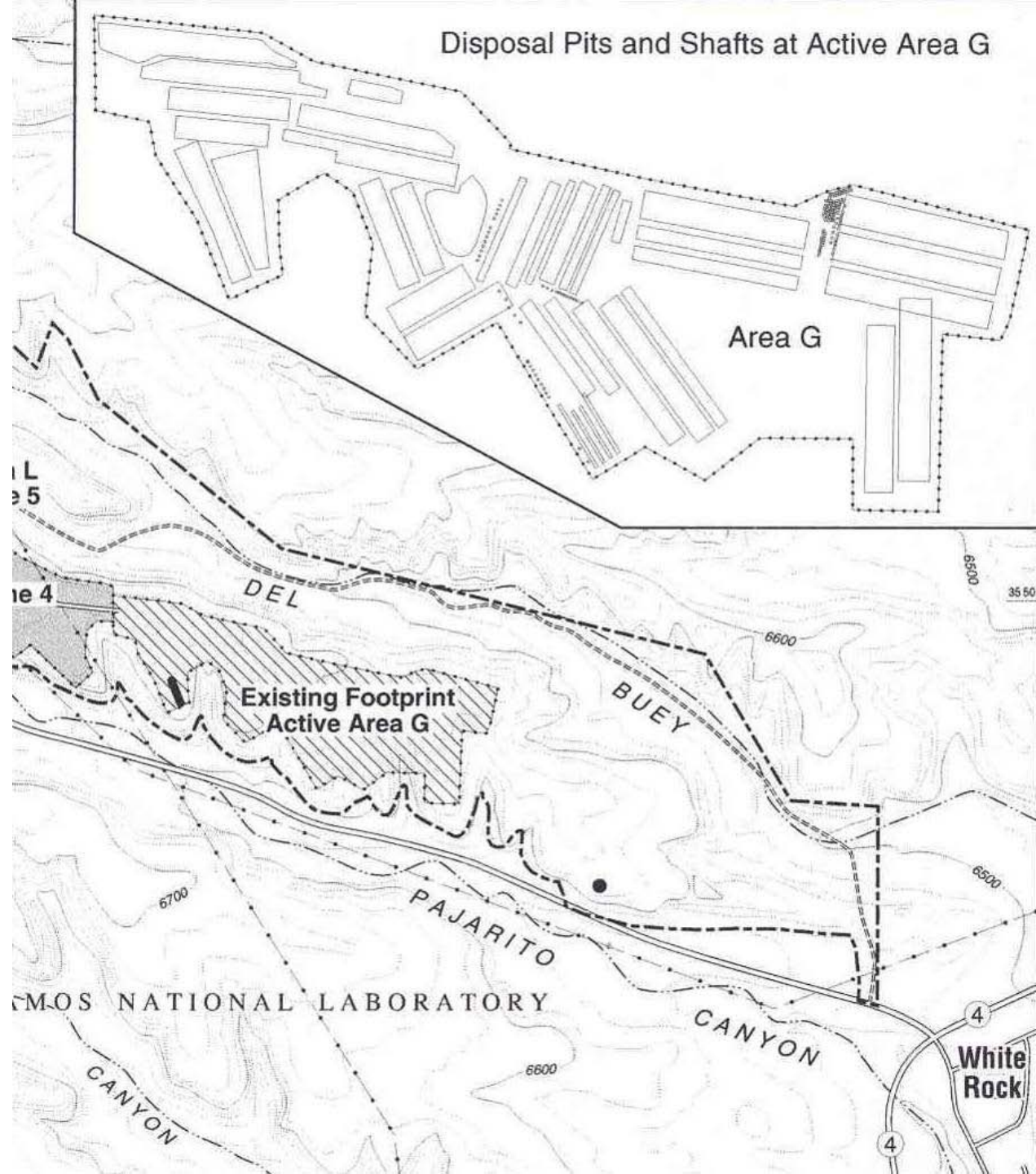
Presented to  
INCOSE Chapter Meeting  
August 10, 2011

Steven Booth  
AET-2, Process Modeling and Analysis Group  
Los Alamos National Laboratory

# 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



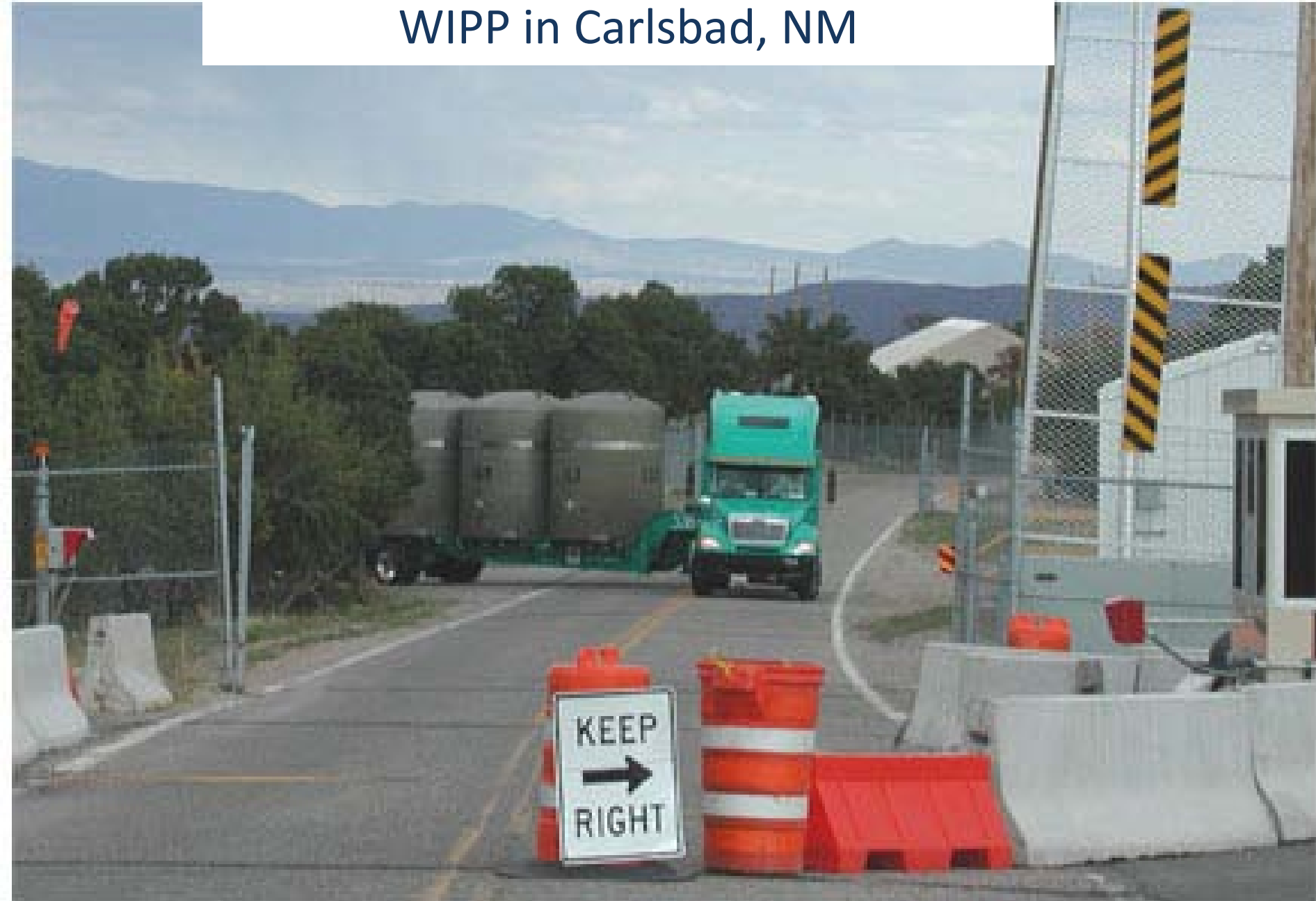
# Inside a TRU Waste Storage Dome



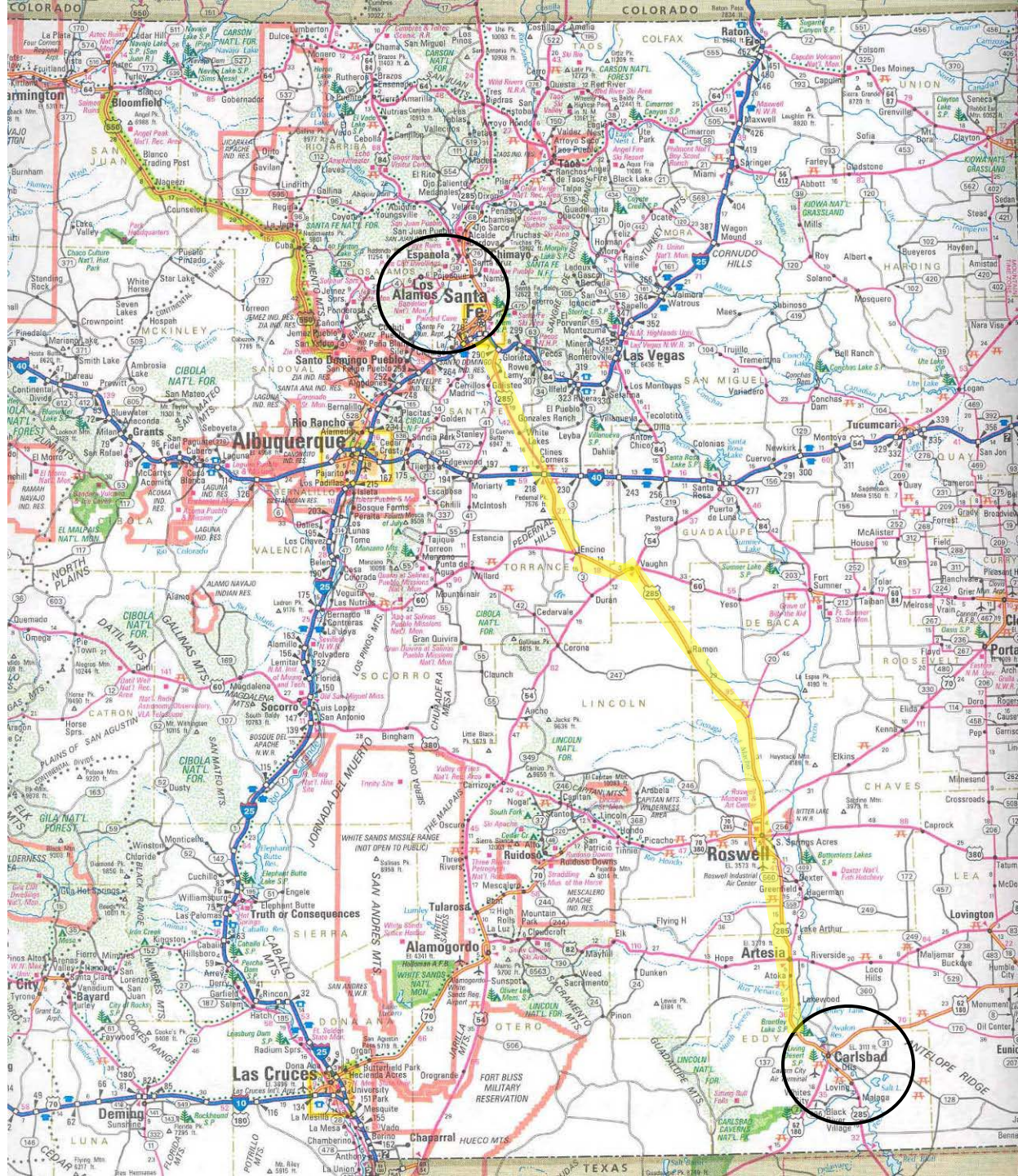
Loading TRU drums into TRUPACT II containers for transport to WIPP



# WIPP truck leaving TA-54 on its way to WIPP in Carlsbad, NM

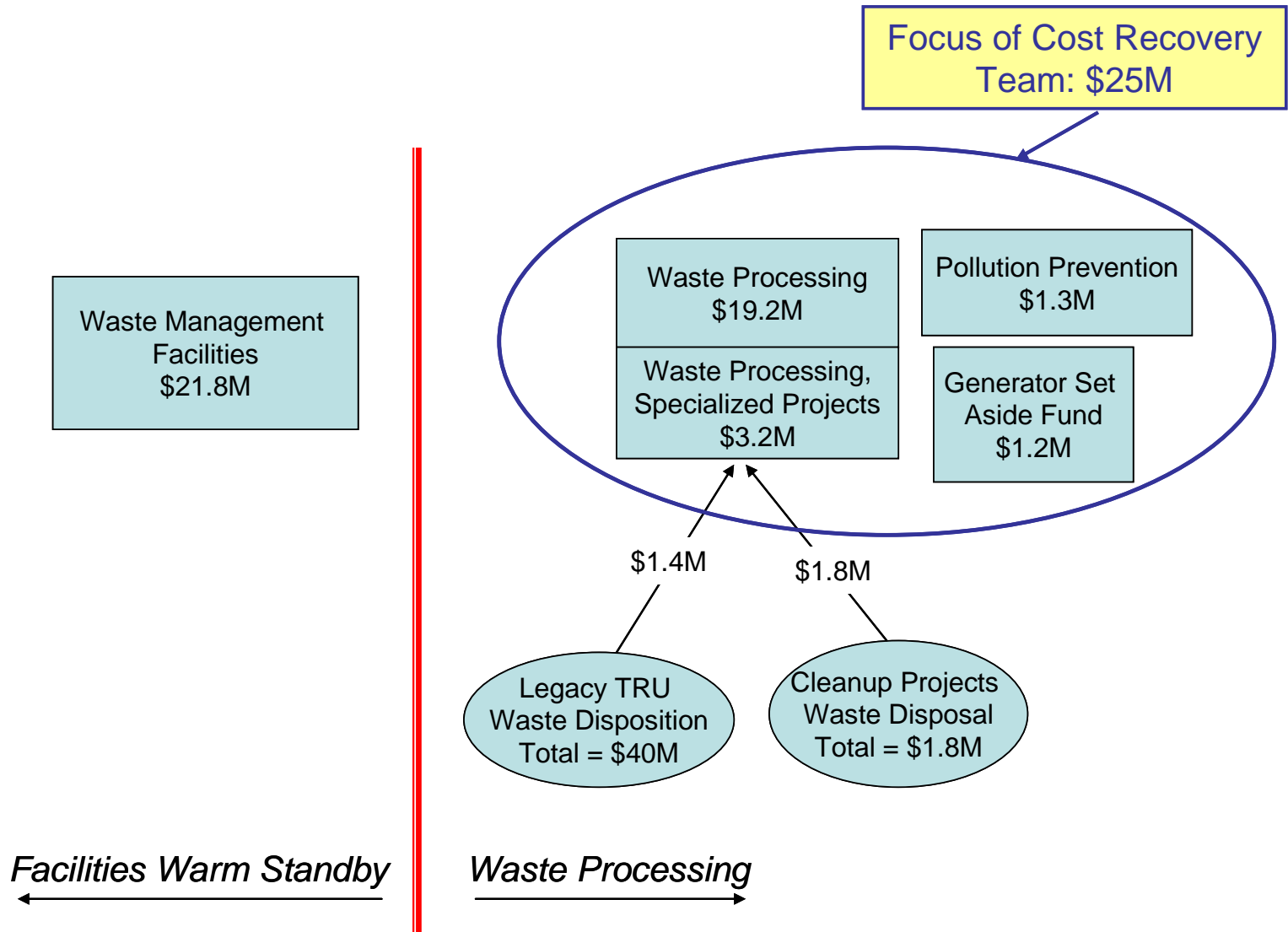


The WIPP route follows Highway 285 from Santa Fe to Carlsbad, NM (300 miles).





# Waste Management at Los Alamos in FY2008 (fully burdened costs)



# Waste Processing Cost Basis: Definition of Fixed and Variable Cost

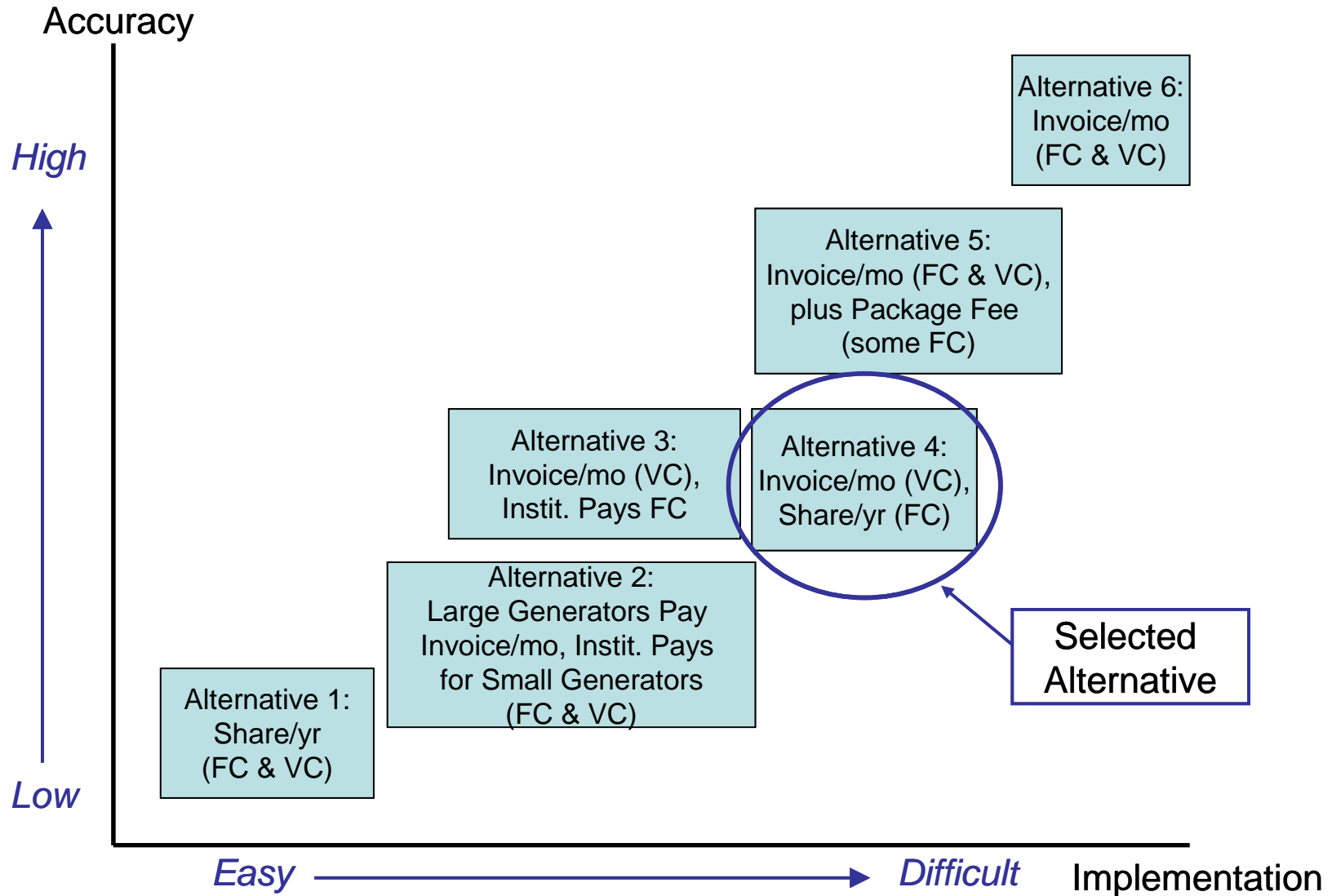
WBS	Fixed Cost (FC)	Variable Cost (VC)
Xxx	\$\$\$	
Xxx	\$\$\$	
Xxx	\$\$\$	
		VC: Processing waste (sensitive to volume)
		\$\$\$
		\$\$\$
		\$\$\$
		\$\$\$
		\$\$\$
Xxx	\$\$\$	
Xxx	\$\$\$	
Xxx		
Xxx		
Xxx		
...		

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

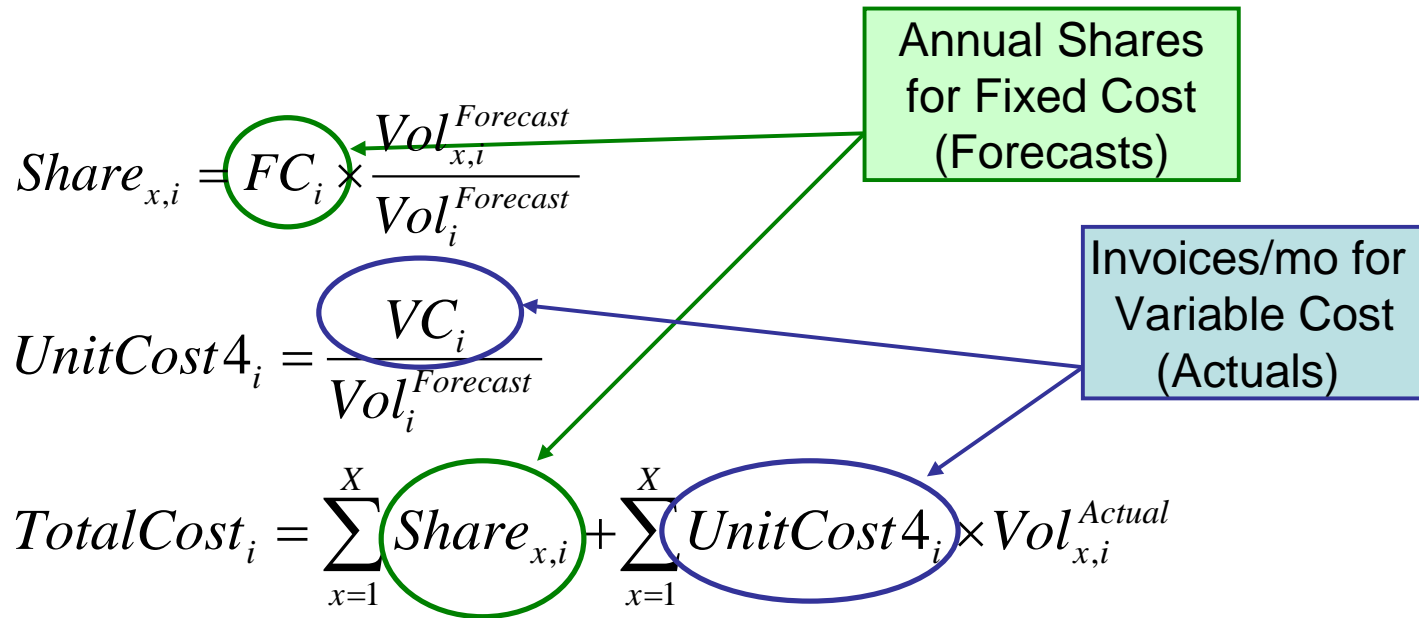
VC: Processing waste (sensitive to volume)

The diagram illustrates the classification of waste processing costs into Fixed Cost (FC) and Variable Cost (VC) based on their sensitivity to volume. The costs are organized into three columns: WBS, Fixed Cost (FC), and Variable Cost (VC). The FC column contains costs that are insensitive to volume, while the VC column contains costs that are sensitive to volume. A callout box for FC explains that it covers support and establishment of processing capability, which does not change with volume. A callout box for VC explains that it covers processing waste, which is sensitive to volume. Arrows indicate that the top three WBS items are classified as FC, and the bottom five WBS items are classified as VC.

# The Team Considered Six Alternative Cost Recovery Models



# The Two Components of Alternative 4: Annual Cost Shares and Monthly Invoices



where  $Share_{x,i}$  = annual waste processing fee paid by generator  $x$  for waste  $i$ ,

$FC_i$  = annual fixed cost for processing waste  $i$ ,

$Vol_{x,i}^{Forecast}$  = annual volume forecast of waste  $i$  for generator  $x$ ,

$Vol_i^{Forecast}$  = 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  $i$ ,

$Vol_{x,i}^{Actual}$  = 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

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

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

4. Can a new  
generator "join"  
mid-year?

# Implementation Issues: Monthly Invoices

$$UnitCost4_i = \frac{VC_i}{Vol_i^{Forecast}}$$

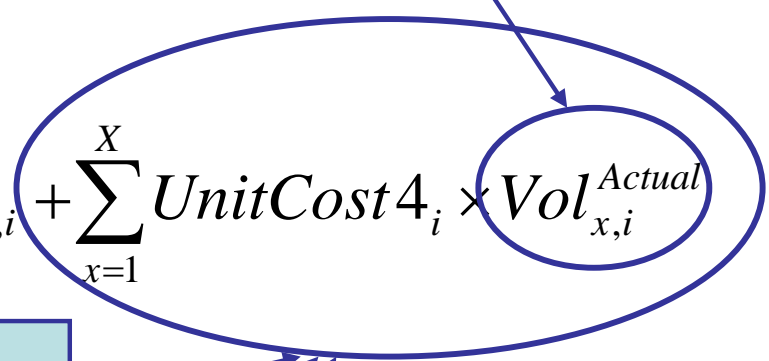
$$TotalCost_i = \sum_{x=1}^X Share_{x,i} + \sum_{x=1}^X UnitCost4_i \times Vol_{x,i}^{Actual}$$

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

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

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

1. Need accurate volume forecasts

$$UnitCost4_i = \frac{VC_i}{Vol_i^{Forecast}}$$

2. Need accurate waste tracking system

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

4. Use a large pool of generators (SNL)

3. Need strong cost accounting verification