

# US Department of Energy Laboratory

## Water Treatment Plant Waste Solidification

**Problem: How to solidify LLRW water for transport across country to the Hanford Nuclear Reservation (WA) without doubling/tripling waste volume?**



**Application of liner to B-25 Box.**

**The water treatment plant at this site generates about 15,000 gallons of liquid waste which must be solidified and shipped to the Hanford site for disposal.**

**The LLRW is solidified in steel B-25 boxes.**



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The waste is pure liquid and contains contaminants of radioisotopes.

About 100 lbs of *Waste Lock*® is first added to the bottom of the box.

Then, the liquid waste, which is 100-130° F, is added on top to a depth of 2-3" ( $\pm$  200 gallons).

Because the liquid is warm, diffusion into the polymer proceeds rapidly and the layer solidifies in minutes.



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**Additional *Waste Lock*<sup>®</sup> is added to the first gel layer.**

**Again, more liquid waste is added on top of the fresh polymer to a depth of 2-3”.**

**No agitation is applied.**

**The polymer swells as liquid is added. More polymer is added to the top of the gel and then more liquid added to the fresh polymer.**



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In this step-by-step/layered approach, the entire liquid content of the B-25 box is solidified to meet EPA Paint Filter Test Requirement.

End result for the B-25 box:

400 lbs of *Waste Lock*<sup>®</sup>

Plus

600 gallons (or 4,700 lbs)

Time for one box = 90 minutes

Weight / Volume Increase:

*No volume increase.*

*Polymer adds about 7% to weight.*

