

James Alzheimer

Comments in the attached file

Comments on the Dual Path Approach to Accelerate the Cleanup Mission in Hanford's 200 East Area

Jim Alzheimer

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Grouting is a good option for most of the Hanford Tank Waste. With the proper composition, it provides a stable waste form that can be adequately protective of human health and the environment. I firmly believe we should use grout for Hanford Waste Disposal whenever feasible. We do need to make sure the composition of the grout is proper for both the radiological and chemical contaminants in the waste.

It has been stated that any disposal method for Hanford Tank Waste must be as good as glass. When we consider how protective grout can be along with the cost of using it, it is not as good as glass. It is much better.

I do not think shipping Hanford Tank Waste out of state is a good idea. The transportation costs will be significant. I do not think the risk to human health and the environment will be less for out of state disposal. There have been concerns that the grout is too porous and contaminants will leak out of the canisters and migrate to groundwater at unacceptable levels. However, I have not seen a Performance Assessment Modeling to support these concerns.

There is also one disposal option that I have not seen discussed. For both vitrification and grouting, the only options I have seen considered are disposal in canisters. One option that we need to seriously consider is using vaults to dispose of the waste on the Hanford Site. The vaults I am discussing are not new vaults built for this purpose but rather Single-Shell and Double-Shell Tanks that are repurposed into disposal vaults. Tanks are by definition vessels used to store liquids and compressed gases. If solid waste is properly disposed of in these tanks, they would not have to meet the requirements for tanks but rather vaults. The degradation of the concrete structures of the tanks is occurring at a very slow rate. Evaluation of core samples from the dome of C-107 was used as part of the process for evaluating the degradation rate of the concrete. The thinnest thickness of the concrete structures of the tanks is on the bottom. For the A and AX Tank Farms, the Performance Assessment predicted the time required for the bottom of the tanks to degrade through its thickness to allow release of the tank residuals on the tank bottom would be over 10,000 years. By then, the Curies of Cesium-137, Strontium-90, and Nickel-63 radioisotopes and their daughter products which currently account for 97.5 percent of all radionuclides will have decayed to essentially zero. The radionuclides with much longer half-lives will still remain but their releases to the environment will be very slow. If we put a layer of clean

concrete on top of the waste residuals on the bottom of the tanks, it would take much longer for the concrete to degrade through this thickness. We could mix tank waste with the concrete we are already planning to fill the tanks with in order to prevent the long-term collapse of the tanks concrete structure. The primary difference between grout and concrete is concrete includes gravel and/or crushed rock.

I think we should be using the Reduce, Reuse, and Repurpose approach. By using the concrete already needed to provide the long-term structural integrity of the tank and not needing containers or long-distance transfers, we will be reducing cost and the time for waste disposal. By reusing the Performance Assessment modeling used to evaluate if the closure requirements for the tanks will be met, we can demonstrate how much tank waste could be disposed of safely in concrete/grout at the Hanford Site. By repurposing the tanks into disposal vaults, we will be using our available resources more wisely.

I also do not understand why Cesium removal is needed for grouted waste. Cesium-137 has a boiling point of 1240 °F which is significantly below the vitrification temperature. This is probably why Cesium removal is needed for vitrification but I do not think it would be needed for grouting.

We currently have over twenty emptied Single-Shell Tanks that could already be used to dispose of grouted waste. This could speed up waste disposal as well as speed up the tank closure process. It might speed up the Single-Shell Tank retrieval rates since there is a lack of Double-Shell Tank capacity to support these retrievals. It might even be feasible to skip retrieving Single-Shell Tanks into Double-Shell Tanks by transferring the retrieved waste to the facility that will mix the waste with the grout/concrete used to fill the tanks that have been converted into vaults. If this were done for sludge wastes, it would eliminate having to do another difficult sludge removal from the Double-Shell Tank used to support the Single-Shell Tank retrieval. We will still need to do the waste retrieval from each Single-Shell Tank before it can be converted into a disposal vault.

Another possible benefit of repurposing tanks into vaults is related to tank waste that is hard sludge. The Interface Control Document for waste feed to the WTP has particle size limits that may be hard achieve. The maximum median particle size requirement is essentially the same as talcum powder which is very small. It would probably be much easier to dispose of hard sludge waste in grout rather than having to build a facility for size reduction.

We will need to make sure disposal of Hanford Tank Waste mixed with concrete/grout into repurposed tanks will meet the relevant disposal requirements. This will require determining the composition of the concrete/grout used for each type of waste that is being

disposed. We must also do a Performance Assessment that demonstrates that all on the exposure release pathways will not result in unacceptable risk to human health and the environment.

When the original Tri-Party Agreement Milestones for Single-Shell Tanks were established, all Single-Shell Tanks were to be retrieved by the end of 2019 and all Single-Shell Tanks Closed by the end of 2024. We need to speed up the retrieval and Closure process and repurposing tanks into disposal vaults can be one part of this.