

# ERDF Questions

The following questions were generated by Board members for the Tri-Party agencies to answer when developing materials and a presentation/workshop about ERDF for the Board and general public.

## History and Assumptions

- 1) What was the original rationale for consolidating Hanford waste in ERDF, how was it sited, and what were the original assumptions about what kinds of waste would be accepted?
- 2) What are the assumptions used by the Tri-Party agencies for the rest of the operating life of ERDF?
  - a. What wastes?
  - b. What hazards?
  - c. What characteristics?
  - d. What changes in limits (waste acceptance plan ...)?
  - e. What, if any, further expansion is planned?
- 3) How valid were the assumptions and the analysis used in the PA in light of the 20 years of actual operational data and how is this data being used to impact future ERDF operations?
- 4) What is ERDF's final end state?
- 5) What was the initial design margin for ERDF? And what is the new design margin?
  - a. Geotextile
  - b. Barrier (top)
  - c. Risk of failure in 40, 60, 80, 100 years
  - d. Risk of public exposure
- 6) What is the current ERDF closure date?

## ERDF Waste Acceptance

- 7) What changes were made to the kinds of waste that were accepted at ERDF during its operation from 1996 through 2016?
- 8) What are some specific examples of waste that ERDF receives, including where the waste originated, and how are contaminant levels inventoried prior to disposal?
- 9) What limits are used for individual pieces of contaminated equipment for acceptance into ERDF for disposal?
- 10) What, if any, changes are anticipated over the coming decades to the types of waste ERDF accepts?

- 11) When the Tri-Party agencies negotiated a change in the waste acceptance criteria in order to facilitate other waste material being placed in ERDF, what kinds of alternative waste did that change address?
- 12) Spent fuel, TRU, and HLW are not allowed to be disposed in ERDF. What other kinds of waste are prohibited?
- 13) How is ERDF WAC affected by ERDF expansions, both vertical and new cells?
- 14) Will ERDF accept waste from outside of the Hanford site? If so, how does/will those outside waste streams be evaluated?

### **Contaminant Inventories**

- 15) How are total contaminant levels inventoried for all waste that has been disposed of at ERDF and where is that information stored?
- 16) How does ERDF's current inventory stack up against the aggregate allowance limits for uranium and technetium-99 (or other key nuclides like C-14 ...)?
- 17) Has the performance assessment been updated? What does it indicate about allowable quantities that can go into ERDF?

### **Leachate Collection System**

- 18) How does ERDF's leachate collection system work, and where is the leachate treated?
- 19) What is the current monthly volume of leachate collected from ERDF, what are the anticipated projections of monthly volumes of leachate over time, and where will it be treated?
- 20) When ERDF leachate is channeled to the 200-West pump and treat system, instead of being treated at the Effluent Treatment Facility, what is the anticipated volume, per month, that the system will have to treat?
- 21) Will the waste stream from the ERDF leachate system impact pumping and treatment of the deep vadose zone contamination volumes through 200-West?
- 22) Does it matter where this treated waste stream is reinjected into the Hanford stratigraphy? Is it going to 200-West soil, or should it be reinjected into the 200-East geologic system, or elsewhere?
- 23) What is the cradle to grave collection process and design life of the leachate system?
- 24) What are the volumes of water that will be used for dust abatement in the supercells and how do these volumes compare to what is anticipated for dust abatement during waste placement in the vertical expansion?
- 25) What is the purpose of the liner and how does it function throughout the life of ERDF?

### **Mobilization of Waste and Containment**

- 26) How much effluent is too much, in terms of potentially mobilizing other vadose zone contaminant plumes?
- 27) How will groundwater/vadose zone monitoring be maintained into the future?
- 28) ~~How will the agencies handle/deal with the liner versus cap problem? I.e. If the cap fails before the liner, then the wastes may be submerged in a bathtub effect before the liner fails in a surge. If the liner fails first, wastes may leak and intrusion may become a question. And what will the agencies do to maintain whatever resolution is arrived at for this problem.~~
- 29) There has been indication in the past of possible release of carbon 14 from ERDF from detections in down gradient monitoring wells. Has there been any detection of hazardous or radioactive constituents in groundwater that may originate in ERDF?
- 30) Has the performance assessment been updated to include preferential transport (not retardation) in the subsurface (both vertical and horizontal). Lateral transport has been observed in this part of the site, and major clastic dikes intrude directly into the ERDF site.
- 31) Has there been consideration of a long-term performance assessment for placement at height of higher activity wastes which are now being routinely disposed in ERDF, compared to projections from 20 years ago, relating to potential intrusion?
- 32) How will possible atmospheric/windblown dispersion and release of contaminants be controlled and monitored?

### **Vertical Expansion**

- 33) How has the vertical expansion been implemented?
- 34) What are the estimated costs of the vertical expansion?
- 35) What are the impacts of the vertical expansion on previous assumptions about ERDF's end state?
- 36) How does the vertical expansion impact the liner?
- 37) How has the vertical slope angle been analyzed and designed to ensure there won't be a "mudslide effect"?
- 38) What are the design limits established by the Performance Assessment and other ERDF design documents? Were the impacts of ERDF's vertical expansion verified against these design limits?
- 39) What are the other limits set in the waste acceptance criteria or PA? (i.e. radiological)
- 40) Was a Documented Safety Analysis (DSA) performed for the initial operation of ERDF, which is normally required for DOE nuclear facilities?
  - a. If so, was the DSA updated to address changes (e.g. vertical expansion) covering
    - i. Design

- ii. Operational events (e.g. fire, dropped containers, Hydrogen explosions, various waste types, equipment, etc.)
  - b. How does the change review process work?
    - 41) Is more vertical expansion planned or will DOE go back to more supercells?
    - 42) How has the effect of the enhanced side slope on drainage and possible enhanced subsurface release and transport been evaluated and accounted for?
    - 43) How much design and analysis was conducted before committing to the vertical expansion?
    - 44) Please explain the process for placing and covering waste in the vertical expansion and how it is different than the existing process for placing waste in ERDF.
    - 45) Did the ERDF expansion have an evaluation done by an Independent Qualified Registered Professional Engineer (IQRPE)?
    - 46) What is the criteria for determining what types of waste are amenable to vertical placement?
    - 47) Does the engineering study on the height increase change the performance assessment?

### **Regulatory Requirements**

- 48) What were the regulatory requirements when you put together the Performance Assessment?

### **Cultural Impacts**

- 49) How have cultural impacts been considered? The vertical expansion could have impacts to cultural resources ie: the aesthetic and viewshed.
- 50) What process will there be to consider cultural impacts? For instance, will there be a chance to consider monumentalizing vs. blending (landscape aesthetic)?

### **Future Use and Institutional Controls**

- 51) Will the leachate collection system be shut off and the liner punctured prior to closure to prevent a “bathtub” effect from occurring? If not, will the cap be maintained to ensure that water infiltration into ERDF is prevented? What assurance is there that liquid wastes will not exit from ERDF and contaminate the groundwater?
- 52) How will the agencies permanently prevent the use of ERDF by future persons as a building site for homes or agriculture? If these ever occur, roads will be cut into the cap and the cap may be breached during the construction.

- 53) How will Tri-Parties physically preclude drilling into ERDF (e.g. water wells for homes built on top of the site)?
- 54) How will the Tri-Parties assure the maintenance of institutional knowledge about the contents and hazards of the site for as long as the wastes remain dangerous?
- 55) How might climate change affect the site?
- 56) Will there be potentially accessible materials in ERDF that people in the future might want to recover?

### **Public Involvement**

- 57) What does it take to trigger public/HAB engagement in any decision when not required by law?
- 58) Could you develop graphics to increase understanding of the visual of slope and cap at the end of ERDF's operation?

### **Comments and Questions that Need Fleshing Out**

- Melanie Myers: Waste generated from DFLAW/WTP etc. should go to ERDF versus sending it to an offsite facility for disposal. ERDF will be in the foot print that will be fenced, not be used for commercial activity. The taxpayer cost for disposal will be significantly increased going to offsite facility. I would like to see an analysis done for adding a cell to ERDF to accommodate that disposal vs. offsite. This would include LLW debris, equipment, etc. as well as treated waste returned from PFNW, and macro-encapsulated mixed low level waste at ERDF (versus sending offsite – on public roads) to be treated at PFNW – the cost is very significant.
- Emmett and Larry had questions about Technecium-99