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[37] From: Pamela S Innis at ~TPA1 12/17/93 12:55PM (19763 bytes: 5 ln, 1 fl)
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Receipt Requested
cc: Pamela S Innis
Subject: ERDF 60% Comments
---------- Message Contents ----------

Text item 1:

Attached are the EPA comments on the Environmental Restoration and Disposal Facility Conceptual Design Report 60% Draft. It is my understanding that we will resolve the comments and any questions concerning transmittal of the 100% draft at the Tuesday meeting.

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Conceptual Design Report for the ERDF

60% Draft

EPA Informal Comments

General Comments

Overall, the 60 percent draft conceptual design report (CDR) is not complete. The following areas should be addressed:

- Several inconsistencies exist between the design and final functional design criteria (FDC). Some of these inconsistencies are discussed in the comments below.
- Waste acceptance criteria for evaluating chemical and radiological compatibilities (resistance) of geosynthetic and natural liner materials with wastes and leachates should be identified.
- Several appendices are listed, but the contents of those appendices are omitted. At a minimum, the following appendices should have been included as part of the 60 percent draft CDR:
  - preliminary groundwater monitoring plan
  - identification of environmental compliance items
  - preliminary cost estimates for the ERDF
  - conceptual project schedule for definitive design, construction, and operation
  - outline specifications
  - mass balance

Specific Comments

Section 1.1, Paragraph 2:

There is the potential that some remediation wastes from 200 Area activities may be placed in ERDF before 2001, i.e., (pump and treat sludge, etc.). The CDR should not preclude use of the ERDF for 200 Area waste disposal.

Section 2.0:

Paragraph 1: The Hanford Barrier has not been accepted as RCRA equivalent at this time and, therefore, cannot be the proposed cover. (See comment on Section 5.4.3.6)

Paragraph 1: Closure should be addressed under this project even though funding etc may be under another project.

Paragraph 2: This is misleading. Characterization and other fundamental portions of this project are proceeding as if the final site has been selected.

Paragraph 3: Define solid waste. What about non-hazardous, non-radioactive wastes? It should be clarified that the ERDF will not handle this type of waste and that it will be handled in the central landfill.

Paragraph 5: The regulators should be provided of all the supporting reports mentioned on pages 2 and 3 of this report. It is important that any separate engineering study that is completed for this project be transmitted as supporting documentation to enable the regulators to do an adequate review.

Section 3.0:

Paragraph 2, Last sentence: This sentence implies that all waste that is removed will be treated. Text should be changed to note that treatment will be determined on a case-by-case bases.

Paragraph 3: The paragraph notes that technology does not exist to effectively treat or destroy a majority of the wastes at Hanford. The wastes <u>can</u> be treated to reduce the volume or immobilize the contaminants, but cannot destroyed.

Paragraph 5: Waste will primarily be generated from 100 and 300 Area RODs. Do not preclude waste from 200 Area remedial activities.

Section 4.0:

Paragraph 1, Last sentence: Define FDC.

Paragraph 2: The possibility of back haul of material should be mentioned.

Paragraph 3: The earlier version called for a dewatering facility. Has this been eliminated or is it going to be done at the operable unit?

Section 4.1.1, Paragraph 1:

Cut and fill is noted. Is this for the sloped area or remnants of the overall cut and fill concept?

Section 4.1.1, Paragraph 1:

Road systems, etc., should also be oriented to minimize fugitive dust exposure.

Section 4.1.2:

Clarify the meaning of "sampled for release prior to treatment" as it pertains to potentially contaminated runoff.

Section 4.1.3,

Landscape should also provide a positive environment for local fauna and provide for wind reduction.

Section 4.1.4:

Preparation should be made for out-bound trains to contain fill material.

Section 4.1.5, Page 8, Paragraph 6:

Transfer pad should be provided for back haul loading.

Section 4.2.2.1:

Paragraph 2: Where are the tractor/trailers inspected/ screened for contamination?

Paragraph 3: How are trailers that have contained organics handled?

Paragraph 5: Again, surveying for contamination other than radiation may be necessary.

Section 4.2.2.2:

The number of containers to be decontaminated is estimated on the assumptions of operating ERDF with 175 containers per shift, two shifts per day for 200 operating days per year. The FDC, however, states that based on daylight and weather conditions, the ERDF will operate two shifts per day, 5 days per week, during 6 months of the year, and will operate on a single shift base during the reminder of the year (Appendix A, Section 2.3). Deviations from the FDC should be explained in the text of the CDR.

Section 4.2.2.3:

Build-up of other constituents must be examined, i.e., organics. How will evaporation reduce radiation contamination? Though some constituents are prone to evaporation, for the majority the opposite seems true.

Section 4.2.2.4.5, Paragraph 2:

The paragraph notes that a "build-up of radiation will occur over time", however, it fails to note where the build-up will occur, in the rinse water or on the containers.

Section 4.2.2.4.6, Paragraph 1:

The paragraph notes that the mobile unit will be used to decontaminate the exterior of containers handling mixed or hazardous waste. In an effort to help reduce cost, the regulators have reduced the number of samples used to characterize waste. This has forced the assumption that much of the waste coming from the areas is mixed waste. Therefore, most of the containers are assumed to be carrying mixed waste. Please clarify this statement.

Section 4.2.2.4.6, Paragraph 4:

How are containers going to be inspected for other than radiation contamination?

Section 4.3.7, Paragraph 2:

The decontamination facility water has the potential of being contaminated with hazardous waste.

Section 4.3.7, Page 18, Paragraph 4:

Please reference the literature concerning lime removal of uranium.

A lime softening process is proposed for treating trench leachate and decontamination facility wastewater, assuming that uranium is the predominant contaminant. The trench leachate and decontamination facility wastewater, however, may contain substantial amounts of other radionuclides such as cesium-137, strontium-90, cobalt-60, technetium-99, europium-154, and inorganic constituents. Lime softening is reportedly ineffective for those cited radionuclides and metals except uranium (Cower 1963, Schonfeld 1966).

Further, seven evaporation tanks with leak detection are proposed to treat the effluent from the lime softening process or to pump the effluent from to the grout plant or the site water truck. Evaporation tanks are intended to reduce the volume of the lime softening process effluent

through evaporation but not to treat or reduce the contaminant levels. Since the lime softening process may only effectively remove uranium, the water from the evaporation tanks may be highly contaminated, and using this water for dust control operations may not be acceptable to regulators. Although the contaminant levels in the trench leachate and decontamination facility wastewater are currently not known, alternative treatment technologies such as ion exchange or reverse osmosis should be evaluated and documented for comparison and implementation. Because of the following concerns with the proposed contaminated wastewater treatment systems, reverse osmosis in conjunction with evaporation tanks should be considered as a viable process option in place of the lime softening process:

- Contaminant types and levels in the wastewater are not known
- Lime softening is not effective for those radionuclides and metals cited above except uranium
- Secondary waste streams generated from lime softening and evaporation tanks may be large compared to concentrated brine from reverse osmosis
- Large land area (3.27 acres) and a leak detection system are required for evaporation tanks
- The water from the tanks may not be usable for dust control operations
- Permitting process for evaporation tanks may be complex
- Total capital and operation and maintenance costs for lime softening in combination with evaporation tanks may be higher than the reverse osmosis option

Section 4.3.7, Page 18, Paragraph 4:

The effort to minimize development of leachate by reducing moisture content of the solids should carryover to treatment

plant sludge disposal. How is moisture content going to be reduced in the sludge?

Section 5.1.2.1

A RCRA compliant storage pond is proposed for detention of storm water runoff from potentially contaminated areas. The following information, however, is missing for the proposed pond:

- Location
- Size and capacity
- Type of pond construction materials
- Expected amount of runoff from the contaminated areas

Section 5.2:

Monitoring and disposing of high-efficiency particulate air filters should be discussed under Sections 5.2.1.2 and 5.2.2.1.2.

Paragraph 3: The building load noted for wind is 70 mph. Is this an average wind speed or maximum gust? Wind speed gusts are known to peak at higher velocities in this area.

Section 5.3.7, page 38:

This section refers to section 4.2.3.3 which does not exist. The reference may be section 4.2.2.

Section 5.4.1

The project requirements include minimizing leachate generation. The method and sequence of construction activities needs to be more fully explained so that the regulators can evaluate how this requirement will be met.

Section 5.4.3

A depth of 70 feet is proposed for the trench at the ERDF to minimize the land surface area required. EPA (1988) recommends a slope stability analysis of the excavated slopes if the total depth of excavation exceeds approximately 10 feet because a landfill slope failure can seriously damage the liner system, allowing releases of waste and leachate to surrounding soils and groundwater. For landfills, there are no specific slope stability regulations; however, the regulations at 40 CFR 264.301 require that a liner system in a landfill be placed on a foundation or base to prevent liner failure. To demonstrate that the entire liner system is placed on a stable base, the stability of the slopes must be demonstrated. The draft final CDR should demonstrate with the results of slope stability analysis that excavated slopes will assure sufficient stability to withstand the loading and hydraulic conditions to which they will be subjected during the unit's construction, operation, and post-closure periods. If a failure is anticipated with the proposed depth of excavation, alternative depths should be specified, which would alter the conceptual design in terms of increased land area for trenches as well as liner and final cover materials.

Section 5.4.3.2

The bottom liner is described as a low permeability soil. A description of the type of soil proposed for the liner should be given. Certain types of clay have an affinity for certain radionuclides. Providing a sorptive barrier would enhance the long term effectiveness of the disposal unit.

Section 5.4.3.3:

Paragraph 2: How is Project W-199 related to the ERDF? It seems prudent to have instrument readings located on-site at the administration building, as well as the side slope of the trench.

Paragraph 3: Describe and define the HELP model.

The performance assessment of the trenches for leak protection should be evaluated by using HELP model with the following options:

a. Lined trench with a single lift of waste material and interim cover

b. Lined trench with double lifts of waste material and interim cover to each lift

The volume of leachate generated cannot be calculated from the information provided. However, using simplistic assumptions and conservative estimates of the magnitude of precipitation events possible at the site (80 acres and 2 inches of rain becoming leachate), the potential leachate volume is 5 times greater than the storage volume planned.

Section 5.4.3.3, Paragraph 4:

It is stated that rainfall will flow off the interim cover. Some detail of the interim cover must be given to clarify this assumption. Also, how is flow off the interim cover going to be collected/separated from other trench leachate?

Section 5.4.3.4

See comment on Section 5.4.3.6

Section 5.4.3.4, Paragraph 2:

It should be noted that compaction requirements will be determined at a later time prior to definitive design.

Section 5.4.3.6:

General: The Hanford Barrier has not been accepted by the regulators as RCRA equivalent at this time. Work is proceeding such that an equivalency demonstration should be completed before closure of the ERDF cells begin.

References here and throughout the CDR should be changed to "RCRA equivalent barrier".

Paragraph 3: The acceptable levels of settlement should be defined. At this time, settlement requirements for the Hanford Barrier have not been determined. Referencing maximum values for a standard RCRA cap may be appropriate.

Paragraph 5: Waste minimization is key to any operation. Efforts should be made to minimize the leachate generation. Cost should not be the only criteria examined to justify using a higher permeability interim cover. One of the landfill project requirements is to minimize leachate production to limit the size of storage and treatment facilities and reduce operating costs (Section 5.4.1). Elimination of low permeability interim cover contradicts the project requirements. Since the installation of low permeability interim cover would be protective of the environment, the CDR should further examine the use of a low permeability cover from the beginning of ERDF operation.

Section 5.5.1:

Bullet 4: It seems that this bullet should read "It is assumed that most of the makeup water used for the grout will be waste water from the decontamination facility".

Section 5.5.2:

The capability of the wheeled container handler is 50 tons. The empty container weighs 20 tons. The capacity of each container is 32 yd^3 (Section 4.2.2.1) of waste. Assuming a conservative value of 150 pounds per cubic feet (lb/ft) as waste density, the loaded container will weigh approximately 85 tons including the empty weight of the container. Wheeled container handlers used for transferring loaded waste containers should have at least a 90-ton capability.

The text in Sections 5.5.6, 5.5.15, 5.5.16, 6.3, 7.5.2.2.2, and 7.5.2.2.5 should be charged accordingly.

Section 5.6.4.3:

It is not clear whether the CDR report will include information on the locations, number of stations, number of monitoring wells, number of lysimeters, and equipment types for the parameters listed for environmental monitoring. This discrepancy should be addressed. This information would be useful in evaluating the cost estimate for environmental monitoring and verifying the adequacy of the monitoring system to protect the public health and the environment.

Section 7.2.2:

Measures to prevent uncontrolled release of radioactivity to the environment during and after trench operations are listed. The list should also include an interim cover after completion of each lift.

Section 7.5.2.1 and Appendix A:

The expected waste for disposal during 1997 (653,000 yd^3) should be consistent with the value (257,800 yd^3) reported in the final FDC, or an explanation for deviation from the FDC should be provided in the text.

REFERENCES

EPA 1988. Guide to Technical Resources for the Design of Land Disposal Facilities. EPA/625/6-88/018. U.S. Environmental Protection Agency. December.

Cowser, K.E., and Tamura, T. 1963. Health Physics, V.9, p.687.

Schonfeld, E., and Davis, W., 1966. Health Physics, V.12, p.407.