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Secretary



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STATE OF WASHINGTON
DEPARTMENT OF HEALTH
DIVISION OF RADIATION PROTECTION
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May 26, 1993

Dennis Faulk
United States Environmental Protection Agency
712 Swift, Suite 5
Richland, Washington 99352



Dear Mr. Faulk:

The Department of Health is the public health and radiation agency for Washington State. Because radioactive contaminants and safety are of concern in most cleanup issues, it is important that the Department of Health be directly involved in developing cleanup plans, evaluating radiation risk, and assessing cleanup effectiveness.

The authority to regulate radiation and joint authority over mixed wastes within the state, including federal facilities such as Hanford, has statutory justification. Much of the radioactivity at Hanford is long-lived, and will persist on the environment for thousands of years. The management and cleanup of radioactive and mixed wastes will, therefore, have long-term public health implications. It is appropriate and necessary that the Department comment on the cleanup strategy proposed by the *Riverland* ERA.

I have attached a list of specific comments concerning the proposal. The deficiencies identified in those comments have led to the conclusion that the Riverland site has not been adequately characterized, and to start work without further sampling would invite serious problems.

The single soil sample taken from the area where radioactive contamination might be expected tested positive for an number of isotopes. More sampling is needed to determine the physical and radiological extent of the contamination.

No ground water sampling was done. Considering the nature of the operation at Riverland, ground water is a very likely pathway for contamination, both radioactive and non-radioactive.

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Obviously, neither of these problems are insurmountable. The Department looks forward to working with DOE to ensure that the ERA at Riverland proceeds in a timely manner, with minimal radiological impact to workers, the environment, and the public.

If you have questions or need clarification, I can be reached at (206) 586-3306.

Sincerely,

A handwritten signature in black ink, appearing to read "John L. Erickson". The signature is fluid and cursive, with a long horizontal stroke at the end.

John L. Erickson, Head
Environmental Radiation Section
Division of Radiation

JLE:KP
Attachment (1)

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1. Section 2.1.1, paragraphs 3 and 4 on page 2

Deficiency: In summary, this section indicates that radioactive decontamination of rail cars and locomotives was necessary prior to maintenance. Contamination consisted of low levels of "fission product particles (ruthenium, zirconium, niobium, iodine)". Readings were generally "< 1 mr/hr" with "an occasional 200 mr/hr" maximum.

Recommendation: The Table on page B-3 lists analyses for various "man-made" and naturally occurring gamma emitting radionuclides. Radiological analyses should be expanded to include Beta and Alpha emitting radionuclides.

What is the estimated "source term " at the site ?

2. Section 2.1.1, paragraph 6 on page 2

Deficiency: The text states that "about 2 ft. of soil covers the foundations". "Followup radiological surveys in 1977, 1978 and 1993 revealed only natural background radiation levels (8 to 14 uR/hr)".

Recommendation: "Natural background radiation" needs further definition. Is this in reference to Hanford or offsite environs ?

The range of exposure and radiological units would imply that "hand-held" or portable radiation instruments were used to make these measurements. The 2 feet of soil overburden would have attenuated some of the low energy gammas and would not be truly indicative of sub-surface radioactive contaminants.

These surveys are central to the claim that there is not a radioactive contamination problem. What protocols were used for performing these surveys (technique, type of instruments, number of samples, sites examined, etc) ?

3. Section 2.1.2 Munitions Cache

Deficiency: The Table on page B-3 documents the results for the radiological analysis of soil in this area.

Recommendation: The term "non-reportable" needs definition. Do these denote results below the detection level ? If so, what are the lower limits of detection for each ?

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4. Section 2.1.3 Potential Waste Sites

Deficiency: No radiological characterization was done in these areas.

Recommendation: Perform a radiological survey of areas potentially affected by the air pathway.

5. Section 2.2.2 paragraph 1 on page 3

Deficiency: The text states: "Since there are no signs of vegetation stress at the various waste sites and followup radiological surveys in 1977 and in 1978 indicated radiation level indistinguishable from natural background, sampling was kept to a minimum".

Recommendation: The range of exposure and radiological units would imply that "hand-held" or portable radiation instruments were used to make these measurements at the surface. This type of radiological investigation is insufficient to characterize the site radiologically.

The pathways for migration of contaminants from this site to a designated receptor are many and diverse. Other potential pathways were not discussed and it is assumed they were not investigated.

- a. **Ground Water** - Water and other solvents would have been utilized for the decontamination of rail cars and locomotives. The chemical composition of this effluent and each radionuclide would have affected the retention or sorption of radionuclides in soil column.

An investigation and discussion of the hydrology of the site should be included.

- b. **Vegetation** - Native vegetation is generally collected in conjunction with soil sampling activities for data correlation. Analysis of shallow and deep-rooted vegetation covering this site could have been analyzed to determine plant uptake. Analysis of vegetation provide important information for determining radionuclide concentrations in the food chain.

That "vegetation stress" appears to be considered a viable indicator of radioactive contamination implies a misunderstanding about the effects of near environmental level of radioactive contamination.

Collection and analysis of site vegetation should be performed.

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- c. **Soil** - The investigation of radioactive contaminants in the soil column is not complete. Surface and subsurface soil samples collected over the entire site are needed to determine the areal and vertical distribution of radioactive contaminants.

Collection and analysis of surface and sub-surface soil should be performed.

Procedures for sample collection should be provided. What protocols were used for sample collection ?

The measurements for the split concrete sample (B01930) documented in the Table on page B-3 appear to be divergent. What protocols are used to ensure the homogeneity of split samples ?

6. Section 2.2.2, paragraph 2 on page 3

Deficiency: The text states that "Background concrete sample collection took place at a concrete pad north of the maintenance facility".

Recommendation: Define the term "background". Background levels for radioactive contaminants in concrete have not been determined.

The text implies that site operations performed on this pad would have been unaffected by site operations. This is not supported by the data documented in the Table on page B-3.

7. Section 2.2.2, paragraph 2 on page 3 and top of page 4

Deficiency: The text indicates that a soil sample was obtained from the inside of a pipe at sewer line connection 43 feet south of the maintenance facility.

Recommendation: The text does not discuss the fate of the contaminants in the "sewer". Did the "sewer" discharge wastes to the soil column ?

8. Section 2.3.1 paragraph 2 and 3 on page 4

Deficiency: The text indicates "that the site contains small quantities of man-made radionuclide contamination (<20 pCi/g)". "The characterization data support the conclusion that the radiological hazards are well below the levels requiring radiological controls".

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Recommendation: Only the "gamma spectrum" was investigated. A survey of all environmental media should be conducted at the site. This should include a radiological analysis for beta and alpha emitting radionuclides.

The quantity of samples taken to date is insufficient to support this conclusion. The location of these samples would imply that these areas are expected to be "worst case" indicators of existing radioactive contamination.

9. Section 3.0, paragraph 2, bottom of page 4

Deficiency: The text states that "the cleanup standards for this ERA have been developed using Washington State Regulations Model Toxics Control Act (MTCA) (WAC 173-340) and qualitative risk factors".

Recommendation: What are the "de minimis" concentrations for the radioactive contaminants listed in the Table on page B-3 and B-4 using this "risk assessment formula" ? These should be listed so they can be compared against the measured concentrations.

10. Section 5.2, Activity # 4 and Section 6.2.1.1, page 10

Deficiency: "Cleanup activities will consist of excavating fill material from the wash pits and removing vitrified clay drain pipes and contaminated soils". "The soils and pipe fragments will be bioremediated by landfarming while the xenon flash lamp will be used for concrete decontamination". "The lamp raises the surface temperature of the concrete to approximately 1500 °C in a few microseconds, resulting in the ablative remove of the total petroleum hydrocarbon contaminants".

Recommendation: It is implied that radioactive contamination of the wash pit will not be encountered. In addition, this assumes that cross-contamination from the drain removal will not occur.

What radiological controls will be employed during excavation and remediation ?

Define "bioremediation by landfarming".

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11. Section 5.3, Activity # 4 and Section 6.2.1.2, page 10

Deficiency: Cleanup activities at the Riverland Rail Yard and Maintenance Facility will consist of removing the "concrete lined pits (about 985 ft³) and drain pipes".

Recommendation: It is implied that radioactive contamination of the wash pit will not be encountered. In addition, this assumes that cross-contamination from the drain removal will not occur.

What radiological controls will be employed during excavation and remediation ?

12. Section 5.4, Activity # 4 and Section 6.2.1.3, page 10

Deficiency: "Cleanup activities will consist of excavating fill material from the wash pits and removing vitrified clay drain pipes and contaminated soils". "The soils and pipe fragments will be bioremediated by landfarming". "The soil and pipe fragments will be bioremediated by landfarming". "The concrete surface of the maintenance pits will be sandblasted followed by bioremediation of the sandblasting residue with the contaminated soils".

Recommendation: It is implied that radioactive contamination of the wash pit will not be encountered. In addition, this assumes that cross-contamination from the drain removal will not occur.

What radiological controls will be employed during excavation and remediation ?

Define "bioremediation by landfarming".

Describe the process of the "bioremediation of the sandblasting residue with the contaminated soils".

GENERAL COMMENTS

13. Sample Results on page B-3 and B-4

Recommendation: Include the error term whenever reporting radioactivity results. Include the uncertainty for each measurement. Include the laboratory's detection limit.

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14. Cleanup Options on pages 6, 7 and 8

Recommendation: Describe the environmental damage done to the site caused by the remediation activities. What will be done to stabilize the soil and reestablish vegetation at these sites ?

15. Cost Estimates, page C-3 through C-8

Recommendation: Describe the effect on projected costs if additional protective measures are needed to reduce exposure to radioactive contaminants at these sites.

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