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Department of Energy

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

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NOV 21 1995

Mr. Joe Stohr
Section Manager
Nuclear Waste Program
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600



Dear Mr. Stohr:

CHROMIUM CONTAMINATION AT THE 183-H SOLAR EVAPORATION BASINS

The U.S. Department of Energy, Richland Operations Office (RL) is requesting your review and approval of the following information and action associated with chromium contamination at the 183-H Solar Evaporation Basins. RL is requesting that approval be obtained from the State of Washington Department of Ecology (Ecology) by December 1, 1995.

A Data Quality Objective (DQO) process meeting on 183-H soil remediation was held August 11, 1995. This meeting concluded that chromium was still under consideration as a constituent of concern at 183-H. The 1989/1991 soil data from 183-H that was discussed during the meeting was analyzed for total chromium. This data does not differentiate between valence states of chromium within the 183-H soils. Because action levels for the hexavalent form of chromium (Cr[VI]) are significantly lower than that of trivalent chromium (Cr[III]) and because total chromium levels in the 183-H soils exceed the Cr VI action level, resolution of the chromium as a contaminant of concern must occur in order to achieve final remediation of the soils at 183-H.

Chromium in the vadose zone should be eliminated as a constituent of concern based on the following data analysis, facts and pending actions.

Total Chromium Data Background

90th Percentile Values

- Background value for soils Hanford Site 18.50 mg/Kg
- Background value for soils statewide 41.88 mg/Kg
- Background value for soils Eastern WA 31.88 mg/Kg
- Background value for soils in the Yakima basin 38.27 mg/Kg

A total of 56 samples were analyzed from 8 boreholes at 183-H. 53 of the 56 samples had detectable total chromium. Eliminating quality control samples, there are a total of 48 samples analyzed for total chromium.

The overall maximum value was 44.9 mg/Kg in a surface sample. The maximum vadose zone sample is 25 mg/Kg found in two areas. The minimum value was 6.5 mg/Kg. The mean of the data is 13.5 mg/Kg. Standard deviation is 6.1 mg/Kg.

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The upper 95 percent confidence limit on the mean of the data (lognormal distribution) is 14.6 mg/Kg. This is well below the 90th percentile concentration of 18.50 mg/kg for the Hanford sitewide background level for total chromium.

A comparison with the Model Toxic Control Act guidelines for confirming that a site is clean of a contaminant shows the following:

- 1) The 95 percent upper confidence limit on the mean of the waste site data does not exceed the 90th percentile of the Hanford site background value for chromium.
- 2) 4 of the 48 samples exceed the Hanford Sitewide 90th percentile background value of 18.5 mg/Kg. This is a failure percentage of 8.3 percent, which is less than the allowable 10 percent.
- 3) For the 4 samples that do exceed the 90th percentile, none exceeds 37 mg/Kg which is twice the 90th percentile value.

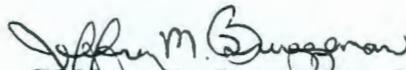
These facts using validated data eliminate total chromium as a constituent of concern in the vadose zone.

Hexavalent chromium as a constituent of concern is highly soluble. The potential for any contaminant to enter the vadose zone was eliminated with the removal of the liquid waste. Any hexavalent chromium would have moved through the vadose zone into the groundwater long ago.

Because of the above supporting information, RL considers that total chromium in the 183-H vadose zone should be eliminated as a contaminant of concern and is requesting that Ecology concur.

If you want to discuss this matter further or require additional information, please contact me at (509) 376-7121.

Sincerely,



Jeffrey M. Bruggeman, Project Manager
Decontamination and Decommissioning Project

DDP:JMB

cc: M. T. Janaskie, EM-442
L. R. Miller, ERC