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Department of Energy

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

NOV 29 1995

Mr. Joe Stohr
Section Manager
Nuclear Waste Program
Washington of State
Department of Ecology
P.O. Box 47600
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Dear Mr. Stohr:

ACCUMULATING WASTE IN EXCEEDENCE OF THE ALLOWED 90 DAY STORAGE PERIOD AT THE 183-H SOLAR EVAPORATION BASINS

This is in reference to the letter from Mr. Robert E. Cordts, State of Washington Department of Ecology (Ecology) to Mr. James E. Rasmussen, U.S. Department of Energy (DOE), Richland Operations Office, dated October 4, 1995, concerning the above subject.

Pursuant to your direction, sampling of the basin residue was conducted in accordance with the approved sampling and analysis plan. The initial data indicated that listed waste constituents were not a concern, but elevated levels of chrome and lead would require the concrete residue to be designated as characteristic waste.

In accordance with the sampling and analysis plan, analysis for toxicity characteristic leaching procedure (TCLP) was conducted on representative samples from the basins. The TCLP results indicated that chrome and lead did not exceed the Model Toxic Control Act Method B cleanup levels. Based on these results, the scabbled concrete residue has not been designated as a characteristic dangerous waste.

In addition to the scabbled concrete residue, cleanout of the 183-H Solar Evaporation Basins resulted in the generation drums of waste consisting of environmental media (e.g., tumbleweeds and sand that have blown into the basins) and miscellaneous wood and metal debris that had been in contact with the interior surfaces of the facility. Inasmuch as the concrete with which these materials had been in contact (represented by the scabbled concrete residue) is not designated as a listed waste, these materials are also not listed waste. Additionally, knowledge regarding the composition of the materials in question is sufficient to conclude that these materials are not designated as characteristic dangerous waste. The wastes are, however, considered radioactively contaminated. Thus, the drummed miscellaneous wastes are considered non-dangerous, low level radioactive waste (LLW).

Mr. Joe Stohr

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In the October 4, 1995, correspondence referenced above, the following Compliance Issue was raised:

For various unforeseen and uncontrollable reasons, waste accumulation at the 183-H Basins exceeded the allowable time period; this is a violation of WAC 173-303-200.

Pursuant to the "contained-in determination" issued on September 29, 1995, sampling was conducted that enabled the waste to be designated as LLW. Since the waste is not dangerous waste, WAC 173-303-200 does not apply to the waste, therefore the 90 day limit for waste accumulation also does not apply. It does not appear that corrective actions are necessary to address the noted Compliance Issue.

Thank you for your efforts on this issue. Ecology has shown great understanding and cooperation on this issue. We have all persisted in our efforts and that persistence has paid off. The designation of the waste as LLW is a major accomplishment for this project. It has been accomplished by the Regulators, DOE, Westinghouse Hanford Company and the Environmental Restoration Contractor working as a team. This action provides benefits in the form of reduced waste management costs at present and in the future.

Attached please find the Evaluation of 183-H Basins Scabbled Concrete Residue Analysis. The data has all ready been forwarded to Mr. Robert Cordts, but please contact Mr. J. M. Bruggeman with any questions in these regards at 376-7121.

Sincerely,



James E. Rasmussen, Director
Environmental Assurance, Permits,
and Policy

DDP:JMB

Attachment

cc w/attach:

R. E. Cordts, Ecology
S. V. Moore, Ecology
M. N. Jaraysi, Ecology
M. T. Janaskie, EM-442
L. R. Miller, ERC

EVALUATION OF 183-H BASINS SCABBLED
CONCRETE RESIDUE ANALYSES

On September 29, 1995, the Washington State Department of Ecology (Ecology) provided a conditional contained-in determination for the scabbled concrete residue and other material in contact with the interior surfaces of the 183-H Solar Evaporation Basins drummed after June 1, 1995. The conditional aspect of this determination was that (1) the material must be managed as specified in the 183-H Basin Closure Plan and (2) adequate analysis must be performed on the scabbled concrete residue to show that listed wastes are below MTCA Method B cleanup levels. This was achieved in accordance with the DOE approved Sampling and Analysis Plan for the 183-H Solar Evaporation Basins - PHASE 1 - CONCRETE (T-1-4).

There are seven listed wastes of concern at the 183-H Solar Evaporation Basins. Five of these are cyanide compounds: cuprous cyanide, cyanogen iodide, cyanide (non-specific), potassium cyanide, and sodium cyanide. Vanadium pentoxide and formic acid are the two other listed wastes that were discharged into the units. Samples taken from drums of scabbled concrete residue were analyzed to determine concentration levels for the listed wastes of concern. A summary of the results of the waste analyses and conclusions regarding appropriate designation is presented below.

Listed Waste Evaluation

Cyanide Compounds

The analytical results show that cyanide compounds are not present above the MTCA Method B cleanup limits. Based upon the analytical results, the 95% upper confidence limit on the mean for cyanide (non-specific) is 1.3 mg/kg; the 90% upper tolerance limit is 2.2 mg/kg (all calculations assume a normal distribution). The MTCA Method B cleanup limit for cuprous cyanide (the most toxic of the cyanide compounds of concern at the 183-H basins) is 8 mg/kg in soil to ensure protection of groundwater. Making the very conservative assumption that all the cyanide detected is present in the form of cuprous cyanide, the 95% upper confidence limit (UCL) on the mean becomes 4.3 mg/kg and the 90% upper tolerance limit is 7.7 mg/kg. Both of these values are, of course, below the 8 mg/kg MTCA Method B limit for cuprous cyanide.

In addition to comparing the UCL and upper tolerance limit with the cleanup standard, MTCA evaluation methods typically require that (1) no sample result exhibit a concentration greater than two times the cleanup standard and (2) no more than 10% of the results exceed the cleanup standard. The cyanide results for the 183-H basins scabbled concrete residues meet both these criteria.

Vanadium Pentoxide

Analysis of the 183-H basins scabbled concrete residue samples was performed for total vanadium rather than vanadium pentoxide. The Wilcoxon Rank Sum test was used to compare the distribution of vanadium in the scabbled concrete residue with that found in background concrete samples (i.e., samples of concrete that was not in contact with the 183-H basin wastes). This evaluation showed that the two data sets were not significantly different at the 95% significance level. Thus, the vanadium levels in the concrete residue samples are indistinguishable from background concrete levels for this constituent.

Formic Acid

Analytical results for formate ion in the 183-H basins scabbled concrete residue ranged from below detection limits to a maximum of 51.2 mg/kg. The MTCA Method B cleanup limit for formic acid in soil is 3,200 mg/kg to ensure protection of groundwater (3,130 mg/kg expressed as formate ion). Thus, the MTCA Method B limit for this constituent is well above the maximum concentration detected in any of the 183-H basins scabbled concrete residue samples.

Listed Waste Conclusion

Results of cyanide and formate ion analyses demonstrates that the concentrations of these constituents in the 183-H basins scabbled concrete residue are below the MTCA Method B cleanup limits. Vanadium results show that levels of this constituent in the concrete residue is indistinguishable from that found in background concrete samples. As a consequence, it is concluded that the 183-H basins scabbled concrete residue and other material which contacted this interior of the basins and which was drummed on or after June 1, 1995, satisfies one of the two criteria for Ecology's conditional contained-in determination. Thus, this material is not considered listed waste when managed as specified in the 183-H Basin Closure Plan (this latter requirement being the second criterion specified in the conditional contained-in determination), and the listed waste codes should not be assigned to the drummed material.

Characteristic Waste Evaluation

In addition to analyzing for listed waste components, the 183-H basin scabbled concrete residue was evaluated for several of the dangerous waste characteristics. Included in this effort was analysis for seven of the eight metals found on the toxicity characteristic leaching procedure (TCLP) list. Mercury was eliminated from consideration as a potential constituent of concern for this analysis based upon results from a previous sampling effort which had shown that mercury concentrations in the 183-H basins concrete did not exceed TCLP limits for characteristic waste and were, in fact, below the 0.2 mg/kg MTCA Method B cleanup level for soil.

A total metals analysis for the metal constituents on the TCLP list other than mercury indicated that there were two potential constituents of concern in the concrete residue samples: chromium and lead. Because these constituents could not be eliminated from consideration based upon the total metals analysis, subsequent analysis was performed on four samples (one from each of the 183-H Basins) using the actual TCLP test. The highest sample requested in Basin 3 was not available. This testing demonstrated that neither chromium nor lead were present in concentrations above TCLP limits.

The chromium levels detected via the TCLP testing ranged from less than the 14.8 $\mu\text{g/L}$ detection limit to a maximum value of 304 $\mu\text{g/L}$. The highest TCLP value was found in the sample that had the second highest result for total chromium. The sample with the highest total chromium content was not subjected to the TCLP test. Since the sample with the highest total chromium value (1,490 mg/kg) was only slightly more concentrated than the sample with the second highest total chromium content (1,450 mg/kg), and since the TCLP value for the sample with the latter value was a factor of 16 times lower than the TCLP designation limit of 5 mg/L (5,000 $\mu\text{g/L}$) for chromium, it is concluded that the scabbled concrete residue is not designated as a characteristic dangerous waste for this constituent.

Lead concentrations in the four TCLP extracts were all less than the 153 $\mu\text{g/L}$ detection limit. The sample which had exhibited the highest total lead content (228 mg/kg) was not subjected to TCLP testing. However, TCLP testing was performed on the sample with the second highest total lead content (149 mg/kg). Since the TCLP result for this sample was below the detection limit, and since the detection limit was a factor of 32 times lower than the TCLP designation limit of 5 mg/L (5,000 $\mu\text{g/L}$), it is concluded that the scabbled concrete residue is not designated as a characteristic dangerous waste for lead.

Based upon these results, the scabbled concrete residue is not designated as a characteristic dangerous waste.

Designation of Miscellaneous Wastes

In addition to the scabbled concrete residue, cleanout of the 183-H Solar Evaporation Basins resulted in the generation of several drums of waste consisting of environmental media (e.g., tumbleweeds and sand that have blown into the basins) and miscellaneous wood and metal debris that had been in contact with the interior surfaces of the facility. Inasmuch as the concrete which these materials had been in contact (represented by the scabbled concrete residue) is not designated as a listed waste, these materials are also not listed waste. Additionally, knowledge regarding the composition of the materials in question is sufficient to conclude that these materials are not designated as characteristic dangerous waste. The wastes are, however, considered radioactively contaminated. Thus, the drummed miscellaneous wastes are considered non-dangerous, low level radioactive waste.