- RAS 10932

ACTIVITY CONCENTRATIONS OF MATERIALS PLACED IN WIPP THROUGH SEPTEMBER, 2002 AND COMPARISON TO THE ACTIVITY CONCENTRATION OF DEPLETED URANIUM

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Statistics related to activity concentration of various radionuclides in materials placed in WIPP through September, 2002 can be obtained from the 2004 WIPP Compliance Recertification Application, DOE/WIPP 04-3231, March 2004, posted at http://www.wipp.ws/library/CRA/CRA_index.htm. All relevant data are contained in Appendix DATA, Attachment D.

Waste Material Weights

Estimates of the weight of waste materials placed in WIPP through September, 2002 are provided in Appendix DATA, Attachment D, Table D2. Data from that table are summarized below.

Waste Material Weights, kg (materials placed in WIPP through 9/02)	
Cellulose, plastic, rubber	9.27E5
Metal	2.52E6
Total	3.45E6

(These material classes may not capture all materials placed in WIPP. However, Table DATA-D4 indicates a total weight of waste and containers of 5.36E6 kg. Because the total weight of waste and containers is not much larger than the total weight of waste in the table above, the weight of excluded materials must be small relative to the total weight of the materials in the table above. Therefore, the total in the table above can be taken as a reasonably accurate estimate of the total weight of waste placed in WIPP.)

Radionuclide Weight and Activity

Estimates of radionuclide activity and weight placed in WIPP through September 2002 are listed in Appendix DATA, Attachment D, Table D1. Data from that table are summarized below.

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U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Louisiana Energy Services, L.P.

Docket No. 70-3103-ML Official Exhibit No. LES 102

OFFERED by (Applicant/Licensee) Intervenor _____

NRC Staff Other _____

IDENTIFIED on 10/26/05 Witness/Panel LES Disposal

Action Taken: (ADMITTED) REJECTED WITHDRAWN

Reporter/Clerk Bellamy Engel

Radionuclide Activity and Weight (materials placed in WIPP through 9/02)		
Nuclide	Activity, Ci	Weight, kg
Total	7.2845E5	2.1622E4
U-235	0.12	5.5718E1
U-238	6.5	1.9204E4
Total less U-235 and U-238	7.28E5	2.36E3

The table above shows that uranium accounts for a large part of the radionuclide weight. (This uranium is included in WIPP waste because it is contaminated with plutonium or other transuranic radionuclides.) The uranium constitutes only a negligible fraction of the radionuclide radioactivity.

Activity Concentrations in Radionuclides and Waste

Activity concentrations in the radionuclides contained in WIPP waste and in the waste itself can be calculated from data in the tables above. Results of this calculation are provided in the table below.

WIPP Waste Radionuclide Activities (Ci) and Weights (kg) (materials placed in WIPP through 9/02) (activity and weight data from tables above)			
	Activity, Ci	Weight, kg	Concentration, nCi/g
All nuclides	7.2845E5	2.1622E4	3.37E7
All nuclides except U	7.28E5	2.36E3	3.09E8
Total Waste	7.2845E5	3.45E6	2.11E5

Comparison of Activity Concentrations in WIPP Waste and in Radionuclides Contained in WIPP Waste to the Activity Concentration of Depleted Uranium

The average activity concentration of depleted uranium is approximately 400 nCi/g. The table above shows that the average activity concentration in materials placed in WIPP through 9/02 is about 530 times the activity concentration of depleted uranium. The table also shows that the average activity concentrations in the radionuclide component of material deposited in WIPP through 9/02 is far higher than the average activity concentration of depleted uranium. The average activity concentration for all radionuclides (total activity divided by total radionuclide weight) is 84,000 times higher than the average activity of depleted uranium. If uranium nuclides are excluded from the nuclide mix, this ratio jumps to 770,000. These results show that the average activity concentrations of WIPP waste and in radionuclides contained in the waste are greatly higher and enormously higher, respectively, than the activity concentration of depleted uranium.