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Energy/  
Environment  
Systems Division

December 14, 1989

Ms. Elizabeth Ullrich  
Region I  
Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Subject: RESULTS OF ROYERSFORD SAMPLE ANALYSES

Dear Ms. Ullrich:

Enclosed are results of analyses performed on samples submitted by the Royersford Wastewater Treatment Plant. All concentrations are reported in units of activity per gram of solids. Table 1 contains gamma spectrometry, uranium, plutonium, and Sr-90 data for seven composite samples collected in August 1989 from the primary digester. Table 2 lists results of gamma spectrometry on two samples from the secondary digester, collected in October 1989. Data from wet chemistry analyses will be provided when evaluation is completed.

You may contact me at FTS 626-3305 if you have any questions regarding these data.

Sincerely,



James D. Berger, Director  
Environmental Survey and  
Site Assessment Program

JDB:jls

Enclosures:

cc: L. Rouse, NRC/6H3  
G. LaRoche, NRC/6H3  
D. Tiktinsky, NRC/6A4  
V. Tharpe, NRC/6H3

TABLE 1

RADIONUCLIDE CONCENTRATIONS MEASURED IN  
DAILY COMPOSITE SAMPLES FROM THE PRIMARY DIGESTER  
ROYERSFORD, PENNSYLVANIA

Radionuclide	Radionuclide Concentration (pCi/g of Solids)							
	Dates and Times (1989)							
	8/15 1430	8/16 1500	8/17 1430	8/18 1530	8/21 1510	8/22 1530	8/23 1030	
Cr-51	<88 <sup>a</sup>	<66	<61	<51	<74	<44	<51	
Mn-54	22.4 ± 7.7 <sup>b</sup>	37.1 ± 6.6	27.8 ± 6.6	41.9 ± 5.8	50.2 ± 8.4	30.4 ± 4.9	38.5 ± 6.7	
Co-58	6.2 ± 5.9	< 3.3	14.1 ± 8.8	13.1 ± 5.8	12.4 ± 9.0	12.5 ± 4.3	11.5 ± 6.4	
Fe-59	<29	<24	<21	<17	<29	<15	<23	
Co-60	95 ± 12	150 ± 12	123 ± 10	210 ± 10	200 ± 15	144.3 ± 8.8	160 ± 12	
Zn-65	20 ± 17	48 ± 15	33 ± 13	69 ± 13	67 ± 21	40 ± 11	44 ± 19	
Sr-90	6.6 ± 0.5	63.7 ± 1.4	8.0 ± 0.4	16.2 ± 0.5	10.5 ± 0.5	10.5 ± 0.4	5.5 ± 0.3	
Nb-95	<12	<12	< 8.3	< 7.7	<13	< 6.8	< 8.9	
Zr-95	<18	<14	<13	<11	<17	< 8.4	<14	
Ag-110m	< 7.0	< 6.3	< 5.1	< 4.8	< 7.7	< 4.3	< 6.4	
Sb-125	<14	<11	<12	<10	<17	< 8.8	<13	
Cs-134	<18	< 6.1	4.5 ± 2.5	4.6 ± 2.9	< 7.7	3.6 ± 2.6	< 5.9	
Cs-137	31 ± 18	23.6 ± 6.1	25.0 ± 5.1	51.3 ± 5.5	33.4 ± 7.7	22.8 ± 4.4	25.6 ± 5.9	
U-234	2.0 ± 0.2	3.3 ± 0.2	2.8 ± 0.2	2.9 ± 0.1	4.5 ± 0.2	2.3 ± 0.1	2.7 ± 0.1	
U-235	< 0.1	< 0.1	0.1 ± 0.1	0.1 ± 0.1	0.2 ± 0.1	<0.1	0.1 ± 0.1	
U-238	0.9 ± 0.1	1.7 ± 0.2	1.6 ± 0.2	1.5 ± 0.1	1.8 ± 0.1	1.2 ± 0.1	1.3 ± 0.1	
Pu-238	< 0.1	< 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	
Pu-239/240	0.1 ± 0.1	< 0.1	0.2 ± 0.1	0.2 ± 0.1	0.3 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	

<sup>a</sup>Poor detection sensitivities for Cr-51 are the result of small solids content and correction for decay between collection and analysis dates.

<sup>b</sup>Uncertainties represent the 95% confidence levels, based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

TABLE 2

RADIONUCLIDE CONCENTRATIONS IN SAMPLES  
FROM SECONDARY DIGESTOR  
ROYERSFORD, PENNSYLVANIA

Radionuclide	Radionuclide Concentration (pCi/g of Solids)	
	Sludge (5.7% solids) (10/23/89)	Dewatered Sludge (29.3% solids) (10/24/89)
Cr-51	15.8 ± 17.5 <sup>a</sup>	25.6 ± 9.9
Mn-54	170 ± 5	193 ± 4
Co-58	10.5 ± 3.5	15.7 ± 2.0
Fe-59	12.3 ± 7.0	24.9 ± 5.8
Co-60	354 ± 7	399 ± 7
Zn-65	254 ± 11	286 ± 8
Sr-90	--b	--
Nb-95	<5.0	<3.1
Zr-95	<7.0	<5.7
Ag-110m	<3.5	2.0 ± 1.7
Sb-125	<7.0	<4.8
Cs-134	5.0 ± 1.8	7.8 ± 2.0
Cs-137	45.6 ± 3.5	52.9 ± 1.7
U-234	--	--
U-235	--	--
U-238	--	--
Pu-238	--	--
Pu-239/240	--	--

<sup>a</sup>Uncertainties represent the 95% confidence levels, based only on counting statistics; additional laboratory uncertainties of ± 6 to 10% have not been propagated into these data.

<sup>b</sup>Dash indicates analysis not yet completed.

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