OAK RIDGE NATIONAL LABORATORY
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

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OAK RIDGE, TENNESSEE 37831

February 6, 1985

Mr. Dan Goode
U.S. NRC
MS 623-SS
Washington, DC 20555

Subject: Results of Ground Water Analytical Program

Greetings Dan,

Attached are analytical results for the samples obtained from Sheffield, Illinois. The analytical parameters are grouped according to parameter type and analytical technique.

In general, water quality is best in Well 574 (the background well) and worst in the Trench well. Wells 575 and 563, located near the U.S. Ecology operations building, are of intermediate quality for inorganic and organic parameters. Organic constituents at Well 523, located in close proximity to disposal trenches, appears similar to those of the sample from the Trench 18 sump.

We have completed analyses for the Method 8600 Matrix and a short write-up of those results is in preparation with delivery to you anticipated by 2/15/85. Identification of specific organic compounds present in the samples is anticipated to be complete in approximately 2 weeks and results will be forwarded to you as they are available.

Please feel free to call if you have questions regarding these data.

Sincerely,

Richard H. Ketelle

RHK/mg

Attachment

ANALYTICAL RESULTS FOR GROUND WATER CHEMICAL CHARACTERIZATION AT SHEFFIELD, ILLINOIS

Parameter	Units of Measurement	Well 574	Well 574-1[a]	Well 575	Well 563	Trench 18	Trench 18-1[a]
			Metals measured by atomic absorption				
Ag	µg/ml	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
As	"	0.002	b	0.005	<0.001	0.003	b
Ba	"	0.30	0.22	0.52	0.22	0.33	0.37
Cd	"	0.0002	0.0005	0.0002	0.0004	0.0007	0.0015
Cr	"	0.002	0.019	<0.002	<0.002	0.003	0.009
Cu	"	0.011	0.01	0.004	0.005	0.020	0.01
Pb	"	<0.001	0.002	<0.001	<0.001	0.002	0.002
Ni	"	<0.005	<0.005	<0.005	0.011	0.028	0.046
Se	"	<0.003	b	<0.003	<0.003	<0.003	b
Sb	"	<0.004	<0.004	<0.004	<0.004	0.007	0.008
Hg	"	<0.00005	b	<0.00005	<0.00005	<0.00005	b
			Anions				
Br	"	<5	<5	<5	<5	<5	<5
Cl	"	13	4	4	19	32	23
F	"	<1	<1	<1	<1	<1	<1
CO_3	"	0.0	0.0	0.0	0.0	0.0	0.0
HCO_3	"	436	440	563	562	1173	1161
NO_2	"	0.3	0.4	0.3	0.3	1.2	0.9
NO_3	"	<5	<5	<5	<5	<5	<5
SO_4	"	84	89	295	171	380	390
Cyanide	"	<0.0014	<0.002	<0.0014	<0.0014	0.0016	0.0032
Sulfide	"	<0.1	<0.1	<0.1	<0.1	c	<0.1

ANALYTICAL RESULTS FOR GROUND WATER CHEMICAL CHARACTERIZATION AT SHEFFIELD, ILLINOIS (continued)

Parameter	Units of Measurement	Well 574	Well 574-1[a]	Well 575	Well 563	Trench 18	Trench 18-1[a]
		Cations measured by inductive coupled plasma					
Al	µg/ml	<0.2	<0.2	<0.2	<0.2	0.44	0.34
B	"	0.59	0.74	0.32	2.1	27	27
Be	"	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	"	89	88	160	170	240	240
Co	"	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fe	"	0.44	0.4	0.65	0.22	0.28	0.22
Ga	"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hf	"	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
K	"	2.8	2.9	0.8	0.9	120	120
Li	"	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mg	"	47	46	70	69	120	120
Mn	"	0.17	0.17	1.9	1.1	1.1	1.1
Mo	"	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Na	"	53	52	18	17	190	200
P	"	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Si	"	9.9	9.7	16	14	11	11
Sr		0.7	0.68	0.18	0.19	0.89	0.89
Ti		<0.02	<0.02	<0.02	<0.02	0.025	0.022
V	"	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Zn	"	<0.02	<0.02	<0.02	0.073	0.17	0.18
Zr	"	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
		Radionuclides					
Gross alpha	Bq/l	0.7±4.0	0.1±4.1	3±5	3±5	3±5	1.4±4.5
Gross beta	"	2±5	0.2±4.4	<4	0.5±4.7	49±9	50±9
Tritium	"	<30	<30	5.6E3±0.1E3	6.2E3±0.1E3	1.6E4±0.1E4	1.6E4±0.1E4

ANALYTICAL RESULTS FOR GROUND WATER CHEMICAL CHARACTERIZATION AT SHEFFIELD, ILLINOIS (continued)

Parameter	Units of Measurement	Well 574	Well 574-1[a]	Well 575	Well 563	Trench 18	Trench 18-1[a]	Well 523
				General organics				
TOC	µg/ml	2.8	1.9	2.9	10	48	43	40
TOX	µg/l	3,950	d	3,600	140	11,000	2,250	5,450

Notes: [a] Samples 574-1 and Trench 18-1 are duplicate sample splits obtained in the field for Quality Assurance purposes.

[b] Data will be reported pending QA recheck of results.

[c] Sample was accidentally lost during preparation for shipping.

[d] Sample bottle broke after receipt at lab while warming.

DRAFT

ESTIMATE OF TOTAL VOLATILES IN SHEFFIED GROUND WATER SAMPLES

Well No.	Estimated Volatiles Concentration, PPB
574	170
574-1[a]	50
575	200
563	500
Trench 18	400
Trench 18-1[a]	3000
Well 523	1450

Note: [a] Sample 574-1 and Trench 18-1 are duplicates of samples obtained from Well 574 and Trench 18, respectively.