LOS ALAMOS SCIENTIFIC LABORATORY
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OFFICE MEMORANDUM

TO : Tom Keenan, H-7 Group Leader MS 518 DATE: July 30, 1975

THRU : R. D. Baker, CMB-Division Leader MS 756

FROM : G. R. Waterbury & Al Zerwekh

SUBJECT: TRANSURANIC WASTE & DEVELOPMENT PROGRAM(A412)MONTHLY REPORT FOR JULY, 1975

SYMBOL : CMB-1

Analytical Chemistry

Corrosion Studies: An improved fire-retardant coating for fiber drums was discussed with Don Tator of Continental Can Company and Gerald Maestas of Group H-7. Mr. Tator agreed that their development staff would continue to work on a suitable fire-retardant. Meanwhile, the Continental Can Company will send LASL about six "improved" fibre drums for testing purposes. Three additional resin coating materials were received and will be applied to fibre and steel drums to check their resistance to corrosion and fire.

Radiolysis Studies: An updated data summary, Table I, of monitoring ^{238}Pu-contaminated hydrogenous waste in retrievable storage at LASL shows the higher temperatures reached in summer and the approximately constant relative compositions of the gases generated. Two additional drums containing, respectively, 19.9 and 20.2 g of ^{238}Pu, in recently stored waste, were instrumented. A gas sample was withdrawn from one drum, No. 232, into an evacuated 0.5 ℓ flask to bring the flask internal pressure to atmospheric. A radio frequency arc was repeatedly discharged through the gas mixture with no discernible reaction. The composition of the gas after 238 days' storage is shown in Table I. A duplicate sample was withdrawn at the same time, and it is believed that withdrawal of the combined volume of these samples was sufficient

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Data From ^{238}Pu-contaminated Waste in Covered-Trench Storage

Drum Number	^{238}Pu Content g	Waste Content Kg	Days in Storage	Temperature, °C: In-side Drum	Out-side Drum	Ambient	Soil Under Cask	Sample With-Drawn From	Gas Composition (Mol %): H_2	CH_4	O_2	CO_2	CO	N_2
223	14.9	17.9	(Dec) 41	12.5	11.5	2.0	7.0	DRUM	0.8	0.1	16.0	6.3	2.0	74.0
			(Feb) 94	12.0	12.0	5.0	7.0	DRUM	0.9	0.1	15.0	5.4	0.9	77.0
								CASK	<0.1	0.1	20.0	0.1	0.3	79.0
			(May) 176	14.5	14.5	24.5	6.0	DRUM	1.0	0.1	15.0	5.6	1.3	76.0
								CASK	0.1	<0.1	20.0	<0.1	0.4	7[illegible]
			(Jul) 238	24.0	23.0	27.0	16.0	DRUM	1.0	0.1	13.0	6.2	1.8	77.0
								CASK	0.1	<0.1	20.0	<0.1	0.3	79.0
224	22.1	14.5	(Dec) 41	18.0	12.5	2.0	7.0	DRUM	0.2	<0.1	19.0	1.4	0.7	77.0
			(Feb) 94	16.5	12.0	5.0	7.0	DRUM	0.2	<0.1	19.0	1.2	0.3	78.0
								CASK	0.1	<0.1	20.0	<0.1	0.1	79.0
			(May) 176	19.0	13.5	24.5	6.0	DRUM	0.2	<0.1	20.0	1.2	0.4	78.0
								CASK	<0.1	<0.1	20.0	<0.1	0.2	79.0
			(Jul) 238	29.0	24.0	27.0	16.0	DRUM	0.2	<0.1	18.0	1.3	0.3	79.0
								CASK	<0.1	<0.1	20.0	<0.1	0.2	79.0
232	29.4	10.2	(Dec) 41	20.5	13.0	2.0	7.0	DRUM	6.7	0.4	11.0	12.0	3.0	66.0
			(Feb) 94	20.0	12.5	5.0	7.0	DRUM	10.0	0.4	7.7	14.0	4.8	62.0
								CASK	0.5	<0.1	20.0	0.1	0.5	78.0
			(May) 176	23.5	20.0	24.5	6.0	DRUM	13.0	0.6	5.3	18.0	7.0	56.0
								CASK	0.6	<0.1	20.0	<0.1	0.6	78.0
			(Jul) 238	34.0	26.5	27.0	16.0	DRUM	9.0	0.5	6.0	17.0	6.0	61.0
								CASK	0.8	<0.1	19.0	<0.1	0.6	78.0
233	17.0	14.5	(Dec) 41	19.0	12.5	2.0	7.0	DRUM	<0.1	<0.1	20.0	0.6	0.7	78.0
			(Feb) 94	17.5	11.0	5.0	7.0	DRUM	0.1	<0.1	20.0	0.6	<0.1	79.0
								CASK	<0.1	<0.1	20.0	0.1	<0.1	79.0
			(May) 176	20.0	13.5	24.5	6.0	DRUM	<0.1	<0.1	20.0	0.6	<0.1	78.0
								CASK	0.1	0.1	20.0	0.1	0.1	78.0
			(Jul) 238	29.0	24.0	27.0	16.0	DRUM	<0.1	<0.1	19.0	0.7	<0.1	79.0
								CASK	<0.1	<0.1	21.0	0.1	<0.1	78.0

to cause dilution of the gaseous contents of the drum by pulling in gas mixture from the enveloping cask. Following the arcing of the gas mixture from the drum, the arced sample was re-analyzed by mass spectrograph. The composition was unchanged. Additional mixtures with gradually increasing oxygen contents will be arced until an explosive mixture is achieved. After 90 days at ambient temperature (20°C) the cylinders of typical Mound Laboratory wastes have shown no pressure increase on 0-105 kPa gauges. If these samples are typical of currently generated Mound waste, the hazard in shipping such waste to Idaho for storage would be minimal.

Bring up again in 6 mos.

The cylinder containing strongly contaminated cellulosics plus water equal in weight to the matrix (62 mg $^{238}PuO_2$ on 52.5 g waste) is generating gas at the rate of 5.04 kPa/d, compared to a duplicate cylinder with no added water which is forming gas at 2.78 kPa/d.

Miscellaneous. On July 22 through 24, Al Zerwekh, together with Tom Keenan and John Warren of Group H-7, attended a meeting of the ALO Working Group on Radioactive Waste Management at Rockwell International-Rocky Flats Plant.

Glenn R Waterbury
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GRW:tb

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