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OFFICE MEMORANDUM

TO : Tom Keenan, H-7 Group Leader, MS 518 DATE: August 4, 1976

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, 1976

SYMBOL : CMB-1

ANALYTICAL CHEMISTRY

1496 Report

Radiolysis Studies: Tests were started to determine the radiolytic degradation of two filtering materials, GORE-TEX with Webril Back and GORE-TEX Heavy Polyester, which might be used as prefiltering media to reduce the clogging of HEPA filters by fine plutonium oxide particles in production drybox exhaust lines. Two experimental cylinders have been prepared, one containing 1.30 g GORE-TEX with WEBRIL BACK contaminated with 0.647 g $^{239}PuO_2$ and one containing 7.93 g GORE-TEX HEAVY POLYESTER contaminated with 0.592 g $^{239}PuO_2$. The oxide layers on the filter materials were reasonably uniform with 4 to 8 mg PuO_2 per cm^2 of filter, a level of contamination slightly less than required to cause a serious pressure drop. The cylinders will be observed for gas pressure buildup.

Table I shows selected data from the ongoing monitoring of ^{238}Pu-contaminated hydrogenous waste stored at the LASL disposal area. Drums 223 and 232, which have been emplaced for 1.7 yr apparently are losing H_2 more rapidly than it is being generated. Drum 301, which contained an explosible gas mixture after 36 d but not after 64, now shows a significant increase in mol percentage of H_2, but the O_2 content apparently is all combined as CO and CO_2. Of the latest two drums instrumented, radiolytic gas generation is significant in Drum 330 after 23 d. Drum 260 (not tabulated) currently has an internal temperature of 44.5 °C, with the ambient air tempera-

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ture 23 °C and the soil 19 °C. The gas sample withdrawn from this drum shows no evidence of H_2 formation from radiolysis. The 20.2 g of ^{238}Pu contaminant is apparently concentrated in a small volume near the thermocouple, but not in contact with hydrogenous matrix. No stored drum has pressurized. This additional data reinforces our conclusion that hydrogen generation will not create an insurmountable problem.

Meetings and Discussions: Al Zerwekh attended the International Symposium on the Management of Wastes from the LWR Fuel Cycle, July 11 - 15, 1976, where he also met with representatives of Continental Can Company and other LASL Waste Management personnel to discuss improvements to a fire-retardant coating for 210-ℓ fibre drums; and with other LASL Waste Management personnel discussed on July 22 with Joe Ledbetter, U. of Texas, the disposal of TRU-contaminated wastes in salt domes.

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GRW:vmw

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Table I

Data from Selected Drums of ^{238}Pu-contaminated Waste in Covered-Trench Storage

(Trenches A & B at Area G)

Drum Number	^{238}Pu Content g	Waste Content Kg	Days in Storage	Temperature, °C: In-Side Drum	Temperature, °C: Out-Side Drum	Temperature, °C: 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	434 (Jan)	17.0	17.0	8.0	Drum	1.0	0.1	12.0	7.0	1.0	7.0
			626 (Jul)	23.5	24.0	19.0	Drum	0.9	0.1	11.2	7.5	0.8	78.6
232	29.4	10.2	434	23.5	17.5	12.0	Drum	6.0	0.3	6.6	12.0	3.0	71.0
			626 (Jul)	32.5	27.0	19.0	Drum	2.9	0.2	10.0	8.8	0.9	76.4
281	19.7	26.0	36		15.0	9.5	Drum	1.0	<0.1	18.0	3.0	0.7	76.0
			229 (Jul)		24.5	19.0	Drum	1.3	0.2	15.9	4.1	0.8	76.8
301	18.7	23.6	36 (Jun)		15.0	11.0	Drum	11.0	0.5	10.0	11.0	4.0	62.0
			64 (Feb)				Drum	15.1	0.7	7.0	14.4	6.5	55.6
			222 (Jul)		25.0	19.0	Drum	41.9	1.4	<0.1	23.2	10.1	2.9
323	16.7	16.3	23	24.5	23.5	19.0	Drum	<0.1	<0.1	20.4	<0.1	0.2	78.3
							Cask	<0.1	<0.1	20.4	<0.1	0.3	78.4
330	17.4	10.9	23	20.5	21.0	19.0	Drum	1.7	<0.1	18.1	3.0	1.2	75.0
							Cask	0.4	<0.1	19.6	0.1	0.5	78.4