

OFFICE MEMORANDUM

TO : Tom Keenan, Group Leader, H-7, MS 518      DATE: February 2, 1978  
THRU : R. D. Baker, CMB-Division Leader  
FROM : G. R. Waterbury & Al Zerwekh  
SUBJECT: TRANSURANIC WASTE RESEARCH & DEVELOPMENT PROGRAM (A412)  
MONTHLY REPORT FOR JANUARY, 1978  
SYMBOL : CMB-1

ANALYTICAL CHEMISTRY

Waste Isolation Pilot Project (WIPP): Preparations for testing contaminated wastes at WIPP lithostatic pressure (150 atmospheres) continued with completion of the mold for the pressure vessel liner and fabrication of the first liner. The pressure vessel was fitted with the liner, loaded with uncontaminated cellulose, and plumbing was started for over-pressure testing under safe conditions. When it has been proved satisfactory, the pressure vessel will be loaded with contaminated cellulose and instrumented for the initial laboratory test at WIPP lithostatic pressure (150 atmospheres). Additional vessels will then be fabricated as soon as possible, loaded with a variety of waste matrices, and placed under test. Thermogravimetric analyses (TGA) experiments are continuing. The first series of experiments using wastes contaminated with sodium chloride and iron oxide catalysts did not produce significantly different degradation temperatures or rates than the uncatalyzed materials, but there are too few data to draw definite conclusions.

Radiolysis Studies: Two, stainless-steel, 300-cm<sup>3</sup> laboratory cylinders were prepared to be tested at one atmosphere pressure for comparison with the WIPP pressure vessels at 150 atmospheres. Cylinder No. 39 was filled with 50 g of



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low density polyethylene contaminated with 335 mg of  $^{239}\text{PuO}_2$  (weapons grade). This is an alpha contamination of  $4 \times 10^5$  nCi/g, "worst case" for WIPP disposal. Cylinder No. 40 was filled with 50 g of paper, also contaminated at the  $4 \times 10^5$  nCi/g level. At least for the present, these cylinders will be observed at ambient temperature ( $20^\circ\text{C}$ ). Twenty-six 115-liter drums of  $^{238}\text{Pu}$ -contaminated waste were recently emplaced in concrete casks in a LASL interim storage trench. One of these, drum No. 415, contains 20.4 Kg of rags, paper, plastic, and graphite powder, contaminated with 13.2 g of ~~weapons~~<sup>heat</sup> grade  $^{238}\text{Pu}$ , probably as oxide. It was instrumented so that it can be sampled for gas composition and monitored for temperature. The first gas sample will be withdrawn after 30 days.

Meetings & Discussions: On January 25 with Karl Haff and Neil Case, ORNL, for a discussion of Controlled Air Incineration, including intermediate level beta-gamma contaminated waste that does not require shielding. ORNL personnel are investigating shredding, grinding, slurring, and mixing with grout of solid intermediate level waste to be disposed of along with liquid intermediate level waste by the shale hydrofracture process. Also to be examined for possible hydrofracture disposal are non-combustibles such as ground glass, slag from metal-melting purification processes, spent electrolyte from electropolishing operations, and possibly ash from the incineration of TRU solid waste.

*Glenn R. Waterbury*  
G. R. Waterbury