

OFFICE MEMORANDUM

TO : Tom Keenan, H-7 Group Leader MS 518      DATE: June 2, 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 MAY, 1975  
SYMBOL : CMB-1

1504  
Report  
Radiolysis Studies - - Matrices contaminated with  $^{238}\text{Pu}$  at three levels typical of Mound Laboratory Wastes have been stored in experimental cylinders in the laboratory for 5 weeks without developing gas pressure.

A cylinder containing a strongly contaminated, mixed-cellulosics matrix, which was saturated with water equal in weight to the matrix, pressurized gradually in three weeks to a high of 10.34 kPa, and then decreased to 1.72 kPa during the fourth week. The cylinder does not appear to be leaking, and a duplicate cylinder which contains no added water has shown an average daily pressure increase of 2.89 kPa.

Pressures were measured in two other experimental cylinders, each containing 35 g of Duo-Seal Vacuum Pump Oil on 17.5 g of vermiculite. One matrix was contaminated with 62 mg (strong level) of  $^{238}\text{Pu}$  and the other with 31 mg (medium level). The contaminant was added as finely divided oxide and well-dispersed in the waste matrix. The time-pressure data (Table I) for these two cylinders seem inconsistent at this time, but additional data may clarify the situation.



June 2, 1975

Gas samples were withdrawn and temperatures measured after 176 days of storage of  $^{238}\text{Pu}$ -contaminated waste in exclusive-use trenches at the LASL contaminated waste storage site. Table II compares the data from all measurements made to date. Traces of organic degradation products in gaseous form with masses of approximately 60 continue to be present in gas samples withdrawn from both drums and casks.

Meetings - - Al Zerwekh participated in a conference on solid waste disposal with six visitors from Great Britian, representatives of ALO, and other LASL staff on May 8 and 9; and in a similar conference for 14 visitors from the Federal Republic of Germany, representatives of WMT Division, ERDA, from both Washington and Albuquerque, and other LASL staff on May 21 and 22.

G. R. Waterbury  
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GRW:tb

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Table II

Data from  $^{238}\text{Pu}$ -contaminated Waste in Covered-Trench Storage

| Drum<br>Number | $^{238}\text{Pu}$<br>Content, g | Waste<br>Content, kg | Days in<br>Storage | Temperature, °C |                 |         | Soil<br>Under<br>Cask | Sample<br>Withdrawn<br>From | Gas Composition (Mol %) |               |              |               |              |              |
|----------------|---------------------------------|----------------------|--------------------|-----------------|-----------------|---------|-----------------------|-----------------------------|-------------------------|---------------|--------------|---------------|--------------|--------------|
|                |                                 |                      |                    | Inside<br>Drum  | Outside<br>Drum | Ambient |                       |                             | $\text{H}_2$            | $\text{CH}_4$ | $\text{O}_2$ | $\text{CO}_2$ | CO           | $\text{N}_2$ |
| 223            | 14.9                            | 17.5                 | 41                 | 12.5            | 11.5            | 2.0     | 7.0                   | DRUM                        | 0.8                     | 0.1           | 16.0         | 6.3           | 2.0          | 4.0          |
|                |                                 |                      | 94                 | 12.0            | 12.0            | 5.0     | 7.0                   | DRUM<br>CASK                | 0.9<br><0.1             | 0.1<br>0.1    | 15.0<br>20.0 | 5.4<br>0.1    | 0.9<br>0.3   | 77.0<br>79.0 |
|                |                                 |                      | 176                | 14.5            | 14.5            | 24.5    | 6.0                   | DRUM<br>CASK                | 1.0<br>0.1              | 0.1<br><0.1   | 15.0<br>20.0 | 5.6<br><0.1   | 1.3<br>0.4   | 76.0<br>79.0 |
| 224            | 22.1                            | 14.5                 | 41                 | 18.0            | 12.5            | 2.0     | 7.0                   | DRUM                        | 0.2                     | <0.1          | 19.0         | 1.4           | 0.7          | 77.0         |
|                |                                 |                      | 94                 | 16.5            | 12.0            | 5.0     | 7.0                   | DRUM<br>CASK                | 0.2<br>0.1              | <0.1<br><0.1  | 19.0<br>20.0 | 1.2<br><0.1   | 0.3<br>0.1   | 78.0<br>79.0 |
|                |                                 |                      | 176                | 19.0            | 13.5            | 24.5    | 6.0                   | DRUM<br>CASK                | 0.2<br><0.1             | <0.1<br><0.1  | 20.0<br>20.0 | 1.2<br><0.1   | 0.4<br>0.2   | 78.0<br>79.0 |
| 232            | 29.4                            | 10.2                 | 41                 | 20.5            | 13.0            | 2.0     | 7.0                   | DRUM                        | 6.7                     | 0.4           | 11.0         | 12.0          | 3.0          | 1.0          |
|                |                                 |                      | 94                 | 20.0            | 12.5            | 5.0     | 7.0                   | DRUM<br>CASK                | 10.0<br>0.5             | 0.4<br><0.1   | 7.7<br>20.0  | 14.0<br>0.1   | 4.8<br>0.5   | 62.0<br>78.0 |
|                |                                 |                      | 176                | 23.5            | 20.0            | 24.5    | 6.0                   | DRUM<br>CASK                | 13.0<br>0.6             | 0.6<br><0.1   | 5.3<br>20.0  | 18.0<br><0.1  | 7.0<br>0.6   | 56.0<br>78.0 |
| 233            | 17.0                            | 14.5                 | 41                 | 19.0            | 12.5            | 2.0     | 7.0                   | DRUM                        | <0.1                    | <0.1          | 20.0         | 0.6           | 0.7          | 78.0         |
|                |                                 |                      | 94                 | 17.5            | 11.0            | 5.0     | 7.0                   | DRUM<br>CASK                | 0.1<br><0.1             | <0.1<br><0.1  | 20.0<br>20.0 | 0.6<br>0.1    | <0.1<br><0.1 | 79.0<br>79.0 |
|                |                                 |                      | 176                | 20.0            | 13.5            | 24.5    | 6.0                   | DRUM<br>CASK                | <0.1<br>0.1             | <0.1<br>0.1   | 20.0<br>20.0 | 0.6<br>0.1    | <0.1<br>0.1  | 78.0<br>78.0 |