OFFICE MEMORANDUM

TO : William R. Kennedy, Group Leader, H-6 DATE: November 21, 1969

FROM : Jack W. Aeby, H-6

SUBJECT: PERMEABILITY OF THE TUFF TO WATER VAPOR

SYMBOL : H-6

In order to establish a background bore line for tritium samples taken from test borings around the DP slurry dump holes, advantage was taken of the fact that drillers were in the process of boring a new 8 ft. diameter hole in Area "H", the classified shops disposal area. When we arrived at this area in the afternoon of November 6, we found them bailing out the loose tuff from the 40 ft. depth. We simply bagged a few handfuls of the loose material for our background sample.

Approximately one liter of this material was placed in a two liter beaker and heated to drive off the moisture which was collected on a watch glass cooled with a single ice cube. It required a very high heat to drive off 1 ml of water for our analysis. (This tuff actually gave a slightly negative reading on the moisture balance.) A 500 lambda alliquote of the water was placed in a standard scintillation counting bottle along with 15 ml of scintillation solution for scintillation counting. The counting results showed an activity of 4,586,795.9 ± 8,958.8 dis/min. ml or 69,496.91% RCG. A very surprising result indeed for a background sample. Subsequent repeat counting verified the above values.

$= 2.066 \times 10^{-6}$ μCi/ml

The search continues for an adequate background sample. However, our initial failure and subsequent failures have launched us on an interesting experiment to determine the permeability of the local formations to tritium or moisture. The results to date are contained in the enclosed chart.

Even though this sample is 69,496.9% RCG for water, one must remember that it is rather difficult to extract from the tuff. Subsequent air samples taken in this same hole at the 45 ft. depth ran a maximum of 118% RCG air, 100% is the concentration in the air one could tolerate with no measurable effects.

The Boys
Jack W. Aeby

JWA:mtj

Enc. Chart

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