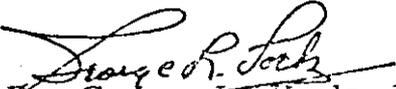


OFFICE MEMORANDUM

TO : H. Jack Blackwell, Area Manager, LAAO

DATE: June 5, 1973

NM10-3

FROM : 
Dr. George L. Voelz, H-Division LeaderSUBJECT : ENVIRONMENTAL RADIOACTIVITY SURVEY OF LOS ALAMOS
COMMUNITY LAND AREAS

AMBOL : H8M-73-102

At your request an environmental radioactivity survey of four tracts of AEC-owned land in Los Alamos County was conducted. The monitoring and analysis of samples paralleled that described in Los Alamos Scientific Laboratory Report LA-5097-MS, "Los Alamos Land Areas Environmental Radiation Survey 1972."

The four land areas surveyed were: (1) the Indian Ruin site near the Community Center (designated "SS"); (2) the Lodge and Museum property (designated "BB"); (3) the site of the old community water storage tank west of the Lodge (designated "JJ"); and (4) lot no. 67 in Barranca Mesa Subdivision No. 1 (designated "67").

No records or recollection of long-time employees exist which indicate that these land areas were used for radioactive material disposal or deposition due to Laboratory work. No evidence of non-radioactive environmental hazards was observed in the course of obtaining in situ radiation measurements and collecting samples for radioassay.

Gross gamma radiation measurements were taken using a Ludlum Model 12S survey meter. The following exposure rates are those corrected in accordance with the procedures described in the above reference. The observed values are not significantly different from measurements previously reported as natural background radiation levels in north central New Mexico or other parts of the world.

Gross Gamma Radiation Measurements in the Field

<u>Location</u>	<u>μR/h</u>
SS	15
BB	14
JJ	15
67	18
Background range	11-20

TO: H. Jack Blackwell

2

DATE: June 5, 1973

LAFPHA/FIDLER Measurement Ratios

<u>Location</u>	<u>ch2/ch4</u>	<u>ch5/ch6</u>
SS	1.6	3.6
BB	1.7	3.6
JJ	1.7	3.7
67	1.6	3.6
Background	1.8	3.3

The LAFPHA/FIDLER System was employed to detect the low energy photon emissions of such radiocontaminants as plutonium or americium. Ratios of the observed count rates in channels 2 and 5, the channels into which photons of 17 and 59.5 keV characteristic of Pu and Am fall, divided by adjacent channels were computed for each measurement location. High ratios indicate the possible presence of the materials of concern. The observed ratios were not significantly different from the background ratio.

Soil and grass samples were collected at each point for radiochemical analyses. The samples were collected and processed as described in the report cited above.

The results of the tritium determinations on plant free-water are summarized below. Compared to background, the tritium concentration in the free-water of grass samples appears to be measureably

Tritium in Free-Water of Grass

<u>Location</u>	<u>pCi/ml</u>
SS	3.7
BB	3.5
JJ	2.9
67	2.7
Background	<1.0 (trees and shrubs)

TO: H. Jack Blackwell

3

DATE: June 5, 1973

higher. This finding is consistent with that for the tritium activity measured in the atmospheric water collected on the Laboratory's air sampling network and noted in the annual environmental monitoring reports. Standards for the tritium concentration in the moisture of vegetation have not been established. For comparison purposes, the observed concentrations in vegetation are about 0.1 percent of the concentration guide in USAECM 0524 for tritium in water in uncontrolled areas.

The observed gross beta concentrations in the grass and soil samples are shown below.

Gross Beta Activity in Grass and Soil

<u>Location</u>	<u>Grass, pCi/g(wet weight)</u>	<u>Soil, pCi/g</u>
SS	9	27
BB	6	26
JJ	9	31
67	6	27
Background range	4-5(trees and shrubs)	16-32

The gross beta activity on the grass samples appears to be somewhat higher than the tree-shrub background levels. The higher gross beta activity reported for the grass samples may be due to the inclusion of a variable amount of associated soil. The soil gross beta measurements are within the expected range for naturally occurring radioactivity.

The ¹³⁷Cs activity in both grass and soil samples was measured. The results are tabulated below. The ¹³⁷Cs values measured on the land parcels surveyed appear to be within the background values previously obtained for north central New Mexico.

Grass and Soil ¹³⁷Cs Content

<u>Location</u>	<u>Grass, pCi/g(wet weight)</u>	<u>Soil, pCi/g</u>
SS	<1.0	1.6
BB	<1.0	1.9
JJ	<1.0	2.2
67	<1.0	1.7
Background range	0.5-2.4 (trees and shrubs)	1.2-5.7

TO: H. Jack Blackwell

4

DATE: June 5, 1973

The total uranium concentration in the samples collected was determined and are shown below compared to measurements on samples collected at locations remote from nuclear facilities. All values except the SS grass sample fall within the expected range. It is possible the SS grass sample had some adhering soil which produced the slightly elevated observation.

Plutonium activity measurements were made on the grass and soil samples. These results are listed below. The plutonium concentrations measured do not appear to be significantly different from the observed background measurements nor from reported plutonium in soil concentrations due principally to worldwide fallout.

Uranium in Soil and Vegetation

<u>Location</u>	<u>U in grass, ug/g</u>	<u>U in soil, ug/g</u>
SS	0.07	0.9
BB	<0.01	0.8
JJ	0.02	0.5
67	<0.02	0.1
Background range	<0.02-0.05 (trees and shrubs)	0.2-1.2

Plutonium Concentration in Grass and Soil

<u>Location</u>	<u>Grass Pu, pCi/g(wet weight)</u>	<u>Soil Pu, pCi/g</u>
SS	<0.004	0.05
BB	0.002	0.09
JJ	<0.005	0.03
67	0.002	0.01
Background range	<0.002-0.008 (trees and shrubs)	0.03-0.61

TO: H. Jack Blackwell

5.

DATE: June 5, 1973

The results of this survey indicate that only low levels of environmental radiocontamination are associated with the land parcels monitored. Except for the tritium concentrations noted above, the observed concentrations are within the range expected at locations distant from nuclear facilities. All results generated by this study are in agreement with the generally low levels of radiation and radioactivity previously reported in special and routine LASL monitoring reports. No radiation or radiocontamination observations were encountered which are of radiological or environmental concern.

GLV:LJJ:mar

bxc: H. S. Jordan, H-DO