

NM 06-2

UNIVERSITY OF CALIFORNIA  
LOS ALAMOS SCIENTIFIC LABORATORY  
(CONTRACT W-7405-ENG-36)  
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LOS ALAMOS, NEW MEXICO 87544

NO REPLY  
REFER TO H8-76-259  
MAIL STOP 490

April 27, 1976

Mr. Kenneth R. Braziel  
Area Manager  
Energy Research & Development Administration  
Los Alamos Area Office  
Los Alamos, NM 87544

Dear Mr. Braziel:

At your request (letter of May 15, 1975, Braziel to Agnew) an environmental survey has been conducted on Tract 00 of Eastern Area No. 3. The field and chemistry work was conducted during 1975 and 1976 with the results now complete. The following description outlines the methods and findings of this survey.

I. Background Information

Tract 00 is located south of Trinity Drive just to the east of the telephone building. It is the site of the old fire alarm building, and during the occupancy of TA-1, part of the power plant and several warehouses were included within its boundaries. After reviewing the TA-1 maps and making contact with people who were familiar with TA-1 activities, we have concluded that the only known potential source of radio-contamination for the subject property would have been fallout from TA-1 operations to the west of Tract 00.

II. Environmental Clearance Survey

The survey conducted on this parcel of land consisted of field radiation measurements with the LAFPHA/FIDLER, RSS-111 (pressurized ionization chamber), LASL's field phoswich detector, and Ludlum 12S portable instruments. Soil samples for laboratory analysis were also collected. The procedures followed during the survey are parallel to those used in other excess property surveys conducted by the LASL since 1972. Background references are to several locations around northern New Mexico greater than 20 miles from Los Alamos.

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### III. Results

The results of the field measurements and laboratory analyses are summarized in Table I, II, and III (the attached map of Tract 00 indicates measurement and sampling locations).

The LAFPHA/FIDLER system is a field portable six channel analyzer connected to a thin NaI(Tl) detector. The system is calibrated to measure and store in channel two the 17 keV L series x rays emitted following alpha decay of plutonium and americium isotopes and to measure and store in channel five the 60 keV gamma ray characteristic of  $^{241}\text{Am}$ . The data shown in Table I collected with the LAFPHA/FIDLER system suggest some differences from the northern New Mexico background information. However, based upon the relatively tight grouping of the channel ratios and past experience with the system, it is felt that no significant radioactive contamination is indicated.

Gross gamma radiation measurements were made in the field with an ionization chamber (RSS-111), a sodium iodide detector (Ludlum 12S) and a sodium iodide/cesium iodide detector (phoswich). The measurements presented in Table II on all three systems were not significantly different from background radiation measurements.

The laboratory analyses on the soil samples collected on Tract 00 are presented in Table III. The analytical results show sample 00-1 to have an elevated  $^{137}\text{Cs}$  level and samples 00-1, 00-2, and 00-3 to have elevated levels of  $^{239}\text{Pu}$ . These samples show contamination values about an order of magnitude above worldwide fallout levels. All other analyses are within the range of values found for background locations.

The results of this environmental survey of Tract 00 indicate only very low level radiocontamination. No abnormal in situ field radiation measurements were observed. Concentrations of  $^{137}\text{Cs}$  and  $^{239}\text{Pu}$  in soil were slightly elevated in one of six and three of six soil samples respectively. All other soil determinations were not distinguishable from natural levels.

No environmental standards exist for radionuclides in soil and, therefore, the measured values have been compared to worldwide levels. No radiation or radiocontamination observations were encountered which are of radiological or

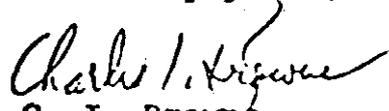
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environmental concern. It is reasonable, therefore, to recommend that the subject tract of land be handled without restriction.

Sincerely yours,



C. I. Browne  
Assistant Director

LJJ:CIB:mar

Attachments: "a/s"

xc: G. L. Voelz, M.D., H-DO (cy of ref. letter attached)

A. K. Stoker, H-8           "   "   "   "   "

J. B. Montoya, ENG-3       "   "   "   "   "

**TABLE I**  
**LOW ENERGY X AND GAMMA RADIATION MEASUREMENTS**  
**WITH THE LAFPHA/FIDLER\***

<u>Location</u>	<u>Gross Counts Per Minute Per Channel</u>					
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
00-1	518	489	525	211	1616	346
00-2	487	435	491	194	1523	325
00-3	599	529	548	225	1648	362
00-4	528	538	644	267	2076	448
00-5	429	407	522	210	1649	341
00-6	592	604	715	296	2325	490
NNM Bkg (Ranges)	<u>1</u> 233-322	<u>2</u> 346-454	<u>3</u> 333-496	<u>4</u> 140-191	<u>5</u> 1268-1557	<u>6</u> 349-461

<u>Location</u>	<u>Channel Ratios</u>	
	<u>2/4</u>	<u>5 (4+6)</u>
00-1	2.31	2.90
00-2	2.24	2.93
00-3	2.35	2.81
00-4	2.01	2.90
00-5	1.94	2.99
00-6	2.04	2.96
NNM Bkg (Ranger)	2.22-282	2.27-2.39

\* Channel 2 covers the 17 keV and channel 6 covers the 60 keV photons.

**TABLE II**  
**GROSS GAMMA-FIELD RADIATION MEASUREMENTS**

<u>Location</u>	<u>RSS-111, uR/h</u>	<u>Ludlum 125, uR/h</u>	<u>Field Phoswich** CPM Range</u>
00-1	17	14	800-1000
00-2	16	14	" "
00-3	19	17	" "
00-4	17	18	" "
00-5	16	18	" "
00-6	18	20	" "
NNM Bkg	13-18	13-25	" "

\* NaI detector corrected for energy response

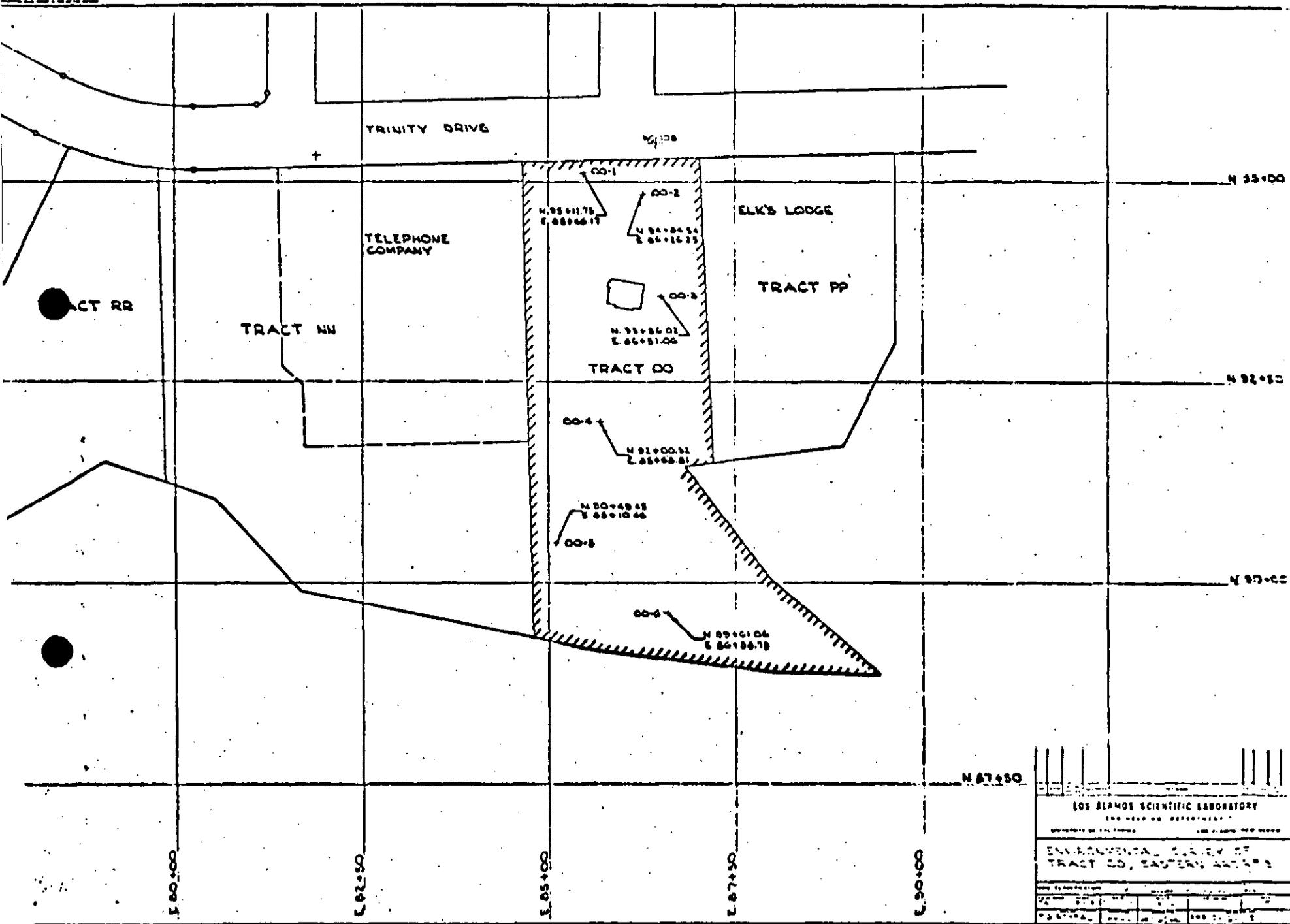
\*\* NaI/CsI detector

TABLE III

LABORATORY ANALYSES\*  
TRACT OO SOIL SAMPLES

Location	Gross $\alpha$ , pCi/g	Gross $\beta$ , pCi/g	Gross $\gamma$ , Net CPM/g	$^{137}\text{Cs}$ , pCi/g	$^{238}\text{Pu}$ , pCi/g	$^{239}\text{Pu}$ , pCi/g	Total U, $\mu\text{g/g}$
00-1	4.9 $\pm$ 1.1	6.5 $\pm$ 0.7	7.1 $\pm$ 0.2	3.18 $\pm$ 0.11	0.010 $\pm$ 0.004	0.333 $\pm$ 0.019	0.8 $\pm$ 0.1
00-2	6.0 $\pm$ 1.3	6.3 $\pm$ 0.7	7.26 $\pm$ 0.19	0.84 $\pm$ 0.04	0.009 $\pm$ 0.005	0.76 $\pm$ 0.03	0.4 $\pm$ 0.1
00-3	5.2 $\pm$ 1.1	5.2 $\pm$ 0.6	6.60 $\pm$ 0.14	0.49 $\pm$ 0.02	0.005 $\pm$ 0.003	0.151 $\pm$ 0.011	0.5 $\pm$ 0.1
00-4	4.5 $\pm$ 1.0	3.9 $\pm$ 0.5	6.78 $\pm$ 0.19	0.18 $\pm$ 0.02	0.039 $\pm$ 0.006	0.061 $\pm$ 0.006	1.2 $\pm$ 0.1
00-5	2.5 $\pm$ 0.6	3.4 $\pm$ 0.4	3.93 $\pm$ 0.14	0.42 $\pm$ 0.03	-0.001 $\pm$ 0.003	0.073 $\pm$ 0.008	0.8 $\pm$ 0.1
00-6	3.8 $\pm$ 0.8	4.1 $\pm$ 0.4	6.78 $\pm$ 0.19	0.86 $\pm$ 0.04	0.008 $\pm$ 0.005	0.062 $\pm$ 0.009	0.4 $\pm$ 0.1
NNM Bkg (Ranges)	4.5-8.0	5.2-8.2	2.88-12.9	0.40-1.67	0-0.002 (<0.005)	0.010-0.034	1.4-2.9

\* All values are  $\pm 1 \sigma$  (one std dev)



LOS ALAMOS SCIENTIFIC LABORATORY SAN JUAN, NEW MEXICO	
ENVIRONMENTAL DIVISION	
TRACT OO, EASTERN AREA	
DATE	BY