R 402553

MDT-45-59

# LRL FALLOUT INFORMATION
## APRIL 5 - NOVEMBER 15, 1958

The work reported herein is authorized by the chiefs of LRL Health Chemistry Sections, N. B. Garden and O. L. Meadors, of Berkeley and Livermore respectively. Responsibility for the work was assigned to their Airborne Activity Control groups under direction of M. D. Thaxter and J. R. Murrow.

This report was written by M. D. Thaxter with the collaboration of J. Young.

---


ABSTRACT

"Hardtack" fallout was estimated by the two LRL sites independently by analysis of filter collections of air-dusts at both sites and by several other methods at the Berkeley site. Examination of various data permits some conclusions and comparisons within the report period as well as in the light of previous fallout periods. Activity graphs and an appendix of data with brief description of methods employed are submitted.


---

During the report period, fallout data was collected by LRL by both the Berkeley and Livermore sites. These sites are 45 miles apart in the San Francisco Bay Area in central California.

The Livermore data is confined to the collection of dust aerosols, as concentrated from air at 4 CFM on filters, and may be roughly divided into two categories of samplings: "daily" and "weekly." The daily sample is taken at a single on-site location whereas the weekly samples were taken at 11 places located 2 to 12 miles from the site.

The Berkeley data involves samples taken by various means:

a) A "daily" dust aerosol concentrated from air at 4 CFM on filters.

b) "Horizontal" fallout trays, at 5 locations on the project and one about 70 miles afield to the N. W.

c) Vertical cloth screens, vane-guided to be normal to the to the prevailing wind, at the same six locations as in "b)."

d) Rainwater samples, on site.

e) Tap-water samples, on site (public water supply.)

f) Gamma surveys at 3' above outdoor pavement, at author's residence 3 miles off'site.

Items "a)" and "d)" have become routinized; "b)" and "c)" are exploratory in nature and the data are sparse; "e)" and "f)" were terminated prior to the conclusion of the period. A description of the methods employed will be found with the data in the appendix.

Herewith will be found copy of letter (MDT-611-58) presenting information covering a period of especial interest, namely Oct. 15--Nov. 10, 1958. This letter was a reply to the request of Gordon M. Dunning, Chief, Radiation Effects of Weapons Branch, DBM, AEC, Washington, D. C., in connection with the fallout incident which suffered some national and California publicity. Its data covers some information of non-LRL origin and differences in treatment of data are noted.

Attention is called to a correction in the factor employed for converting LRL Livermore counts-per-minute to $\mu\mu c/m^3$. A critical re-examination of the counting equipment and procedures dictates the figure "17.9" should have read "24.8." This would have increased the magnitude but not the trends of the concentrations reported.

Examination of the information indicates the following:

1) A parallelism exists between the two sites in the daily samples, as to trend. (This testifies that the isotopes involved are not of local but rather are of external--or "fallout"--origin.)

On the whole, the Livermore values are higher than Berkeley's. The reason for this is not established, but other information (not in this report) suggests the possibility that greater area ventilation at Berkeley may be related, particularly in the windy months of June, July, and August.

2) Compared with previous years, an increase in averaged fallout concentrations was observed. (An estimated six fold in the last 7 years; $1\frac{1}{2}$ fold since last year.)

3) A decrease in activity was noted as Hardtack I, progressed to a low in July and August. (A similar decrease was observed during June, July, and August of the previous three years.)

4) Hardtack I was preceded and followed by a period of activity 4-10 times greater. (Closely before, in time, to these peaks were two series of publicly-reported Soviet experiments. Causality is not rigidly demonstrated, but it is interesting to note this same picture also appeared in the 1957 and 1956 record.) Following the 1958 rise in mid-October, it was observed that during Hardtack II one fallout incident occurred which appeared clearly to be of continental origin.

5) Rainfall is not sufficiently frequent in the LRL area to reflect fallout trends during the spring summer, and fall. Quantities of fallout material transiting the area concomitant with rain will bring substantial quantities to ground collectors. During Hardtack, 30 fold variations in radioactive rainfall (expressed as $mc/mi^2$) were observed; such could not be related to air dusts sampled near ground level.

6) Based on sparse data, horizontal fallout trays and vertical cloth screens evaluated by radioautograph and/or counting techniques showed parallel trends to filter paper counting data.

7) No correlation was found between fallout variations in air or rainwater and gamma values 3 feet above ground. In fact the gamma values did not vary significantly over many months.

8) During the reporting period no correlation was apparent between tap-water and either rainfall activity or air dusts. (Prior to this period a heavy rainout was followed by a sharp increase in tap-water activity.)

APPENDIX

1. "Daily" Air Samples, LRL Berkeley
2. Air Samples, LRL Livermore
    a) Air Intake, Bldg 125, "Daily"
    b) Off Site, "Weekly"
3. Graph: Berkeley & Livermore "Daily" Air Samples
4. Rain Samples, LRL Berkeley
5. Tap Water Samples, LRL Berkeley
6. Tray and Cloth Samplers, LRL Berkeley
7. Gamma Survey Readings, LRL Berkeley
8. Copy of Letter MDT-611-58

University of California Ernest O. Lawrence Radiation Laboratory
Berkeley, California

Air samples taken daily M, T, W. Th, F, and F - M at 4 CFM thru 4" x 9" HV-70 paper at Building 70 air intake. Beta-gamma activity estimated periodically thereafter by disposing collections about Geiger tube in 1" thick lead pig. Conversion to $\mu\mu c/m^3$ is obtained by the expression

$$\frac{\text{counts/min} \times 15.9}{m^3}$$

employing an average of 6 counting determinations for 1 minute for each entry. The instrument is standardized daily to a $U^{238}$ foil cylinder sealed in epoxy resin. Background average for year is 21 counts per minute, maximum 26 c/m, minimum 16 c/m.

Alpha activity is determined on a proportional chamber gas-flow counter standardized daily to $Pu^{239}$. Background is 1 count per minute.

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 0816 4/4<br>0804 4/7 | 487 | 226(0,44); 165(51,17) | 114(0,34); 0(49,26) | 5.38 |
| 0804 4/7<br>0759 4/8 | 162 | 160(0,45); 105(49,44) | 145(0,34); 0(49,34) | 10.3 |
| 0759 4/8<br>0750 4/9 | 161.8 | 69(0,40); 42(51,58) | 98(0,37); 1(51,48) | 4.13 |
| 0750 4/9<br>0744 4/10 | 161 | 40(0,58); 10(100,29) | 130(0,48); 0(100,11) | 0.99 |
| 0744 4/10<br>0744 4/11 | 162.8 | 105(1,6); 78(76,53) | 84(0,55); 0(76,53) | 7.62 |
| 0744 4/11<br>0807 4/14 | 490 | 492(1,17); 451(50,49) | 114(0,48); 2(50,30) | 14.62 |
| 0807 4/14<br>0744 4/15 | 160.1 | 168(1,15); 121(54,57) | 164(1,6); 4(55,12) | 12.01 |
| 0744 4/15<br>0733 4/16 | 161.4 | 112(1,17); 78(51,29) | 105(1,5); 0(51,18) | 7.68 |
| 0733 4/16<br>0752 4/17 | 164.8 | 54(1,2); 25(100,2) | 93(0,52); 0(99,51) | 2.41 |
| 0752 4/17<br>0751 4/18 | 162.6 | 38(1,8); 11(76,25) | 76(0,56); 1(76,17) | 1.08 |
| 0751 4/18<br>0820 4/21 | 498.2 | 284(0,49); 210(122,50) | 217(0,40); 1(122,43) | 6.70 |
| 0820 4/21<br>0800 4/22 | 160.4 | 72(0,59); 44(51,20) | 84(0,49); 1(51,10) | 4.36 |
| 0800 4/22<br>0816 4/23 | 164.5 | 103(0,43); 47(52,56) | 186(0,33); 2(52,44) | 4.54 |
| 0816 4/23<br>0808 4/24 | 161.8 | 111(0,47); 52(97,38) | 202(0,38); 1(97.27) | 5.11 |
| 0808 4/24<br>0812 4/25 | 162.2 | 83(1,8); 41(74,17) | 148(0,58); 1(74,5) | 4.02 |
| 0812 4/25<br>0743 4/28 | 484.7 | 186(0,57); 152(123,37) | 145(0,47); 1(123,28) | 4.99 |
| 0743 4/28<br>0805 4/29 | 165.2 | 103(0,44); 55(50,51) | 172(0,33); 1(50,41) | 5.29 |
| 0805 4/29<br>0807 4/30 | 162.9 | 112(0,40); 48(50,17) | 213(0,29); 1(50,8) | 4.69 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M³ |
|---|---|---|---|---|
| 0807 4/30<br>0811 5/1 | 163.2 | 111(0,47); 54(98,40) | 215(0,37); 0(98,24) | 5.26 |
| 0811 5/1<br>0805 5/2 | 162.0 | 106(0,51); 100(75,9) | 54(0,43); 0(74,58) | 9.81 |
| 0805 5/2<br>0816 5/5 | 489.3 | 203(0,44); 176(50,58) | 77(0,33); 2(50,47) | 5.72 |
| 0816 5/5<br>0804 5/6 | 161.5 | 54(1,11); 27(50,53) | 145(1,0); 0(50,26) | 2.66 |
| 0804 5/6<br>0751 5/7 | 161.2 | 126(0,58); 84(51,10) | 154(0,47); 3(50,59) | 8.29 |
| 0751 5/7<br>0806 5/8 | 164.4 | 62(0,46); 41(101,36) | 80(0,37); 0(101,20) | 3.97 |
| 0806 5/8<br>0753 5/9 | 161.2 | 90(0,47); 38(78,17) | 149(0,36); 1(78,3) | 3.75 |
| 0753 5/9<br>0811 5/12 | 490.1 | 238(1,5); 206(50,44) | 103(0,55); 2(50,31) | 6.68 |
| 0811 5/12<br>0752 5/13 | 160.6 | 72(0,45); 53(53,20) | 89(0,36); 1(53,11) | 5.25 |
| 0752 5/13<br>0749 5/14 | 162.4 | 133(0,56); 85(51,47) | 120(0,46); 3(51,36) | 8.32 |
| 0749 5/14<br>1041 5/15 | 182.2 | 285(0,39); 95(95,54) | 659(0,30); 1(95,43) | 8.29 |
| 1041 5/15<br>0754 5/16 | 143.8 | 172(0,46); 100(75,12) | 269(0,35); 0(75.1) | 11.09 |
| 0754 5/16<br>0748 5/19 | 487.4 | 224(0,43); 209(49,50) | 127(0,33); 3(49,37) | 6.82 |
| 0748 5/19<br>0805 5/20 | 164.6 | 59(0,46); 50(50,21) | 45(0,36); 1(50,11) | 4.83 |
| 0805 5/20<br>0748 5/21 | 160.8 | 90(0,53); 89(52,11) | 54(0,43); 2(52,2) | 8.80 |
| 0748 5/21<br>0748 5/22 | 162.7 | 112(1,11); 67(99,12) | 134(1,1); 0(99,12) | 6.55 |
| 0748 5/22<br>0745 5/23 | 162.4 | 75(3,25); 50(80,19) | 67(3,15); 0(80,15) | 4.90 |
| 0745 5/23<br>0835 5/26 | 493.8 | 146(1,0); 137(55,41) | 61(1,0); 2(55,36) | 4.41 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0835 5/26<br>0925 5/27 | 163.8 | 54(1,5); 35(48,49) | 58(1,5);1(48,40) | 3.40 |
| 0925 5/27<br>0809 5/28 | 154.1 | 31(7,40); 21(123,11) | 33(7,35); 0(123,3) | 2.27 |
| 0809 5/28<br>0830 5/29 | 165.0 | 84(0,34); 32(99,24) | 141(0,25); 0(99,11) | 3.08 |
| 0830 5/29<br>0805 6/2 | 648.0 | 159(2,3); 114(50,50) | 42(1,57); 2(50,42) | 2.80 |
| 0805 6/2<br>0812 6/3 | 163.5 | 62(1,31); 40(50,22) | 38(1,26); 1(50,17) | 3.89 |
| 0812 6/3<br>0830 6/4 | 164.7 | 34(1,23); 17(50,5) | 26(1,15); 0(49,55) | 1.64 |
| 0830 6/4<br>0820 6/5 | 161.6 | 44(0,25); 18(98,34) | 86(0,20); 0(98,25) | 1.77 |
| 0820 6/5<br>0845 6/6 | 165.5 | 86(0,46); 31(75,0) | 132(0,36); 0(74,50) | 2.98 |
| 0845 6/6<br>0746 6/9 | 481.4 | 73(1,3); 54(50,3) | 72(0,53); 2(49,52) | 1.78 |
| 0746 6/9<br>0803 6/10 | 164.6 | 53(0,39); 24(49,11) | 120(0,30); 0(49,2) | 2.32 |
| 0803 6/10<br>0754 6/11 | 161.7 | 57(0,45); 29(50,51) | 111(0,36); 2(50,39) | 2.86 |
| 0754 6/11<br>1033 6/12 | 180.7 | 48(0,32); 20(96,21) | 82(0,24); 2(96,9) | 1.76 |
| 1033 6/12<br>0753 6/13 | 144.6 | 66(1,1); 20(75,31) | 147(0,52); 1(75,21) | 2.20 |
| 0753 6/13<br>0750 6/16 | 487.8 | 167(0,53); 114(50,41) | 155(0,40); 3(50,31) | 3.72 |
| 0750 6/16<br>0743 6/17 | 161.9 | 76(0,48); 44(50,50) | 96(0,38); 2(50,39) | 4.32 |
| 0743 6/17<br>0748 6/18 | 163.3 | 70(0,49); 49(53,38) | 83(0,33); 1(53,22) | 4.77 |
| 0748 6/18<br>0910 6/19 | 172.0 | 89(0,42); 60(97,35) | 141(0,33); 0(97,22) | 5.55 |
| 0910 6/19<br>0906 6/20 | 162.2 | 94(0,38); 59(74,5) | 117(0,29); 1(73,54) | 5.78 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0906 6/20<br>0801 6/23 | 480.7 | 89(0,56); 72(55,17) | 83(0,47); 0(55,10) | 2.38 |
| 0801 6/23<br>1420 6/24 | 205.6 | 78(0,48); 34(44,25) | 44(0,53); 3(44,19) | 2.63 |
| 1420 6/24<br>1040 6/25 | 137.8 | 104(0,35); 22(48,2) | 212(0,32); 2(48,4) | 2.54 |
| 1040 6/25<br>0854 6/26 | 150.8 | 80(0,33); 30(100,13) | 101(0,58); 0(100,1) | 3.16 |
| 0854 6/26<br>0900 6/27 | 163.4 | 124(0,43); 66(76,40) | 142(0,37); 0(76,24) | 6.42 |
| 0900 6/27<br>0812 6/30 | 482.7 | 140(1,31); 94(50,48) | 152(1,8); 3(50,36) | 3.10 |
| 0812 6/30<br>0752 7/1 | 160.4 | 63(0,44); 28(49,56) | 138(0,33); 2(49,45) | 2.78 |
| 0752 7/1<br>0745 7/2 | 161.9 | 25(1,40); 13(122,59) | 54(1,30); 0(122,49) | 1.28 |
| 0745 7/2<br>0756 7/3 | 163.9 | 36(0,52); 6(99,13) | 124(0,43); 0(98,59) | 0.58 |
| 0756 7/3<br>0810 7/7 | 652.4 | 46(0,42); 31(50,29) | 98(0,33); 2(50,19) | 0.76 |
| 0810 7/7<br>0714 7/8 | 156.4 | 44(0,55); 6(51,49) | 92(0,45); 1(51,39) | 0.61 |
| 0714 7/8<br>0739 7/9 | 165.6 | 95(0,52); 32(51,3) | 193(0,42); 3(50,51) | 3.07 |
| 0739 7/9<br>0742 7/10 | 163.0 | 114(1,2); 35(99,21) | 256(0,51); 1(99,10) | 3.41 |
| 0742 7/10<br>0734 7/11 | 161.8 | 64(0,53); 17(75,38) | 181(0,41); 0(75,26) | 1.67 |
| 0734 7/11<br>0746 7/14 | 489.5 | 82(0,58); 46(50,28) | 63(0,49); 1(50,19) | 1.49 |
| 0746 7/14<br>0736 7/15 | 161.6 | 48(0,36); 17(51,0) | 71(0,26); 2(50,49) | 1.67 |
| 0736 7/15<br>0737 7/16 | 162.8 | 35(0,55); 18(50,12) | 80(0,44); 2(49,59) | 1.76 |
| 0737 7/16<br>0740 7/17 | 163.0 | 41(1,1); 10(98,55) | 53(0,49); 0(98,45) | 0.98 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M³ |
|---|---|---|---|---|
| 0740 7/17<br>0723 7/18 | 160.8 | 33(1,0); 9(75,32) | 87(0,48); 0(75,22) | 0.89 |
| 0723 7/18<br>0803 7/21 | 492.6 | 84(0,48); 47(50,30) | 123(0,38); 2(50,20) | 1.52 |
| 0803 7/21<br>0749 7/22 | 161.1 | 32(0,44); 4(53,4) | 92(0,33); 2(52,56) | 0.39 |
| 0749 7/22<br>0742 7/23 | 161.9 | 31(0,49); 9(49,44) | 67(0,39); 1(49,33) | 0.85 |
| 0742 7/23<br>0734 7/24 | 161.8 | 24(0,52); 7(99,31) | 40(0,42); 0(99,21) | 0.68 |
| 0734 7/24<br>0735 7/25 | 162.8 | 48(0,36); 9(75,50) | 113(0,27); 0(75,40) | 0.88 |
| 0735 7/25<br>0748 7/28 | 489.6 | 34(1,6); 22(51,4) | 84(0,56); 1(50,50) | 0.71 |
| 0748 7/28<br>0742 7/29 | 162.0 | 21(1,10); 5(50,40) | 63(1,0); 2(49,54) | 0.49 |
| 0742 7/29<br>0735 7/30 | 161.9 | 41(0,46); 12(53.46) | 120(0,40); 0(53,36) | 1.18 |
| 0735 7/30<br>0748 7/31 | 164.2 | 61(1,0); 9(101,36) | 177(0,48); 0(101,26) | 0.87 |
| 0748 7/31<br>0755 8/1 | 163.5 | 40(2,40); 15(77,48) | 68(2,29); 0(77,39) | 1.46 |
| 0755 8/1<br>0825 8/4 | 491.5 | 133(1,10); 58(51,0) | 206(1,0); 7(50,48) | 1.88 |
| 0825 8/4<br>0805 8/5 | 160.4 | 59(1,5); 17(51,2) | 178(0,57); 4(50,53) | 1.69 |
| 0805 8/5<br>0819 8/6 | 164.3 | 78(0,51); 13(50,41) | 236(0,42); 4(50,40) | 1.26 |
| 0819 8/6<br>0805 8/7 | 161.4 | 47(1,1); 11(99,15) | 170(0,49); 0(99,5) | 1.08 |
| 0805 8/7<br>0740 8/8 | 159.9 | 28(1,33); 14(76,1) | 57(1,27); 0(75,51) | 1.39 |
| 0820 8/8<br>0805 8/11 | 487 | 134(1,39); 116(51,31) | 80(1,30); 4(51,16) | 3.5 |
| 0805 8/11<br>0805 8/12 | 162.7 | 80(1,32); 42(50,55) | 138(1,24); 2(50,45) | 4.11 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 0805 8/12<br>0817 8/13 | 164.1 | 88(1,23); 30(53,28) | 259(1,12); 3(53,18) | 2.91 |
| 0817 8/13<br>0808 8/14 | 161.7 | 47(1,45); 20(99,17) | 141(1,35); 1(99,8) | 1.97 |
| 0808 8/14<br>0820 8/15 | 164.1 | 82(1,6); 18(74,39) | 185(0,56); 1(74,29) | 1.74 |
| 0820 8/15<br>0815 8/18 | 487.5 | 98(0,47); 57(50,55) | 150(0,38); 3(50,45) | 1.86 |
| 0815 8/18<br>0810 8/19 | 162.1 | 43(0,44); 17(50,41) | 108(0,34); 3(50,29) | 1.67 |
| 0810 8/19<br>0840 8/20 | 166.1 | 49(0,45); 14(49,51) | 121(0,36); 2(49,41) | 1.34 |
| 0840 8/20<br>0804 8/21 | 158.6 | 52(0,41); 15(99,23) | 101(0,30); 0(99,16) | 1.50 |
| 0804 8/21<br>0812 8/22 | 163.6 | 61(0,47); 10(75,37) | 137(0,38); 0(75,27) | 0.97 |
| 0812 8/22<br>0841 8/25 | 491.4 | 55(0,41); 21(49,50) | 123(0,32); 4(49,41) | 0.68 |
| 0841 8/25<br>0816 8/26 | 160.0 | 65(1,5); 8(50,54) | 214(1,0); 4(50,45) | 0.80 |
| 0816 8/26<br>0816 8/27 | 162.7 | 57(0,44); 7(51,22) | 143(0,34); 3(51,13) | 0,68 |
| 0816 8/27<br>0814 8/28 | 162.5 | 71(0,44); 36(122,34) | 82(0,35); 0(122,22) | 3.52 |
| 0818 8/28<br>0759 8/29 | 160.6 | 45(1,9); 23(99,12) | 109(0,56); 0(99,2) | 2.28 |
| 0759 8/29<br>0816 9/2 | 652.7 | 108(0,52); 47(50,59) | 212(0,43); 4(50,52) | 1.14 |
| 0816 9/2<br>0809 9/3 | 161.9 | 58(0,54); 29(50,46) | 107(0,43); 3(50,36) | 2.85 |
| 0809 9/3<br>0820 9/4 | 163.9 | 38(1,33); 15(98,53) | 74(1,24); 1(98,43) | 1.46 |
| 0820 9/4<br>0758 9/5 | 160.3 | 101(0,55); 26(75,35) | 302(0,45); 1(75,24) | 2.58 |
| 0759 9/5<br>0831 9/8 | 491.7 | 165(0,52); 130(50,24) | 170(0,40); 6(50,12) | 4.20 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0831 9/8<br>0827 9/9 | 162.2 | 80(0,47); 31(50,38) | 146(0,36); 2(50,27) | 3.04 |
| 0827 9/9<br>0812 9/10 | 161.0 | 31(0,48); 12(53,58) | 51(0,38); 1(53,48) | 1.19 |
| 0812 9/10<br>0810 9/11 | 162.5 | 37(1,0); 16(101,35) | 71(0,46); 0(101,24) | 1.57 |
| 0810 9/11<br>0813 9/12 | 163.0 | 50(0,49); 12(77,53) | 94(0,37); 0(77,43) | 1.17 |
| 0813 9/12<br>0818 9/15 | 488.7 | 182(0,48); 70(50,25) | 383(0,40); 7(50,11) | 2.28 |
| 0818 9/15<br>0806 9/16 | 161.3 | 135(0,46); 44(50,29) | 340(0,36); 3(50,19) | 4.34 |
| 0806 9/16<br>0816 9/17 | 163.8 | 168(0,54); 19(55,46) | 468(0,45); 4(55,36) | 1.84 |
| 0816 9/17<br>0755 9/18 | 160.3 | 78(1,39); 22(99,5) | 235(1,3); 1(98,55) | 2.18 |
| 0755 9/18<br>0837 9/19 | 167.4 | 204(0,47); 38(74,44) | 514(0,37); 3(74,34) | 3.61 |
| 0837 9/19<br>0816 9/22 | 485.7 | 157(1,5); 87(50,42) | 212(0,55); 9(50,29) | 2.85 |
| 0816 9/22<br>0825 9/23 | 163.7 | 129(0,47); 32(50,29) | 387(0,38); 2(50,19) | 3.11 |
| 0825 9/23<br>0816 9/24 | 161.7 | 69(1,31); 27(53.30) | 156(1,22); 2(53.19) | 2.66 |
| 0816 9/24<br>0826 9/25 | 163.8 | 118(0,51); 27(97.53) | 351(0,42); 1(97,27) | 2.62 |
| 0826 9/25<br>0810 9/26 | 160.9 | 63(1,29); 24(74,30) | 137(1,20); 0(74,20) | 2.38 |
| 0810 9/26<br>0800 9/29 | 487.0 | 160(0,53); 53(51,3) | 360(0,42); 5(50,54) | 1.73 |
| 0800 9/29<br>0805 9/30 | 163.3 | 121(0,50); 4(50,52) | 285(0,39); 4(50,42) | 0.39 |
| 0805 9/30<br>0856 10/1 | 168.5 | 150(0,49); 7(49,30) | 489(0.31); 5(49,21) | 0.66 |
| 0856 10/1<br>0810 10/2 | 157.5 | 171(0,42); 15(101,3) | 502(0,34); 1(100,55) | 1.51 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0810 10/2<br>0810 10/3 | 162.7 | 185(0,43); 20(77,22) | 569(0,33); 1(77,14) | 1.95 |
| 0810 10/3<br>0810 10/6 | 488.1 | 241(0,51); 153(50,44) | 136(0,40); 3(50,35) | 4.98 |
| 0810 10/6<br>0800 10/7 | 161.6 | 101(0,55); 37(51,36) | 231(0,46); 4(51,7) | 3.64 |
| 0800 10/7<br>0756 10/8 | 162.2 | 153(1,3); 30(123,45) | 315(0,53); 0(123,35) | 2.94 |
| 0756 10/8<br>0835 10/9 | 167.1 | 113(1,1); 20(100,44) | 294(0,51); 0(100,35) | 1.90 |
| 0835 10/9<br>0855 10/10 | 165.0 | 220(0,45); 19(76,46) | 642(0,35); 1(76,34) | 1.83 |
| 0855 10/10<br>0832 10/13 | 485.5 | 75(2,9); 33(51,15) | 135(1,59); 4(50,56) | 1.08 |
| 0832 10/13<br>0803 10/14 | 159.4 | 89(0,54); 22(49,39) | 205(0,44); 6(49,28) | 2.19 |
| 0803 10/14<br>0820 10/15 | 165.0 | 85(0,37); 11(26,21) | 209(0,28); 3(26,12) | 1.06 |
| 0820 10/15<br>0817 10/16 | 162.8 | 141(0,35); 20(98,39) | 374 (0,25); 0(98,30) | 1.95 |
| 0817 10/16<br>0759 10/17 | 161.1 | 363(0,54); 46(75,24) | 1157(0,42); 1(75,7) | 4.54 |
| 0759 10/17<br>0833 10/20 | 493.0 | 341(0,36); 229(55,54) | 431(0,27); 3(55,44) | 7.39 |
| 0833 10/20<br>0816 10/21 | 161.3 | 436(0,34); 298(51,5); | 461(0,24); 7(51,2) | 29.38 |
| 0816 10/21<br>0805 10/22 | 162.1 | 664(0,40); 370(50,51) | 701(0,32); 8(51,22) | 36.29 |
| 0805 10/22<br>0815 10/23 | 164.2 | 253(1,29); 152(98,52) | 104(1,20); 0(99,2) | 14.72 |
| 0815 10/23<br>0805 10/24 | 162.1 | 287(0,49); 170(75,44) | 246(0,40); 2(75,33) | 16.67 |
| 0805 10/24<br>0824 10/27 | 491.6 | 586(0,35); 421(53,44) | 417(0,27); 6(53,32) | 13.62 |
| 0824 10/27<br>0805 10/28 | 161.0 | 298(0,41); 125(51,12) | 512(0,33); 8(51,1) | 12.34 |

| Sampling Times (PST) & Dates | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0805 10/28<br>0740 10/29 | 161.0 | 469(3,13); 245(49,38) | 651(3,3); 11(49,25) | 24.20 |
| 0740 10/29<br>0827 10/30 | 168.2 | 579(0,53); 257(98,18) | 767(0,43); 4(98,5) | 24.29 |
| 0827 10/30<br>0756 10/31 | 159.7 | 462(0,40); 267(77,22) | 248(0,32); 6(75,0) | 26.58 |
| 0756 10/31<br>0829 11/3 | 497.9 | 1313(0,33); 873(50,5) | 632(0,24); 20(49,20) | 27.87 |
| 0829 11/3<br>0800 11/4 | 159.9 | 93(0,43); 33(54,35) | 213(0,34); 2(54,24) | 3.28 |
| 0800 11/4<br>0806 11/5 | 163.6 | 196(0,50); 91(55,27) | 296(0,41); 4(55,22) | 8.84 |
| 0806 11/5<br>0736 11/6 | 159.8 | 161(0,43); 44(99,38) | 358(0,34); 0(99,22) | 4.38 |
| 0736 11/6<br>0830 11/7 | 169.0 | 134(1,3); 20(75,8) | 261(0,54); 0(74,58) | 1.88 |
| 0834 11/7<br>0836 11/10 | 489.3 | 148(1,27); 93(48,42) | 153(1,17); 5(48,32) | 3.02 |
| 0840 11/10<br>0805 11/11 | 158.7 | 284(0,40); 140(53,35) | 387(0,32); 0(53,16) | 14.03 |
| 0805 11/11<br>0800 11/12 | 162.1 | 199(0,30); 47(49,56) | 446(0,21); 2(49,47) | 4.61 |
| 0800 11/12<br>0805 11/13 | 163.3 | 94(2,46); 58(98,48) | 87(2,36); 1(98,38) | 5.65 |
| 0805 11/13<br>0756 11/14 | 161.7 | 83(0,46); 50(75,24) | 80(0,33); 0(75,13) | 4.92 |
| 0756 11/14<br>0826 11/17 | 491.5 | 272(1,17); 177(49,16) | 285(1,9); 8(49,6) | 5.73 |

University of California Ernest O. Lawrence Radiation Laboratory
Livermore, California

Air samples are taken daily on site and counted as described for UCRL-Berkeley (above) with the exception of a slightly different conversion factor, viz:

$$\frac{\text{counts/min} \times 24.8}{m^3}$$

Their Building 125 intake is the sampling location.

"Weekly" samples are taken using identical equipment and rates at 11 stations beyond the site and counted as above.

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 4/4 4/7 | 489 | 140(0,6); 108(48,0) | 167(0,4); 0(48,0) | 5.5 |
| 4/7 4/8 | 163 | 174(0,6); 56(47,0) | 196(0,4); 29(47,0) | 8.5 |
| 4/8 4/9 | 156 | 129(0,6); 29(48,0) | 276(0,4); 2(48,0) | 4.6 |
| 4/9 4/10 | 163 | 204(0,6); 13(96,0) | 794(0,4); 0(96,0) | 2.0 |
| 4/10 4/11 | 163 | 176(0,6); 82(72,0) | 287(0,4); 1(72,0) | 12.5 |
| 4/11 4/14 | 489 | 642(0,6); 422(48,0) | 491(0,4); 1(48,0) | 21.4 |
| 4/14 4/16 | 329 | 559(0,6); 308(54,0) | 738(0,4); 10(54,0) | 22.6 |
| 4/16 4/17 | 163 | 61(0,6); 35(144,0) | 36(0,4); 0(144,0) | 5.3 |
| 4/17 4/18 | 163 | 73(0,6); 5(71,0) | 93(0,4); 0(71,0) | 0.8 |
| 4/18 4/21 | 481 | 442(0,6); 150(48,0) | 448(0,4); 18(48,0) | 7.7 |
| 4/21 4/22 | 163 | 106(0,6); 13(48,0) | 136(0,4); 1(48,0) | 2.0 |
| 4/22 4/23 | 163 | 154(0,6); 42(48,0) | 341(0,4); 7(48,0) | 6.4 |
| 4/23 4/24 | 163 | 283(0,6); 48(96,0) | 279(0,4); 0(96,0) | 7.3 |
| 4/24 4/25 | 163 | 380(0,6); 50(72,0) | 526(0,4); 1(72,0) | 7.6 |
| 4/25 4/28 | 489 | 264(0,6); 151(48,0) | 137(0,4); 2(48,0) | 7.7 |
| 4/28 4/29 | 163 | 132(0,6); 72(51,0) | 215(0,4); 1(51,0) | 11.0 |
| 4/29 4/30 | 163 | 324(0,6); 53(50,0) | 878(0,4); 0(50,0) | 8.1 [redacted] |
| 4/30 5/1 | 170 | 545(0,6); 97(25,0) | 207(0,4); 108(25,0) | 15.6 |

Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta+Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 5/1 5/2 | 163 | 127(0,6); 68(72,0) | 188(0,4); 4(72,0) | 10.4 |
| 5/2 5/5 | 489 | 411(0,7); 247(48,0) | 366(0,5); 3(48,0) | 12.5 |
| 5/5 5/7 | 329 | 608(0,5); 154(48,0) | 1282(0,3); 19(48,0) | 12.0 |
| 5/7 5/8 | 163 | 134(0,13); 71(96,0) | 306(0,10); 1(96,0) | 10.8 |
| 5/8 5/9 | 163 | 416(0,4); 46(72,0) | 970(0,2); 4(72,0) | 7.0 |
| 5/9 5/12 | 495 | 236(0,8); 247(48,0) | 170(0,6); 22(48,0) | 12.4 |
| 5/12 5/13 | 170 | 477(0,6); 69(47,0) | 1170(0,4); 11(47,0) | 10.1 |
| 5/13 5/14 | 156 | 572(0,6); 73(48,0) | 744(0,4); 4(48,0) | 11.6 |
| 5/14 5/15 | 163 | 828(0,6); 87(96,0) | 1175(0,4); 0(96,0) | 13.2 |
| 5/15 5/16 | 163 | 608(0,6); 117(72,0) | 1279(0,4); 0(72,0) | 17.8 |
| 5/16 5/19 | 489 | 376(0,6); 227(48,0) | 296(0,4); 0(48,0) | 11.5 |
| 5/19 5/20 | 163 | 127(0,6); 44(48,0) | 89(0,4); 0(48,0) | 6.7 |
| 5/20 5/21 | 163 | 136(0,6); 95(48,0) | 209(0,4); 4(48,0) | 14.5 |
| 5/21 5/22 | 163 | 219(0,6); 39(97,0) | 539(0,4); 0(97,0) | 5.9 |
| 5/22 5/23 | 163 | 315(0,6); 57(73,0) | 311(0,4); 0(73,0) | 8.7 |
| 5/23 5/26 | 489 | 387(0,8); 140(48,0) | 520(0,6); 8(48,0) | 7.1 |
| 5/26 5/27 | 163 | 282(0,6); 42(48,0) | 593(0,4); 15(48,0) | 6.4 |
| 5/27 5/28 | 163 | 131(0,6); 27(121,0) | 105(0,4); 0(121,0) | 4.1 |

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 5/28 5/29 | 163 | 334(0,6); 23(96,0) | 726(0,4); 0(96,0) | 3.5 |
| 5/29 6/2 | 652 | 258(0,6); 114(48,0) | 551(0,4); 12(48,0) | 4.3 |
| 6/2 6/3 | 163 | 175(0,6); 42(48,0) | 166(0,4); 0(48,0) | 6.4 |
| 6/3 6/4 | 163 | 483(0,6); 28(48,0) | 1098(0,4); 35(48,0) | 4.3 |
| 6/4 6/5 | 163 | 214(0,6); 36(96,0) | 501(0,4); 0(96,0) | 5.5 |
| 6/5 6/6 | 163 | 152(0,6); 29(72,0) | 186(0,4); 2(72,0) | 4.4 |
| 6/6 6/9 | 489 | 188(0,6); 62(72,0) | 389(0,4); 0(72,0) | 3.3 |
| 6/9 6/10 | 163 | * 31(48,0) | * 0(48,0) | 4.7 |
| 6/10 6/11 | 163 | 111(0,15); 27(48,0) | 351(0,10); 2(48,0) | 4.1 |
| 6/11 6/12 | 163 | 72(0,6); 7(96,0) | 106(0,4); 0(96,0) | 1.1 |
| 6/12 6/13 | 163 | 457(0,6); 31(72,0) | 760(0,4); 3(72,0) | 4.7 |
| 6/13 6/16 | 489 | 393(0,6); 148(48,0) | 703(0,4); 20(48,0) | 7.5 |
| 6/16 6/17 | 163 | 146(0,6); 29(48,0) | 491(0,4); 7(48,0) | 4.4 |
| 6/17 6/18 | 163 | 152(0,6); 38(48,0) | 254(0,4); 0(48,0) | 5.8 |
| 6/18 6/19 | 163 | 105(0,6); 51(96,0) | 209(0,4); 0(96,0) | 7.8 |
| 6/19 6/20 | 163 | 48(0,6); 68(72,0) | 100(0,4); 0(72,0) | 10.3 |
| 6/20 6/23 | 489 | 145(0,6); 105(48,0) | 120(0,4); 0(48,0) | 5,3 |

* Not Determined

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 6/23 6/24 | 163 | 65(0,6); 25(50,0) | 123(0,4); 0(50,0) | 3.8 |
| 6/24 6/25 | 163 | 426(0,8); 27(48,0) | 404(0,6); 4(48,0) | 4.1 |
| 6/25 6/26 | 176 | 189(0,6); 37(94,0) | 199(0,4); 0(94,0) | 5.2 |
| 6/26 6/27 | 149 | 183(0,6); 55(72,0) | 301(0,4); 2(72,0) | 9.2 |
| 6/27 6/30 | 489 | 513(0,8); 134(48,0) | 1552(0,6); 8(48,0) | 6.8 |
| 6/30 7/2 | 329 | 116(0,6); 71(120,0) | 123(0,4); 1(120,0) | 5.3 |
| 7/2 7/3 | 163 | 246(0,12); 6(96,0) | 664(0,10); 0(96,0) | 0.9 |
| 7/3 7/7 | 652 | 289(0,6); 94(48,0) | 371(0,4); 13(48,0) | 3.6 |
| 7/7 7/8 | 163 | 278(0,6); 42(48,0) | 460(0,4); 10(48,0) | 6.4 |
| 7/8 7/9 | 163 | 501(0,6); 30(50,0) | 653(0,4); 21(50,0) | 4.6 |
| 7/9 7/10 | 163 | 649(0,6); 134(96,0) | 1590(0,4); 0(96,0) | 20.4 |
| 7/10 7/11 | 176 | 450(0,6); 93(70,0) | 1154(0,4); 3(70,0) | 13.1 |
| 7/11 7/14 | 475 | 278(0,6); 96(48,0) | 467(0,4); 11(48,0) | 5.0 |
| 7/14 7/15 | 163 | 69(0,6); 28(48,0) | 121(0,4); 1(48,0) | 4.3 |
| 7/15 7/16 | 163 | 75(0,6); 21(48,0) | 107(0,4); 2(48,0) | 3.2 |
| 7/16 7/17 | 163 | 100(0,6); 21(96,0) | 295(0,4); 0(96,0) | 3.2 |
| 7/17 7/18 | 163 | 131(0,6); 22(72,0) | 215(0,4); 1(72,0) | 3.3 |
| 7/18 7/21 | 489 | 248(0,6); 69(48,0) | 553(0,4); 17(48,0) | 3.5 |

Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 7/21 7/22 | 163 | 147(0,6); 6(47,0) | 382(0,4); 14(47,0) | 0.9 |
| 7/22 7/23 | 163 | 134(0,6); 21(47,0) | 251(0,4); 7(47,0) | 3.2 |
| 7/23 7/24 | 156 | 195(0,6); 28(97,0) | 300(0,4); 0(97,0) | 4.5 |
| 7/24 7/25 | 163 | 271(0,6); 22(73,0) | 532(0,4); 4(73,0) | 3.3 |
| 7/25 7/28 | 495 | 205(0,6); 58(48,0) | 610(0,4); 2(48,0) | 2.9 |
| 7/28 7/29 | 163 | 190(0,6); 74(49,0) | 713(0,4); 2(49,0) | 11.3 |
| 7/29 7/30 | 163 | 233(0,6); 23(48,0) | 422(0,4); 3(48,0) | 3.5 |
| 7/30 7/31 | 170 | 503(0,6); 80(97,0) | 1919(0,4); 0(97,0) | 11.7 |
| 7/31 8/1 | 156 | 439(0,6); 47(74,0) | 1165(0,4); 1(74,0) | 7.5 |
| 8/1 8/4 | 502 | 460(0,6); 153(46,0) | 989(0,4); 23(46,0) | 7.6 |
| 8/4 8/5 | 149 | 30(0,22); 12(53,0) | 25(0,20); 0(53,0) | 2.0 |
| 8/5 8/11 | 977 | 270(0,22); 79(47,0) | 376(0,20); 9(47,0) | 2.0 |
| 8/11 8/12 | 163 | 455(0,6); 58(48,0) | 907(0,4); 4(48,0) | 8.8 |
| 8/12 8/13 | 163 | 496(0,6); 55(48,0) | 1731(0,4); 16(46,0) | 8.4 |
| 8/13 8/14 | 163 | 416(0,6); 25(97,0) | 1590(0,4); 0(97,0) | 3.8 |
| 8/14 8/15 | 163 | 548(0,6); 54(73,0) | 1248(0,4); 0(73,0) | 8.2 |
| 8/15 8/18 | 495 | 250(0,22); 89(47,0) | 513(0,20); 0(47,0) | 4.5 |
| 8/18 8/19 | 163 | 235(0,7); 31(47,0) | 659(0,5); 1(47,0) | 4.7 |

Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 8/19 8/20 | 156 | 211(0,6); 20(48,0) | 557(0,4); 2(48,0) | 3.0 |
| 8/20 8/21 | 163 | 266(0,6); 24(72,0) | 821(0,4); 0(72,0) | 3.7 |
| 8/21 8/25 | 509( | 248(0,5); 52(46,0) | 550(0,3); 6(46,0) | 2.5 |
| 8/25 8/26 | 143 | 351(0,6); 43(48,0) | 672(0,4); 9(48,0) | 7.5 |
| 8/26 8/27 | 163( | 365(0,6); 56(48,0) | 395(0,4); 12(48,0) | 8.5 |
| 8/27 8/28 | 163 | 208(0,5); 21(120,0) | 623(0,3); 0(120,0) | 3.2 |
| 8/28 8/29 | 163 | 359(0,6); 10(96,0) | 1328(0,4); 0(96,0) | 1.5 |
| 8/29 9/2 | 652 | 495(0,6); 73(48,0) | 1194(0,4); 17(48,0) | 2.8 |
| 9/2 9/3 | 163 | 354(0,6); 36(48,0) | 1096(0,4); 21(48,0) | 5.5 |
| 9/3 9/4 | 163 | 322(0,6); 29(48,0) | 1092(0,4); 15(48,0) | 4.4 |
| 9/4 9/5 | 163 | 753(0,6); 41(72,0) | 2176(0,4); 8(72,0) | 6.2 |
| 9/5 9/6 | 163 | 858(0,6); 78(48,0) | 3242(0,4); 17(48,0) | 11.9 |
| 9/6 9/8 | 329 | 897(0,6); 94(48,0) | 2035(0,4); 32(48,0) | 7.1 |
| 9/8 9/9 | 170 | 350(0,6); 26(48,0) | 1023(0,4); 8(48,0) | 3.8 |
| 9/9 9/10 | 156 | 130(0,6); 7(48,0) | 8(0,4); 0(48,0) | 1.1 |
| 9/10 9/11 | 163 | 123(0,6); 8(96,0) | 293(0,4); 13(96,0) | 1.2 |
| 9/11 9/12 | 163 | 107(0,6); 46(77,0) | 129(0,4); 1(77,0) | 7.0 |
| 9/12 9/13 | 163 | 118(0,20); 2(53,0) | 326(0,26); 2(53,0) | 0.3 |

Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 9/13 9/15 | 329 | 301(5 hrs.); 41(48,0) | 568(5 hrs.); 23(48,0) | 3.1 |
| 9/15 9/16 | 163 | 1040(0,6); 70(48,0) | 2807(0,4); 56(48,0) | 10.6 |
| 9/16 9/17 | 163 | 750(0,6); 49(48,0) | 1892(0,4); 20(48,0) | 7.5 |
| 9/17 9/18 | 163 | 912(0,6); 76(53,0) | 2898(0,4); 48(53,0) | 11.6 |
| 9/18 9/19 | 163 | 177(0,6); 22(72,0) | 619(0,4); 3(72,0) | 3.3 |
| 9/19 9/20 | 163 | 245(0,6); 44(48,0) | 706(0,4); 13(48,0) | 6.7 |
| 9/20 9/22 | 329 | 424(0,6); 71(48,0) | 903(0,4); 6(48,0) | 5.4 |
| 9/22 9/23 | 163 | 273(0,6); 44(48,0) | 854(0,4); 8(48,0) | 6.7 |
| 9/23 9/24 | 168 | 70(0,6); 7(48,0) | 18(0,4); 2(48,0) | 1.1 |
| 9/24 9/25 | 163 | 679(0,6); 33(48,0) | 2406(0,4); 30(48,0) | 5.0 |
| 9/25 9/26 | 163 | 456(0,6); 25(72,0) | 1850(0,4); 7(72,0) | 3.8 |
| 9/26 9/27 | 163 | 728(0,6); 31(48,0) | 3097(0,4); 35(48,0) | 4.7 |
| 9/27 9/29 | 329 | 816(0,6); 40(50,0) | 3434(0,4); 51(50,0) | |
| 9/29 9/30 | 176 | 629(0,6); 23(46,0) | 2185(0,4); 38(46,0) | 3.2 |
| 9/30 10/1 | 163 | 628(0,6); 26(47,0) | 2812(0,4); 63(47,0) | 4.0 |
| 10/1 10/2 | 156 | 459(0,6); 24(48,0) | 2053(0,4); 50(48,0) | 3.8 |
| 10/2 10/3 | 163 | 782(0,6); 31(47,0) | 3688(0,4); 12(49,0) | 4.7 |

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | μμc/M³ |
|---|---|---|---|---|
| 10/3 10/4 | 163 | 838(0,6); 23(55,0) | 3245(0,4); 13(55,0) | 3.5 |
| 10/4 10/6 | 332 | 188(0,5); 71(48,0) | 276(0,3); 0(48,0) | 5.3 |
| 10/6 10/7 | 163 | 336(0,6); 33(48,0) | 1300(0,4); 17(48,0) | 5.0 |
| 10/7 10/8 | 163 | 954(0,6); 44(48,0) | 3035(0,4); 63(48,0) | 6.7 |
| 10/8 10/9 | 163 | 184(0,6); 22(48,0) | 789(0,4); 16(48,0) | 3.3 |
| 10/9 10/10 | 163 | 547(0,6); 26(72,0) | 2969(0,4); 5(72,0) | 4.0 |
| 10/10 10/11 | 163 | 682(0,6); 36(48,0) | 3256(0,4); 11(48,0) | 5.5 |
| 10/11 10/13 | 329 | 1164(0,6); 48(48,0) | 3212(0,4); 45(48,0) | 3.6 |
| 10/13 10/14 | 163 | 768(0,6); 42(48,0) | 976(0,4); 41(48,0) | 6.4 |
| 10/14 10/15 | 163 | 508(0,6); 23(48,0) | 1262(0,4); 24(48,0) | 3.5 |
| 10/15 10/16 | 163 | 544(0,6); 29(48,0) | 1249(0,4); 34(48,0) | 4.4 |
| 10/16 10/17 | 163 | 1349(0,6); 46(72,0) | 3765(0,4); 12(72,0) | 7.0 |
| 10/17 10/18 | 163 | 342(0,6); 37(48,0) | 873(0,4); 17(48,0) | 5.6 |
| 10/18 10/20 | 329 | 566(0,6); 276(48,0) | 757(0,4); 24(48,0) | 20.8 |
| 10/20 10/21 | 163 | 583(0,6); 288(48,0) | 1137(0,4); 30(48,0) | 44.0 |
| 10/21 10/22 | 163 | 1174(0,6); 275(48,0) | 3465(0,4); 63(48,0) | 41.8 |
| 10/22 10/23 | 156 | 377(0,26); 55(98,0) | 665(0,24); 6(98,0) | 8.8 |

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 10/23 10/24 | 163 | * 59(72,0) | * 2(72,0) | 9.0 |
| 10/24 10/25 | 163 | 886(0,6); 154(48,0) | 2665(0,4); 35(48,0) | 23.6 |
| 10/25 10/27 | 329 | 1312(0,6); 273(48,0) | 3548(0,4); 65(48,0) | 20.6 |
| 10/27 10/28 | 163 | 935(0,6); 96(48,0) | 2658(0,4); 42(48,0) | 14.6 |
| 10/28 10/29 | 163 | 1553(0,6); 286(48,0) | 5096(0,4); 75(48,0) | 43.5 |
| 10/29 10/30 | 163 | 1494(0,6); 235(104,0) | 4147(0,4); 0(104,0) | 35.8 |
| 10/30 10/31 | 163 | 15,722(0,6); 3383(72,0) | 3565(0,4); 31(72,0) | 51.5 |
| 10/31 11/1 | 163 | * 1123(75,0) | * 23(75,0) | 17.1 |
| 11/1 11/3 | 329 | 1694(0,6); 618(49,0) | 3712(0,4); 73(49,0) | 46.5 |
| 11/3 11/4 | 170 | 395(0,7); 81(47,0) | 921(0,5); 28(47,0) | 11.8 |
| 11/4 11/5 | 356 | 536(0,6); 68(48,0) | 1308(0,4); 27(48,0) | 10.8 |
| 11/5 11/6 | 163 | 1124(0,6); 56(96,0) | 3265(0,4); 2(96,0) | 8.5 |
| 11/6 11/7 | 163 | 914(0,6); 32(72,0) | 3046(0,4); 11(72,0) | 4.9 |
| 11/7 11/10 | 489 | 173(0,6); 66(48,0) | 342(0,4); 9(48,0) | 3.3 |
| 11/10 11/11 | 163 | 635(0,6); 45(49,0) | 2251(0,4); 34(49,0) | 6.8 |
| 11/11 11/12 | 163 | 1051(0,6); 127(48,0) | 2871(0,4); 45(48,0) | 19.3 |
| 11/12 11/13 | 163 | 1096(0,3); 40(96,0) | 2688(0,2); 4(96,0) | 6.1 |

* Not Determined

## Air Samples LRL Livermore

| Sampling Period | Volume Cubic Meters | Net Count Per Minute After Sampling Terminated (Figures in parentheses are hours and minutes decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 11/13<br>11/14 | 163 | 55(0,6); 8(72,0) | 116(0,4); 2(72,0) | 1.2 |
| 11/14<br>11/17 | 489 | 1109(0,6); 166(50,0) | 3235(0,4); 21(50,0) | 8.4 |

Air Samples, Off Site, LRL Livermore
(1) Location: Water Tank

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1140 4/1<br>1430 4/8 | 1160 | 359(67) | 0(67) | 7.7 |
| 1430 4/8<br>1300 4/15 | 1132 | 796(48) | 10(48) | 17.4 |
| 1300 4/15<br>1235 4/22 | 1140 | 278(51) | 4(51) | 6.1 |
| 1235 4/22<br>1250 4/29 | 1140 | 342(48) | 4(48) | 7.4 |
| 1250 4/29<br>1215 5/6 | 1132 | 565(51) | 7(51) | 12.4 |
| 1215 5/6<br>1330 5/13 | 1148 | 389(50) | 3(50) | 8.4 |
| 1330 5/13<br>1200 5/20 | 1132 | 630(51) | 0(51) | 13.8 |
| 1200 5/20<br>1300 5/27 | 1148 | 336(51) | 0(51) | 7.3 |
| 1300 5/27<br>1350 6/3 | 1148 | 144(49) | 0(49) | 3.1 |
| 1350 6/3<br>1330 6/17 | 2280 | 367(50) | 0(50) | 4.0 |
| 1330 6/17<br>1320 6/24 | 1140 | 536(26) | 0(26) | 11.7 |
| 1320 6/24<br>1330 7/1 | 1140 | 352(48) | 2(48) | 7.7 |
| 1330 7/1<br>1320 7/8 | 1140 | 130(49) | 1(49) | 2.8 |
| 1320 7/8<br>1250 7/15 | 1140 | 384(50) | 2(50) | 8.4 |
| 1250 7/15<br>1330 8/5 | 3425 | 552(48) | 0(48) | 4.0 |
| 1330 8/5<br>1320 8/12 | 1140 | 325(49) | 0(49) | 7.1 |
| 1320 8/12<br>1335 8/19 | 1140 | 271(47) | 0(47) | 5.9 |
| 1335 8/19<br>1400 8/26 | 1140 | 169(49) | 17(49) | 3.7 |

Air Samples, Off Site, LRL Livermore
(1) Location: Water Tank

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1400 8/26<br>1255 9/3 | 1296 | 183(49) | 17(49) | 3.5 |
| 1255 9/3<br>1300 9/9 | 976 | 227(50) | 0(50) | 5.8 |
| 1300 9/9<br>1320 10/14 | 4560 | 999(48) | 27(48) | 5.4 |
| 1320 10/14<br>1240 10/21 | 1132 | 815(50) | 24(50) | 17.9 |
| 1240 10/21<br>1315 10/28 | 1148 | 1034(50) | 27(50) | 22.4 |
| 1315 10/28<br>1415 10/31 | 495 | 5420(93) | 36(93) | 27.2 |
| 1415 10/31<br>1010 11/1 | 136 | 720(73) | 19(73) | 13.1 |
| 1010 11/1<br>1220 11/18 | 1128 | 479(50) | 6(50) | 10.5 |

Air Samples, Off Site, LRL Livermore
(2) Location: Patterson Pass(Upper)

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1150 4/1<br>1450 4/8 | 1160 | 360(67) | 4(67) | 7.7 |
| 1450 4/8<br>1315 4/15 | 1132 | 728(48) | 13(48) | 16.0 |
| 1315 4/15<br>1250 4/22 | 1140 | 344(51) | 0(51) | 7.5 |
| 1250 4/22<br>1305 4/29 | 1140 | 327(48) | 2(48) | 7.1 |
| 1305 4/29<br>1230 5/6 | 1132 | 462(50) | 9(50) | 10.1 |
| 1230 5/6<br>1340 5/13 | 1148 | 345(50) | 5(50) | 7.5 |
| 1340 5/13<br>1210 5/20 | 1132 | 494(51) | 0(51) | 10.8 |
| 1210 5/20<br>1310 5/27 | 1148 | 168(51) | 0(51) | 3.6 |
| 1310 5/27<br>1400 6/3 | 1148 | 140(49) | 0(49) | 3.0 |
| 1400 6/3<br>1350 6/17 | 2280 | 363(50) | 6(50) | 4.0 |
| 1350 6/17<br>1345 6/24 | 1140 | 380(26) | 4(26) | 8.3 |
| 1345 6/24<br>1345 7/1 | 1140 | 324(49) | 0(49) | 7.1 |
| 1345 7/1<br>1340 7/8 | 1140 | 146(49) | 1(49) | 3.2 |
| 1340 7/8<br>1300 7/15 | 1132 | 580(49) | 0(49) | 12.7 |
| 1300 7/15<br>1345 7/22 | 1148 | 203(45) | 10(45) | 4.4 |
| 1345 7/22<br>1300 7/29 | 1132 | 158(50) | 0(50) | 3.5 |
| 1300 7/29<br>1345 8/5 | 1148 | 528(48) | 0(48) | 11.4 |
| 1345 8/5<br>1340 8/12 | 1140 | 401(49) | 5(49) | 8.7 |

Air Samples, Off Site, LRL Livermore
(2) Location: Patterson Pass(Upper)

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μc/M$^3$ |
|---|---|---|---|---|
| 1340 8/12<br>1350 8/19 | 1140 | 463(47) | 0(47) | 10.1 |
| 1350 8/19<br>1415 8/26 | 1140 | 205(49) | 33(49) | 4.9 |
| 1415 8/26<br>1310 9/3 | 1296 | 287(49) | 25(49) | 5.5 |
| 1310 9/3<br>1315 9/9 | 976 | 443(49) | 17(49) | 11.3 |
| 1315 9/9<br>1330 9/16 | 1140 | 211(49) | 10(49) | 4.6 |
| 1330 9/16<br>1330 9/23 | 1140 | 314(49) | 8(49) | 6.8 |
| 1330 9/23<br>1335 9/30 | 1140 | 216(49) | 41(49) | 4.7 |
| 1335 9/30<br>1340 10/7 | 1140 | 237(49) | 21(49) | 5.2 |
| 1340 10/7<br>1335 10/14 | 1140 | 226(48) | 25(48) | 4.9 |
| 1335 10/14<br>1300 10/21 | 1132 | 751(50) | 33(50) | 16.4 |
| 1300 10/21<br>1330 10/28 | 1140 | 1265(50) | 29(50) | 27.6 |
| 1330 10/28<br>1130 11/1 | 638 | 21135(52) | 102(52) | 82.2 |
| 1130 11/1<br>1410 11/4 | 509 | 601(49) | 17(49) | 29.3 |
| 1410 11/4<br>1420 11/11 | 1140 | 82(54) | 2(54) | 1.8 |
| 1420 11/11<br>1310 11/18 | 1132 | 589(50) | 36(50) | 14.1 |

Air Samples, Off Site, LRL Livermore
(3) Location: Patterson Pass **(Lower)**

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1200 4/8<br>1440 4/8 | 1153 | 406(67) | 4(67) | 8.7 |
| 1440 4/8<br>1325 4/15 | 1132 | 676(48) | 17(48) | 14.8 |
| 1325 4/15<br>1300 4/22 | 1140 | 300(50) | 0(50) | 6.5 |
| 1300 4/22<br>1315 4/29 | 1140 | 490(48) | 0(48) | 10.7 |
| 1315 4/29<br>1240 5/6 | 1132 | 491(50) | 15(50) | 10.8 |
| 1240 5/6<br>1350 5/13 | 1148 | 441(50) | 5(50) | 9.5 |
| 1350 5/13<br>1220 5/20 | 1132 | 530(51) | 0(51) | 11.6 |
| 1220 5/20<br>1320 5/27 | 1148 | 348(51) | 0(51) | 7.5 |
| 1320 5/27<br>1410 6/3 | 1148 | 140(49) | 0(49) | 3.0 |
| 1410 6/3<br>1400 6/17 | 2280 | 327(50) | 2(50) | 3.6 |
| 1400 6/17<br>1345 6/24 | 1140 | 392(26) | 0(26) | 8.5 |
| 1345 6/24<br>1350 7/1 | 1140 | 272(49) | 0(49) | 5.9 |
| 1350 7/1<br>1350 7/8 | 1140 | 174(49) | 3(49) | 3.8 |
| 1350 7/8<br>1315 7/15 | 1132 | 296(49) | 2(49) | 6.5 |
| 1315 7/15<br>1355 7/22 | 1148 | 135(45) | 0(45) | 2.9 |
| 1355 7/22<br>1310 7/29 | 1132 | 86(50) | 0(50) | 1.9 |
| 1310 7/29<br>1355 8/5 | 1148 | 208(48) | 0(48) | 4.5 |

Air Samples, Off Site, LRL Livermore
(3) Location: Patterson Pass(Lower)

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1355 8/5<br>1350 8/12 | 1140 | 233(49) | 9(49) | 5.1 |
| 1350 8/12<br>1345 8/19 | 1140 | 199(47) | 1(47) | 4.3 |
| 1345 8/19<br>1425 8/26 | 1148 | 209(49) | 21(49) | 4.5 |
| 1425 8/26<br>1315 9/3 | 1296 | 185(49) | 21(49) | 3.5 |
| 1315 9/3<br>1320 9/9 | 976 | 211(49) | 1(49) | 5.4 |
| 1320 9/9<br>1335 9/16 | 1140 | 158(49) | 41(49) | 3.4 |
| 1335 9/16<br>1335 9/23 | 1140 | 151(49) | 12(49) | 3.3 |
| 1335 9/23<br>1340 9/30 | 1140 | 160(49) | 29(49) | 3.5 |
| 1340 9/30<br>1330 10/7 | 1140 | 393(49) | 5(49) | 8.5 |
| 1330 10/7<br>1345 10/14 | 1140 | 145(48) | 18(48) | 3.2 |
| 1345 10/14<br>1310 10/21 | 1132 | 652(50) | 19(50) | 14.3 |
| 1310 10/21<br>1340 10/28 | 1140 | 949(50) | 24(50) | 20.6 |
| 1340 10/28<br>1140 11/1 | 638 | 698(52) | 79(52) | 27.2 |
| 1140 11/1<br>1400 11/4 | 502 | 438(49) | 9(49) | 21.6 |
| 1400 11/4<br>1430 11/11 | 1140 | 322(54) | 2(54) | 7.0 |
| 1430 11/11<br>1320 11/18 | 1132 | 339(49) | 1(49) | 7.4 |

Air Samples, Off Site, LRL Livermore
(4) Location: Altamont Pass

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1215 4/1<br>1510 4/8 | 1160 | 435(67) | 3(67) | 9.3 |
| 1510 4/8<br>1340 4/15 | 1132 | 732(48) | 10(48) | 16.1 |
| 1340 4/15<br>1310 4/22 | 1140 | 284(50) | 0(50) | 6.2 |
| 1310 4/22<br>1330 4/29 | 1140 | 477(48) | 7(48) | 10.4 |
| 1330 4/29<br>1250 5/6 | 1132 | 535(50) | 9(50) | 11.7 |
| 1250 5/6<br>1405 5/13 | 1148 | 405(49) | 0(49) | 8.7 |
| 1405 5/13<br>1230 5/20 | 1128 | 598(50) | 0(50) | 13.2 |
| 1230 5/20<br>1340 5/27 | 1148 | 396(51) | 0(51) | 8.5 |
| 1340 5/27<br>1420 6/3 | 1148 | 300(49) | 4(49) | 6.5 |
| 1420 6/3<br>1415 6/17 | 2280 | 151(50) | 0(50) | 1.6 |
| 1415 6/17<br>1400 6/24 | 1140 | 208(25) | 12(25) | 4.5 |
| 1400 6/24<br>1405 7/1 | 1140 | 244(49) | 2(49) | 5.3 |
| 1405 7/1<br>1405 7/8 | 1140 | 138(48) | 0(48) | 3.0 |
| 1405 7/8<br>1330 7/15 | 1132 | 392(49) | 2(49) | 8.6 |
| 1330 7/15<br>1410 7/22 | 1148 | 175(45) | 30(45) | 3.8 |
| 1410 7/22<br>1320 7/29 | 1132 | 162(50) | 6(50) | 3.5 |
| 1320 7/29<br>1410 8/5 | 1148 | 484(48) | 0(48) | 10.5 |

Air Samples, Off Site, LRL Livermore
(4) Location: Altamont Pass

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1410 8/5<br>1400 8/12 | 1140 | 285(49) | 5(49) | 6.2 |
| 1400 8/12<br>1405 8/19 | 1140 | 71(47) | 0(47) | 1.5 |
| 1405 8/19<br>1440 8/26 | 1148 | 261(48) | 25(48) | 5.6 |
| 1440 8/26<br>1330 9/3 | 1296 | 243(49) | 9(49) | 4.6 |
| 1330 9/3<br>1340 9/9 | 976 | 311(49) | 25(49) | 7.9 |
| 1340 9/9<br>1350 9/16 | 1140 | 240(49) | 38(49) | 5.2 |
| 1350 9/16<br>1345 9/23 | 1140 | 296(49) | 7(49) | 6.4 |
| 1345 9/23<br>1350 9/30 | 1140 | 176(49) | 29(49) | 3.8 |
| 1350 9/30<br>1350 10/7 | 1140 | 235(49) | 12(49) | 5.1 |
| 1350 10/7<br>1400 10/14 | 1140 | 325(48) | 20(48) | 7.1 |
| 1400 10/14<br>1330 10/21 | 1132 | 126(49) | 0(49) | 2.8 |
| 1330 10/21<br>1355 10/26 | 1140 | 2(50) | 0(50) | 0.0 |
| 1355 10/26<br>1155 11/1 | 638 | 16(52) | 5(52) | 0.6 |
| 1155 11/1<br>1420 11/4 | 509 | 1(49) | 1(49) | 0.0 |
| 1420 11/4<br>1340 11/18 | 1132 | 419(49) | 31(49) | 912[illegible] |

Air Samples, Off Site, LRL Livermore
(5) Location: Vasco Road

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μc/M$^3$ |
|---|---|---|---|---|
| 1230 4/1<br>1525 4/8 | 1160 | 330(65) | 3(65) | 7.0 |
| 1525 4/8<br>1400 4/15 | 1132 | 774(48) | 12(48) | 17.0 |
| 1400 4/15<br>1330 4/22 | 1140 | 216(50) | 0(50) | 4.7 |
| 1300 4/22<br>1350 4/29 | 1140 | 463(48) | 12(48) | 8.8 |
| 1350 4/29<br>1310 5/6 | 1132 | 496(50) | 37(50) | 10.9 |
| 1310 5/6<br>1420 5/13 | 1148 | 685(49) | 13(49) | 14.8 |
| 1420 5/13<br>1245 5/20 | 1128 | 446(50) | 4(50) | 9.8 |
| 1245 5/20<br>1405 5/27 | 1148 | 428(51) | 8(51) | 9.3 |
| 1405 5/27<br>1440 6/3 | 1148 | 256(49) | 0(49) | 5.5 |
| 1440 6/3<br>1430 6/17 | 2280 | 363(49) | 2(49) | 4.0 |
| 1430 6/17<br>1425 6/24 | 1140 | 296(24) | 0(24) | 6.4 |
| 1425 6/24<br>1425 7/1 | 1140 | 204(49) | 14(49) | 4.4 |
| 1425 7/1<br>1420 7/8 | 1140 | 94(48) | 21(48) | 2.1 |
| 1420 7/8<br>1355 7/15 | 1140 | 340(49) | 0(49) | 7.4 |
| 1355 7/15<br>1425 7/22 | 1148 | 175(45) | 6(45) | 3.8 |
| 1425 7/22<br>1340 7/24 | 1132 | 202(50) | 2(50) | 4.4 |
| 1340 7/24<br>1420 8/5 | 1148 | 324(48) | 4(48) | 7.0 |
| 1420 8/5<br>1420 8/12 | 1140 | 245(49) | 21(49) | 5.3 |

Air Samples, Off Site, LRL Livermore
(5) Location: Vasco Road

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M³ |
|---|---|---|---|---|
| 1420 8/12<br>1420 8/19 | 1140 | 291(47) | 0(47) | 6.3 |
| 1420 8/19<br>1455 8/26 | 1148 | 169(48) | 61(48) | 3.6 |
| 1455 8/26<br>1350 9/3 | 1296 | 231(48) | 29(48) | 4.4 |
| 1350 9/3<br>1350 9/9 | 976 | 283(49) | 37(49) | 7.2 |
| 1350 9/9<br>1405 9/16 | 1140 | 191(49) | 63(49) | 4.2 |
| 1405 9/16<br>1400 9/23 | 1140 | 252(49) | 47(49) | 5.5 |
| 1400 9/23<br>1405 9/30 | 1140 | 124(49) | 33(49) | 2.7 |
| 1405 9/30<br>1410 10/7 | 1140 | 349(49) | 93(49) | 7.6 |
| 1410 10/7<br>1410 10/14 | 1140 | 268(47) | 42(268) | 5.8 |
| 1410 10/14<br>1350 10/21 | 1140 | 835(49) | 38(49) | 18.2 |
| 1350 10/21<br>1410 10/28 | 1140 | 1229(50) | 45(50) | 26.7 |
| 1410 10/28<br>1210 11/1 | 638 | 3704(52) | 108(52) | 144.0 |
| 1210 11/1<br>1440 11/4 | 502 | 704(49) | 24(49) | 34.8 |
| 1440 11/4<br>1500 11/11 | 1140 | 501(54) | 2(54) | 10.9 |
| 1500 11/11<br>1355 11/18 | 1132 | 804(49) | 48(49) | 17.6 |

Air Samples, Off Site, LRL Livermore
(6) Location: F. C. C.

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1330 3/25<br>1540 4/8 | 1160 | 399(66) | 4(66) | 8.5 |
| 1540 4/8<br>1415 4/15 | 1132 | 628(48) | 47(48) | 13.7 |
| 1415 4/15<br>1380 4/22 | 1140 | 264(50) | 0(50) | 5.7 |
| 1380 4/22<br>1400 4/29 | 1140 | 334(47) | 8(47) | 7.3 |
| 1400 4/29<br>1320 5/6 | 1132 | 486(50) | 32(50) | 10.6 |
| 1320 5/6<br>1435 5/13 | 1148 | 441(49) | 41(49) | 9.5 |
| 1435 5/13<br>1300 5/20 | 1128 | 578(50) | 0(50) | 12.7 |
| 1300 5/20<br>1420 5/27 | 1148 | 460(50) | 12(50) | 9.9 |
| 1420 5/27<br>1450 6/3 | 1140 | 232(48) | 20(48) | 5.0 |
| 1450 6/3<br>1445 6/17 | 2280 | 479(49) | 10(49) | 5.2 |
| 1445 6/17<br>1440 6/24 | 1140 | 372(25) | 24(25) | 8.1 |
| 1440 6/24<br>1440 7/1 | 1140 | 268(48) | 6(48) | 5.8 |
| 1440 7/1<br>1435 7/8 | 1140 | 142(48) | 21(48) | 3.1 |
| 1435 7/8<br>1405 7/15 | 1140 | 368(48) | 6(48) | 8.0 |
| 1405 7/15<br>1440 7/22 | 1148 | 171(45) | 10(45) | 3.7 |
| 1440 7/22<br>1350 7/29 | 1132 | 150(50) | 0(50) | 3.3 |
| 1350 7/29<br>1435 8/5 | 1148 | 404(48) | 10(48) | 8.7 |

Air Samples, Off Site, LRL Livermore
(6) Location: F. C. C.

| Sampling Period | Volume Cubic Meters | Net Counts er Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1435 8/5<br>1440 8/12 | 1140 | 313(48) | 21(48) | 6.8 |
| 1440 8/12<br>1435 8/19 | 1140 | 295(47) | 29(47) | 6.4 |
| 1435 8/19<br>1510 8/26 | 1148 | 241(48) | 109(48 | 5.2 |
| 1510 8/26<br>1400 9/3 | 1296 | 219(48) | 85(48) | 4.2 |
| 1400 9/3<br>1400 9/9 | 976 | 239(49) | 41(49) | 6.1 |
| 1400 9/9<br>1415 9/16 | 1140 | 288(49) | 277(49) | 6.3 |
| 1415 9/16<br>1410 9/23 | 1140 | 281(49) | 49(49) | 6.1 |
| 1410 9/23<br>1415 9/30 | 1140 | 212(49) | 157(49) | 4.6 |
| 1415 9/30<br>1420 10/7 | 1140 | 509(48) | 149(48) | 11.1 |
| 1420 10/7<br>1425 10/14 | 1140 | 445(47) | 219(47) | 9.7 |
| 1425 10/14<br>1405 10/21 | 1140 | 937(49) | 71(49) | 20.4 |
| 1405 10/21<br>1420 10/28 | 1140 | 1261(49) | 295(49) | 27.4 |
| 1420 10/28<br>1220 11/1 | 638 | 3519(51) | 218(51) | 137.0 |
| 1220 11/1<br>1455 11/4 | 502 | 616(48) | 50(48) | 30.5 |
| 1455 11/4<br>1510 11/11 | 1140 | 522(54) | 118(54) | 11.4 |
| 1510 11/11<br>1410 11/18 | 1132 | 657(49) | 34(49) | 14.8 |

Air Samples, Off Site, LRL Livermore
(7) Location: City Hall, Livermore

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | pc/M$^3$ |
|---|---|---|---|---|
| 1255 4/1<br>1315 4/8 | 1140 | 386(67) | 4(67) | 8.4 |
| 1315 4/8<br>1430 4/15 | 1128 | 1299(48) | 14(48) | 28.6 |
| 1430 4/15<br>1400 4/22 | 1140 | 312(49) | 0(49) | 6.8 |
| 1400 4/22<br>1410 4/29 | 1140 | 467(47) | 1(47) | 10.2 |
| 1410 4/29<br>1330 5/6 | 1132 | 580(50) | 13(50) | 12.7 |
| 1330 5/6<br>1445 5/13 | 1148 | 377(49) | 5(49) | 8.1 |
| 1445 5/13<br>1215 5/20 | 1128 | 306(49) | 0(49) | 6.7 |
| 1215 5/20<br>1435 5/27 | 1153 | 432(50) | 0(50) | 9.3 |
| 1435 5/27<br>1500 6/3 | 1140 | 240(48) | 0(48) | 5.2 |
| 1500 6/3<br>1510 6/17 | 2280 | 451(48) | 2(48) | 4.5 |
| 1510 6/17<br>1455 6/24 | 1140 | 388(25) | 0(25) | 8.4 |
| 1455 6/24<br>1455 7/1 | 1140 | 356(48) | 6(48) | 7.7 |
| 1455 7/1<br>1455 7/8 | 1140 | 70(48) | 5(48) | 1.5 |
| 1455 7/8<br>1425 7/15 | 1140 | 336(48) | 6(48) | 7.3 |
| 1425 7/15<br>1450 7/22 | 1140 | 79(44) | 0(44) | 1.7 |
| 1450 7/22<br>1400 7/29 | 1132 | 118(50) | 0(50) | 2.5 |
| 1400 7/29<br>1445 8/5 | 1148 | 180(47) | 10(47) | 3.9 |

Air Samples, Off Site, LRL Livermore
(7) location: City Hall, Livermore

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | μμc/M$^3$ |
|---|---|---|---|---|
| 1445 8/5<br>1440 8/19 | 2280 | 0(46) | 0(46) | 0.0 |
| 1440 8/19<br>1520 8/26 | 1148 | 129(48) | 11(48) | 2.8 |
| 1520 8/26<br>1420 9/3 | 1296 | 203(48) | 13(48) | 3.9 |
| 1420 9/3<br>1430 9/16 | 1140 | 512(48) | 17(48) | 11.1 |
| 1430 9/16<br>1425 9/23 | 1140 | 196(49) | 21(49) | 4.3 |
| 1425 9/23<br>1430 9/30 | 1140 | 152(48) | 17(48) | 3.3 |
| 1430 9/30<br>1435 10/7 | 1140 | 361(48) | 137(48) | 7.6 |
| 1435 10/7<br>1440 10/19 | 1140 | 113(47) | 17(47) | 2.5 |
| 1440 10/19<br>1430 10/21 | 1140 | 719(48) | 31(48) | 15.6 |
| 1430 10/21<br>1440 10/28 | 1140 | 1096(49) | 41(49) | 23.8 |
| 1440 10/28<br>1430 10/31 | 489 | 5449(73) | 56(73) | 276.0 |
| 1430 10/31<br>1240 11/1 | 149 | 746(51) | 34(51) | 124.0 |
| 1240 11/1<br>1510 11/4 | 502 | 598(48) | 23(48) | 29.5 |
| 1510 11/4<br>1420 11/8 | 2275 | 853(49) | 23(49) | 63.6 |

Air Samples, Off Site, LRL Livermore
(8) Location: Veterans Hospital

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1315 4/1<br>1345 4/8 | 1140 | 515(68) | 1(68) | 11.2 |
| 1345 4/8<br>1500 4/15 | 1128 | 723(47) | 6(47) | 15.9 |
| 1500 4/15<br>1420 4/22 | 1132 | 352(49) | 0(49) | 7.7 |
| 1420 4/22<br>1430 4/29 | 1140 | 437(47) | 7(47) | 9.5 |
| 1430 4/29<br>1455 5/6 | 1140 | 397(48) | 3(48) | 8.6 |
| 1455 5/6<br>1515 5/13 | 1140 | 105(48) | 1(48) | 2.3 |
| 1515 5/13<br>1345 5/20 | 1128 | 518(49) | 8(49) | 11.4 |
| 1345 5/20<br>1450 5/27 | 1148 | 368(50) | 0(50) | 7.9 |
| 1450 5/27<br>1515 6/3 | 1140 | 272(48) | 0(48) | 5.9 |
| 1515 6/3<br>1525 6/17 | 2280 | 451(48) | 2(48) | 4.9 |
| 1525 6/17<br>1510 6/24 | 1140 | 308(24) | 4(24) | 6.7 |
| 1510 6/24<br>1515 7/1 | 1140 | 300(48) | 2(48) | 6.5 |
| 1515 7/1<br>1505 7/8 | 1140 | 130(48) | 5(48) | 2.8 |
| 1505 7/8<br>1445 7/15 | 1140 | 416(48) | 2(48) | 9.0 |
| 1445 7/15<br>1502 7/22 | 1140 | 211(44) | 2(44) | 4.6 |
| 1502 7/22<br>1420 7/29 | 1132 | 122(49) | 0(49) | 2.7 |
| 1420 7/29<br>1500 8/5 | 1140 | 420(47) | 2(47) | 9.1 |

Air Samples, Off Site, LRL Livermore
(8) Location: Veterans Hospital

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1500 8/5<br>1510 8/12 | 1140 | 281(48) | 1(48) | 6.1 |
| 1510 8/12<br>1515 8/19 | 1140 | 267(46) | 0(46) | 5.8 |
| 1515 8/19<br>1540 8/26 | 1140 | 233(47) | 9(47) | 5.1 |
| 1540 8/26<br>1500 9/3 | 1296 | 243(47) | 9(47) | 4.6 |
| 1500 9/3<br>1440 9/9 | 976 | 259(48) | 5(48) | 6.6 |
| 1440 9/9<br>1500 9/16 | 1140 | 203(48) | 12(48) | 4.4 |
| 1500 9/16<br>1450 9/23 | 1140 | 17(48) | 2(48) | 0.4 |
| 1450 9/23<br>1500 10/7 | 2280 | 73(48) | 1(48) | 0.8 |
| 1500 10/7<br>1505 10/14 | 1140 | 6(47) | 2(47) | 0.1 |
| 1505 10/14<br>1455 10/21 | 1140 | 37(48) | 0(48) | 0.8 |
| 1455 10/21<br>1500 10/28 | 1140 | 40(49) | 0(49) | 0.9 |
| 1500 10/28<br>1300 11/1 | 638 | 526(51) | 3(51) | 20.4 |
| 1300 11/1<br>1530 11/4 | 502 | 25(48) | 0(48) | 1.2 |
| 1530 11/4<br>1535 11/11 | 1140 | 402(53) | 6(53) | 8.7 |
| 1535 11/11<br>1510 11/18 | 1140 | 522(48) | 19(48) | 11.4 |

Air Samples, Off Site, LRL Livermore
(9) Location: Mines Road

| Sampling Period. | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1420 4/1<br>1410 4/8 | 1140 | 360(66) | 0(66) | 7.8 |
| 1410 4/8<br>1540 4/15 | 1132 | 607(46) | 1(46) | 13.3 |
| 1540 4/15<br>1540 4/29 | 1140 | 279(47) | 6(47) | 6.1 |
| 1540 4/29<br>1520 5/6 | 1140 | 232(48) | 9(48) | 5.0 |
| 1520 5/6<br>1540 5/13 | 1140 | 313(48) | 13(48) | 6.8 |
| 1540 5/13<br>1450 5/20 | 1132 | 354(48) | 0(48) | 7.7 |
| 1450 5/20<br>1530 5/27 | 1148 | 228(49) | 4(49) | 4.9 |
| 1530 5/27<br>1610 6/3 | 1148 | 226(47) | 0(47) | 4.9 |
| 1610 6/3<br>1620 6/17 | 2280 | 391(48) | 10(48) | 4.3 |
| 1620 6/17<br>1610 6/24 | 1140 | 268(24) | 4(24) | 5.8 |
| 1610 6/24<br>1545 7/1 | 1140 | 412(47) | 0(47) | 9.0 |
| 1545 7/1<br>1610 7/8 | 1140 | 150(47) | 1(47) | 3.3 |
| 1610 7/8<br>1550 7/15 | 1140 | 476(47) | 2(47) | 10.4 |
| 1550 7/15<br>1600 7/22 | 1140 | 191(43) | 2(43) | 4.2 |
| 1600 7/22<br>1540 7/29 | 1140 | 122(48) | 0(48) | 2.7 |
| 1540 7/29<br>1545 8/5 | 1140 | 148(46) | 0(46) | 3.2 |

Air Samples, Off Site, LRL Livermore
(9) Location: Mines Road

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in Parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1545 8/5<br>1600 8/12 | 1140 | 313(47) | 1(47) | 6.8 |
| 1600 8/12<br>1535 8/19 | 1140 | 315(46) | 0(46) | 6.8 |
| 1535 8/19<br>1630 8/26 | 1148 | 269(47) | 17(47) | 5.8 |
| 1630 8/26<br>1550 9/3 | 1296 | 289(47) | 33(47) | 5.5 |
| 1550 9/3<br>1550 9/9 | 976 | 199(47) | 0(47) | 5.0 |
| 1550 9/9<br>1545 9/16 | 1140 | 225(47) | 10(47) | 4.9 |
| 1545 9/16<br>1535 9/23 | 1140 | 281(48) | 5(48) | 6.1 |
| 1535 9/23<br>1610 9/30 | 1148 | 117(47) | 9(47) | 2.5 |
| 1610 9/30<br>1610 10/7 | 1140 | 319(47) | 1(47) | 6.9 |
| 1610 10/7<br>1600 10/14 | 1140 | 384(46) | 16(46) | 8.3 |
| 1600 10/14<br>1555 10/21 | 1140 | 817(47) | 18(47) | 17.8 |
| 1555 10/21<br>1555 10/28 | 1140 | 1152(48) | 17(48) | 25.1 |
| 1555 10/28<br>1345 11/1 | 638 | 12745(50) | 65(50) | 495.0 |
| 1345 11/1<br>1605 11/4 | 502 | 601(48) | 11(48) | 29.7 |
| 1605 11/4<br>1610 11/11 | 1140 | 408(53) | 2(53) | 8.9 |
| 1610 11/11<br>1610 11/18 | 1140 | 486(47) | 7(47) | 10.6 |

Air Samples, Off Site, LRL Livermore
(10) Location: Site 300 C. P.

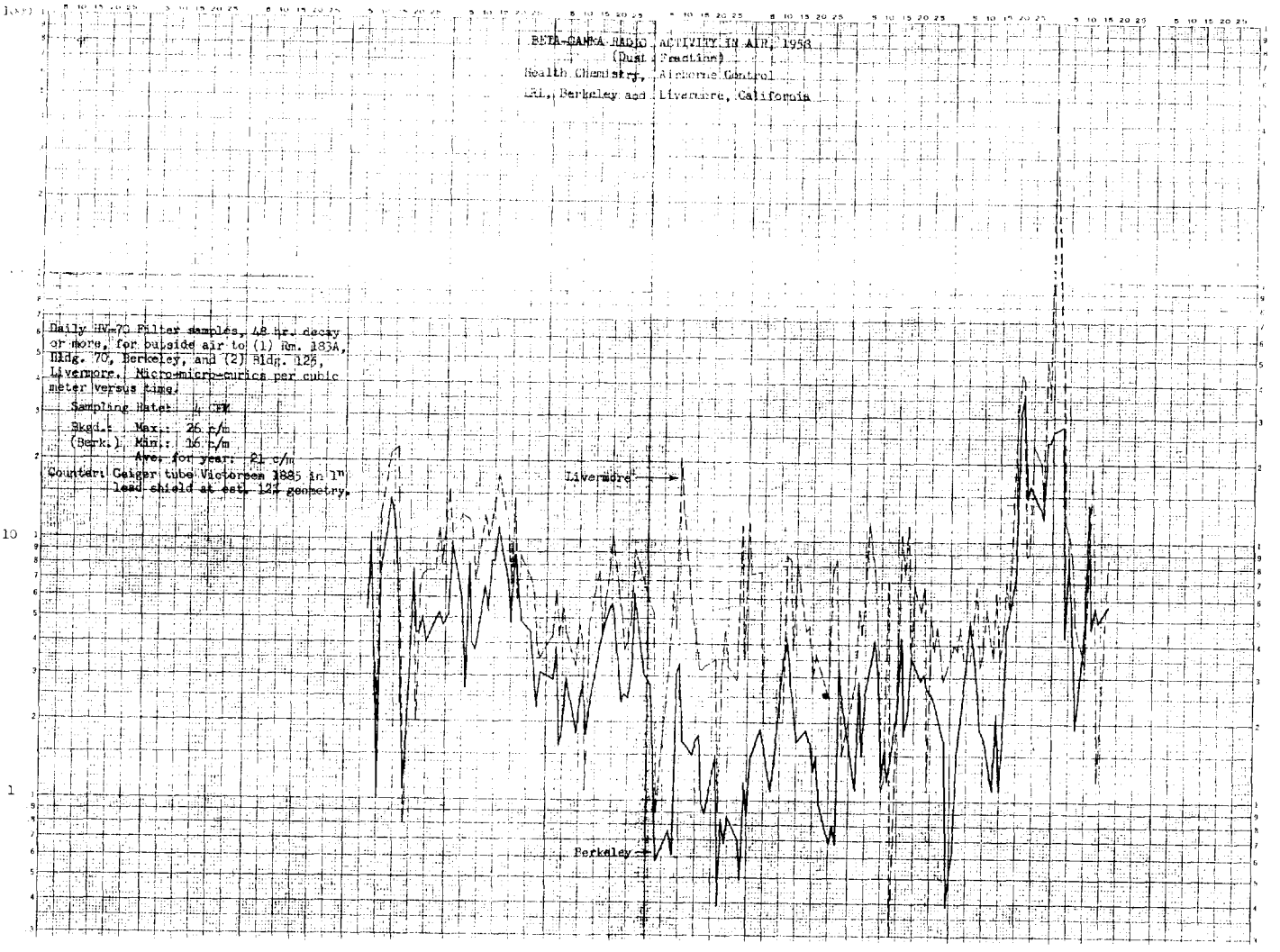
| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1030 4/2<br>1030 4/8 | 1140 | 168(120) | 0(120) | 3.7 |
| 1030 4/8<br>1100 4/16 | 1140 | 648(51) | 2(51) | 14.1 |
| 1100 4/16<br>1100 4/23 | 1140 | 296(52) | 0(52) | 6.4 |
| 1100 4/23<br>1000 4/30 | 1132 | 308(49) | 1(49) | 6.8 |
| 1000 4/30<br>1030 5/12 | 1128 | 395(51) | 17(51) | 8.7 |
| 1030 5/12<br>1030 5/21 | 1140 | 415(53) | 5(53) | 9.0 |
| 1030 5/21<br>1045 5/28 | 1140 | 157(123) | 0(123) | 3.4 |
| 1045 5/28<br>1115 6/4 | 1148 | 159(52) | 0(52) | 3.4 |
| 1115 6/21<br>1130 6/25 | 652 | 478(125) | 0(125) | 18.2 |
| 1130 6/25<br>1200 6/30 | 814 | 294(50) | 2(50) | 9.0 |
| 1200 6/30<br>1115 7/9 | 1296 | 303(47) | 0(47) | 5.8 |
| 1115 7/9<br>1115 7/16 | 1140 | 549(51) | 1(51) | 12.0 |
| 1115 7/16<br>1210 7/22 | 984 | 199(47) | 18(47) | 5.0 |
| 1210 7/22<br>1000 7/30 | 1290 | 502(52) | 0(52) | 9.6 |
| 1000 7/30<br>1045 8/6 | 984 | 247(51) | 3(51) | 6.2 |
| 1045 8/6<br>1100 8/13 | 1140 | 377(51) | 25(51) | 8.2 |

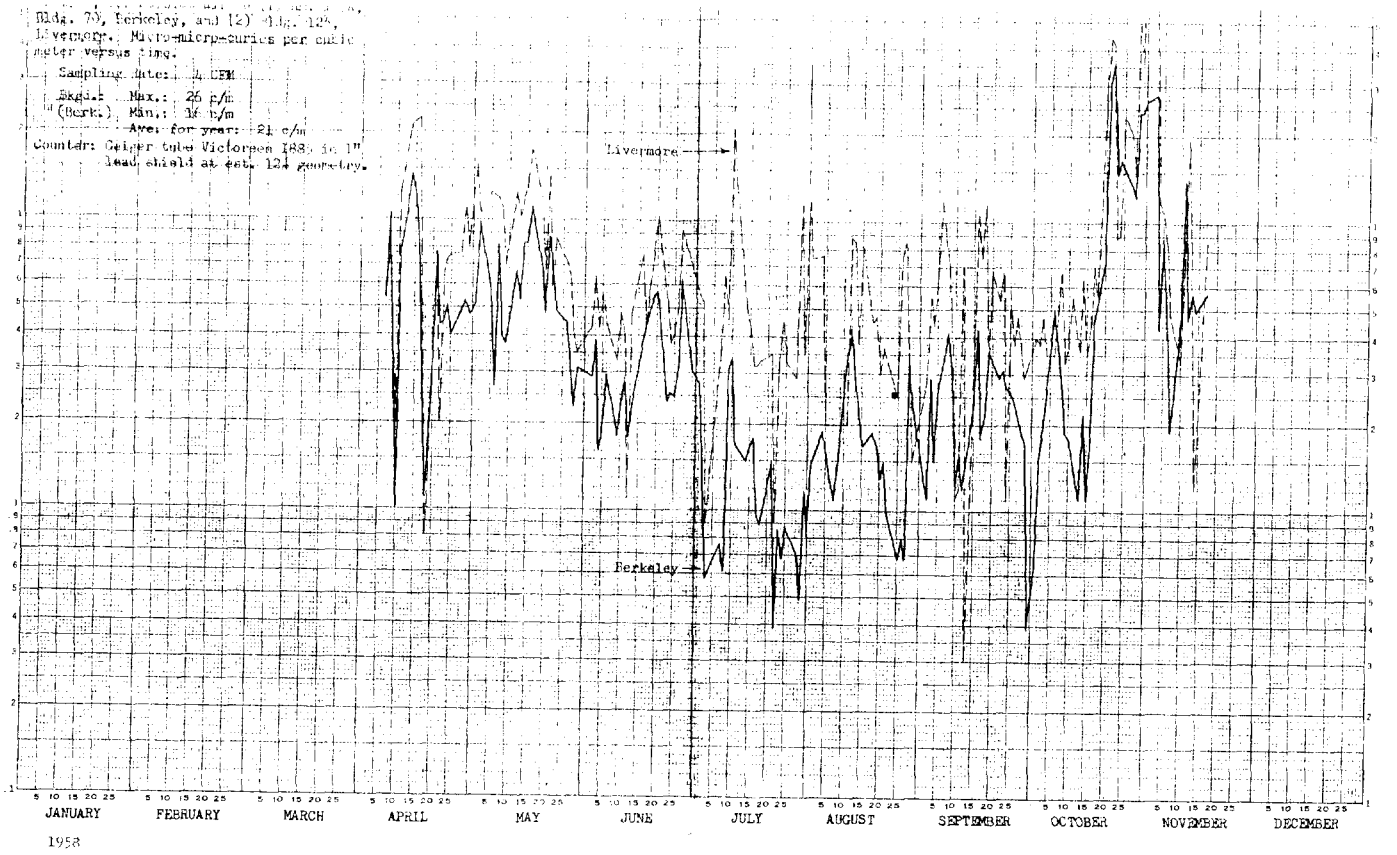
Air Samples, Off Site, LRL Livermore
(10) Location: Site 300 C.P.

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 1100 8/13<br>1200 8/26 | 2124 | 705(51) | 5(51) | 8.2 |
| 1200 8/26<br>1100 9/3 | 1302 | 19(51) | 5(51) | 0.4 |
| 1100 9/3<br>0400 9/4 | 149 | 46(53) | 6(53) | 7.6 |
| 0400 9/4<br>1900 9/9 | 814 | 239(53) | 13(53) | 7.3 |
| 1900 9/9<br>1030 9/16 | 1148 | 173(52) | 1(52) | 3.7 |
| 1030 9/16<br>1030 9/25 | 1465 | 283(52) | 6(52) | 4.8 |
| 1030 9/25<br>1050 9/30 | 814 | 72(52) | 0(52) | 2.2 |
| 1050 9/30<br>1330 10/7 | 1160 | 193(49) | 21(49) | 4.1 |
| 1330 10/7<br>1315 10/27 | 4340 | 1860(50) | 0(50) | 10.6 |
| 1315 10/27<br>1040 11/1 | 1120 | 10032(73) | 51(73) | 222.0 |
| 1040 11/1<br>0700 11/3 | 311 | 616(57) | 13(57) | 49.1 |
| 1030 11/4<br>1040 11/18 | 2280 | 625(360) | 0(360) | 6.8 |

Air Samples, Off Site, RL Livermore
(11) Location: Butte Field

| Sampling Period | Volume Cubic Meters | Net Counts Per Minute After Sampling Terminated (Figures in parentheses are hours decay) Combined Beta-Gamma | Alpha | $\mu\mu c/M^3$ |
|---|---|---|---|---|
| 0945 10/6<br>1215 10/7 | 180.1 | 33(50) | 9(50) | 4.5 |


BETA-GAMMA RADIO ACTIVITY IN AIR, 1958
(Dust Fractions)
Health Chemistry, Airborne Control
LRL, Berkeley and Livermore, California
Daily HV-70 Filter samples, 48 hr. decay or more, for outside air to (1) Rm. 183A, Bldg. 70, Berkeley, and (2) Bldg. 125, Livermore. Micro-micro-curies per cubic meter versus time.
Sampling Rate: 4 CFM
Skgd.: Max.: 26 c/m
(Berk.) Min.: 16 c/m
Ave. for year: 21 c/m
Counter: Geiger tube Victoreen 1885 in 1" lead shield at est. 12% geometry.
Livermore
Berkeley
10
1


Bldg. 70, Berkeley, and (2) Bldg. 124, Livermore. Micro-microcuries per cubic meter versus time.
Sampling Rate: 4 CFM
Bldg.: Max.: 26 c/m
(Berk.) Min.: 14 c/m
Ave. for year: 21 c/m
Counter: Geiger tube Victoreen 1883 in 1" lead shield at est. 124 geometry.
Livermore
Berkeley
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER

1958

RAIN SAMPLES, LRL BERKELEY

## Collection

From the period April 5, 1958 through October 18, 1958, rain was collected in ceramic enameled trays which were exposed outdoors for various lengths of time. Between 8 to 9 a.m. after a rainfall, the sample was collected. The trays were subsequently washed-out with tap water and reexposed outdoors.

For the period October 18 through November 15, a bag of 4 mil polyethylene was inserted into a galvanized iron drum with the edge of the bag folded over the lip of same. This presents a collection area of 1.78 sq. ft. After rainfall, the bag containing the sample was removed and replaced with a new bag. Bags were changed daily during the rainy season.

## Water Processing

The water sample is filtered through a Whatman 41H filter paper to remove the included dust and foreign debris. About 50 ml. distilled water is used to wash the filter paper*. A drop of conc. $HNO_3$ is added to the filtrate and the sample is then evaporated to dryness over a hot plate and/or a heat lamp. Care is taken to avoid bumping.

## β Counting

Counting is done with a 3 mg/cm$^2$ end window GM tube placed in a 1½" lead pig. Length of time for counting is random but varies from at least ½ hr. to several hours. Background of machine is taken prior to each days counting for a similar time period.

## Data Sheet

Column headings of the table below are described as follows:

"Raw beta-gamma c/m net"--- The net counts per minute from the GM tube, followed by the decay time in hours;

"d/m/l"--- 8% counter efficiency
95% material collection efficiency on the bottom of the beaker
90% conficence level

$$d/m/l = \frac{\text{net c/m}}{\text{volume (ml)}} \times 1.32 \times 10^4$$

"μc/ml"--- $\mu c/ml = d/m/l \times 4.55 \times 10^{-10}$

"μc/sq.ft." --- $\frac{\text{total } \mu c \text{ per sample}}{\text{collection area (1.75 sq.ft.)}}$

"inches of rain: --- $\frac{\text{total volume of collected sample}}{\text{collection area}}$

* an average of 18% is lost to this filter

RAIN SAMPLES

| Sample # | Period of Collection | Total Volume Collected (ml) | Volume Sample Processed (ml) | "Raw" Beta-Gamma c/m Net (and hours decay) | d/m/l x $10^3$ | μμc/l x $10^2$ | mc/sq. mi. | inches rain |
|---|---|---|---|---|---|---|---|---|
| 1 | 4/4/58 to 4/7/58 | * | 1000 | 186(24), 146(103) | 2.5±* | 11 | * | * |
| 2 | 5/11/58 to 5/12/58 | 400 | 400 | 31(32) | 1.0±* | 5 | 3 | .10 |
| 3 | 5/12/58 to 5/22/58 | 94 | 94 | 213(3), 145(121), 133 (176), 106(271), 82(482) | 30. ±5 | 137 | 19 | .02 |
| 4 | 5/22/58 to 5/23/58 | 2410 | 1000 | 185(8), 162(96), 155 (152), 140(248), 118 (458) | 2.5±.4 | 11 | 16 | .22 |
| 5 | 5/23/58 to 6/2/58 | 194 | 194 | 37(6) | 2.5±.4 | 11 | 3 | .05 |
| 6 | 6/2/58 to 6/9/58 | 1024 | 1000 | 75(53) | 1.0±.2 | 5 | 8 | .25 |
| 7 | 6/9/58 to 7/16/58 | 40 | 40 | 28(6) | 9.2±2 | 42 | 3 | .01 |
| 8 | 7/16/58 to 8/8/58 | 259 | 259 | 313(7) | 16. ±3 | 73 | 30 | .06 |
| 9 | 8/8/58 to 9/22/58 | 90 | 90 | 30(208) | 4.4±1 | 20 | 3 | .02 |
| 10 | 9/22/58 to 9/23/58 | 276 | 276 | 13(216) | 0.6±.2 | 3 | 1 | .07 |
| 11 | 9/23/58 to 10/18/58 | 1790 | 1350 | 48(96) | 0.5±.2 | 2 | 6.5 | .03 |

* Insufficient Data

| Sample # | Period of Collection | Total Volume Collected (ml) | Volume Sample Processed (ml) | "Raw" Beta-Gamma c/m Net (and hours decay) | d/m/l x $10^3$ | μμc/l x $10^2$ | mc/sq. mi. | inches rain |
|---|---|---|---|---|---|---|---|---|
| 12 | 10/18/58 to 11/10/58 | 534 | 534 | 289(7) | 7.1±1 | 32 | 30 | .12 |
| 13 | 10/31/58 to 11/10/58 | 504 | 454 | 139(8) | 4.0±.6 | 18 | 14 | .12 |
| 14 | 11/13/58 to 11/14/58 | 198 | 198 | 23(8) | 1.6±.6 | 7 | 7.2 | .05 |

TAP WATER SAMPLES, LRL, BERKELEY

Samples were taken daily at 0900 from east sink tap, room 208, Building 4, after letting water run for at least ten minutes.

One liter samples were evaporated to dryness and counted at least 7 hours on 3 mg/cm$^2$ end-window GM tubes.

Wide error spread is due to relatively high background on GM counters.

Calculations are similar to those employed on rainwater samples.

TAP WATER RADIOACTIVITY

| Date of Sample | d/m/liter Activity | Date of Sample | d/m/liter Activity |
|---|---|---|---|
| April 5, 1958 | 76±20 | May 26, 1958 | 10± 6 |
| 6 | 50±18 | 27 | < 5 |
| 7 | 32±10 | June 2 | < 5 |
| 8 | 56±14 | 3 | 7± 5 |
| 9 | 86±20 | 4 | < 6 |
| 10 | 13± 8 | 5 | < 5 |
| 11 | 22± 8 | 6 | < 6 |
| 12 | 13± 9 | 9 | < 5 |
| 13 | 16± 7 | 10 | 18± 7 |
| 14 | 40±14 | 12 | 12± 5 |
| 15 | 6± 6 | 13 | 7± 5 |
| 16 | 22± 6 | 16 | < 5 |
| 17 | 45±13 | 17 | 9± 5 |
| 18 | 29±13 | 18 | 13± 6 |
| 19 | 6± 6 | 19 | 14± 6 |
| 20 | 23± 9 | May 14 | 8± 5 |
| 21 | 22± 9 | 15 | < 6 |
| 22 | < 5 | June 20 | 49±11 |
| 23 | < 5 | 30 | 63±13 |
| 24 | 8± 7 | July 2 | 7± 5 |
| 25 | 12± 6 | 1 | 28± 8 |
| 29 | 8± 5 | 3 | 7± 5 |
| 30 | < 5 | 7 | 27± 8 |
| May 1 | 24± 5 | 15 | < 9 |
| 2 | < 3 | 16 | < 6 |
| 5 | < 5 | 22 | 6± 5 |
| 6 | 14± 6 | | |
| 7 | < 6 | Sampling Program Stopped | |
| 8 | < 5 | | |
| 9 | 14± 6 | | |
| 12 | < 5 | | |
| 13 | < 6 | | |
| 19 | < 3 | | |
| 20 | < 4 | | |
| 22 | < 4 | | |

TRAY AND CLOTH SAMPLES, LRL, BERKELEY

Two static-sampling devices are utilized for monitoring ambient outdoor air. These are trays and cloth screens.

A coated metal tray of 17" x 14" x 7/8" size is clamped on a plywood turntable. A vane on the table is the means of facing the same long side of the tray to the wind. No provision is made for retention or drainage of rain water. A cloth screen, open weave of fiberglass material, is mounted in an eight inch square frame underneath the turntable and just back of center. Thus the screen is always faced to the wind and is sheltered from all but driving rains.

Five sampling stations of one tray and screen each are widely spaced about the project. A sixth station is maintained for reference purposes approximately 70 miles north of San Francisco Bay at St. Helena. All samplers are mounted on five to eight foot high posts away from wind obstructions.

Periodically, the samplers are changed; the period varies with unrelated factors, such as available manpower and nuclear testing.

After 48-hour decay, processing of samples involves radioautographing the pans and screens, and in addition, instrument counting of the latter. Kodak type KK x-ray film size 16 7/8 x 13 7/8 is placed against the tray and/or screen for one-week exposure. The number of resultant "spots" on the developed film is taken as a measure of the activity. A "spot" is defined as that area bounded by the circumference of a circle (in which the darker portion just fades to the film background) which touches the four sides or overlaps the smallest square of a particular size graph paper.

The "spots" are counted on a back-illuminated glass plate covered with a graph paper. The various size graph papers used are as follows:

1) 10 x 10 to one-half inch, Keuffel and Esser #359-11L
2) 10 x 10 to inch, K & E #359-5DG
3) 5 x 5 to inch, K & E #359-2

A G.M. tube (see Daily Air Samples, LRL, Berkeley) is used to obtain the beta-gamma counts. A zinc-sulfide crystal is used to obtain the alpha counts.

Information prior to the reporting period is included in the data compilation below. This is done to give the reader a "feel" for the variability of the determinations; the method, after all, is considered in the exploratory stage.

For the purpose of this report much of the data has been compressed into averages, and only the total number of "spots" greater than 1/20" diameter considered.

| Sampling Period | TRAYS Radioautograph Avg. # Spots Per Sq. Meter Per Mo. Collection | CLOTH Radioautograph Avg. # Spots Per Sq. Meter Per Mo. Collection | SCREENS Radioactivity by Counting $c/m/m^2$ |
|---|---|---|---|
| 5/15/57 7/1/57 | 98 | 133 | 87 |
| 6/14/57 9/29/57 | 63 | 147 | 62 |
| 9/16/57 1/20/58 | 30 | 95 | 37 |
| 12/2/57 5/4/58 | 345 | 426 | 203 |
| 4/15/58 11/23/58 | 69 | * | 87 |

* Not Determined

GAMMA DETERMINATIONS OUTDOORS - 1958

All readings were taken 3' above ground primarily at the author's residence employing a "Nuclear" beta-gamma portable 33 mgm/cm$^2$ Geiger Survey Meter with probe shield closed.

| Date | mr/hr. | |
|---|---|---|
| 4/21 | 0.015 | |
| 4/22 | 0.015 | |
| 4/23 | .015 | |
| 4/24 | .010 | |
| 4/25 | .010 | |
| 4/26 | .010 | |
| 4/27 | .015 | |
| 4/28 | .012 | |
| 4/29 | .010 | |
| 4/30 | .015 | |
| 5/1 | .010 | |
| 5/2 | .010 | |
| 5/3 | .010 | |
| 5/4 | .015 | |
| 5/6 | .010 | |
| 5/7 | .010 | |
| 5/8 | .005 | |
| 5/9 | .012 | |
| 5/10 | .015 | |
| 5/11 | .010 | |
| 5/12 | .015 | |
| 5/13 | .010 | |
| 5/14 | .010 | |
| 5/15 | .010 | |
| 5/16 | .010 | |
| 5/17 | .015 | |
| 5/18 | .010 | |
| 5/19 | .010 | |
| 5/20 | .015 | |
| 5/21 | .015 | |
| 5/22 | .010 | Oakland |
| 5/23 | .010 | |
| 5/24 | .010 | |
| 5/25 | .010 | |
| 5/26 | .010 | |
| 5/27 | .012 | |
| 5/28 | .012 | |
| 5/29 | .01 | |
| 5/30 | .005 | |
| 5/31 | .01 | |
| 6/1 | .01 | |
| 6/2 | .01 | |
| 6/3 | .01 | |

| Date | mr/hr. |
|---|---|
| 6/4 | .01 |
| 6/5 | .01 |
| 6/6 | .01 |
| 6/7 | .005 |
| 6/8 | .01 |
| 6/9 | .025 |
| 6/10 | .015 |
| 6/11 | .01 |
| 6/12 | .01 |
| 6/13 | .015 |
| 6/14 | .015 |
| 6/15 | .015 |
| 6/16 | .010 |
| 6/17 | .015 |
| 6/18 | .015 |
| 6/19 | .015 |
| 6/20 | .010 |
| 6/21 | .010 |
| 6/22 | .015 |
| 6/23 | .010 |
| 6/24 | .020 |
| 6/25 | .015 |
| 6/26 | .010 |
| 6/27 | .010 |
| 6/28 | .015 |
| 6/29 | .015 |
| 6/30 | .015 |
| 7/1 | .010 |
| 7/2 | .015 |
| 7/3 | .010 |
| 7/4 | .010 |
| 7/5 | .010 |
| 7/6 | .015 |
| 7/7 | .010 |
| 7/8 | .010 |
| 7/9 | .015 |
| 7/10 | .010 |
| 7/11 | .015 |
| 7/12 | .010 |
| 7/13 | .010 |
| 7/14 | .015 |
| 7/15 | .005 |
| 7/16 | .005 |
| 7/17 | .010 |

| Date | mr/hr. | Date | mr/hr. |
|---|---|---|---|
| 7/18 | .015 | 8/14 | .010 |
| 7/19 | .010 | 8/15 | .010 |
| 7/20 | .010 | 8/16 | .010 |
| 7/21 | .010 | 8/17 | .010 |
| 7/22 | .010 | 8/18 | .010 |
| 7/23 | .005 | 8/19 | .015 |
| 7/24 | .015 | 8/20 | .010 |
| 7/25 | .010 | 8/21 | .010 |
| 7/26 | .010 | 8/22 | .010 |
| 7/27 | .010 | 8/23 | .010 |
| 7/28 | .015 | 8/24 | .010 |
| 7/29 | .010 | 8/25 | .010 |
| 7/30 | .010 | 8/26 | .010 |
| 7/31 | .020 | 8/27 | .010 |
| 8/1 | .015 | 8/28 | .010 |
| 8/2 | .010 | 8/29 | .010 |
| 8/3 | .010 | 8/30 | .010 |
| 8/4 | .015 | 8/31 | .010 |
| 8/5 | .015 | 9/1 | .010 |
| 8/6 | .010 | 9/2 | .010 |
| 8/7 | .010 | 9/3 | .010 |
| 8/8 | .010 | 9/4 | .010 |
| 8/9 | .010 | 9/5 | .010 |
| 8/10 | .010 | 9/6 | |
| 8/11 | .015 | 9/7 | no determinations |
| 8/12 | .010 | 9/8 | |
| 8/13 | .010 | | |