

The first group generally used 90 kvp machines or high speed films or both; in the long-exposure group, many had average exposure times of 3 seconds or longer. The middle group, comprising 55 percent of the total, used predominantly 65 kvp machines with mechanical timers and medium speed commercial film. The one-second average exposure of this group is considered reasonable. The use of high speed film would reduce exposure significantly, but the difference in radiographic image appears to present a fundamental objection to dentists who are accustomed to medium speed film.

The control of development factors such as solution quality was in most cases entrusted to a commercial supplier on a monthly basis. As shown in figure 2d, only 25 percent reported a development time of 4 minutes or more at room temperature. The other two groups, representing 75 percent of all facilities, are considered to be underdeveloping; in other words, they were overexposing to produce equivalent film density.

In continuance of the program it is proposed to:

- a. Evaluate mechanical timers for accuracy.
- b. Increase educational efforts to convince dentists of the value of proper dark-room procedures and equipment to reduce exposure times, including the use of faster film.

5. **Exposure Records.**—A very small percentage of facilities inspected could produce evidence of any cumulative radiation surveillance such as a film badge service. During the survey, limited exposure tests were made, revealing varying degrees of exposure. The re-

quirement for a film badge exists if 25 percent of the MPD (100 mr/wk average) is exceeded. Future plans include dose studies of personnel and areas, employing pocket chambers in the Division.

6. **Workload.**—The shielding requirements standards of Handbook 76 (1) establish workload figure of 800 ma-minutes for a dental installation. Only one facility in the City of Los Angeles approached this workload. Figures 2e and 2f show the distribution of workload in minutes per week and milliamp minutes per week, respectively. Approximately 60 percent of all facilities had a weekly workload below 15 ma-minutes, and only 7 percent exceeded 50 ma-minutes per week.

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## Environmental Levels of Radioactivity at Atomic Energy Commission Installations

### BETTIS ATOMIC POWER LABORATORY

Westinghouse Electric Corporation, Pittsburgh, Pennsylvania  
Last Half of 1961 and First Half of 1962

The Bettis Atomic Power Laboratory (BAPL), operated for the Atomic Energy Commission by Westinghouse Electric Corporation, was established in 1949. Since that time BAPL has been engaged in research and development work related to naval atomic propulsion systems and the central station atomic power reactor at Shippingport, Pennsylvania.

#### Liquid Radioactive Waste Disposal

The liquid effluent from the Laboratory is sampled continually, and a composite sample is collected and analyzed weekly. This effluent includes the discharge from the Laboratory storm drainage system so that it may include some activity from fallout. The average concentrations of gross radioactivity and strontium-90 are presented in table 1.

TABLE 1.—RADIOACTIVITY IN LIQUID WASTES

Type of activity	[Concentrations in $\mu\text{mc}/\text{liter}$ ]			
	Third quarter 1961	Fourth quarter 1961	Average calendar year 1961	First half 1962
Gross activity*	710 2.1	310 1.2	510 1.3	240 0.5
Strontium-90				

\*The environmental MPC for gross radioactivity in water is 2,000  $\mu\text{mc}/\text{liter}$  for  $^{137}\text{Cs}$ ,  $^{134}\text{Cs}$ ,  $^{131}\text{I}$ ,  $^{90}\text{Sr}$ ,  $^{90}\text{Y}$ ,  $^{60}\text{Co}$ ,  $^{132}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{132}\text{Xe}$ ,  $^{132}\text{Ba}$ ,  $^{132}\text{La}$ ,  $^{132}\text{Ce}$ ,  $^{132}\text{Pr}$ ,  $^{132}\text{Nd}$ ,  $^{132}\text{Pm}$ ,  $^{132}\text{Sm}$ ,  $^{132}\text{Eu}$ ,  $^{132}\text{Gd}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Zr}$ ,  $^{132}\text{Y}$ ,  $^{132}\text{Zn}$ ,  $^{132}\text{Ga}$ ,  $^{132}\text{Ge}$ ,  $^{132}\text{As}$ ,  $^{132}\text{Se}$ ,  $^{132}\text{Br}$ ,  $^{132}\text{Kr}$ ,  $^{132}\text{Rb}$ ,  $^{132}\text{Xe}$ ,  $^{132}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{132}\text{Sb}$ ,  $^{132}\text{Sn}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{132}\text{Es}$ ,  $^{132}\text{Fm}$ ,  $^{132}\text{Md}$ ,  $^{132}\text{No}$ ,  $^{132}\text{Lr}$ ,  $^{132}\text{Lu}$ ,  $^{132}\text{Hf}$ ,  $^{132}\text{Ta}$ ,  $^{132}\text{W}$ ,  $^{132}\text{Re}$ ,  $^{132}\text{Os}$ ,  $^{132}\text{Ir}$ ,  $^{132}\text{Pt}$ ,  $^{132}\text{Au}$ ,  $^{132}\text{Hg}$ ,  $^{132}\text{Tl}$ ,  $^{132}\text{Pb}$ ,  $^{132}\text{Bi}$ ,  $^{132}\text{Po}$ ,  $^{132}\text{At}$ ,  $^{132}\text{Rn}$ ,  $^{132}\text{Ac}$ ,  $^{132}\text{Th}$ ,  $^{132}\text{Pa}$ ,  $^{132}\text{U}$ ,  $^{132}\text{Np}$ ,  $^{132}\text{Pu}$ ,  $^{132}\text{Am}$ ,  $^{132}\text{Cm}$ ,  $^{132}\text{Bk}$ ,  $^{132}\text{Cf}$ ,  $^{13$

### Soil Sampling

Soil samples are collected at 11 sampling locations as shown in figure 1 during the second and fourth quarters each year. The fourth quarter 1961 average concentrations in soil based on the eleven samples were 84  $\mu\text{c } \alpha/\text{g}$  and 43  $\mu\text{c } \beta/\text{g}$ . Soil samples collected during

the first half of 1962 had average concentrations of 55  $\mu\text{c } \alpha/\text{g}$  and 35  $\mu\text{c } \beta/\text{g}$ .

### Previous coverage in Radiological Health Data:

Period	Issue
1959 and first quarter 1960	November 1960
Second quarter 1960	January 1961
Third and fourth quarters 1960	October 1961
First and second quarters 1961	April 1962

### Reported Nuclear Detonations

March 1963

Only one nuclear detonation was announced by the Atomic Energy Commission during the month of March 1963. Arbitrarily referenced by *Radiological Health Data* as test number

101, this test of low yield range was conducted underground at the Nevada Test Site. (Low yield range has been announced as being less than 20 kilotons yield.)

TABLE 1.—GROSS BETA ACTIVITY OF PARTICULATES IN AIR, RSN, JANUARY 1963

[Concentrations in  $\mu\text{c}/\text{m}^3$ ]

Station location	Number of samples	Maximum	Minimum	Average*
Alaska: Adak.....	29	9.5	<0.10	2.3
Anchorage.....	30	14	<0.10	3.9
Attu.....	31	31	<0.10	4.8
Fairbanks.....	23	11	0.63	4.2
Junesau.....	24	16	<0.10	3.5
Kodiak.....	17	26	<0.10	4.4
Nome.....	26	5.7	<0.10	2.3
Point Barrow Island.....	23	7.9	1.3	4.5
St. Paul Island.....	14	9.1	0.45	4.7
Ariz: Phoenix.....	29	25	5.2	15
Ark: Little Rock.....	22	16	1.7	9.8
Calif: Berkeley.....	30	22	0.58	10
Los Angeles.....	21	22	7.5	16
Denver.....	29	21	6.8	10
Hartford.....	30	11	0.66	6.9
Del: Dover.....	22	19	3.5	8.8
D.C.: Washington.....	21	14	1.1	6.7
Fla: Jacksonville.....	29	20	4.1	11
Miami.....	30	20	1.6	8.6
Atlanta.....	31	10	0.19	6.2
Agua.....	30	11	1.7	6.1
Hawaii: Honolulu.....	30	11	1.7	6.1
Bole.....	30	30	3.1	9.0
Springfield.....	29	30	9.4	6.6
Ind: Indianapolis.....	29	11	0.57	6.9
Iowa: Iowa City.....	25	5.4	0.99	4.5
Topeka.....	28	11	1.7	6.5
Ky: Frankfort.....	29	24	2.7	11
La: New Orleans.....	29	16	0.59	7.3
Maine: Augusta.....	31	12	1.5	6.3
Presque Isle.....	19	8.2	1.3	4.4
Md: Baltimore.....	22	12	0.45	5.4
Rockville.....	14	12	3.0	7.3
Mass: Lawrence.....	22	12	1.5	6.4
Worcester.....	22	30	4.8	10
Mich: Lansing.....	31	12	2.5	7.9
Minneapolis.....	29	9.1	1.8	6.2
Jackson.....	29	11	1.2	8.2
Pascagoula.....	21	18	2.0	9.0
Mo: Jefferson City.....	20	12	1.2	6.2
Mont: Helena.....	30	15	4.6	8.3
Neb: Lincoln.....	19	18	1.8	6.9
Nev: Las Vegas.....	25	35	4.6	17
N.H.: Concord.....	20	17	4.7	9.8
Trenton.....	31	18	0.91	7.3
N. Mex: Santa Fe.....	27	16	5.3	6.6
Albany.....	22	12	0.72	6.5
Buffalo.....	29	11	1.9	7.4
New York.....	15	7.7	2.1	6.3
N.C.: Gastonia.....	30	27	1.3	9.9
Harrisburg.....	30	18	3.8	7.9
Ohio: Cincinnati.....	21	11	1.8	6.7
Columbus.....	29	12	1.1	9.0
Painesville.....	30	16	1.4	7.7
Okla: Oklahoma City.....	30	12	2.7	7.0
Ponca City.....	30	4.2	1.4	8.8
Ore: Portland.....	27	23	1.2	11
Pa: Harrisburg.....	21	10	0.32	6.5
San Juan.....	22	5.6	1.1	8.1
P.R.: Providence.....	30	18	0.91	4.7
S.C.: Columbia.....	27	13	0.32	6.4
S. Dak: Pierre.....	29	9.7	2.8	6.0
Tenn: Nashville.....	28	16	2.1	6.7
Tex: Austin.....	31	16	1.9	8.7
El Paso.....	31	17	2.8	6.9
Utah: Salt Lake City.....	31	18	3.8	10
Vt: Burlington.....	31	15	2.0	8.2
Va: Richmond.....	30	11	0.5	6.5
Seattle.....	30	16	2.37	7.1
W. Va: Charleston.....	22	13	2.1	7.2
Wis: Madison.....	31	13	2.2	7.0
Wyo: Cheyenne.....	27	20	2.9	7.8
Network average.....				7.2

TABLE 2.—GROSS BETA ACTIVITY IN PRECIPITATION, RSN, JANUARY 1963

Station location	Average concentration ( $\mu\text{c}/\text{liter}$ )	Total deposition ( $\mu\text{c}/\text{m}^2$ )
Alaska: Adak.....	0	0
Anchorage.....	1,700	22
Attu.....	2,300	190
Fairbanks.....	1,500	98
Junesau.....	0	0
Kodiak.....	0	0
Nome.....	0	0
Point Barrow Island.....	0	0
St. Paul Island.....	0	0
Ariz: Phoenix.....	3,500	64
Ark: Little Rock.....	840	79
Calif: Berkeley.....	2,200	8.6
Los Angeles.....	2,400	120
Denver.....	2,400	120
Hartford.....	0	0
Del: Dover.....	3,000	96
D.C.: Washington.....	1,400	94
Fla: Jacksonville.....	1,400	94
Miami.....	2,200	27
Atlanta.....	0	0
Agua.....	0	0
Hawaii: Honolulu.....	2,700	9.8
Bole.....	2,300	7.5
Springfield.....	2,000	45
Ind: Indianapolis.....	0	0
Iowa: Iowa City.....	0	22
Topeka.....	0	55
Ky: Frankfort.....	4,800	180
La: New Orleans.....	1,300	120
Maine: Augusta.....	1,900	120
Presque Isle.....	2,100	2.4
Md: Baltimore.....	2,400	120
Rockville.....	1,300	140
Mass: Lawrence.....	2,400	120
Worcester.....	1,900	140
Mich: Lansing.....	2,400	78
Minneapolis.....	1,900	12
Jackson.....	2,000	14
Pascagoula.....	2,400	22
Mo: Jefferson City.....	2,400	22
Mont: Helena.....	2,400	22
Neb: Lincoln.....	0	0
Nev: Las Vegas.....	0	0
N.H.: Concord.....	3,400	18
Trenton.....	5,600	57
N. Mex: Santa Fe.....	520	9.8
Albany.....	510	10
Buffalo.....	0	0
New York.....	670	55
N.C.: Gastonia.....	2,800	15
Harrisburg.....	0	0
Ohio: Cincinnati.....	2,200	77
Columbus.....	3,700	220
Painesville.....	6,200	40
Okla: Oklahoma City.....	1,100	26
Ponca City.....	2,400	78
Ore: Portland.....	0	0
Pa: Harrisburg.....	440	120
San Juan.....	1,700	150
P.R.: Providence.....	0	0
S.C.: Columbia.....	7,400	12
S. Dak: Pierre.....	0	0
Tenn: Nashville.....	0	0
Tex: Austin.....	1,400	84
El Paso.....	11,000	24
Utah: Salt Lake City.....	5,900	100
Vt: Burlington.....	2,200	170
Va: Richmond.....	1,700	62
Seattle.....	2,700	68
W. Va: Charleston.....	3,800	49
Wis: Madison.....	780	17
Wyo: Cheyenne.....	1,700	8.6

\* Indicates no evaporated sample received.

### REFERENCE

(1) Radiation Surveillance Network: *Monthly Tabulation of Findings*, Division of Radiological Health, Public Health Service, Washington 25, D.C. (Distribution by official request).