

This report includes the significant findings of CETO Program 37, related to the distribution, characteristics, and biological availability of fallout debris originating from the Plumbbob Test Series (1957) at the Nevada Test Site.

The use of aerial radiometric survey was adapted to routine radiation surveys and greatly increased the detail, accuracy and distance of fallout pattern delineation. Isodose rate and time-of-arrival contour maps are presented for seven tower mounted and four balloon mounted shots along with the predominant particle size fraction on several arcs along each fallout pattern.

Studies clearly indicated that accumulation of radionuclides by mammals cannot be assessed only on the basis of dose rate measurements of the gamma radiation field. Radionuclides from radioactive fallout debris are assimilated by animals with the maximum degree of accumulation occurring not necessarily near ground zero.

Furthermore, within a distance of 10 to 400 miles from the Nevada Test Site, the plant foliage is a selective collector of small size fallout particles within the less than 44 micron fraction and is the primary source of radionuclides to foraging animals.

No significant accumulation of radionuclides through the root system of plants has been observed in this area during the sampling periods following fallout deposition.

Biological availability of fallout debris is strongly influenced by the distribution of fallout contamination and by the physical and chemical nature of the fallout material and its interaction with climatic, biotic, and edaphic factors.

The data suggest that the higher levels of Sr90 in the indigenous animals are associated with animals that were living in the early sequence of contamination, i. e., during and immediately after fallout, rather than with animals that were born later and merely lived in the contaminated environment.