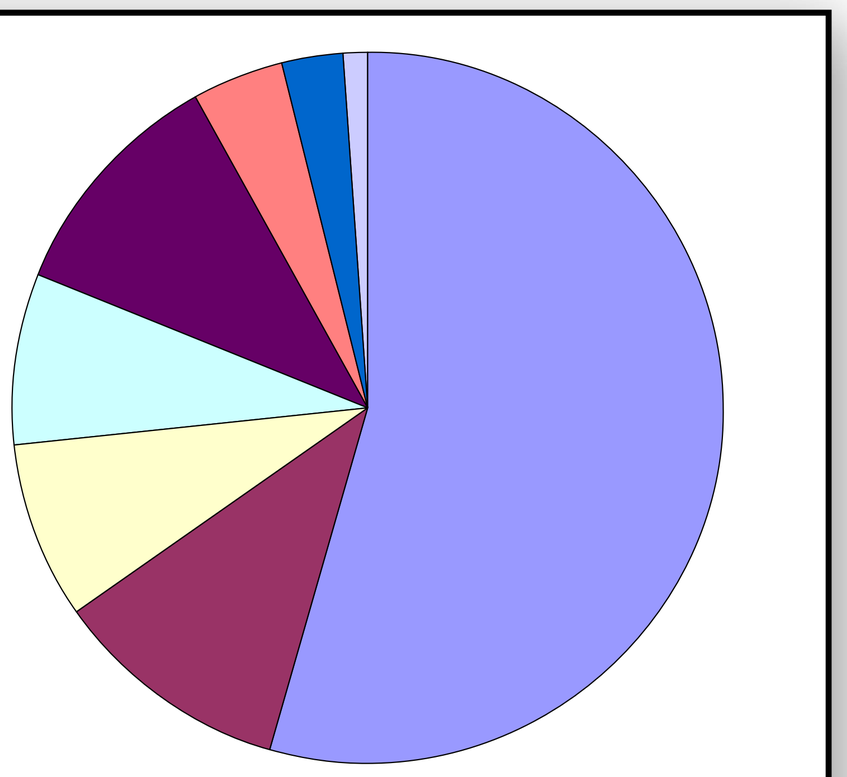
RADIATION BASICS

U.S. Army Corps of Engineers
St. Louis District



Exposure Due to Natural Sources

- Radon- 200mrem (55%)
- Inside Human Body- 40mrem (11%)
- Rocks & Soil- 28mrem (8%)
- Cosmic- 27mrem (8%)

Exposure Due to Human Activities

- Medical/Dental X-rays- 39mrem (11%)
- Nuclear Medicine- 14mrem (4%)
- Consumer Products- 10mrem (3%)
- Other (<1%)

Total Average Annual Exposure = 360mrem/year

Source: (NCRP) Report No. 93, 1987
National Council on Radiation Protection and Measurements

What is Radiation?

Radiation is all around us, all the time, everywhere. It is energy that travels in the form of unseen waves or particles.

Depending on how much energy it has, radiation can be:

- Non-ionizing (low energy) such as visible light and microwaves, or
- Ionizing (high energy) such as x-ray machines.

Ionizing radiation may be one of three types.

- Alpha particles can travel approximately one to two inches in air and can be blocked by a sheet of paper.
- Beta particles can travel 6-10 feet in air, but can be blocked by a few millimeters of substance (i.e. clothing, glass, plastic, aluminum.)
- Gamma rays can travel the farthest but may be stopped with lead or concrete.

How are we exposed to radiation?

The average American receives 300 millirem of radiation every year from natural sources. An additional 60 millirem per year is received from man-made sources, like x-rays.

At the IAAAP FUSRAP Sites, uranium is the primary radioactive contaminant. By testing the IAAAP FUSRAP sites, scientists assess what needs to be cleaned up, where and to what level to reduce the overall risk to human health and the environment.

Source of Exposure	Amount of Exposure
Average Cigarette Smoker (1 pack/day)	1300 mrem/year
Nuclear Medicine Examination of Brain	650 mrem/exam
Nuclear Medicine Examination of the Thyroid	509 mrem/exam
Upper Gastrointestinal Tract Series	245 mrem/exam
Nuclear Medicine Examination of the Lungs	150 mrem/exam
CT Scan of the Head and Body	110 mrem/exam
Dental X-ray	6 mrem/x-ray
Foods Grown with Phosphate Fertilizers	5 mrem/year
Highway and Road Construction Materials	4 mrem/year
Gas Mantles for Camping Lantern	2 mrem/year
Cross Country Airline Trip	1.5 mrem/year
Domestic Water Supply	1 to 6 mrem/year
Television Receivers	1 mrem/year
Eating Pound of Brazil Nuts	0.5 mrem/year
Sleeping with Spouse (or significant other)	0.1 mrem/year