



CDC Research Involving Radiation Releases from the Idaho National Laboratory

What is the Idaho National Laboratory?

The Idaho National Laboratory (INL) is on the upper Snake River Plain in the Arco Desert in southeastern Idaho, which is 4,900 feet above sea level. The 890-square-mile site spans Butte, Bingham, Bonneville, Clark, and Jefferson Counties.

The federal government used the site in the 1940s as a gunnery test range. In 1949, the Atomic Energy Commission designated the site as the National Reactor Testing Station (NRTS) to develop and test nuclear reactors and related facilities. The first nuclear fuel was brought to the site in 1951, and radioactive waste disposal and storage was begun in 1954.

The facility has been referred to as the Idaho National Engineering Laboratory (INEL) and the Idaho National Engineering and Environmental Laboratory (INEEL) during its operating history.

Were radioactive materials released from INL during its operating history?

In 1991, the Idaho National Engineering Laboratory completed a 3-year effort to evaluate historical releases of radioactive materials and potential doses to a hypothetical individual who may have resided at an off-site location with the highest concentration of airborne radionuclides (less significant pathways to off-site radiation doses were not fully evaluated). Airborne releases were highest from 1955 through 1965. The most important radionuclides were iodine-129 and -131, cesium-137, strontium-90, and noble gases including krypton-88. The body organs receiving the highest doses were the thyroid and the skin. However, the evaluation found that “radiation doses from airborne releases over the operating history of the INL were small compared to doses from natural background radiation,” and “the largest radiation doses were calculated for an infant in 1956 when the [effective dose equivalent](#) from operational and episodic releases was estimated to be 61 mrem.” (For comparison, a chest X-ray delivers a dose of about 20 mrem.) In that year, doses to infants, the most sensitive population, were twice as high as doses to adults.

The Idaho Department of Health and Welfare formed the Dose Evaluation Review and Assessment Advisory Panel to review the 1991 Historical Dose Evaluation and to make recommendations for future work. The advisory panel published its findings in 1993 and concluded that the following recommendations should be implemented for future activities to reconstruct doses from toxic exposures to workers and members of the public who were potentially affected by INL:

- Independent collection and verification of data
- Comparisons between modeled and monitored data
- Rigorous uncertainty analysis
- Quality assurance program for all data collection and analysis
- Dose reconstruction for all exposure pathways
- Dose reconstruction for both radiation and chemical exposure
- Future studies to include full public participation

What is CDC's role at INL?

CDC was asked to conduct a dose reconstruction study at this site in 1992. The purpose of this research was to identify the release of chemical and radioactive materials since the site opened and to determine the potential health effects of these releases on the community.

CDC and its contractors began by locating and cataloguing several thousand documents for use in calculating the extent of releases and exposures to the public. Since that time, CDC has completed a screening analysis of releases identified by the INL Environmental Dose Reconstruction document search to determine which contaminants and exposure pathways have the highest potential for affecting the public. CDC contractors, using the documents found in the first phase of the research, have listed in order of importance the chemicals and radionuclides released from INL over the years based on screening calculations for representative persons and exposure scenarios. Working with the INEEL Health Effects Subcommittee (which serves as a vehicle for the public and tribal nations to express concerns and to provide advice to CDC and ATSDR on the public health activities and research at INL), the results of these screenings have been used to develop dose reconstruction projects for a limited number of locations on site, contaminants, and years of release.

What are the findings of CDC's research?

In 2004, CDC contractors completed a dose reconstruction on two sources—the Aircraft Nuclear Propulsion Program Initial Engine Test series and the Idaho Chemical Processing Plant. These two sources represent the largest episodic and operational releases of radioisotopes, respectively, at INL. The study found that the calculated doses for these two sources were small and not sufficient to cause human health effects. It is unlikely that additional work would produce findings of larger exposures, nor result in reports of additional doses that would produce cumulatively large doses. CDC presented these findings to the INEEL Health Effects Subcommittee in August 2004. The reports for these studies are available on CDC's Radiation Studies Web site at http://www.cdc.gov/nceh/radiation/brochure/profile_ineel.htm.