How were people exposed?

Contaminants from Rocky Flats moved off the site through the air and water. The studies determined that breathing radioactive materials or chemicals was the primary way in which people living or working near the plant were exposed to these substances. The lung is the primary organ affected. Because plutonium moves from the lung to the liver and bone, these organs and bone marrow also can be affected. Researchers focused on determining the increased risk of developing cancer in these organs.

What were the potential cancer risks from exposure to these substances?

Because it is not feasible to determine the risk to each individual, researchers developed "exposure scenarios" representing people who may have lived or worked near the plant and who would have been exposed to releases from Rocky Flats. These "exposure scenarios" considered:

- Lifestyle (the amount of time the individual spent outdoors working or playing);
- When and how long the person lived near the facility during the key release events in 1957 and the late 1960s, or in the 1970s and later when there were fewer releases;
- Age and gender of the person; and,
- Where the person lived and worked in relationship to the plant.

Each scenario represents one individual. The scenarios were not designed to include all conceivable lifestyles of residents who lived in this area during the time of the Rocky Flats Plant operations. Rather, the scenarios serve as profiles of people who lived or worked in the area.

Exposure Scenarios

The individuals in the scenarios were organized according to occupational and non-occupational activities. Occupational activities include work, school and activities away from home. Non-occupational activities include time spent at home doing chores inside and outside, sleeping and leisure activities.

- **Laborer**
  Lived and worked outdoors in communities around the site.
- **Rancher**
- Spent most of the time outdoors, was physically active and lived in the area near Rocky Flats during its entire operational history.
- **Office Worker**
- Lived and worked in a sedentary job in communities near the site.
- **Housewife**
- Lived in communities near the plant.
- **Child**
- Grew up in communities near the plant.

The age of the individual and years during which exposure occurred were considered when calculating contaminant exposures and potential health risks. Each exposure scenario was divided into three types of activities: sleeping, non-occupational activity and occupational activity. For each activity, time spent at four different exercise levels was assigned. The exercise levels were resting, sitting (sedentary), light exercise and heavy exercise.

The scenarios are independent of location, which means that a particular scenario can be moved to different locations in the study area. As a result, the effect of location on the individual risk can be assessed. Cancer risks for the representative individuals were estimated in the project.

Cancer risks for the major releases (the 1957 and 1969 fires, re-distribution of plutonium from the 903 Area, releases of carbon tetrachloride) were calculated for each exposure scenario. These risk figures are available in the studies' technical reports. The following information describes the combined or cumulative cancer risk to a laborer living or working off-site from the major Rocky Flats releases included in these studies.