Summary Fact Sheets for Selected Environmental Contaminants to Support Health Risk Analyses



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These fact sheets were developed for the U.S. Department of Energy (DOE) Richland Operations Office, to support Hanford's System Assessment Capability Team, and for the DOE Chicago Operations Office, to serve as a general resource for those working in environmental programs. These sheets provide health-related information for contaminants present at many sites due to past operations and disposal activities, and they are geared toward an audience familiar with basic risk concepts. Their intent is to provide an overview context for the health risk analyses that guide long-term environmental management plans.

Twenty-six radionuclide-specific fact sheets have been prepared:

- Americium
- Cadmium
- Carbon-14
- Cesium
- Chlorine
- Cobalt
- Curium
- Europium
- Iodine
- Krypton
- Neptunium
- Nickel
- Plutonium
- Potassium-40
- Protactinium
- Radium
- Samarium
- Selenium
- Strontium
- Technetium
- Thorium
- Tin
- Tritium
- Uranium
- Depleted uranium (DU) *complements uranium sheet*
- Zirconium

Four companion fact sheets presenting basic radiological concepts have also been prepared:

- Ionizing radiation
- Natural decay series (radium, thorium, and uranium)
- Transuranic radionuclides and decay series (plutonium and others)
- Radioactive properties, internal distribution, and risk coefficients

Several of the radiological fact sheets also include information for chemical toxicity, notably the summaries for cadmium, chlorine, nickel, selenium, strontium, and uranium. In addition to the set of radiological fact sheets, twelve chemical-specific fact sheets have been prepared covering seven nonradioactive metals, four organic compounds, and an ion set:

- Arsenic
- Beryllium
- Chromium
- Copper
- Lead *(includes link to radiological information)*
- Mercury
- Zinc
- Carbon tetrachloride
- Chloroform
- Trichloroethane
- Trichloroethylene
- Nitrate/nitrite

These forty-two fact sheets are provided in alphabetical order in this report except DU, which follows the general sheet for uranium. Each contaminant-specific sheet presents brief information on:

- Key properties, origin, and use
- General environmental levels
- Distribution in the body
- Primary health effects
- Values for estimating risk

Additional information provided separately includes a summary of radionuclide morbidity and mortality risk coefficients for key isotopes (Table 1), a summary of the radioactive properties of these isotopes (Table 2), source references for the radiological fact sheets (Table 3), and an illustration of radionuclide distribution in the body (Figure 1). For the chemicals, parallel information (chemical toxicity values, illustration of organs affected, and references) is included within the individual fact sheets. Also included in this report are illustrations of relative radiological and chemical toxicities (Figures 2 through 9).