



## Environmental Restoration

### Overview

Nearly 40 years of nuclear weapons production at Rocky Flats, approximately 15 miles northwest of downtown Denver, left behind an environmental legacy that includes thousands of cubic meters of radioactive and hazardous wastes, contaminated facilities, and areas of environmental contamination. Weapons production was halted in 1989; today Rocky Flats is a Superfund Cleanup Site with a mission to clean up and close down the 6,300-acre facility.

A major part of the work to be done to close Rocky Flats involves restoration of the environment. Analysis indicates that elevated levels of plutonium, uranium, and other metals of concern have been found in the environment at Rocky Flats, and that chemical contamination from solvents, degreasers, and paint thinners such as carbon tetrachloride, trichloroethylene and tetrachloroethylene, has also been detected.

In all, Rocky Flats has more than 380 areas of suspected environmental contamination which must be analyzed and closed out. The majority of these are minor and are expected to be closed out with no further action following appropriate investigation and sampling. Some cleanup actions are expected to be required at 134 sites. Already, the Kaiser-Hill Team has cleaned up many of the top 20 highest priority sites, including Ryan's Pit, a former

chemical dump site; Trenches 3 and 4, former waste burial areas; the Mound, a former waste drum burial site; Trench 1, a former depleted uranium disposal site; several former process tanks; and others.

### Environmental Restoration

Environmental restoration, or cleanup, involves the removal or containment of contamination in the environment. This is done to eliminate potential pathways for public exposure. One of the most common forms of environmental restoration is the excavation of contaminated soils using heavy equipment. The soil is then either treated to remove the contaminants or disposed of as waste at a permitted disposal facility. Other forms include in-the-ground or in-place treatment of contaminated soils or groundwater, or the construction of barriers to contain contaminants.

### Protective of Future Uses

The cleanup of Rocky Flats is being conducted in accordance with a regulatory agreement known as the Rocky Flats Cleanup Agreement. Signed by the U.S. Department of Energy, the U.S. Environmental Protection Agency and the Colorado Department of Public Health and Environment, this agreement calls for Rocky Flats to be cleaned up to a level to support primarily future open space and some limited industrial uses, and to protect

surface water leaving the site for any and all uses. Ultimately, specific future land use decisions will be made by appropriate government entities once cleanup is complete.

**Cleanup Strategy**

The key tenets of the environmental restoration program at Rocky Flats are to:

- 1) **PRIORITIZE:** Address the areas of highest risk first. Contamination areas have been prioritized based on risk to ground water, surface water, the environment, and the public.
- 2) **ACCELERATE:** Where possible, safely accelerate work to reduce risks as quickly and cost-effectively as possible.
- 3) **PROTECT:** Cleanup will be conducted to a level that is protective of future uses defined by the Rocky Flats Cleanup Agreement.
- 4) **SAFELY CONTROL:** Because of the delicate nature of work involving the removal of contaminants from the environment, great care is taken to ensure that adequate planning and protective measures are in place for the safety of the workers, the public, and the environment. Protective measures include project-specific air monitoring; the use of protective clothing and respiratory protection for workers; designation of project exclusion areas and safety points at which work must be stopped; dust suppression; and extensive Health and Safety Planning documents for every project.
- 5) **APPLY TECHNOLOGY:** In an effort to meet the challenges of environmental restoration, cleanup workers at Rocky Flats are using proven treatment and restoration techniques, including the use of a low-temperature process to remove chemical contaminants from soils, avoiding costly waste disposal; and the use of polyurethane foam to stabilize former underground process waste storage tanks.

Environmental cleanup is one of the key project elements for the closure of Rocky Flats. Rocky Flats has an extensive environmental stewardship program to ensure the protection of the public, the workers, and the environment in doing the important work at the site and doing it safely.

**TOP 20 RISK CLEANUP AREAS AT ROCKY FLATS**

- 1 Ryan's Pit, former chemical dump site (COMPLETE)
- 2 Trench 1, former depleted uranium waste burial site (COMPLETE)
- 3 Trench 3, former waste burial site (COMPLETE)
- 4 Trench 4, former waste burial site (COMPLETE)
- 5 Mound, former waste drum burial site (COMPLETE)
- 6 903 Pad and Lip Area, former waste drum storage area (INVESTIGATION UNDER WAY)
- 7 East Trenches Plume, area of ground water contamination (CLEANUP UNDER WAY)
- 8 Tanks 9 and 10 (INTERIM ACTION COMPLETE\*)
- 9 Mound Plume (COMPLETE)
- 10 Tank 40 (INTERIM ACTION COMPLETE\*)
- 11 Process Waste Tank T-14 (INTERIM ACTION COMPLETE\*)
- 12 Process Waste Tank T-16N (INTERIM ACTION COMPLETE\*)
- 13 Tanks 2 and 3 and Underground Concrete Tanks (INTERIM ACTION COMPLETE\*)
- 14 Solar Ponds
- 15 Solar Ponds Plume (PLANNED FOR 1999)
- 16 903 Pad and Ryan's Pit Plume (PLANNED FOR 1999)
- 17 Carbon Tetrachloride Plume (NATURAL ATTENUATION MONITORING)
- 18 881 Hillside Plume (RECORD OF DECISION IN PROCESS)
- 19 Industrial Area Plume
- 20 Tank T-29

*\* Interim Action Complete means that actions have been taken to stabilize, control, or mitigate the hazards of concern, but that the final close out has not been completed.*



U.S. Department of Energy

**Make It Safe. Clean It Up. Close It Down.**



*For further information about Rocky Flats*

Contact DOE Communication at (303) 966-6088, or Kaiser-Hill Communication at (303) 966-2882, or toll free at (800) 269-0157 (press \*82882# when you hear the automated attendant)

Also, additional information about Rocky Flats is available on the internet at: <http://www.rf.doe.gov>