

## BIOGRAPHICAL INFORMATION

### JOHN E. BAUBLITZ

John ("Jack") Baublitz is the Associate Deputy Assistant Secretary for Environmental Restoration at the U.S. Department of Energy (DOE). He is responsible, under the Deputy Assistant Secretary, for day-to-day management of the Department's nation-wide program for cleanup of contaminated sites and facilities resulting from past operations of the Department and its predecessors. He has been involved in management of environmental restoration or cleanup programs at the Department since 1982.

From 1976 to 1982, Mr. Baublitz served in the DOE Magnetic Fusion Energy Program, with management responsibilities during the last four of those years for conducting conceptual design studies of fusion power reactors and for developing fusion power reactor engineering subsystems. He also worked for two years as a reactor safety specialist with DOE's predecessor agencies.

During his Federal service, Mr. Baublitz has received numerous performance and special achievement awards, and, in 1986, he was awarded the DOE Meritorious Service Award (Silver Medal).

Prior to joining the Federal Government, Mr. Baublitz was employed from 1968 to 1974 at Argonne National Laboratory. At Argonne, he served as Reactor Facility Manager for the JANUS and CP-5 research reactors. His early professional experience was in the Naval Nuclear Power Program in which he served in various engineering assignment, including Chief Engineer, on three nuclear submarines.

Mr. Baublitz graduated from Yale University in 1960 with a Bachelor's degree in Chemical Engineering.

## **BIOGRAPHICAL INFORMATION**

### **ALBERT R. CHERNOFF**

In October 1992, Albert R. Chernoff was assigned as the Project Manager for the Uranium Mill Tailings Remedial Action Project. In that capacity he has overall responsibility for managing the planning, remedial action, and licensing of 24 inactive uranium mill tailings sites in nine states across the U.S. This environmental restoration project has completed ten sites with construction of engineered disposal cells isolating the tailings from the environment for design life times of 200-1000 years. From June 1988 to October 1991, Al served as the Area Manager for the Kirtland Area Office within the DOE's Albuquerque Field Office, with responsibility for Sandia National Laboratories, ITRI and Ross Aviation. Other assignments within the DOE's Albuquerque Field Office have been Director, Information Management Division for DOE from 1985 until June 1988, Chief of the Finance and Budget Divisions, and Program Analyst in the Office of Strategic Planning and Analysis.

Al serves as Commander in the Naval Reserves in a Defense Attache Unit assigned to the Defense Intelligence Agency (DIA). He is designated as an Assistant Naval Attache to Mexico. He completed his undergraduate degree at the University of New Mexico in Accounting with an emphasis in computers and completed his Masters under an ERDA fellowship at UNM earning a masters in Public Administration in Public Science Policy.

Al lives in Albuquerque with this wife and children.

## **BIOGRAPHICAL INFORMATION**

### **HOWARD ROITMAN**

Howard Roitman has been with the Colorado Department of Health for five years. He was originally hired to manage the UMTRA Program in 1987. In 1988, he became Chief of Remedial Programs in the Hazardous Materials and Waste Management Division. In that capacity, he is responsible for Colorado's participation in the federal Superfund program, technical and policy direction of natural resource damage litigation, as well as the UMTRA Program.

Howard is an attorney by training, having graduated from Yale Law School in 1973. Since 1978, he has held various positions in environmental regulation and management for the federal and state government, as well as in the private sector.

## REMEDIAL ACTION

# BRIEFING PAPER GUNNISON, COLORADO, URANIUM MILL TAILINGS REMEDIAL ACTION (UMTRA) PROJECT GROUNDBREAKING CEREMONY JULY 30, 1992

## BACKGROUND

The July 30, 1992, groundbreaking ceremony for the cleanup of the former Kermac Nuclear Fuels Corporation uranium mill site marks another major milestone in the ongoing cleanup of uranium mill tailings under the U.S. Department of Energy's (DOE) Uranium Mill Tailings Remedial Action (UMTRA) Project.

The Gunnison uranium mill site was authorized for remedial action under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Title I of the UMTRCA established a program to clean up and dispose of tailings and related contamination at 24 inactive uranium processing sites across the country and provided a means for federal and state funding of the cleanup efforts. Under UMTRCA, the DOE and the state of Colorado entered into a cooperative agreement to clean up nine sites in Colorado, including the Gunnison site. Cleanup of these sites is cost-shared between the DOE and the state on a 90/10 percent basis. The cleanup plan for Gunnison was developed with the concurrence of the state and the U.S. Nuclear Regulatory Commission (NRC). The goal is to meet U.S. Environmental Protection Agency standards for protection of human health and the environment.

## SITE LOCATION AND HISTORY

The Gunnison mill site is a 25-hectare (61-acre) tract located southwest of the city of Gunnison and adjacent to the Gunnison airport (see attached location map). There are an estimated 547,200 cubic meters (720,000 cubic yards) of tailings and other contaminated materials at the site (see attached detail map). The city and the site are located in the valley of Gunnison River at an elevation of 2,300 meters (7,600 feet) and are surrounded by mountains rising to 3,650 meters (12,000 feet).

The mill was owned and operated by the Gunnison Mining Company from 1958 to 1961. Gunnison Mining Company merged with Kermac Nuclear Fuels Corporation, a wholly owned subsidiary of Kerr-McGee Oil Industries, in late 1961. Kermac operated the mill until it closed in 1962. In August 1973, the property was purchased by a limited partnership: Clarence A. Decker and N. Marcus Bishop, both of Denver, Colorado. The state acquired the site in December 1990.

## **REMEDIAL ACTION**

The cleanup plan is to consolidate and remove all contaminated materials associated with the Gunnison processing site to a permanent disposal site six miles east of Gunnison. This site is approximately one-half mile south of the Gunnison County landfill.

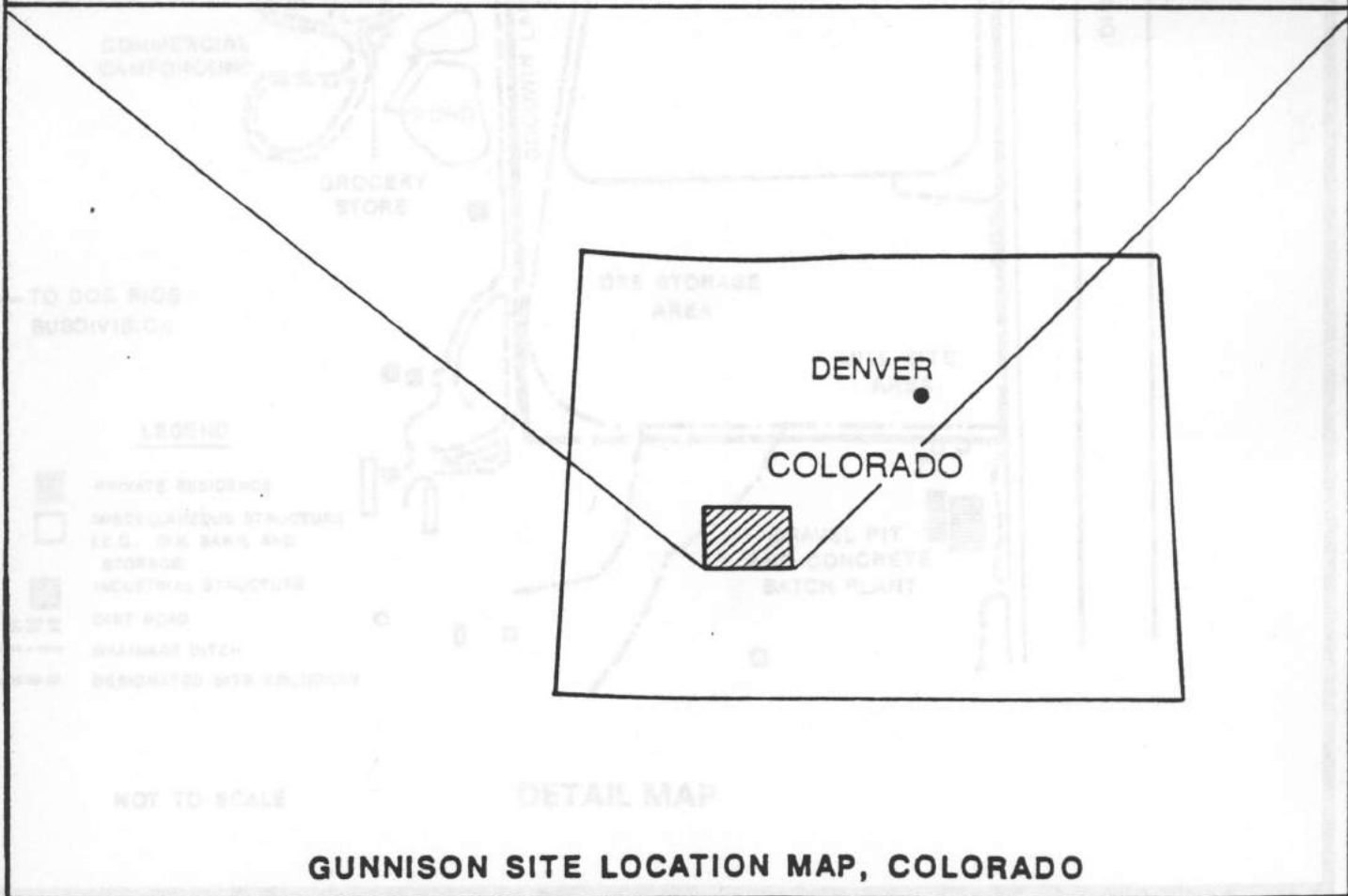
All structures on the existing mill site (e.g., water tower, office buildings) were demolished in 1991. The debris is being stored on site until it can be incorporated into the disposal cell. All contaminated materials would be trucked to the Landfill disposal site on a to-be-constructed haul road that crosses BLM-administered land.

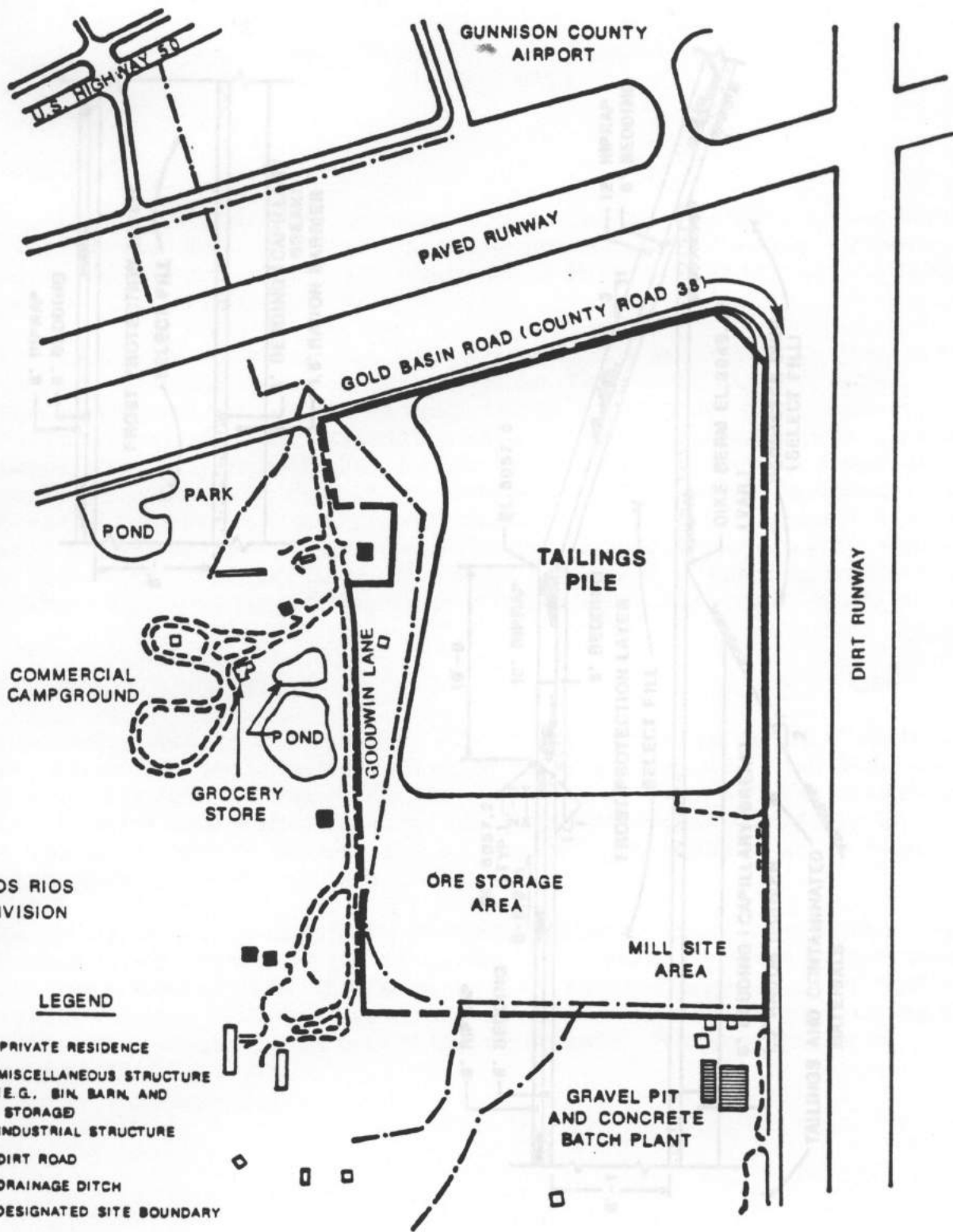
At the disposal site, the tailings and other contaminated materials would be placed on an excavated surface approximately ten feet below the ground surface. A cover system of earth, clay, and rock would then be placed on the tailings. Materials excavated from the disposal site would be used as fill along the embankment sides and for the upper portion of the cover. The most highly contaminated materials would be placed first, followed by less contaminated materials. All contaminated materials would be covered with a 45-centimeter (1.5-foot) thick layer of fine-grained earthen materials (radon barrier) to prevent radon emanation. A 15-centimeter (0.5-foot) thick layer of gravel would be placed over the radon barrier to act as a capillary break. Successive cover layers would include a 1.8-meter (six-foot one-inch) thick frost protection layer, a 15-centimeter (0.5-foot) thick sand/gravel bedding layer, and a 15-centimeter (0.5-foot) thick layer of riprap to prevent erosion (see attached cross section). The tailings embankment would cover 11.6 hectares (29 acres).

The planned cleanup includes the incorporation of the contaminated materials recovered from the known vicinity properties associated with the Gunnison processing site. Vicinity properties are properties that are located outside a designated site boundary and that have been contaminated by tailings dispersed by wind or water erosion or by removal by people before the potential hazards of the tailings were known. Nine vicinity properties in the Gunnison area were cleaned up in 1991. Two additional vicinity properties adjacent to the processing site will be cleaned up concurrently with the remedial action. Contaminated materials from these properties are being stored on the processing site until tailings transportation begins. If any additional vicinity properties are identified during the remedial action or prior to final cover placement, the contaminated materials would be incorporated in the disposal cell.

Upon completion of the remedial action at the Gunnison site, the site will be licensed by the NRC and monitored under the DOE's long-term care program for the completed disposal sites. Under this program, the site will be inspected annually and groundwater will be monitored to ensure the disposal cell performs as designed.

The state of Colorado share of the Gunnison remedial action costs is approximately \$2.5 million. A 1991 report prepared to determine the economic benefits of the UMTRA Project estimated that the state of Colorado would obtain a \$5.25 net economic benefit for every dollar of state funding.









**GENERAL VISITOR ORIENTATION**

**1.0 SOURCES OF RADIATION**

People have always been exposed to radiation. Radiation, simply defined, is energy emitted through space and matter. We are exposed to this energy or radiation from our environment and even from materials inside our bodies.

- The average annual radiation dose to a member of the general population is about 360 mrem/year. This amount is a combination of both natural background and man-made sources of radiation.

**1.1 NATURAL BACKGROUND SOURCES OF RADIATION**

Natural background radiation is by far the largest contributor (about 300 mrem/year) to radiation doses. The main sources of natural background radiation are listed.

- a) Cosmic radiation or radiation from the sun and outer space
- b) Radon
- c) Materials in the earth's crust such as rocks and soil (Terrestrial radiation)
- d) Materials present in our bodies such as Potassium-40

**1.2 MAN-MADE SOURCES OF RADIATION**

Man-made sources of radiation contribute to the remainder of the annual average radiation dose. Man-made sources include the following list.

- a) Medical uses such as x rays and nuclear medicine
- b) Consumer products such as smoke detectors, lantern mantels and tobacco products
- c) Fallout from nuclear weapons testing

**1.3 COMPARISON OF ANNUAL RADIATION DOSES FROM SELECTED SOURCES**

As stated earlier, natural background radiation is by far the largest contributor to radiation doses. To illustrate this, let's take selected sources that we've discussed and link the annual radiation dose to that source. (Expressed in mrem/year)

- Cigarette smoking 1300
- Radon in homes 200
- Medical exposures 53
- Terrestrial radiation 30
- Cosmic radiation 30
- Round trip US by air 5
- Building materials 3.6
- World wide fallout <1
- Natural gas range 0.2
- Smoke detectors 0.0001

**2.0 RISKS OF OCCUPATIONAL RADIATION EXPOSURE**

The risks associated with occupational exposures are very small and considered acceptable when compared to that of other occupational health risks (e.g., being a coal miner or construction worker).

**a) Radiation dose limit**

The DOE radiation dose limit for visitors to the site from occupational exposures is 100 mrem/year. Let's compare this amount to other occupations.

**b) Average annual radiation dose for various occupations (mrem/year)**

- Airline flight crew member about 1000
- Nuclear power plant worker 700
- Grand central station worker 120
- Medical personnel 70

ATTACHMENT 1 (continued)

- DOE/DOE contractors 44

2.1 CHRONIC RADIATION DOSE

A chronic radiation dose refers to small amounts of ionizing radiation received over a long period of time. Examples of chronic radiation dose are those from natural background, routine medical and occupational radiation.

2.2 POTENTIAL BIOLOGICAL EFFECTS FROM CHRONIC RADIATION DOSES

Biological effects from chronic doses of radiation may occur in the exposed individual or in the future children of the exposed individual.

a) Exposed individual

There is a slight risk that cancer may be caused by chronic radiation doses. This risk is small when compared to the natural occurrence of cancer. (The data used to compile this risk is based on large amounts of exposure received in a short period of time.)

b) Future children of the exposed individual

Genetic effects have been extensively studied in plants and animals, but there have been no genetic effects clearly caused by radiation observed in human populations.

2.3 COMPARISON OF RISKS OF OCCUPATIONAL RADIATION DOSES WITH OTHER HEALTH RISKS

Let's now compare the risk of working with or around sources of ionizing radiation versus the risks we accept as part of every day life.

a) Loss of life expectancy due to various causes (expressed in days)

- Being unmarried male 3500
- Smoking (1 pack/day) 2250

- Being unmarried female 1600
- Being a coal miner 1100
- 25% overweight 777
- Alcohol (US average) 365
- Being a construction worker 227
- Driving a motor vehicle 207
- All industry 60
- Radiation 100 mrem/yr (70 yr) 10
- Coffee 6

b) Relative risk of 1 in a million chances of dying

- Smoking 1.4 cigarettes (lung cancer)
- Eating 40 tablespoons of peanut butter
- Eating 100 charcoal broiled steaks
- Spending 2 days in New York City (air pollution)
- Driving 40 miles in a car (accident)
- Flying 2500 miles in a jet (accident)
- Canoeing for 6 minutes
- Receiving 10 mrem of radiation (cancer)\*

\*Radiational workers on the UMTRA Project receive an average exposure of 10 mrem/year (i.e. 2000 hours). As a visitor to the UMTRA Project you will not be allowed to exceed 50 hours/year in the controlled area where you can receive exposure.

2.4 BENEFIT VERSUS RISK

Accepting a risk is a personal matter and each individual must weigh the benefits against the potential risk. We know that there are many benefits from ionizing radiation. However, because it may harm us if we receive too much, just like taking too many aspirin can kill you, we must learn to respect it and learn to work safely with and around radiation.



Attachment 1 (continued)

3.0 PRENATAL EXPOSURE

A developing embryo/fetus is especially sensitive to ionizing radiation.

a) Possible effects

Radiation dose to the embryo/fetus may increase the chances that the child will develop conditions such as slower growth or mental development or childhood cancer. These effects can also be caused by many other hazards in our environment.

b) DOE Policy

The risk of these effects occurring is minimized by having special protective measures for the embryo/fetus and by keeping all exposures as low as reasonably achievable (ALARA).

- 1) A female radiological worker is encouraged to voluntarily notify her employer, in writing, when she is pregnant.
- 2) The employer shall provide the option of a mutually agreeable assignment of work tasks, without loss of pay or promotional opportunity, such that further occupational radiation exposure is unlikely.

c) Radiation Dose Limit

The limiting value of total effective dose equivalent received by the unborn child from the period of conception to birth (entire gestation period) as a result of occupational exposure of a female occupational worker, who has notified her employer in writing that she is pregnant, is 0.5 rem (0.005 Sievert). Efforts should be made to avoid substantial variation above the uniform monthly exposure rate that would satisfy this limiting value.

4.0 BASIC RADIATION PROTECTION CONCEPTS

4.1 ALARA CONCEPT

The DOE and the Site are firmly committed to having a Radiological Control Program of the highest quality. Therefore, maintaining occupational exposures to radiation and radioactive materials As Low As Reasonably Achievable is an integral part of all site activities.

4.2 SOURCES OF RADIATION

You can receive a dose of radiation from radioactive sources that are present either inside and/or outside the body.

- a) Sources of radiation exposure outside of the body include: cosmic radiation, natural soil radiation, man-made sources such as medical diagnostic tests, dental X-rays, and radioactive mill tailings that may be present on UMTRA Project Sites.

Exposure from sources outside the body are reduced by:

- 1) Time: Reduce the amount of time spent near a source of radiation.
- 2) Distance: Stay as far away from the source as possible.
- 3) Shielding: Shielding is placed between workers and the source.

- b) Sources of radiation exposure inside the body include: naturally radioactive sources that a person takes into their bodies on a fairly regular basis by eating, drinking, and breathing radon which is emitted from the earth. Other sources of internal exposure may include radioactive contamination that could be ingested or inhaled while a person is in a controlled area on the UMTRA Project.

Attachment 1 (continued)

GENERAL VISITOR ORIENTATION

You can control intakes of unwanted radioactive material (contamination) by not eating, drinking, or smoking in a controlled area and by keeping contamination off your personal clothing and skin. Contamination monitoring will be performed upon exiting a controlled area to ensure there is no detectable contamination on your person. Health Physics personnel at the access control point will assist you with contamination monitoring (i.e. frisking)

for monitoring the radiological condition on and off the site. Information gained through this monitoring is used to make radiation protection decision.

4.3 RADIOLOGICAL CONTROLS

In support of the ALARA concept, radiological controls are established in order to protect individuals from exposure to radiation and radioactive material. These controls include:

5.0 EMPLOYEE RESPONSIBILITIES IN THE ALARA PROGRAM

A positive radiological attitude is not limited to those who perform radiological work. All employees and visitors have an impact on maintaining exposures to radiation and radioactive material ALARA. Some of the responsibilities are listed.

- a) Signs that have the standard radiation symbol colored magenta or black on a yellow background are used.
- b) Yellow and magenta rope, tape, chains or other barriers are used to designate the boundaries of posted areas.
- c) Designated areas are used to store radioactive material.
- d) Protective clothing and equipment are used to prevent personnel contamination.
- e) Eating drinking smoking and chewing are not permitted within the controlled area.
- f) All personnel and equipment must be monitored for contamination prior to exiting the controlled area.

- 1) Obey all signs/postings.
- 2) Comply with all radiological and safety rules.
- 3) Do not enter any area controlled for radiological purposes unless escorted or trained.

If visiting a radiological area with an escort:

- a) obey the instructions of your escort.
- b) obtain and properly wear personal protective equipment as instructed by procedure, Radiological Control personnel, or your escort.
- c) utilize ALARA techniques to minimize your exposure.
- 4) Be alert for and report unusual radiological situations.

4.4 MONITORING (DOSIMETRY)

Since radiation cannot be detected with any of the human senses, special detection devices must be used. The health physics department is responsible

6.0 EMERGENCY PROCEDURES

All Visitors are required to be escorted in the controlled area. Your escort has been trained in emergency response procedures for the various emergency situations that could arise. In the unlikely event that an emergency occurs you are required to follow the instructions of your escort.

**JOHN V. INNIS**  
SITE MANAGER



ENGINEERS AND CONSTRUCTORS

**MK-FERGUSON COMPANY**

A MORRISON KNUDSEN COMPANY

REMEDIAL ACTION CONTRACTOR - UMTRA PROJECT

P.O. BOX 809

GUNNISON, CO 81230

PHONE: (303) 641-3935

July 30, 1992

Remedial action planning was coordinated by the UMTRA Project Technical Assistance Contractor, Jacobs Engineering Group Inc. The DOE's Remedial Action Contractor, MK-Ferguson Company, completed the disposal cell design and is managing the field work. Ames Construction Company of Denver, Colorado, is performing the cleanup.

FOR GUNNISON, COLORADO, TAILINGS CLEANUP

DOE Gunnison Site Manager Steve Hamp said the project is expected to result in a peak employment of between 105 workers in 1993 and 1994. The cost of the remedial action project is being shared, with the federal government paying 90 percent and the state of Colorado paying 10 percent.

To date, remedial action has been completed at ten UMTRA Project sites: Canonsburg, Pennsylvania; Shiprock, New Mexico; Salt Lake City and Green River, Utah; Lakeview, Oregon; Tuba City, Arizona; Durango, Colorado; Riverton and Spook, Wyoming, and Lowman, Idaho.

For more information on either the Gunnison, Colorado, UMTRA Project site or the project in general, call toll free at 1-800-523-6495. (In New Mexico, call 1-800-423-2539.)

-DOE-

FOR FURTHER INFORMATION, CONTACT:

Dave Jackson (505) 845-5699

Jack Hoopes (505) 845-4015

-MORE-



# Site Manager's Report Gunnison, Colorado

*John Innis -*

## GENERAL

Mobilization for the 1994 Gunnison UMTRA construction season is underway and will continue through the month of May, with the hauling of tailings starting on May 19.

At the time of the winter shutdown, an estimated 159,000 cubic yards of tailings and other materials had been hauled to the disposal site. The tailings haul was 19 percent complete with the project construction approximately 52 percent complete. Changes were also made to haul truck gate seals to reduce potential problems due to wet tailings.

Employment figures for the period ending September 30, 1993, showed 103 persons employed, including 27 local hires and an additional 63 in-state. These numbers were reduced during the winter shutdown and, as of April 30, the site employed 61 persons, including 24 local hires and 24 from within the state. Additional hiring will take place in 1994 as the tailings haul accelerates.

## PROCESSING SITE

Excavation of the subpile materials on the north end of the processing site and other miscellaneous site work and repairs began during April in anticipation of the construction start. Cleanup activities on the Gunnison County Airport emergency runway began during the first part of May and will continue through July 1994.

## DISPOSAL CELL

Because of existing agreements with the Bureau of Land Management (BLM), no construction activities take place at the disposal cell during winter shutdown

and spring activities do not begin until after May 15 when facilities are set up, and the haul road graded and treated. BLM agreements also require an annual sage grouse count be conducted along the haul road and in the area of the disposal site. Counts were held this year between April 2- May 11.

## MONITORING

Environmental monitoring continues on the project. Wildlife and wetland mitigation work in the south Parlin area was completed in 1993. A thorium lab has been set up and is undergoing methodology testing.

## NEW DOE GUNNISON SITE MANAGER

DOE Gunnison Project Manager Steve Hamp was given new management responsibilities during the fall of 1993 at the UMTRA Project Office in Albuquerque. Management responsibilities were assigned to Sharon Arp, who is also site manager at the Rifle, Colorado, UMTRA site.

The UMTRA Project Office hopes you find these construction update letters useful. If you have any questions or suggestions regarding this progress report, please contact the office by calling (505) 845-5640, or write and address comments to:

Sharon Arp  
Gunnison Site Manager  
U.S. Department of Energy  
UMTRA Project Office  
2155 Louisiana NE, Suite 4000  
Albuquerque, NM 87110

*MK Ferguson*  
*641-3935*

## GUNNISON, COLORADO

### FACT SHEET

- The Gunnison millsite covers 61 acres adjacent to the Gunnison County airport.
- 720,000 cubic yards of tailings and other contaminated materials.
- History:
  - The mill operated from 1958 to 1962 extracting uranium ores mined locally.
  - The tailings pile was covered with six inches of soil and revegetated.
  - The state of Colorado currently owns the site.
- Groundwater downgradient of the processing site is contaminated; several domestic residences are affected.
- Bottled water is currently being supplied to all potentially affected residences.
- An alternate water system for an area southwest of the processing site has been designed. The contract will be awarded next month if the bids are as expected.

#### Remedial Action

- Nine off-site vicinity properties have been remediated to date.
- Two remaining vicinity properties are adjacent to the processing site and will be cleaned up as part of the site remedial action.
- Relocation of the tailings and contaminated materials will be to the Landfill disposal site six miles east of Gunnison.
- Contaminated materials will be trucked to the disposal site on a to-be-constructed road (Tenderfoot Mountain haul road) that crosses BLM lands.
- The disposal cell is designed to meet U.S. Environmental Protection Agency (EPA) requirements for longevity, control of radon emissions, and groundwater protection.
- The disposal cell will be capped with a nine-foot-thick cover composed of soil and rock layers that will meet the EPA requirements.
- It is estimated that the remedial action will provide approximately 105 jobs during peak employment in 1993 and 1994.



## PROPERTY OWNER CONSENT FORM



# Vicinity Property Program

Once a property has been identified as potentially eligible for inclusion in the UMTRA Project, several steps must be taken before the cleanup can begin.

- A Property Owner Consent Form, signed by the property owner, must be filed. This consent form allows the DOE legal access to the property to conduct studies to determine if uranium mill tailings are responsible for the elevated radiation levels.
- If no tailings are found, no further work is required. If tailings do exist on the property, and the resultant radiation levels exceed EPA standards for the UMTRA Project, the DOE will officially include the property for remedial action under the UMTRA Project.

Technicians Survey a Vicinity Property



# U M T R A

URANIUM MILL TAILINGS REMEDIAL ACTION

U.S. Department  
of Energy



## WHAT IS A VICINITY PROPERTY?

- From the early 1940's through the 1960's much of the uranium ore mined in the United States was processed by private companies under contract to the Federal government.
- When the contracts terminated, the mills shut down, leaving large uranium tailings piles on the mill sites. Tailings are the sand-like waste product of the uranium mining and milling process. They contain 85 percent of the radioactivity present in the unprocessed uranium ore.
- When the mill sites were abandoned, the potential long-term health hazards associated with exposure to radioactive elements in the tailings were not recognized. As a result, most tailings piles were left unstabilized and exposed to the environment.
- The tailings were considered to be excellent material for use in construction and were used extensively on public and private property in many of the communities where the uranium mills were located. Also, the unprotected tailings piles were subjected to the erosive forces of wind and water.
- Locations away from the inactive mill sites where tailings were used for construction purposes or carried by wind or water are called "vicinity properties."

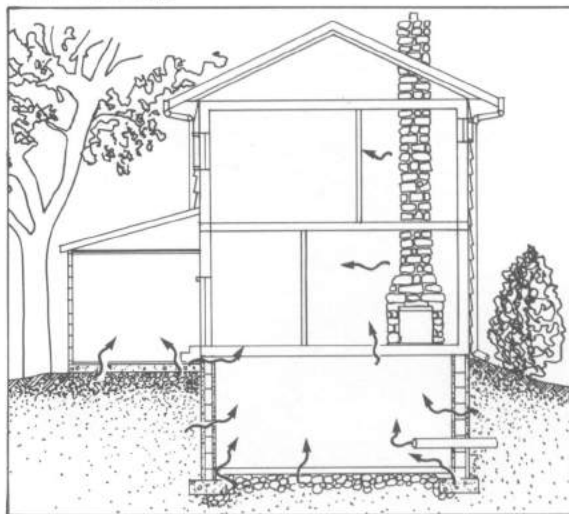
Typical Vicinity Property Setting



## WHAT IS THE CONCERN?

- The tailings contain radium, an element found with uranium in the ore. As radium undergoes radioactive decay, a radioactive gas, called radon, is formed.
- Radon is a colorless, odorless, radioactive gas which, when it decays, produces other radioactive elements that are solid particulates called radon daughters.
- Radon daughters can adhere to dust and other particles in the air we breathe. Once inhaled they can remain trapped in the lungs where they undergo radioactive decay which may cause cell damage.
- Levels of human exposure to radon and other radioactive materials from the tailings piles are low. Nevertheless, there is concern that even low levels of radiation may pose health hazards to those who might be exposed over long periods of time, particularly in enclosed areas where radon concentrations can build up.
- The U.S. Environmental Protection Agency (EPA) has established exposure levels which apply to vicinity properties and are based on internationally recognized safety standards.

Radon Pathways



## WHAT IS BEING DONE?

## VICINITY PROPERTY PROGRAM FACTS

- **PL92-314**

Congress passed Public Law 92-314 in 1972 creating the Grand Junction Remedial Action Program (GJRAP). This program provided for the clean-up of approximately 600 buildings and structures in Grand Junction, Colorado, and was administered by the Colorado Department of Health. Tailings cleanup under the GJRAP ended September 30, 1988.

- **PL95-604**

In 1978, Congress passed Public Law 95-604, the Uranium Mill Tailings Radiation Control Act. PL95-604 authorized the DOE to conduct a more extensive tailings cleanup program nationwide, which the DOE administers through the Uranium Mill Tailings Remedial Action (UMTRA) Project Office in Albuquerque, New Mexico.

Under both GJRAP and UMTRA, radiation at vicinity properties is reduced to safe levels in accordance with EPA standards. This is usually done by removing the contaminated materials from each property. The property is then restored to a condition comparable to its original state before remedial action, to the satisfaction of the owner, and at no cost to the owner.



- The UMTRA Project encompasses 24 uranium mill tailings sites in 10 states. Four of the sites are on tribal lands.
- Potentially contaminated properties are called vicinity properties. Approximately 11,000 locations have been identified as vicinity properties.
- Five techniques, three of which use very sensitive equipment, are used to identify potentially contaminated properties:
  - aerial surveys
  - mobile van surveys
  - on-site inspections
  - review of records from the state or tribe and the uranium processing plant
  - information and/or requests for survey from property owners.
- The 11,000 vicinity properties will be evaluated to determine if they are eligible for inclusion in the UMTRA Project. An estimated 5,000 vicinity properties will require remedial action.
- The UMTRA Project Vicinity Property Program cleans up all eligible vicinity properties, including open lands.
- Financing for the UMTRA Vicinity Property Program is provided using 90 percent Federal and 10 percent state funds. Where sites are on tribal lands, Federal funding is 100 percent.

## PROPERTY OWNER CONSENT FORM

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- If no tailings are found, no further work is required. If tailings do exist on the property, and the resultant radiation levels exceed EPA standards for the UMTRA Project, the DOE will officially include the property for remedial action under the UMTRA Project.

Technicians Survey a Vicinity Property



## REMEDIAL ACTION AGREEMENT

- The DOE conducts detailed engineering and radiological surveys at each vicinity property included in the UMTRA Project. Using data gathered from the surveys, the DOE prepares a design for remedial action work. All the data are then compiled in a Remedial Action Agreement.
- The Remedial Action Agreement explains:
  - what portions of the property will be remediated
  - the design specifications for property remediation
  - what methods will be taken by the DOE to clean up the property.
- The Remedial Action Agreement serves as a binding document between the property owner, the DOE, and the state that all specified work will be performed to the satisfaction of the property owner and that the property will be restored, as close as possible, to its condition prior to remedial action.

## REMEDIAL ACTION COMPLETE

- Once remedial action is completed, the DOE will certify that radiation levels have been reduced to comply with EPA standards.
- The DOE will then issue a letter to the property owner indicating that the property is certified under the UMTRA Project.
- The state will record the accomplishment of remedial action on the appropriate land records.

## KEY POINTS



Vicinity Property Cleanup in Progress

Restoration Following Tailings Removal



- **The Property Owner Consent Form is very important! Without it, the DOE would not be able to determine whether tailings are present on a property and if so, whether EPA standards are exceeded.**
- **It is important that property owners read and understand the Remedial Action Agreement and have a clear understanding of the work to be conducted on their property.**
- **To ensure quality work, property owners should inspect all work, ask questions, and be satisfied before the remedial action contractor leaves the property.**
- **The DOE assigns a special number to each vicinity property in an effort to protect the owner's rights and privacy.**
- **All required work is performed at no cost to the owner.**

## KEY POINTS

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## VICINITY PROPERTY PROGRAM PARTICIPANTS

The Department of Energy has contracted with several private companies to assist them with the UMTRA Project.



Jacobs Engineering Group Inc. is the DOE's Technical Assistance Contractor providing overall management support for the entire UMTRA Project including all vicinity property work.



Oak Ridge National Laboratory is the Inclusion Survey Contractor (ISC) for all vicinity properties. The ISC gathers data on vicinity properties and makes recommendations to the DOE on which properties should be included for cleanup under the UMTRA Project.



MK-Ferguson Company is the Remedial Action Contractor responsible for remedial action at all vicinity properties except those in Grand Junction, Colorado, and Edgemont, South Dakota.



UNC Geotech is the Remedial Action Contractor responsible for remedial action at vicinity properties in Grand Junction, Colorado, and Edgemont, South Dakota.

If you have questions or concerns, or would like more information on the UMTRA Project, please contact the Uranium Mill Tailings Project Office toll-free at 1-800-523-6495 (in New Mexico, call 1-800-423-2539) and an UMTRA Project representative will return your call. Or you may write to the DOE at the following address:

**Vicinity Properties Manager  
U.S. Department of Energy  
Uranium Mill Tailings Project Office  
5301 Central Avenue NE, Suite 1720  
Albuquerque, NM 87108  
(505) 844-3941**

## PROJECT OFFICE

The Manager of the UMTRA Project Office in Albuquerque, New Mexico, is responsible for the four major activities that are required to carry the project through to completion:

- Planning, scheduling, and budgeting
- Federal, state, tribal, and local coordination
- Engineering, design, and remedial action
- Health, safety, and quality assurance

These responsibilities are met through the assistance of major contractors who support the DOE in the areas of technical assistance, remedial action, and cleanup of vicinity properties.

# U M T R A

URANIUM MILL TAILINGS REMEDIAL ACTION

U.S. Department  
of Energy

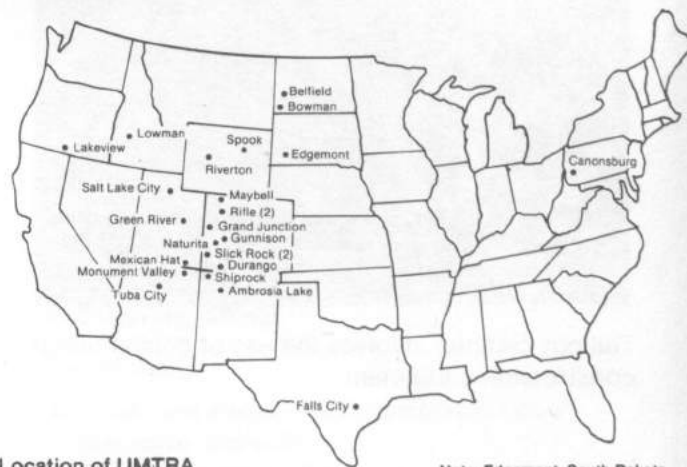


- From the early 1940's through the 1960's much of the uranium ore mined in the United States was processed by private companies under contract to the Federal government.
- The uranium ore was processed for use in national defense research, weapons development, and the developing commercial nuclear energy industry.
- When the contracts terminated, the mills shut down, leaving large uranium tailings piles on the mill sites. Tailings are the sand-like waste product of the uranium mining and milling process. They contain 85 percent of the radioactivity present in the unprocessed uranium ore.
- When the mill sites were abandoned, the potential long-term health hazards associated with exposure to radioactive elements in the tailings were not known. As a result, most piles were left unstabilized, exposed to the environment and subject to use by man.

## BACKGROUND

- The tailings contain radium, an element found with uranium in the ore. As radium undergoes radioactive decay, a radioactive gas, called radon, is formed.
- Radon is a colorless, odorless radioactive gas which, when it decays, produces other radioactive elements that are solid particulates called radon daughters.
- These radon daughters can adhere to dust and other particles in the air we breathe. Once inhaled, they can remain trapped in the lungs, where they undergo radioactive decay and may cause cell damage.
- Levels of human exposure to radon and other radioactive materials from the piles are low. However, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized. In structures containing tailings, the radon gas can concentrate in enclosed spaces where it can be inhaled over a prolonged period.

- After determining that uranium mill tailings may pose a public health hazard, Congress passed Public Law 95-604, the Uranium Mill Tailings Radiation Control Act of 1978.
- PL95-604 directs that "every reasonable effort be made to provide for stabilization, disposal and control of the tailings in a safe and environmentally sound manner to ensure public health, safety and welfare."
- The DOE was given the responsibility for carrying out the program.
- The UMTRA Project Office was formed in 1979 and is part of the DOE Albuquerque Operations Office.



Location of UMTRA Project Sites

Note: Edgemont, South Dakota  
Vicinity Properties only



- The DOE will perform remedial actions at 24 inactive uranium mill tailings sites in 10 states and on certain Indian lands.
- The affected states and tribes are partners in the DOE's Uranium Mill Tailings Remedial Action (UMTRA) Project. They enter into *cooperative agreements with the DOE*, concur on the selected remedial action, and acquire rights to the final disposal site if necessary.
- The states have responsibility for 10 percent of the cost of remedial action, while the Federal government assumes responsibility for the remaining 90 percent of the cost. When the site is on Indian land, the Federal government is responsible for 100 percent of the cost.
- An important part of the UMTRA Project is the cleanup of residences, businesses, and open land to which uranium mill tailings have been carried, either by man or through natural forces. Approximately 5,000 of these areas, called vicinity properties, are eligible for cleanup under the UMTRA Project.
- The DOE reduces radiation levels at a vicinity property to safe levels in accordance with U.S. Environmental Protection Agency (EPA) standards. This is usually done by removing the contaminated material from the property. The property is then restored to its original condition, to the satisfaction of the owner and at no cost to the owner.
- The DOE emphasizes the need for public participation in the UMTRA Project and encourages state, local, and tribal governments, associations, companies, and private citizens to participate in the decision-making process.

Public Law 95-604 requires that the EPA establish standards to be met during remedial action. Under EPA standards, the UMTRA Project is required to:

- Stabilize and control tailings piles in order to control radiation emissions for 200 to 1000 years
- Remediate contaminated open lands
- Remediate contaminated structures
- Protect human health and the environment

Under PL95-604 the U.S. Nuclear Regulatory Commission (NRC) is to provide consultation and concurrence in the:

- Identification and designation of sites
- Determination of site boundaries
- Selection and performance of the remedial action for each site

The DOE must comply with the National Environmental Policy Act (NEPA) and perform detailed studies of the environmental impacts that remedial action will have at each site.

Upon completion of remedial action, the NRC will issue a license for future maintenance and monitoring of each disposal site.

Remedial Action in Progress



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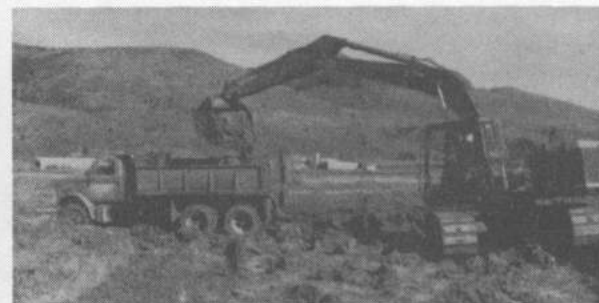
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Remedial Action in Progress



## AREAS TO BE ADDRESSED BY REMEDIAL ACTION

### Control of Tailings Piles

- Radon exhalation
- Alpha and gamma radiation
- Groundwater contamination
- Long-term stability

### Cleanup of Buildings

- Radon daughter concentrations
- Alpha and gamma radiation

### Cleanup of Land

- Radium levels



Dust suppression techniques are used during remedial action.

## DESIGN OPTIONS

### For Radiation Protection

- Construct earthen covers

### For Groundwater Protection

- Construct earthen covers
- Relocate tailings

### For Cleanup of Buildings

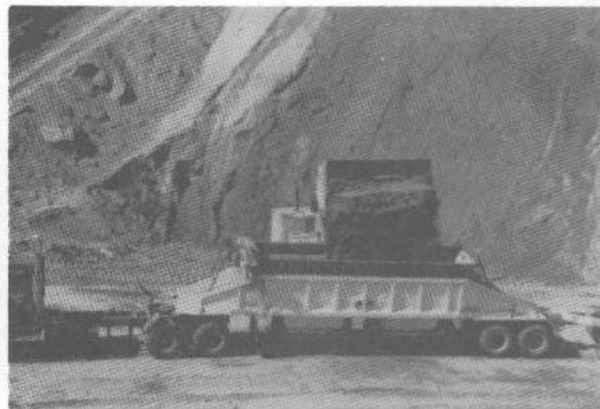
- Excavate Tailings
- Install sealants/mechanical systems

### For Cleanup of Land

- Excavate tailings

### For Stability

- Construct earthen covers/riprap/berms/  
diversion channels
- Contour tailings pile
- Relocate tailings



Tailings cleanup involves the use of conventional construction equipment.

## GLOSSARY

### ALPHA RADIATION

Positively charged particles emitted by certain radioactive materials. Alpha radiation is composed of two protons and two neutrons and is identical to the helium nucleus. An alpha particle cannot penetrate clothing or the outer layer of human skin.

### GAMMA RADIATION

Short wavelength electromagnetic radiation, similar to X-rays, emitted in the radioactive decay of certain elements. Gamma rays are highly penetrating and can pass through the human body.

### PROCESSING SITE

One of 24 locations formally included in the UMTRA Project where uranium was once extracted from ore.

### RADIOACTIVITY

The physical property of certain materials to spontaneously emit particles, electromagnetic radiation, or both.

### RADON-222

The inert, gaseous radioactive decay (daughter) product of radium-226.

### RADON-DAUGHTER

One of several short-lived radioactive products resulting from the decay of radon-222. All radon daughters are solids.

### RESIDUAL RADIOACTIVE MATERIALS

Unprocessed ore and waste in the form of mill tailings derived from the processing of uranium ore.

### RIPRAP

Rock erosion protection.

### VICINITY PROPERTY

Any real property or improvement which is in the vicinity of an UMTRA Project processing site and which is determined by DOE to contain residual radioactive materials derived from that processing site.

If you are interested in reading more about the UMTRA Project, the following documents are available from the UMTRA Project Office:

- Environmental Assessments or Environmental Impact Statements, as they become available for each site.
- Remedial Action Plans, as they become available for each site.
- "UMTRA Questions and Answers"; a four-page information pamphlet on the UMTRA Project.
- "Radon Monitoring"; a two-page fact sheet on radon monitoring.
- "Cleanup of Vicinity Properties"; a brochure describing such properties and how they can be included in the cleanup program.
- Site-specific fact sheets with general information on each of the 24 UMTRA Project sites.

For further information write or call:

Manager, Uranium Mill  
Tailings Project Office  
U.S. Department of Energy  
5301 Central Avenue NE  
Suite 1720  
Albuquerque, NM 87108

Phone: (505) 844-3941  
or call toll free:  
1-800-523-6495  
(outside New Mexico)  
1-800-423-2539  
(within New Mexico)

**WHO'S WHO**  
**URANIUM MILL TAILINGS REMEDIAL ACTION (UMTRA) PROJECT**  
**GUNNISON, COLORADO**  
**(Groundbreaking ceremony probable attendees are in boldface type.)**

U.S. Department of Energy

**James D. Watkins**

**Secretary of Energy**

**Leo P. Duffy**

**Assistant Secretary, Environmental Restoration and Waste Management, Washington, D.C.**

**R.P. (Pat) Whitfield**

**Deputy Assistant Secretary for Environmental Restoration, Office of Environmental Restoration, Washington, D.C.**

**John E. (Jack) Baublitz**

**Associate Deputy Assistant Secretary for Environmental Restoration, Washington, D.C.**

**Dave Mathes**

**Director, Division of Off-Site Remediation, Office of Environmental Restoration, Washington, D.C.**

**Bruce Twining**

**Manager, Albuquerque Field Office**

**James E. Bickel**

**Assistant Manager, Office of Energy and Special Programs, Albuquerque Field Office**

**James J. Szenasi**

**Deputy Assistant Manager, Office of Energy and Special Programs, Albuquerque Field Office**

**Albert R. Chernoff**

**Project Manager, Uranium Mill Tailings Remedial Action Project, Albuquerque Field Office**

**Steve Hamp**

**Site Manager, Uranium Mill Tailings Remedial Action Project, Albuquerque Field Office**

**Don Leske**

**Site Manager, Uranium Mill Tailings Remedial Action Project, Albuquerque Field Office**

**WHO'S WHO (Continued)**

**State and Elected Officials and Staff**

**Honorable Roy Romer**

**Governor, State of Colorado**

**Honorable Tim Wirth**

**U.S. Senator (D)**

**Honorable Hank Brown**

**U.S. Senator (R)**

**Honorable Ben Nighthorse-Campbell**

**U.S. Representative, District 3 (D)**

**Audrey Berry**

**Staff Assistant, Western Slope Office,  
Honorable Tim Wirth, U.S. Senate (D)**

**Kathy Hall**

**Western Slope Office Director, Honorable  
Hank Brown, U.S. Senate (R)**

**Trudy Kareus**

**Western Slope Office Director, Honorable  
Ben Nighthorse-Campbell, U.S. House of  
Representatives, District 3, (D)**

**Local Officials**

**State Agency Officials**

**Patricia Nolan**

**Executive Director, Colorado Department of  
Health**

**Larry Kallenberger**

**Executive Director, Colorado Department of  
Local Affairs**

**Tom Looby**

**Assistant Director, Colorado Department of  
Health**

**Howard Roitman**

**Chief, Remedial Programs Section,  
Colorado Department of Health**

**Jeff Deckler**

**UMTRA Program Manager, Colorado  
Department of Health**

**Wendy Naugle**

**Rifle UMTRA Site Manager, Colorado  
Department of Health**

**Jeanne Williams**

**Gunnison County Planner**

**Dave Baumgarten**

**Gunnison County Attorney**

**Bob Filson**

**Gunnison City Manager**

**Bill Early**

**Gunnison City Engineer**

**WHO'S WHO (Continued)**

**State Senators and Representatives**

**Tilman Bishop**

**Senator, District # 7 (R)  
Member, UMTRA Project Legislative  
Oversight Committee**

*Emerson Swartzkopf*

**Harold McCormick**

**Senator, District # 4 (R)  
Member, UMTRA Project Legislative  
Oversight Committee**

*John Thomas*

**Lewis Entz**

**Representative, District # 60 (R)  
Member, UMTRA Project Legislative  
Oversight Committee**

**Ken Chlouber**

**Representative, District # 61 (R)  
Member, UMTRA Project Legislative  
Oversight Committee**

**Local Officials**

**Fred Field**

**Chairman, Gunnison County Board of  
Commissioners**

**Mario Petri**

**Member, Gunnison County Board of  
Commissioners**

**Rikki Santarelli**

**Member, Gunnison County Board of  
Commissioners**

**Diane Lothamer**

**Mayor, City of Gunnison**

**Jim Gelwicks**

**Mayor Pro-Tem, City of Gunnison**

**Paul Coleman**

**City Councillor**

**Marian Hicks**

**City Councillor**

**William Nesbitt**

**City Councillor**

**Gary Tomsic**

**Gunnison County Manager**

**Joanne Williams**

**Gunnison County Planner**

**Dave Baumgarten**

**Gunnison County Attorney**

**Bob Filson**

**Gunnison City Manager**

**Bill Early**

**Gunnison City Engineer**

**WHO'S WHO (Continued)**

**News Media**

**Roger Morris**

**Managing Editor, Gunnison Country Times**

**Emerson Swartzkopf**

**Gunnison Country Times**

**Kay Shipper**

**Gunnison Country Times**

**John Thomas**

**Gunnison Country Times**

**Lee Ervin**

**Editor, Crested Butte Chronicle-Pilot**

R.P. (Pat) Whitfield

Deputy Assistant Secretary for Environmental Restoration, Office of Environmental Restoration, Washington, D.C.

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Associate Deputy Assistant Secretary for Environmental Restoration, Washington, D.C.

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Director, Division of Off-Site Remediation, Office of Environmental Restoration, Washington, D.C.

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Manager, Albuquerque Field Office

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James J. Searns

Deputy Assistant Manager, Office of Energy and Special Programs, Albuquerque Field Office

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