

United States Department of Energy



# **Key Programmatic Steps And Activities For Implementing the Uranium Mill Tailings Remedial Action Program**

July, 1985

Uranium Mill Tailings Remedial Action Project



KEY PROGRAMMATIC STEPS AND ACTIVITIES  
FOR IMPLEMENTING THE URANIUM MILL TAILINGS  
REMEDIAL ACTION PROJECT

JULY, 1985

## PREFACE

The Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) was enacted based upon findings by Congress "that uranium mill tailings located at active and inactive mill operations may prove a potential and significant radiation health hazard to the public, and that protection of the public health, safety and welfare, and the regulations of interstate commerce, require that every reasonable effort be made to provide for the stabilization, disposal, and control in a safe and environmentally sound manner of such tailings in order to prevent or minimize radon diffusion into the environment and to prevent or minimize other environmental hazards from such tailings."

Public protection from hazards associated with inactive uranium mill tailings sites is provided in response to the findings of Congress through the U.S. Department of Energy (DOE) Uranium Mill Tailings Remedial Action (UMTRA) Project. Cleanup and isolation of contaminated materials are achieved under the UMTRA Project through a series of progressive steps: site characterization, design evaluation and selection, environmental documentation, construction, and licensing. A general understanding of the steps leading to elimination of the hazards associated with designated uranium mill tailings sites, and the parties involved in that effort, are presented in this document. A representative schedule is also presented in this document to show both program sequence and activity interdependence.

The schedule represents typical time durations for respective activities, any of which may vary because of changing circumstances. The average total program effort, i.e., from start of site characterization through licensing, is shown as 60 months, but can reasonably be expected to range from 48 months to 84 months. Those activities that have the most potential to influence program duration, because of the significant amount of additional time that may be required, include identification and selection of a suitable site, field data collection delays due to weather, actual acquisition of the designated or alternate disposal site, construction delays due to weather, and site licensing. This document provides an understanding of the steps, the sequence, the parties involved, and a representative duration of activities leading to remedial action and cleanup at the designated inactive uranium mill tailings sites.

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION . . . . .	1
2.0 ORGANIZATION . . . . .	5
3.0 U.S. ENVIRONMENTAL PROTECTION AGENCY STANDARDS . . . . .	9
4.0 GENERAL PROCEDURES . . . . .	11
4.1 Site characterization . . . . .	11
4.2 Comparison of alternate sites . . . . .	12
4.3 Site acquisition. . . . .	12
4.4 Remedial Action Plan/Site Conceptual Design . . . . .	12
4.5 National Environmental Policy Act (NEPA). . . . .	13
4.6 Engineering design/remedial action. . . . .	14
4.7 Licensing, surveillance, and maintenance . . . . .	14
5.0 KEY STEPS AND ACTIVITIES FOR UMTRA PROJECT REMEDIAL ACTION . . . . .	15
5.1 Early Site Assessment . . . . .	15
5.2 Alternate site selection. . . . .	15
5.3 Site characterization . . . . .	17
5.3.1 Statements of work. . . . .	17
5.3.2 Access agreements and permits . . . . .	18
5.3.3 Procurement and award process . . . . .	18
5.3.4 Field investigations. . . . .	19
5.3.5 Data analysis and modeling. . . . .	19
5.4 Comparative analysis of disposal site alternatives. . . . .	19
5.5 Site acquisition under the UMTRA Project . . . . .	20
5.6 Remedial Action Plan/Site Conceptual Design . . . . .	22
5.7 National Environmental Policy Act (NEPA) - EA/EIS . . . . .	23
5.8 Engineering . . . . .	24
5.8.1 Preliminary engineering . . . . .	24
5.8.2 Final design/engineering and permits . . . . .	24
5.9 Remedial action construction. . . . .	25
5.10 Quality assurance/quality control/audits and validation . . . . .	25
5.11 Surveillance and maintenance. . . . .	25
5.12 Completion Report . . . . .	26
5.13 Certification . . . . .	26
5.14 Licensing . . . . .	26
BIBLIOGRAPHY . . . . .	27
Appendix A, Introductory Chapter from Vicinity Properties Management and Implementation Manual . . . . .	A-1
Appendix B, Procurement Procedures of the Technical Assistance Contractor (TAC) and the Remedial Action Contractor (RAC) . . . . .	A-2



## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1.1 Procedural guidance documents. . . . .	3
2.1 Albuquerque Operations Office. . . . .	6
2.2 UMTRA Project structure. . . . .	7
2.3 UMTRA Project contractor structure . . . . .	8
5.1 Generalized remedial action flow chart . . . . .	16

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
3.1 EPA Standards. . . . .	10

## 1.0 INTRODUCTION

The Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Public Law 95-604, 42 USC 7901, authorizes the Department of Energy (DOE), under Title I - Remedial Action Program, to undertake remedial actions at 24 DOE-designated processing sites. The term "processing site," by statutory definition, means the inactive uranium mill or processing site and any other real property or improvement which is in the vicinity of the mill or processing site and is determined to be contaminated with residual radioactive materials derived from the mill or processing site. For purposes of this document, the inactive mill or processing site is referred to as the "processing site" and other real property or improvements in the vicinity of such site are referred to as a "vicinity properties."

The 24 sites designated by the DOE for remedial action are located in 10 states. Due to health and environmental concerns, the sites have been assigned high (H), medium (M), and low (L) priority ratings on work schedules as indicated in the listing below:

### ARIZONA

Monument Valley (L)\*  
Tuba City (M)\*

### COLORADO

Durango (H)  
Grand Junction (H)  
Gunnison (H)  
Maybell (L)  
Naturita (M)  
Rifle (2)(H)  
Slick Rock (2)(H)

### IDAHO

Lowman (L)

### NEW MEXICO

Ambrosia Lake (M)  
Shiprock (H)\*

### NORTH DAKOTA

Belfield (L)  
Bowman (L)

### OREGON

Lakeview (M)

### PENNSYLVANIA

Canonsburg (H)

### TEXAS

Falls City (M)

### UTAH

Green River (L)  
Mexican Hat (M)\*  
Salt Lake City (H)

### WYOMING

Converse County (L)  
Riverton (H)

\* Site located on the Navajo Reservation.

UMTRCA was amended in January, 1983, by Public Law 97-415 which also authorized DOE to perform remedial actions at vicinity properties associated with the Edgemont, South Dakota, processing site. Cleanup of the Edgemont processing site is the responsibility of the Tennessee Valley Authority.

The remedial actions are performed to stabilize and control the uranium mill tailings and other residual radioactive materials in a safe and environmentally sound manner. Pursuant to the requirements of UMTRCA, selection and performance of the remedial actions undertaken by DOE are to be accomplished:

- o With the full participation of the affected states and Indian tribes.
- o In accordance with standards issued by the Environmental Protection Agency (EPA).
- o With the concurrence of the Nuclear Regulatory Commission (NRC).

In compliance with UMTRCA, the remedial actions are to be completed by March 7, 1990, seven years after the effective date of promulgation of the EPA Standards. UMTRCA requires that DOE establish cooperative agreements for selection and performance of the remedial actions with the affected states and tribes. The agreements establish the procedures to be followed by the DOE and the states or tribes for selection and performance of the remedial action. The Federal Government shall pay 90 percent of the remedial action costs and the state shall pay 10 percent. With respect to sites on Indian tribal lands, 100 percent of the costs for remedial actions are to be borne by the Federal Government. Before the remedial actions can be initiated, DOE must complete the environmental investigations, documentation, and public review required by the National Environmental Policy Act (NEPA). In addition, UMTRCA requires the DOE to determine the practicability of reprocessing the tailings, in conjunction with remedial actions, in order to extract valuable minerals.

The responsibility of the DOE for planning, coordinating, and conducting remedial actions at the processing sites and vicinity properties is delegated through the Assistant Secretary for Nuclear Energy and assigned to the Uranium Mill Tailings Remedial Action (UMTRA) Project Office at the DOE Albuquerque Operations Office, Albuquerque, New Mexico.

Procedural guidance in support of UMTRA Project activities is provided in several documents covering areas ranging from design criteria and technology development through licensing and public information. Some of the procedural documents are shown in Figure 1.1.

The process for selecting the remedial action cleanup to be implemented at a designated processing site or an alternate disposal site involves a series of comprehensive and interrelated steps consisting of:

- o Site assessment/characterization.
- o Preparation of a conceptual design.
- o Development of a plan of implementation.
- o NEPA compliance.
- o Engineering design.
- o Remedial action.
- o Licensing.
- o Surveillance and maintenance.

The DOE solicits state and tribal involvement in all appropriate activities; however, the main activities requiring or needing state and tribal involvement are:



**FIGURE 1.1**  
**PROCEDURAL GUIDANCE DOCUMENTS**



- o Identification of alternate disposal sites.
- o Site acquisition.
- o State contribution of 10 percent of the remedial action cost.
- o Concurrence in the Remedial Action Plan/Site Conceptual Design.
- o Local public participation.
- o Review and comment on site-specific designs, plans, NEPA documents, and procedures.

The basic procedures and key programmatic steps established by the DOE to carry out remedial action at designated sites are presented in the body of this document. General guidelines and procedures for implementing the cleanup of vicinity properties, as documented in the Vicinity Properties Management and Implementation Manual, are presented in Appendix A.

This document is intended to serve as a primer and reference on the UMTRA Project, to present the sequential steps leading to remedial action, and to highlight the involvement of states/tribes and cooperating agencies in developing and implementing appropriate measures to clean up and isolate contaminated materials.



## 2.0 ORGANIZATION

The Department of Energy (DOE), under PL95-604, is responsible for the disposal, stabilization, and control of uranium mill tailings at designated inactive uranium mill sites. Within the DOE, the Assistant Secretary for Nuclear Energy is responsible for selecting and carrying out the remedial action, and certifying that remedial action has been satisfactorily accomplished. The responsibility to carry out remedial action for the individual sites has been assigned to the Uranium Mill Tailings Remedial Action (UMTRA) Project Office within the DOE Albuquerque Operations Office (Figure 2.1).

The UMTRA Project Office is supported by the Oak Ridge National Laboratory, Bendix Field Engineering Corporation under the Grand Junction Project Office, Monsanto Research Corporation under the Dayton Area Office, the Jacobs-Weston Team serving as the Technical Assistance Contractor (TAC), the Morrison-Knudsen Company serving as the Remedial Action Contractor (RAC), and the appropriate states/tribes (Figure 2.2).

The basic responsibilities of the above noted support organizations are presented in Figure 2.3.

The Nuclear Regulatory Commission, Environmental Protection Agency, Department of the Interior, Department of Justice, and states/tribes are also involved in the UMTRA Project, providing consultation and/or concurrence. The Nuclear Regulatory Commission is ultimately responsible for licensing a site for long-term storage following completion of remedial action.

## OFFICE OF PROJECTS AND ENERGY PROGRAMS

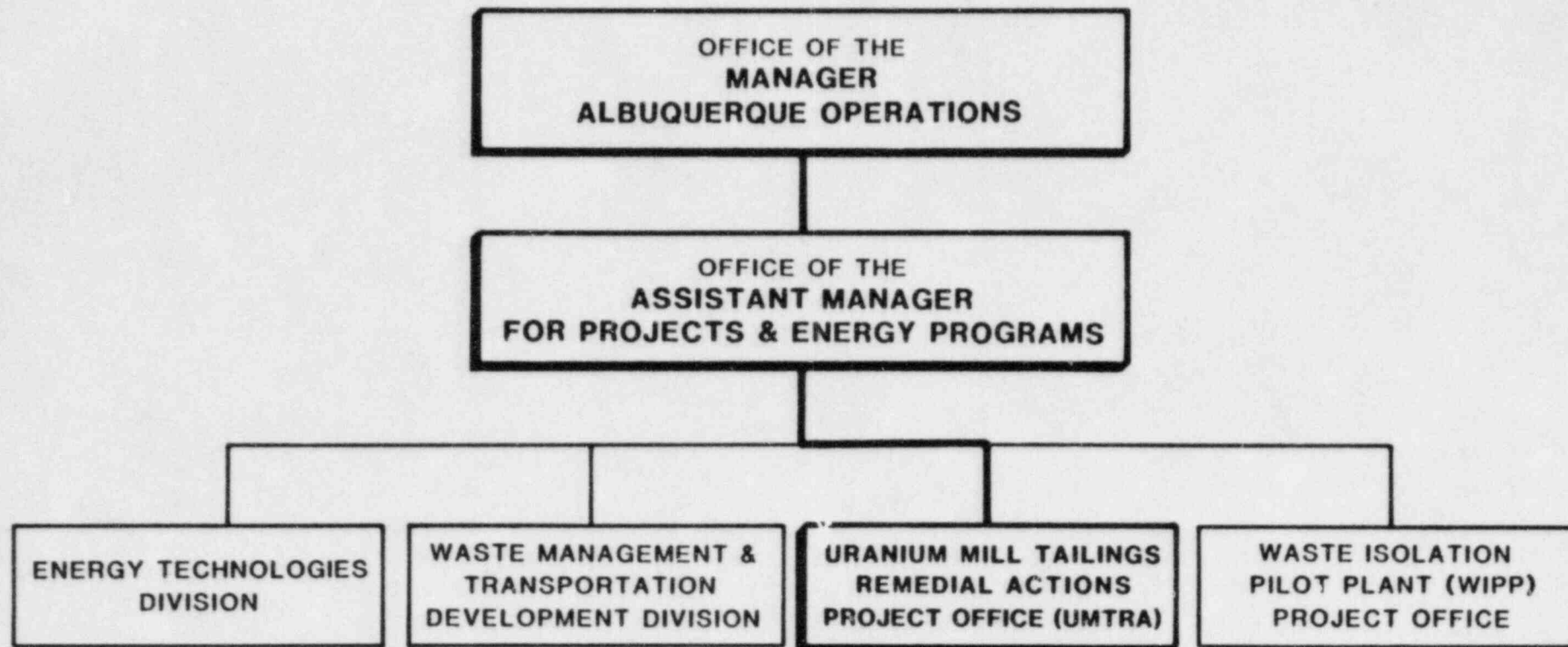


FIGURE 2.1  
ALBUQUERQUE OPERATIONS OFFICE

## PROJECT STRUCTURE

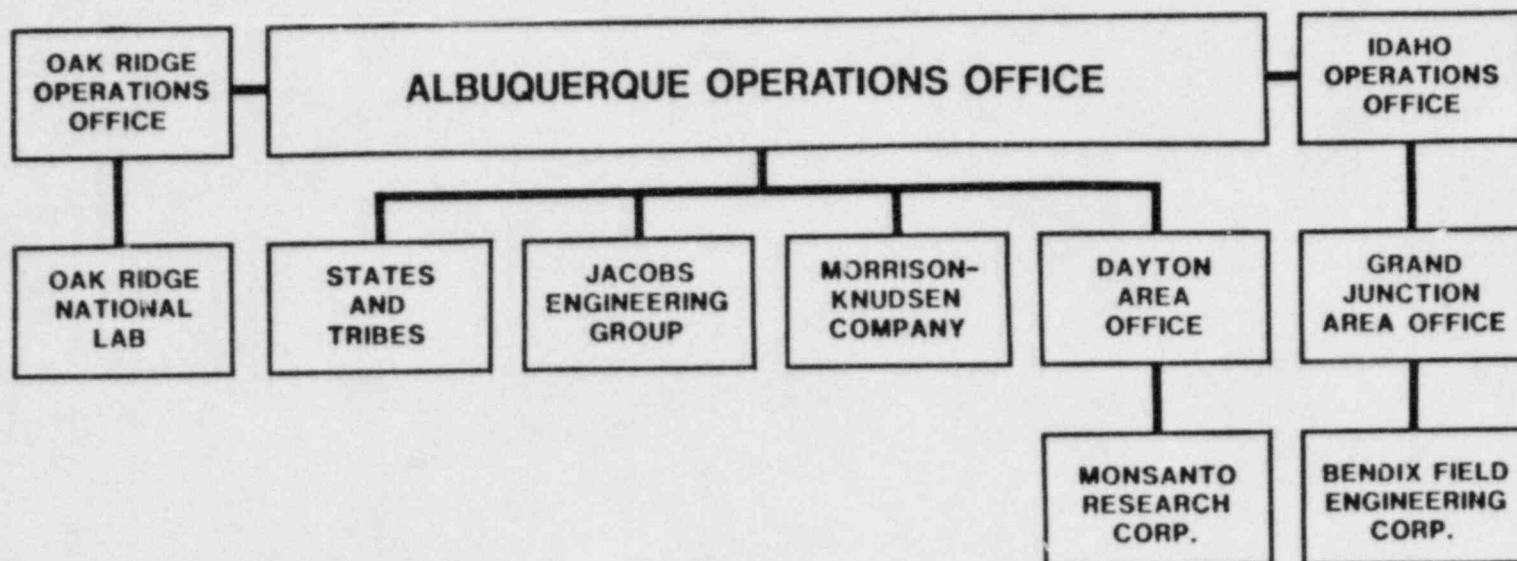


FIGURE 2.2

# UMTRA PROJECT CONTRACTOR STRUCTURE

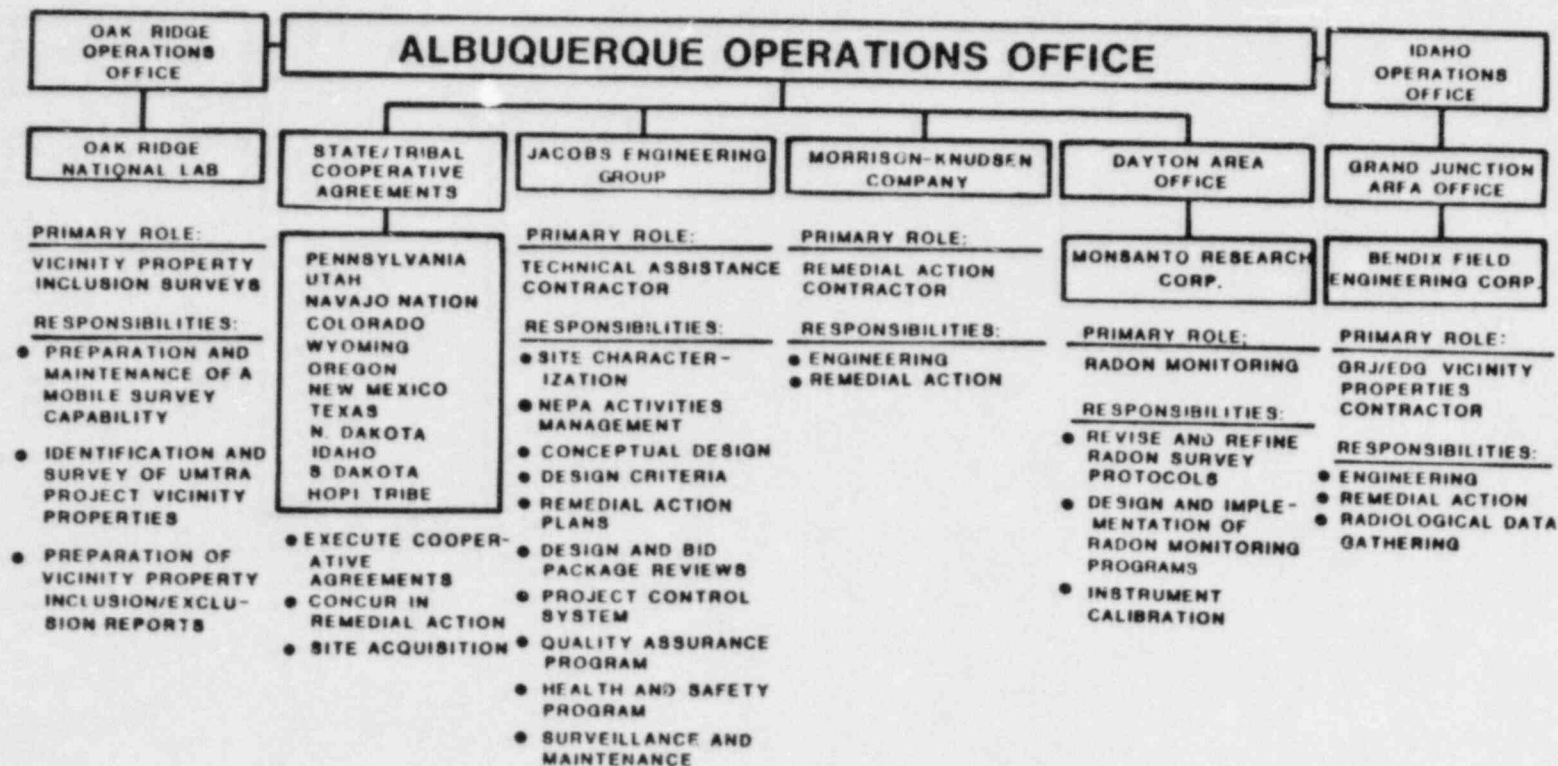


FIGURE 2.3



### 3.0 U.S. ENVIRONMENTAL PROTECTION AGENCY STANDARDS

Pursuant to the requirements of UMTRCA, EPA has promulgated health and environmental standards to govern cleanup, stabilization, and control of residual radioactive materials at inactive uranium mill tailings sites and associated vicinity properties. The promulgated standards establish requirements for long-term stability and radiation protection and provide procedures for ensuring the protection of ground-water quality.

In developing the standards, EPA determined "that the primary objective for control of tailings should be isolation and stabilization to prevent their misuse by man and dispersal by natural forces such as wind, rain and flood waters" and that "a secondary objective should be to reduce radon emissions from tailings piles." A third objective should be "the elimination of significant exposure to gamma radiation from tailings piles." (Ref. preamble to Standards for Remedial Actions at Inactive Uranium Processing Sites, 40 CFR Part 192.) These conclusions were based on a determination that the most significant public health risks associated with inactive tailings were posed by exposure to people living and working in structures contaminated by relocated tailings. EPA further concluded that the potential for contamination of ground water and surface water should be evaluated on a site-specific basis. The EPA Standards are summarized in Table 3.1.

In implementing the standards of Subpart A, Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites, the EPA stipulated in Part 192.20(a)(2) that:

"Protection of water should be considered in the analysis for reasonable assurance of compliance with provisions of Part 192.02. Protection of water should be considered on a case-specific basis . . ."

In Part 192.20(a)(3), it is further stated that:

"Judgements on the possible needs for remedial or protective actions for ground water aquifers should be guided by relevant considerations described in EPA's hazardous waste management system (47 FR 32274, July 26, 1982) and by relevant State and Federal Water Quality Criteria for anticipated or existing uses of water over the term of the stabilization. The decision on whether to institute remedial action, what specific action to take, and to what levels an aquifer should be protected or restored should be made on a case-by-case basis taking into account such factors as technical feasibility of improving the aquifer in its hydrogeologic setting, the cost of applicable restorative or protective programs, the present and future value of the aquifer as a water resource, the availability of alternative water supplies, and the degree to which human exposure is likely to occur."



PART 192 - HEALTH AND ENVIRONMENTAL PROTECTION STANDARDS FOR URANIUM MILL TAILINGS

SUBPART A - Standards for the Control of Residual Radioactive Materials from Inactive Processing Sites

192.02 Standards

Control shall be designed to:

- (a) Be effective for up to one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,
- (b) Provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not:
  - (1) Exceed an average release rate of 20 picocuries per square meter per second, or
  - (2) Increase the annual average concentration of radon-222 in air at or above any location outside the disposal site by more than one-half picocurie per liter.

SUBPART B - Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites

192.12 Standards

Remedial actions shall be conducted so as to provide reasonable assurance that, as a result of residual radioactive materials from any designated processing site:

- (a) The concentration of radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than -
  - (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and
  - (2) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface.
- (b) In any occupied or habitable building -
  - (1) The objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL, and
  - (2) The level of gamma radiation shall not exceed the background level by more than 20 microrentgens per hour.

SUBPART C - Implementation (condensed)

192.20 Guidance for Implementation

Remedial action will be performed with the "concurrence of the Nuclear Regulatory Commission and the full participation of any state that pays part of the cost" and in consultation as appropriate with other government agencies.

192.21 Criteria for Applying Supplemental Standards

The implementing agencies may apply standards in lieu of the standards of Subparts A or B if certain circumstances exist, as defined in 192.21.

192.22 Supplemental Standards

"Federal agencies implementing Subparts A and B may in lieu thereof proceed pursuant to this section with respect to generic or individual situations meeting the eligibility requirements of 192.21."

- (a) "...the implementing agencies shall select and perform remedial actions that come as close to meeting the otherwise applicable standards as is reasonable under the circumstances."
- (b) "...remedial actions shall, in addition to satisfying the standards of Subparts A and B, reduce other residual radioactivity to levels that are as low as is reasonably achievable."
- (c) "The implementing agencies may make general determinations concerning remedial actions under this Section that will apply to all locations with specified characteristics, or they may make a determination for a specific location. When remedial actions are proposed under this Section for a specific location, the Department of Energy shall inform any private owners and occupants of the affected location and solicit their comments. The Department of Energy shall provide any such comments to the other implementing agencies [and] shall also periodically inform the Environmental Protection Agency of both general and individual determinations under the provisions of this section."

Ref: Federal Register, Volume 48, No. 3, January 5, 1983, 40 CFR Part 192.

**TABLE 3.1 EPA STANDARDS**

## 4.0 GENERAL PROCEDURES

DOE has established a sequential procedure for the characterization/selection, acquisition, design, NEPA compliance, construction, licensing, and surveillance and maintenance of remedial actions at UMTRA Project sites. The procedure is designed as a series of increasingly detailed analyses and documentation of alternatives which provide a basis for communication with the state or tribe, the NRC, and the public. This sequential process will usually result in the preparation of the following documents:

- o Early Site Assessment (ESA) - initial site evaluation.
- o Site Characterization Report(s).
  - Processing Site Characterization Report (PSCR).
  - Disposal Site Characterization Report (DSCR).
- o Comparative Analysis of Disposal Site Alternatives.
- o Remedial Action Plan/Site Conceptual Design (RAP).
- o Engineering Fact Sheet.
- o Environmental Assessment (EA) or Environmental Impact Statement (EIS).
- o Detailed engineering plans, drawings, and specifications.
- o Surveillance and Maintenance Plan - specification of post-closure activities.
- o Completion Report - documentation of completion of remedial action in accordance with the RAP and final design.
- o License.

### 4.1 SITE CHARACTERIZATION

Site characterization is the process of consolidating site-specific data required to develop a full understanding of the designated site, and if appropriate, the alternate disposal site(s). Characterization begins with a literature review and an initial inspection of the actual site conditions (early site assessment). Characterization involves not only the compilation and summarization of available data, but, as required, the collection of additional data needed to fully characterize the site. Primary data areas involve engineering, geological, radiological, geotechnical, hydrological, biological, meteorological, seismological, geomorphological, archaeological, cultural, socioeconomic, demographic, and other information pertinent to defining site features and complete delineation of past, present, and predicted impacts.

Field investigations, with the exception of radiological characterization performed by Bendix, are performed by subcontractors under the direction of the TAC. Field studies generally include several phases lasting from two to four months.

Information compiled on the site(s) is documented in an Early Site Assessment (ESA), a Processing Site Characterization Report (PSCR), and, as appropriate, a Disposal Site Characterization Report (DSCR).

#### 4.2 COMPARISON OF ALTERNATE SITES

Using the information acquired through site characterization studies, candidate alternate disposal sites, including the designated site, are independently evaluated against established technical criterion to determine their suitability as a final repository. The technical information on each site is documented in a Comparative Analysis of Disposal Site Alternatives Report.

#### 4.3 SITE ACQUISITION

The site acquisition process is the responsibility of the states/tribes and the DOE as described in Sections 104, 105, and 106 of PL95-604. The acquisition process begins after the preferred alternative has been identified, partially through information provided by the comparative analysis of disposal site alternatives process. A number of different acquisition strategies may be developed depending upon the preferred remedial action strategy (i.e., stabilization in place or relocation) and upon the owner of the preferred site (either public agency or private firm or individual). The acquisition process must be completed prior to issuance by the RAC of subcontracts for construction at the disposal site, with the exception of sites on Indian lands. While preliminary acquisition tasks, such as preparation of legal descriptions and appraisals, may be initiated concurrent with the preparation of NEPA documents, no acquisition decisions will be made which could prejudice the remedial action decision for an UMTRA Project site.

#### 4.4 REMEDIAL ACTION PLAN/SITE CONCEPTUAL DESIGN

When the remedial action requirements are determined, a preliminary conceptual design is prepared. The preliminary conceptual design includes sufficient analyses and calculations to demonstrate regulatory compliance with the EPA standards and other requirements, and allows quantification of impacts for evaluation in accordance with the NEPA process. Following completion of the NEPA process, the Site Conceptual Design (SCD) is finalized and documented in the Remedial Action Plan (RAP).

The RAP presents the series of activities required to affect the long-term control of radioactively contaminated materials through implementation of the conceptual design. Upon selection of the remedial action to be implemented, at the end of the NEPA process a final RAP will be issued. The RAP is concurred upon by the state/tribe and NRC, documenting their agreement with the remedial action to be implemented. Following RAP concurrence and satisfaction of NEPA requirements, the remedial action can be initiated. Changing circumstances may require slight design changes after issuance and concurrence of the final RAP. Any such changes require concurrence by states/tribes and the NRC.



Key contents of the RAP are the final conceptual design, with engineering calculations, to satisfactorily demonstrate compliance with the EPA standards; estimated cost of remedial action; plans for environmental, health, and safety protection; responsibilities of project participants; regulatory compliance for the remedial action; public participation and information plans; quality assurance plans; and a description of the basic elements of post-remedial action surveillance and maintenance.

The conceptual design in the RAP will not include final configuration, dimensions, or material specifications. These details will be provided in the final engineering design prepared by the RAC.

#### 4.5 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Consistent with the requirements of the National Environmental Policy Act (NEPA), DOE will prepare either an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The purpose of an EA is to determine whether a proposed action will have significant environmental impacts. If the EA indicates the environmental impacts will be significant, an EIS may be prepared. In cases where it is obvious at the onset that there will be significant environmental impacts, DOE can omit the EA and proceed directly with the EIS.

An EA contains a proposed action and a detailed impact analysis. An EA also includes alternate actions and impact analyses, though to a lesser extent than the proposed action. EAs generally will be prepared for those sites where stabilization in place appears to be technically feasible and cost effective. However, EAs are also prepared for relocation alternatives when impacts will not be significant. In each EA, the proposed action will be in sufficient detail and will be based upon sufficient data to demonstrate that compliance with the applicable standards is feasible and that impacts of the proposed action can be estimated. Prior to publication, DOE will submit the EA to EPA, NRC, state or tribe, and other agencies as necessary for review and comment. If the EA indicates there are no significant environmental impacts associated with the proposed action, DOE will issue a Finding of No Significant Impact (FONSI) and proceed with implementation of the proposed action.

Should the EA identify significant impacts, DOE will issue a Notice of Intent to prepare an EIS. As required by NEPA, the alternatives considered in the EIS will be treated equally; each will be discussed in detail and will be based upon sufficient data to ensure that impacts and costs can be quantified and compared and that each alternative will comply with applicable standards. DOE will request review and comment by NRC, EPA, state or tribe, and other agencies as appropriate. After consultation with NRC and the affected state or tribe, DOE will publish the draft EIS with a preferred alternative for public comment. Comments received on the draft EIS will be evaluated and given consideration in the preparation of the final EIS. The final EIS will be used by DOE and the participating agencies to select the remedial action to be implemented.

The remedial action selected must be one of the alternatives evaluated in the EIS, but does not have to be the proposed action. The remedial action selection will be documented in a Record of Decision (ROD) issued by the DOE.

#### 4.6 ENGINEERING DESIGN/REMEDIAL ACTION

After completion of and concurrence in the RAP, the Remedial Action Contractor (RAC) will prepare detailed engineering plans and specifications for construction at the site selected for disposal. Design features will be refined consistent with the implementing procedures and major features outlined in the approved conceptual design described in the RAP. The implementing agencies will be requested to review the final design.

The RAC, serving as the construction manager, will direct subcontractors in carrying out the approved remedial action and site construction. The RAC will also be responsible for ensuring and documenting that construction is in compliance with design specifications and regulatory requirements. A completion report will document design compliance with the RAP and approved engineering designs.

#### 4.7 LICENSING, SURVEILLANCE, AND MAINTENANCE

For each site, DOE will prepare a surveillance and maintenance plan defining post-construction monitoring schedules and activities. The plan will provide for sites to be inspected periodically and for formal inspection reports to be prepared. Post-construction surveillance may include periodic aerial photography of the stabilized tailings to identify natural or man-made changes which may affect regional erosion rates and patterns, and releases of radioactivity. The plans will identify a program of custodial maintenance and procedures for accomplishing any needed repairs.

DOE will consult with the state/tribe and the NRC in the preparation of the surveillance and maintenance plan for a particular site. The plan will be reviewed by the NRC as a part of the licensing process.

Along with the surveillance and maintenance plan and the Completion Report, which document through quality assurance and quality control procedures conformance of remedial action with the RAP/SCD and engineering design specification, the DOE will make application to the NRC for a license.

The final procedural step occurs when the NRC issues a license for custodial responsibility of the stabilized site.



## 5.0 KEY STEPS AND ACTIVITIES FOR UMTRA PROJECT REMEDIAL ACTION

The UMTRA Project involves a sequential procedure of key steps and activities from an early discovery of information pertinent to the site through site certification and licensing. Fourteen key steps with subset activities have been identified and are discussed below. The generalized sequential relationships of these activities are presented in a flow chart as Figure 5.1. Responsibilities and relative involvement of implementing and cooperating agencies are also presented. Because of the carefully phased and interdependent nature of these key steps and activities, it is important that involved agencies, groups, and individuals have a full understanding of the key steps and participate in a timely manner.

### 5.1 EARLY SITE ASSESSMENT

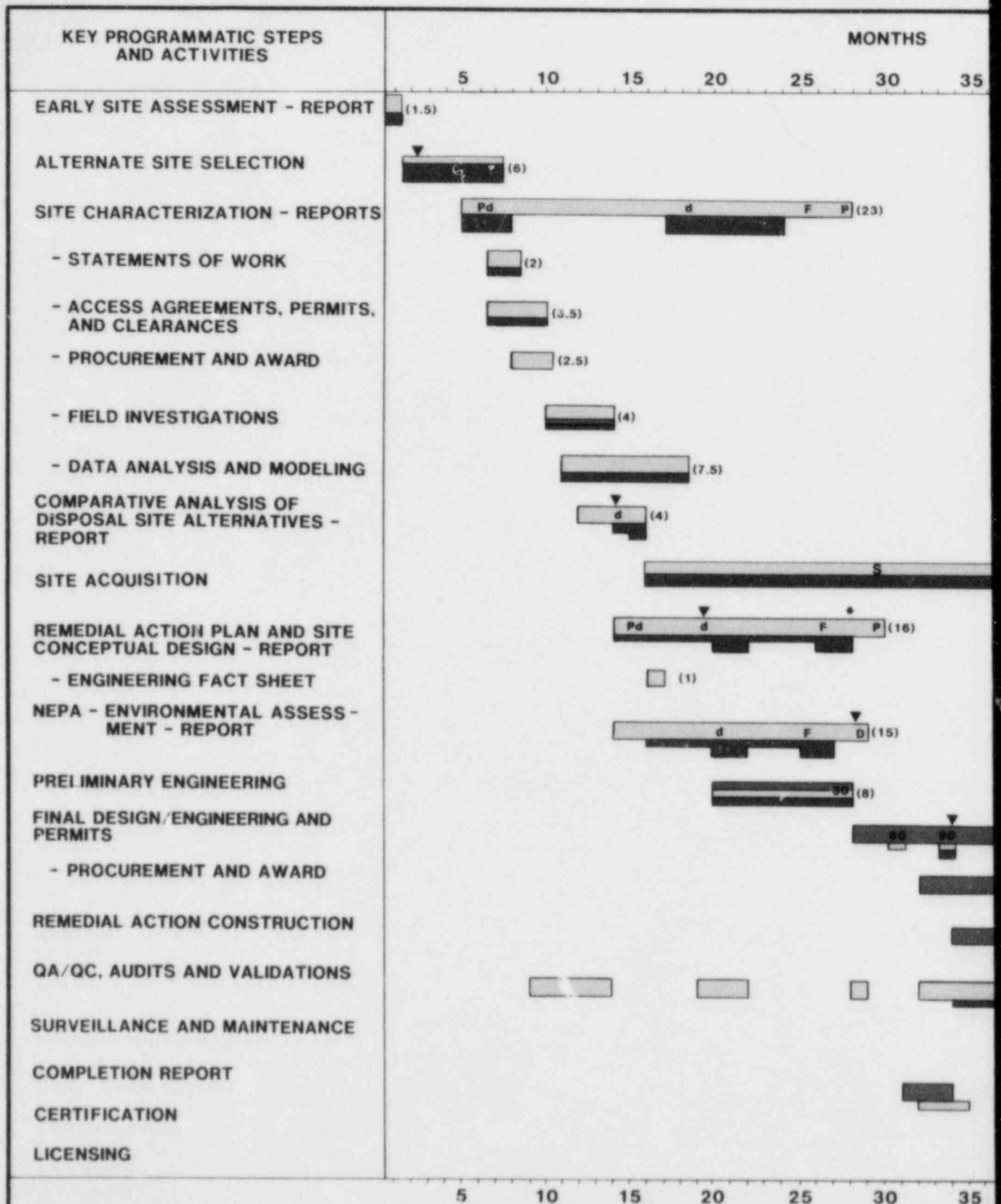
A multi-disciplinary field investigation is performed by the Technical Assistance Contractor (TAC) to determine the existence of any obvious exclusionary features or cumulative factors that would preclude, or introduce a high risk of, meeting the EPA standards if remedial action were to be performed at the designated site. The Early Site Assessment (ESA) will also identify the need for initiating the alternate site selection process if potential problems are observed. The states/tribes and NRC are encouraged to participate in the early site assessment, including site visit, and will be notified by the TAC of scheduled ESA activities sufficiently in advance to permit ample time for schedule coordination and participation. Six weeks' time, on the average, is budgeted for the preparation of the ESA.

### 5.2 ALTERNATE SITE SELECTION

Alternate site selection is initiated, following the ESA, to identify candidate sites for disposal of contaminated materials and subsequent evaluation in an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The alternate site selection process will be a coordinated DOE - state/tribe effort utilizing evaluation criteria established by participating parties.

Normally, as specified in the Cooperative Agreements, it is the states/tribes responsibility to undertake the process of identifying alternate disposal sites; although, in many cases the DOE has been requested to assist in or conduct the alternate site selection process. When undertaken by the TAC for the DOE, either of two levels of the alternate site selection process may be pursued. A limited process, with a typical duration of six weeks, is initiated to identify candidate sites for inclusion in an Environmental Assessment. The limited process is based upon identification and review of existing data and experience acquired through site visits. A full alternate site selection process will typically require six months and involves specific data collection/site characterization activities. Full participation by the states/tribes and consultation with the NRC in the alternate site selection process are essential.

# U.S. DEPARTMENT OF ENERGY GENERALIZED UMTRA REMEDIATION SCHEDULE







## NOTES

1. FUNDING PROBLEMS, UNFORSEEN GEOLOGIC AND CLIMATIC CONDITIONS AND PUBLIC INTEREST MAY SIGNIFICANTLY EFFECT THIS SCHEDULE.
2. CHART IS BASED ON THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT. ENVIRONMENTAL IMPACT STATEMENT PREPARATION WILL ADD SIX (6) MONTHS TO THE PROCESS AND DELAY SUBSEQUENT STEPS BY THAT AMOUNT.
3. REMEDIAL ACTION CONSTRUCTION WILL GENERALLY TWO (2) FULL CONSTRUCTION SEASONS. LARGER SITES REQUIRE ADDITIONAL TIME.
4. COLOR BAR THICKNESS DENOTES RELATIVE DEGREE INVOLVEMENT IN THAT STEP OR ACTIVITY.
5. THE STEPS AND ACTIVITIES AND TIME REQUIRED ARE ON CURRENT STATUTES, REGULATIONS, COOPERATIVE AGREEMENTS, POLICY AND PRACTICE. SPRING 1985

### UNIT OF ENERGY MEDIAL ACTION FLOW CHART



## KEY

- |   |   |
|---|---|
|  | COOPERATING AGENCY PARTICIPATION-STATE-TRIBE-NRC-ETC. |
|  | DOE/TECHNICAL ASSISTANCE CONTRACTOR                   |
|  | DOE/REMEDIAL ACTION CONTRACTOR                        |
|  | U.S. DEPARTMENT OF ENERGY DECISION POINT              |
| *   | U.S. DEPARTMENT OF ENERGY APPROVAL                    |
| Pd  | PRELIMINARY DRAFT                                     |
| d   | DRAFT   |
| F   | FINAL   |
| D   | FINDING OF NO SIGNIFICANT IMPACT                      |
| P   | PUBLISH   |
| S   | STATE ACQUISITION                                     |
| B   | ACQUISITION OF BLM LAND                               |
| 30/60/90  | PERCENT COMPLETION OF DESIGN/ENGINEERING              |
| (xx)  | AVERAGE DURATION OF ACTIVITY (MONTHS)                 |

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### 5.3 SITE CHARACTERIZATION

Site characterization is the identification and compilation of data, both physical and regulatory, at and around a processing or alternate disposal site that describes site features pertinent to remedial action. Site characterization is documented in a Processing Site Characterization Report (PSCR) for the designated site and a Disposal Site Characterization Report (DSCR) for each alternate disposal site. The report documentation process for a PSCR/DSCR involves four phases. All phases are conducted by the DOE Technical Assistance Contractor and its subcontractors. The four phases are:

1. Preliminary draft. Presentation of all existing technical data concerning the designated or alternate disposal site(s). Identification and transfer of information that the states/tribes and NRC have on a particular site is important to a successful initiation of site characterization. The preliminary draft identifies data deficiencies that must be satisfied before conceptual design and remedial action can be initiated.
2. Draft. Presentation of all available technical information including data and analysis resulting from field investigations. Companion document to the draft Remedial Action Plan/Site Conceptual Design and draft Environmental Assessment (or draft Environmental Impact Statement).
3. Final. Presentation of all technical information including data discovered during the NEPA process. Companion document to the final Remedial Action Plan/Site Conceptual Design and Environmental Assessment (or Environmental Impact Statement).
4. Publish. Published document that constitutes the complete record of technical data considered and used for remedial action decision making.

Data collection and documentation leading to publication of the PSCR/DSCR reports span, under normal conditions, 23 months.

Activities leading to characterization of a site involve the steps presented below.

#### 5.3.1 Statements of work

Statements of work provide a detailed description of the data to be collected, analysis to be performed, and procedures to be followed in acquiring data needed to characterize a site. Data collection activities include such areas as meteorology, hydrology, geology, archaeology, biology, topography, geotechnical characteristics, aerial photography and topography, radiological characterization, and the like. To ensure that data collection activities are adequate, activities are coordinated with states, tribes, EPA, and NRC as appropriate. Multiple and sometimes se-



quential, statements of work are prepared in support of site characterization. The preparation of statements of work generally extends over a two-month period.

#### 5.3.2 Access agreements and permits

Access, to allow data collection, is required to the designated site; potentially contaminated areas adjacent to the site; the alternate disposal site(s), if applicable; and potential rock source and borrow material areas. Site access begins with a description of the location of the lands of concern and identification of the land owners. The designated sites and owners have been identified through a formal designation process documented in the Federal Register. Other areas requiring access are identified through the site characterization process. Property owners are typically identified through a review of county tax records.

Access to the designated site and, as appropriate, alternate disposal sites is the responsibility of the DOE through an Access Agreement. The Technical Assistance Contractor (TAC) obtains access to potentially contaminated areas adjacent to the site and those areas containing potential rock sources and materials suitable for cover. Access authorization is documented by the TAC using either a "Right-of-Entry" or "Use Agreement" form or other documentation required by the landowner. Access authorizations are intensely pursued prior to the start of data collection. Obtaining access agreements and permits typically requires a period of three and one-half months. Neither access to designated/alternate sites nor right-of-way entry to adjacent areas is automatic and assured. Public sentiment and private decision can either preclude or significantly delay desired entry.

Permits, clearances, and licenses required for data collection, such as well permits and archaeological clearances, are secured by the TAC, either directly or through subcontractors, during this period. The states and tribes play a key role in obtaining access agreements as well as assisting in the timely acquisition of permits and licenses.

#### 5.3.3 Procurement and award process

Qualified subcontractors to perform field data collection, outlined in the Statement of Work, are solicited and selected through the contract procurement and award process. Contracts are awarded to the low bidder, which often provides qualified local subcontractors with a cost advantage. The procurement process is performed by the TAC and generally spans a two and one-half month period.

The implementation and adherence to quality assurance, quality control, and health and safety procedures throughout the field



investigations is a must. Cooperating agencies are encouraged to become familiar with the studies and observe activities in the field.

Intensive laboratory analysis, testing, and data evaluation are required to support the field collection activities. This information is available for state and tribal agency review.

Subcontractors to be utilized for data collection activities are solicited and qualified during the two and one-half month site characterization procurement and award process. General procurement procedures and policies utilized by the TAC for selecting and securing subcontractors are presented in Appendix B.

#### 5.3.4 Field investigations

Field investigations are the on-site data collection activities required to provide information needed to fully define site features. Data collection activities involve, but are not limited to, investigations in the areas of geology, hydrology, radiation, archaeology, biology, and the like. Data collection programs typically span a four-month period and involve drilling, soils sampling, construction of test pits, monitoring wells, and the like.

#### 5.3.5 Data analysis and modeling

Data collected through the field investigation programs are evaluated, analyzed, and used as input to various predictive models. Models are used to project surface-and ground-water physical and geochemical characteristics; radon diffusion and migration; the Probable Maximum Precipitation (PMP), Probable Maximum Flood (PMF), and Maximum Credible Earthquake (MCE); and other predictive site conditions. Data reduction, analysis, and modeling activities often span seven and one-half months. The information provided through these efforts is used in the estimation of volumes of materials to be handled, the placement of those materials, and the basic parameters for conceptual design.

### 5.4 COMPARATIVE ANALYSIS OF DISPOSAL SITE ALTERNATIVES

A comparative technical analysis of existing data on the processing and alternate disposal sites is performed to support the NEPA process. The comparative analysis is used primarily when an environmental assessment is prepared in lieu of an EIS and several alternate sites are being considered. The comparative analysis of disposal site alternatives document is prepared by the Technical Assistance Contractor. The comparative analysis document serves as the basis for selection of a preferred alternative after discussions with cooperating agencies. Because the analysis is undertaken at an early stage in the process, the technical information and cost estimates are based upon preliminary technical data. However, those data are adequate for determining whether the options will satisfy the EPA

standards and for developing relative costs of the options. The comparative analysis process requires, on the average, four months to complete.

## 5.5 SITE ACQUISITION UNDER THE UMTRA PROJECT

Site acquisition responsibilities of the DOE, the states, and the tribes are described in Sections 104, 105, and 106 of PL95-604. The acquisition process begins after the preferred alternative is identified in the comparative analysis of disposal site alternatives. A number of different acquisition strategies may be developed depending on whether or not the uranium mill tailings will be stabilized on the site or moved to another location and depending on the ownership of the site to be acquired. At a minimum, PL95-604 requires Federal ownership of the disposal site and mill tailings associated with each site.

The acquisition process should be complete prior to award by the RAC of subcontracts for construction at the disposal site. While preliminary acquisition tasks, such as the preparation of legal descriptions, title evidence, and appraisals, will be initiated concurrent with the development of NEPA documents, no acquisition decisions will be made which would prejudice the remedial action decision for an UMTRA Project site.

When a general agreement has been reached between the states/tribes and DOE regarding the preferred alternative for remedial action, the site acquisition process will begin. A general consensus regarding the preferred alternative for remedial action is usually obtained after completion of the "Comparative Analysis of Disposal Site Alternatives Document."

Acquisition of a mill site or a disposal site located on non-Federal lands is principally a state responsibility. Acquisition of non-Federal lands begins when the state is requested in writing by the DOE Contracting Officer to obtain the documentation (e.g. legal description, appraisal, title evidence) specified in the site acquisition appendix to the State/DOE Cooperative Agreement. The Cooperative Agreement requires that the state submit the site acquisition appendix documentation within 90 days of the request by the Contracting Officer. Upon such submittal, DOE reviews the adequacy of the documentation under the Uniform Appraisal Standards and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646. The state is required to cure any defects noted by DOE. A determination is then made in the Albuquerque Operations Office whether to acquire the site in accordance with the requirements of DOE Order 4300.1A.

If the appraised value of the site to be acquired exceeds \$250,000, DOE Headquarters must approve the acquisition. The Contracting Officer issues to the state a written request to acquire the site and identifies a maximum negotiation amount. The state then begins negotiations with the site owner. If the state is unable to negotiate with the owner within the maximum amount, the state notifies the Contracting Officer and DOE either establishes a higher maximum amount or approves the initiation of condemnation proceedings.

In the process of acquiring the property, the owner is provided relocation assistance, consistent with Public Law 91-646, for relocation of a business or purchase of a new residence.

Following are typical time frames required for the various steps identified above:

<u>Step</u>	<u>Approximate time frame</u>
1. State preparation of acquisition documentation.	3 to 4 months
2. DOE approval	
> \$250,000	2 months
< \$250,000.	1 month
3. DOE notification to state to acquire.	1/2 month
4. State negotiations w/owner.	1-1/2 months
5. Condemnation, if required.	Varies in each state
6. Relocation, if required.	Varies depending upon nature of site use

As depicted above, site acquisition requires at least eight and one-half months and may be significantly longer if condemnation or owner relocation is required.

The above description is generic to the typical acquisition process. For particular sites this process may vary as a result of specific circumstances. Some variations are described below.

Where relocation of the tailings is required, the state must acquire the disposal site and may acquire the processing site if DOE determines that it must be acquired to avoid windfall profits to the owner. If the processing site is not acquired for a relocation alternative, a Remedial Action Agreement will have to be negotiated between the owner, DOE, and the state. In certain cases, DOE and the state may decide that acquisition of a vicinity property is necessary to implement the most feasible remedial action option. The state must make any such acquisition; however, the state's consent is required before the Contracting Officer can authorize the state to make such acquisition, in which case the process is the same as that described above.

With respect to sites on Indian reservations, in most cases the land involved will be Government-owned land held in trust for the affected tribe. Therefore, a fee acquisition will not be required; however, the DOE and the tribe must negotiate an appropriate legal instrument allowing DOE use of reservation land for permanent disposal of tailings. This is

because of NRC's position that long-term maintenance of disposal sites on Indian lands will be licensed in the same manner as at non-Indian sites. The BIA must concur with any such instrument.

For final stabilization on lands administered by the BLM, an administrative withdrawal of the land is required pursuant to the Federal Land Policy and Management Act (FLPMA). The FLPMA allows 20-year administrative withdrawals, which would be an inadequate period of withdrawal given the long-term control requirements imposed by the EPA Standards for Title I disposal sites. Consequently, DOE will pursue a five-year administrative withdrawal from the BLM and then initiate the process for permanent withdrawal by Congress.

Following are the required steps for BLM land withdrawal:

<u>Step</u>	<u>Approximate time frame</u>
1. Coordinate application w/BLM and draft the application.	1-1/2 months
2. Obtain DOE Headquarters concurrence.	1 - 2 months
3. Submit application to BLM.	1/2 month
4. BLM Federal Register Notice of Segregation of Land.	1 - 2 months
5. DOE development of case file in support of application pending segregation of land.	12 - 24 months
6. BLM withdrawal decision.	Varies depending upon nature of site use

In certain limited cases, DOE may directly acquire disposal sites pursuant to the authority of Section 106 of PL95-604. In such cases, DOE will utilize the real estate services of the U.S. Army Corps of Engineers and the process is similar to the process described above for state acquisition.

NRC has a concurrence role under Public Law 95-604 regarding state acquisition of processing sites, disposal sites, and vicinity properties. NRC concurrence normally will be effectuated through its concurrence with the RAP for the processing site/disposal site. With respect to land withdrawals, direct DOE acquisitions, or real estate agreements for tribal sites, DOE will inform NRC of its activities.

## 5.6 REMEDIAL ACTION PLAN/SITE CONCEPTUAL DESIGN

The Remedial Action Plan (RAP) documents the actions and procedures that are required to implement the selected remedial action. The Site Conceptual Design (SCD) is the design concept for remedial action that has been selected through the review of various site options and developed to meet design regulatory requirements, principally the EPA standards. The



SCD is an integral component of the RAP. The RAP/SCD process requires on the average 16 months and, like the site characterization reports, progresses through four phases. The four phases are:

1. Preliminary draft. The initial presentation of a conceptual design and implementing actions.
2. Draft. The presentation of the site conceptual design with supporting drawings, materials estimates, and summary calculations. Remedial actions to implement the design are more fully defined, including site licensing requirements. The draft RAP/SCD is provided to the states/tribes and NRC for their review and comment.
3. Final. The presentation of technical data, supporting calculations, site licensing appendix, and site conceptual design that reflects the agreed upon changes as a result of state/tribe and NRC comments on the draft. Serves as the primary document for remedial action concurrence of states or tribes and NRC.
4. Publish. Publication of the Final Remedial Action Plan/Site Conceptual Design following formal concurrence by the states/tribes and the NRC. The published RAP/SCD is used by the RAC in preparation of the final engineering design and implementing procedures. The RAP/SCD is supported by the Processing Site Characterization Report, Disposal Site Characterization Report (if applicable), and is companion to the Environmental Assessment or Environmental Impact Statement. The RAP/SCD becomes Appendix B to the DOE and states/tribes cooperative agreement.

Cooperating agencies are encouraged to participate with the DOE Technical Assistance Contractor in the Albuquerque Project Office during this design phase. Such participation will provide a better understanding of the proposed design and implementing procedures and an opportunity to contribute directly to the design analysis and selection of the most appropriate engineering solutions.

#### Engineering Fact Sheet

The Engineering Fact Sheet, prepared by the TAC, outlines salient statistics, volumes, and other information for use in preparing the environmental assessment and the remedial action plan. Documentation of the basic design features ensures standard and consistent data usage by the various authors that are preparing text. Preparation of the engineering fact sheet requires one month.

#### 5.7 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) - EA/EIS

Assessment of the environmental consequences of a proposed remedial action is required by the National Environmental Policy Act (NEPA). An Environmental Assessment (EA) contains a comprehensive analysis of project options and environmental impacts associated with those options and is used by the DOE and others in evaluating environmental impacts. The EA

process requires approximately 15 months. Where impacts are believed to be significant, the preparation of an Environmental Impact Statement (EIS) following or in lieu of an Environmental Assessment (EA) may be required. Preparation of an EIS is a formal process, with formal administrative procedures and may require an additional six months more than an EA to complete. Even though a project may be initiated with the preparation of an EA, subsequent findings of major environmental impacts may require DOE to modify its NEPA course and prepare an EIS. Upon completion of the NEPA process with either a Finding of No Significant Impact for an EA or a Record of Decision for an EIS and concurrence with the RAP/SCD by cooperating agencies, the project can proceed to completion. The states/tribes and NRC play a key role in reviewing the EA/EIS documents at both the draft and final stages to identify and resolve major issues of concern.

The NEPA process is the major forum for participation in the process by the general public and interested parties; thus, extensive public participation through local task force meetings, public meetings and, as required, formal public hearings is encouraged.

## 5.8 ENGINEERING

### 5.8.1 Preliminary engineering

Preliminary engineering is the first step taken by the RAC to prepare the engineering design consistent with the site conceptual design presented in the RAP/SCD. Preliminary engineering is initiated at the discretion of the DOE following preparation of the draft RAP/SCD. A period of about eight months is available for preliminary engineering work. However, the actual time required by the RAC and the preliminary work that can be performed is dependent upon the complexity of the site and planned remedial action, and the overall program schedule. Preliminary engineering will begin with a review of the SCD and supporting calculations and may proceed to a 30 percent design level. Preliminary engineering may include final engineering for certain aspects of the remedial action that would be common to the alternatives being considered, such as design of an access road, structure demolition, truck decontamination and staging areas, and the like. Preliminary engineering should proceed in concert with final conceptual design to ensure compatibility and consistency.

### 5.8.2 Final design/engineering and permits

Final design and engineering involves the preparation of the final engineering design drawings, materials estimates, and detailed activities required to implement remedial action. Final design and engineering requires about seven months and includes reviews at 60 and 90 percent completion. An additional three months is normally required to obtain permits, licenses, and authorizations from Federal, state, and local regulatory agencies.

## Procurement and award

Subcontractors to be utilized for the various components of the remedial action are solicited and qualified during the six-month procurement and award period. Subcontracts are awarded by the RAC through a competitive process, consistent with Federal procurement regulations. General procurement procedures and policies utilized by the RAC in selecting and securing subcontractors are presented in Appendix B.

### 5.9 REMEDIAL ACTION CONSTRUCTION

Remedial action construction includes all phases of construction required to implement the selected design leading to isolation of the contaminated materials in compliance with regulatory requirements. Construction includes initial activities such as ground breaking, development of site access roads and staging areas, facility construction, building demolition, and the like, and major actions such as tailings handling, encapsulation, and site armoring or restoration. Construction generally requires two construction seasons with winter shutdown periods. Construction activities may continue year round at some sites and other sites may require three construction seasons.

Cooperating agencies are encouraged to monitor remedial actions to ensure their satisfaction with the process. The state or tribe is also encouraged to keep local officials and the general public informed on remedial action progress.

### 5.10 QUALITY ASSURANCE/QUALITY CONTROL/AUDITS AND VALIDATION

Periodic inspections, tests, and other activities will be performed throughout the various program phases and during construction activities to ensure public and worker health and safety, quality assurance and control, and adherence to conceptual design and final engineering requirements and procedures. These activities are designed to verify adherence to procedural requirements, ensure that the remedial action proceeds in accordance with the approved RAP, and to verify that the constructed facility meets applicable requirements. The cooperating agencies have the opportunity to review the procedures, results, and conduct audits and surveillances as appropriate.

### 5.11 SURVEILLANCE AND MAINTENANCE

Upon completion of remedial action, surveillance and maintenance will be performed by the DOE through March 1990, the authorized life of UMTRCA. After March 1990, surveillance and maintenance shall be the responsibility of the DOE or other Federal agency chosen by the President of the United States. Surveillance and maintenance activities may require groundwater monitoring, radiological monitoring, photographic surveillance, and repair to ensure the long term integrity of the remedial action.

#### 5.12 COMPLETION REPORT

Throughout the construction process, the TAC and RAC will document that the construction is in compliance with approved design requirements and standards. This documentation process will involve quality assurance reviews, inspections, quality control checks, and testing. At the completion of construction, the RAC will prepare and submit a Completion Report to the DOE documenting construction activities and detailing the verification procedures that were followed in documenting the construction process. The TAC will assist the DOE in reviewing the Completion Report and supporting documentation. The TAC will prepare and submit to DOE a recommendation on certification.

#### 5.13 CERTIFICATION

Upon completion of the remedial action, the DOE must certify to the NRC that the remedial action was conducted in accordance with the approved remedial action plan and, thus, complies with the EPA standards.

The certification process by the DOE will involve a review of the contractor's construction records, the final completion report, and the results of audits performed during construction activities. The NRC will review and concur in the final site certification report.

#### 5.14 LICENSING

Upon certification by the DOE and concurrence by the NRC that the site is constructed in compliance with the provisions of the approved RAP/SCD and final design, the NRC will license the site. Licensing will include requirements for long-term surveillance and maintenance.



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APPENDIX A

INTRODUCTORY CHAPTER FROM VICINITY PROPERTIES MANAGEMENT  
AND IMPLEMENTATION MANUAL

## 1.0 INTRODUCTION

### 1.1 BACKGROUND

From the early 1940s through 1970, uranium ore from multiple sources in the United States was processed by private companies under contracts with the Manhattan Engineering District and the U.S. Atomic Energy Commission (AEC). As these uranium ore bodies were depleted and the demand for  $U_3O_8$  dropped, many of the mills were deactivated. Large quantities of processed ore residue, or tailings, from the milling operations were left behind. These uranium tailings still contain much of the radium available in the raw ore and are a source of low-level radiation.

Since uranium milling processes followed conventional metallurgical industry practices, these tailings were deposited either in ponds or stockpiles (depending upon the uranium extraction technique employed) adjacent to the mills, and were allowed to dry. Some of these dried piles were unprotected so that significant windblown losses of the solid residue occurred. Also, some piles were accessible to the public for withdrawal and, in some locations, the tailings were used as a sand substitute or backfill material in construction projects.

Later research on the health effects of all forms of low-level radiation exposure indicated that there is a potential health hazard associated with uranium mill tailings which was determined to principally be the potential inhalation of radon decay products.

As radiological criteria for allowable dosages became more stringent, the Federal, state, and tribal governments became more concerned about the radiological hazards associated with the inactive uranium mill tailings sites; in particular, the possible exposures caused by the earlier direct transfer of tailings materials to properties with habitable structures in the vicinity of these abandoned processing sites. These properties included residences, schools, hotels, hospitals, and commercial buildings, and are referred to as "vicinity properties."

In 1972, Congress passed Public Law 92-314 to provide funds for a State-Federal cooperative program for the cleanup of vicinity properties in Grand Junction, Colorado. In 1972, a second program was initiated by the AEC in cooperation with the U.S. Environmental Protection Agency (EPA), to determine the preliminary radiological status and public health effects associated with inactive uranium mill tailings sites, and all associated vicinity properties.

In April, 1978, legislation was proposed to Congress that established a program for performing remedial action to stabilize these uranium mill processing sites and to clean up and restore associated vicinity properties. On November 8, 1978, Public Law 95-604, the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, was passed. This act required the Federal government to perform remedial actions on inactive uranium mill tailings sites that had been used by the Federal government, and on each site's associated vicinity properties.

Responsibility for conducting remedial actions at 24 sites in one eastern and nine western states was delegated to the U.S. Department of Energy, Uranium Mill Tailings Remedial Action (UMTRA) Project Office located in Albuquerque, New Mexico. As outlined in individual cooperative agreements between DOE and the affected states and Indian tribes, the Project Office (PO) is responsible for:

- o Identifying the candidate vicinity properties.
- o Determining the extent of contamination and eligibility for remedial action.
- o Implementing remedial actions.
- o Certifying that properties have been cleaned up in conformance with EPA standards.
- o Coordination with agencies or representatives from the State, tribal, and local governments, the U.S. Nuclear Regulatory Commission, and the DOE Division of Remedial Action Projects.

This task is to be accomplished, according to PL95-604, by March 7, 1990 (seven years from the 1983 effective date of the EPA Standards for Remedial Actions at Inactive Uranium Processing sites, 40 CFR Part 192). The DOE is to perform remedial actions in accordance with the EPA Standards for Cleanup of Lands and Buildings Contaminated with Residual Radioactive Material from Inactive Uranium Processing Sites, 40 CFR 192.12, 192.20-23.

As a first step in the cleanup of UMTRA vicinity properties, aerial surveys were conducted between 1977 and 1983 under DOE contract to identify those areas around the tailings stockpiles which could possibly be contaminated (Section 2.2). Between 1970 and present, the DOE also contracted for mobile ground surveys to further refine the estimates of locations and number of vicinity properties (Section 2.3). In addition, between 1972 and 1980, the EPA and the Colorado Department of Health conducted on-site surveys on individual candidate properties in Mesa County, Colorado.

These surveys, by DOE and others, have indicated that approximately 8100 properties with anomalous radioactive characteristics exist in the vicinity of those abandoned uranium mill tailings sites designated by DOE pursuant to PL95-604. Properties with anomalous readings recorded by EPA and NRC in the vicinity of a mill located in Edgemont, South Dakota, have also been included in the UMTRA Project pursuant to PL97-405, which amended PL95-604. A summary of the estimate of the number of vicinity properties, by property category, and site, is presented in the UMTRA Project Schedule and Cost Estimate Report (UMTRA-DOE/AL-166). A map illustrating the regional location of UMTRA vicinity properties is shown in Figure 1.1.

## 1.2 VPMIM PURPOSE AND OBJECTIVES

The purpose of this manual is to describe UMTRA Project policies and guidelines for remedial action activities on vicinity properties. The



Table 1.1 EPA Standards

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Part 192 - Health and Environmental Protection Standards for Uranium Mill Tailings

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SUBPART B - Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites

192.12 Standards

Remedial actions shall be conducted so as to provide reasonable assurance that, as a result of residual radioactive materials from any designated processing site:

- (a) The concentration of radium-226 in land averaged over any area of 100 square meters shall not exceed the background level by more than -
  - (1) 5 pCi/g, averaged over the first 15 cm of soil below the surface, and
  - (2) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface.
- (b) In any occupied or habitable building -
  - (1) The objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL, and
  - (2) The level of gamma radiation shall not exceed the background level by more than 20 microrentgens per hour.

SUBPART C - Implementation (condensed)

192.20 Guidance for Implementation

Remedial action will be performed with the "concurrence of the Nuclear Regulatory Commission (NRC) and the full participation of any state that pays part of the cost" and in consultation as appropriate with other government agencies (including tribal nations.)

192.21 Criteria for Applying Supplemental Standards

The implementing agencies may (and in the case of Subsection (f) shall) apply standards under Subsection 192.22 in lieu of the standards of Subparts A and B if they determine that any of the following circumstances exists:

- (a) Remedial actions required to satisfy Subparts A or B would pose a clear and present risk of injury to workers or to members of the public, notwithstanding reasonable measures to avoid or reduce risk.

Table 1.1 EPA Standards (Continued)

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Part 192 - Health and Environmental Protection Standards for Uranium Mill Tailings

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192.21 (Continued)

- (b) Remedial actions to satisfy the cleanup standards for land, Subsection 192.12(a), or the acquisition of minimum materials required for control to satisfy Subsection 1292.02(b), would, notwithstanding reasonable measures to limit damage, directly produce environmental harm that is clearly excessive compared to the health benefits to persons living on or near the site, now or in the future. A clear excess of environmental harm is harm that is long-term, manifest, and grossly disproportionate to health benefits that may reasonably be anticipated.
- (c) The estimated cost of remedial action to satisfy Subsection 192.12(a) at a "vicinity" site (described under Section 101(6)(B) of the Act) is unreasonably high relative to the long-term benefits, and the residual radioactive materials do not pose a clear present or future hazard. The likelihood that buildings will be erected or that people will spend long periods of time at such a vicinity site should be considered in evaluating this hazard. Remedial action will generally not be necessary where residual radioactive materials have been placed semi-permanently in a location where site-specific factors limit their hazard and from which they are costly or difficult to remove, or where only minor quantities of residual radioactive materials are involved. Examples are residual radioactive materials under hard surface public roads and sidewalks, around public sewer lines, or in fence post foundations. Supplemental standards should not be applied at such sites, however, if individuals are likely to be exposed for long periods of time to radiation from such materials at levels above those that would prevail under Subsection 192.12(a).
- (d) The cost of a remedial action for cleanup of a building under Subsection 192.12(b) is clearly unreasonably high relative the benefits. Factors that should be included in this judgement are the anticipated period of occupancy, the incremental radiation level that would be affected by the remedial action, the residual useful lifetime of the building, the potential for future construction at the site, and the applicability of less costly remedial methods than removal of residual radioactive materials.
- (e) There is no known remedial action.

Table 1.1 EPA Standards (Concluded)

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Part 192 - Health and Environmental Protection Standards for Uranium Mill Tailings

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192.21 (Continued)

- (f) Radionuclides other than radium-226 and its decay products are present in sufficient quantity and concentration to constitute a significant radiation hazard from residual radioactive materials.

192.22 Supplemental Standards

Federal agencies implementing Subparts A and B may in lieu thereof proceed pursuant to this section with respect to generic or individual situations meeting the eligibility requirements of Subsection 192.21.

- (a) When one or more of the criteria of Subsection 192.21(a) through (e) applies, the implementing agencies shall select and perform remedial actions that come as close to meeting the otherwise applicable standard as is reasonable under the circumstances.
- (b) When Subsection 192.21(f) applies, remedial actions shall, in addition to satisfying the standards of Subparts A and B, reduce other radioactivity to levels that are as low as reasonably achievable.
- (c) The implementing agencies may make general determinations concerning remedial actions under this Section that will apply to all locations with specified characteristics, or they may make a determination for a specific location. When remedial actions are proposed under this Section for a specific location, the Department of Energy shall inform any private owners and occupants of the affected location and solicit their comments. The Department of Energy shall provide any such comments to the other implementing agencies. The Department of Energy shall also periodically inform the Environmental Protection Agency of both general and individual determinations under the provisions of this section.

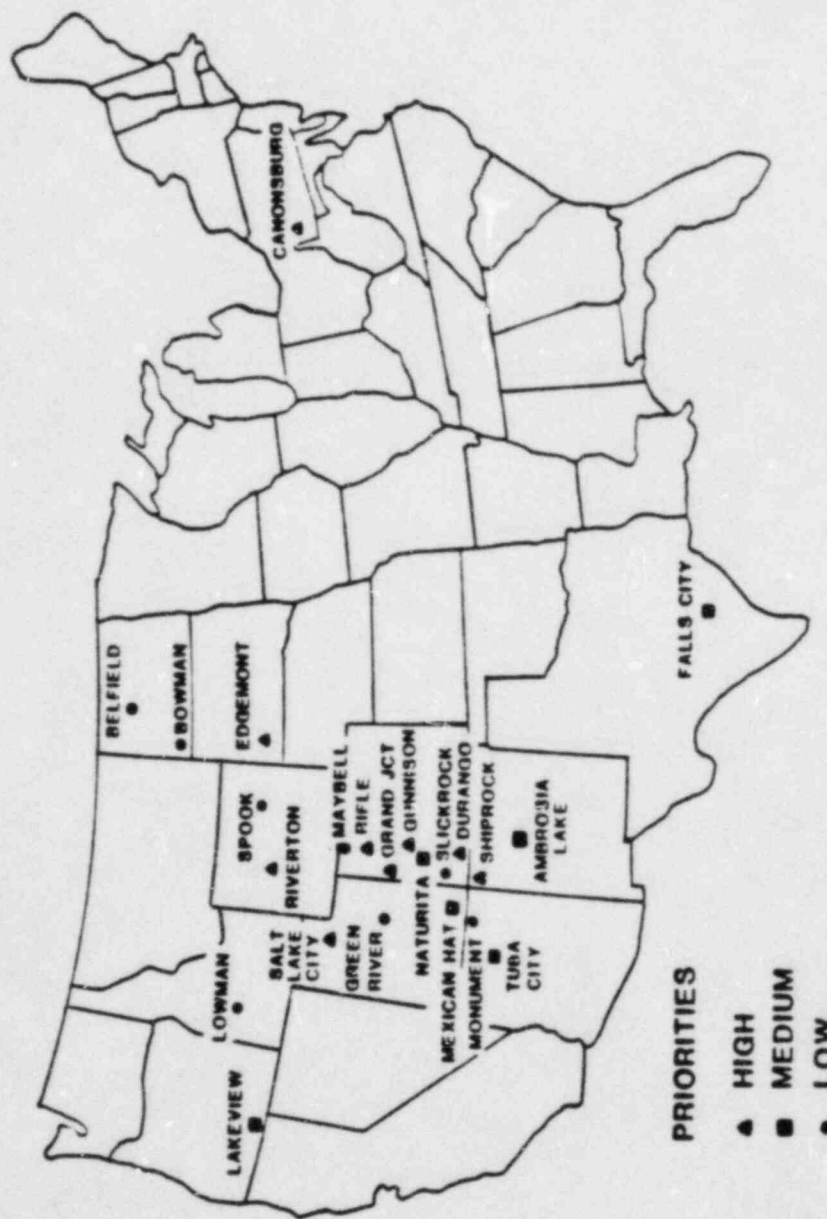
192.23 Effective Date

Subparts A, B and C shall be effective March 7, 1983.

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Ref: Federal Register, Volume 48, No. 3, January 5, 1983, 40CFR Part 192  
Environmental Protection Agency (EPA).





**FIGURE 1.1 VICINITY PROPERTIES LOCATION MAP**



The objective of the manual is to establish standard procedures for all vicinity property activities, and to present a uniform system of planning and scheduling which will promote effective management by the DOE and communication between the DOE, states, tribes, participating contractors, and the public. Specifically, the objectives of the VPMIM are:

- o To describe guidelines to the project participants for conducting the various vicinity property inclusion, engineering, remedial action, and certification tasks.
- o To identify the roles of the various vicinity property participants and their responsibilities.
- o To describe the Vicinity Property Data Management System (VPDMS) which DOE and its contractors will use to assess status and radiological characteristics of individual properties.

This manual will be updated, as required. Significant changes to protocol and/or responsibilities will be provided to the states, tribes, and NRC for comment prior to final incorporation into the document.

### 1.3 PROJECT IMPLEMENTATION

The UMTRA Project includes responsibilities assigned to the Assistant Secretary for Nuclear Energy (ASNE), some of which have been delegated to the Albuquerque Operations Office (AL). An UMTRA Project Office (PO) AL has been established in Albuquerque, New Mexico. It is the responsibility of the PO to administer and implement vicinity property remedial actions for the UMTRA Project according to the guidelines discussed in this manual. Guidelines for remedial action at the UMTRA processing sites are discussed in other UMTRA documents.

#### 1.3.1 Vicinity properties responsibilities

The DOE is assisted in its vicinity property efforts by a Technical Assistance Contractor (TAC), two Remedial Action Contractors (RACs) and the Inclusion Survey Contractor (ISC). In addition, the states, Indian tribes, and Nuclear Regulatory Commission (NRC) provide approvals and concurrence to DOE at various stages of the vicinity property process. The PO is also assisted in its effort by the DOE Headquarters and Grand Junction Area Office. Specifically the Idaho Operations Office, through the Grand Junction Area Office, is administering RAC activities for Grand Junction and Edgemont vicinity property remedial actions and the Technical Measurements Center (TMC) in support of all DOE remedial action programs. With respect to properties, the DOE is responsible for:

- o Overall project management and outline of support contractor's scopes of work.
- o Property designation.

- o Property inclusion.
- o Approval of Radiological and Engineering Assessments (REAs).
- o Approval of Remedial Action Agreements.
- o Approval of remedial action designs.
- o Approval of Quality Assurance and Health and Safety Plans.
- o Property certification.
- o Coordinating communication and concurrence with affected states and Indian tribes.
- o Approval of all vicinity property plans, manuals, systems and activities including the VPMIM.

The states and Indian tribes affected by the UMTRA Project are considered implementing agencies, by virtue of their respective cooperative agreements. These agencies are responsible for:

- o Concurrence of property REAs.
- o Execution of property owner RAAs.
- o Assistance in providing information to the local public and enhancing participation in the project, as required.

In addition, the states and Indian tribes are encouraged to participate in the following activities:

- o Inclusion surveys.
- o REA surveys.
- o Remedial action designs.
- o RAA negotiations with property owners.
- o Health and Safety.
- o Quality assurance.
- o Compliance verification.
- o Property certification.

The U.S. Nuclear Regulatory Commission (NRC), as an implementing agency with the DOE, is responsible for:

- o Concurring with the selection and performance of remedial action for vicinity properties.
  - For most properties, this concurrence is provided through concurrence in the VPMIM and review of the associated NEPA document(s).
  - For unusual or significant properties, concurrence is provided through approval of the REA. An unusually significant property is one with greater than 10,000 cubic yards of tailings or where supplemental standards are being applied.

- o Input into the decision-making process, project planning, and document development.

The purpose of the TAC is to assist the DOE in the technical development planning and monitoring of the project remedial actions. Specifically, the TAC is responsible for the following UMTRA vicinity property activities:

- o Development and maintenance of the Vicinity Property Data Management System (VPDMS) and Vicinity Properties Master Schedule.
- o Overall coordination, monitoring, and status reporting.
- o Development and maintenance of the VPMIM.
- o Review of selected REAs and preparation of Engineering Review Reports.
- o Review of selected construction bid packages and preparation of Bid Package Review Reports.
- o Random performance of Radiological Surveillances.
- o Review of Property Completion Reports and recommendations for property certification.
- o Review of RAC quality assurance program plans and preparation of Vicinity Property Audit Reports.
- o Review of RAC health and safety plans and procedures and preparation of Health and Safety Survey Reports.
- o Coordination of the vicinity properties public information and participation activities with other Project participants.

The TAC will interface on a daily basis with the RACs, ISC, states/tribes, and other participants in fulfilling the above responsibilities. Questions and issues beyond the TAC's level of responsibility/authority will be referred by the TAC to the PO.

The RAC function is to prepare detailed remedial action engineering designs for inactive mill site locations and to design and implement all vicinity property remedial actions. Specifically, the RAC is responsible for the following UMTRA vicinity property activities:

- o Develop REAs on each property.
- o Develop property remedial action cost and schedule estimates.
- o Prepare and assist in the execution of RAAs on each property.



- o Develop remedial action design, specifications, and bid packages.
- o Issue Requests for Proposals and Invitations for Bids on remedial action construction subcontracts.
- o Award remedial action construction subcontracts.
- o Manage remedial action construction and report progress to the PO.
- o Implement vicinity properties public information and participation activities.
- o Perform quality assurance and health and safety activities in accordance with the applicable UMTRA plans.
- o Verify compliance of remedial actions to EPA standards (40 CFR 192) and provide Property Completion Reports.
- o Provide data inputs for the VPDMS and provide status reports as required.

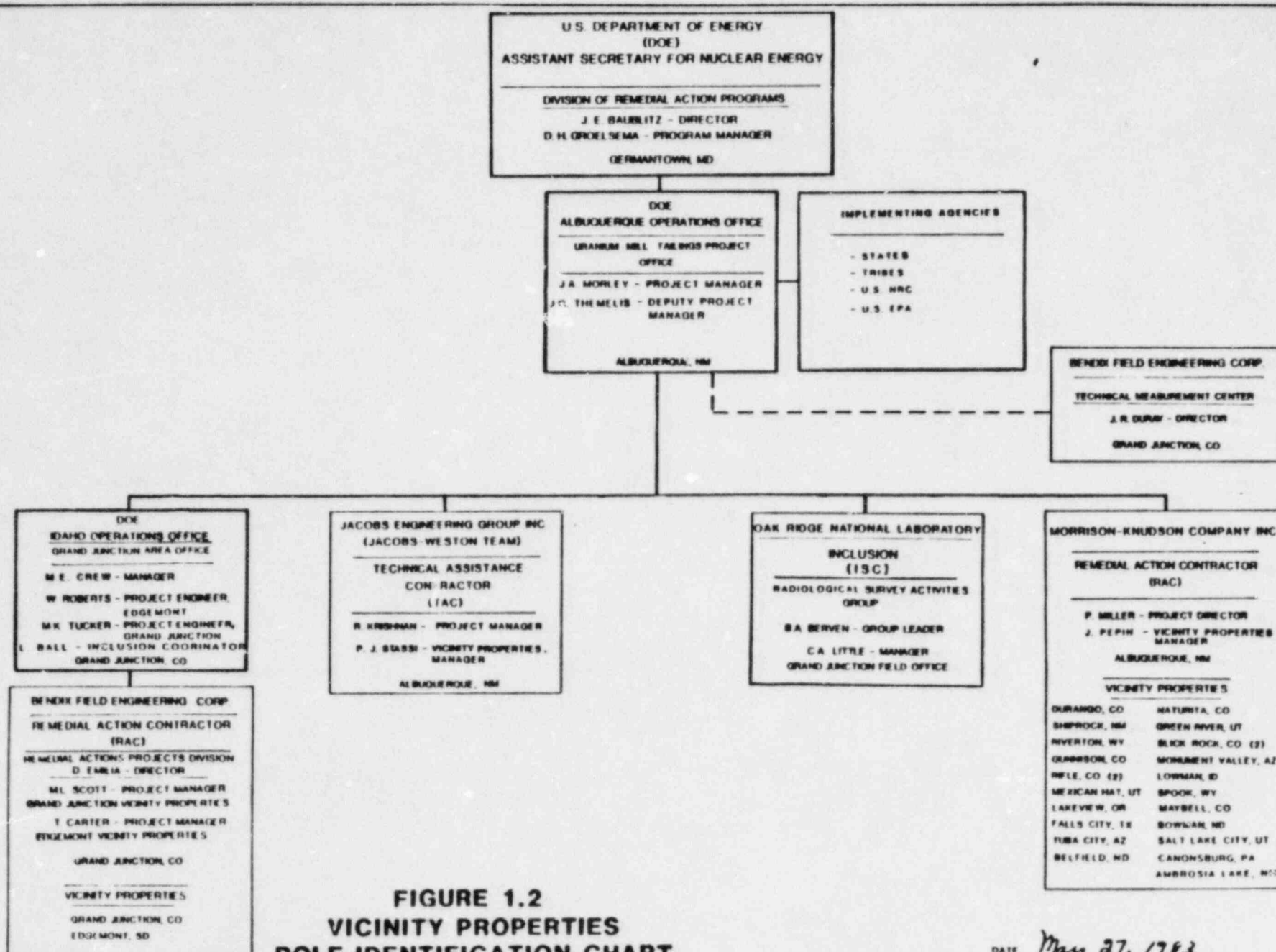
The Inclusion Survey Contractor (ISC) is responsible for performing all radiological surveys and data analysis as required to include properties in the UMTRA Project. Specifically, the following activities are the responsibility of the ISC:

- o Conduct mobile identification surveys.
- o Execute right of entry agreements with property owners (consent forms).
- o Conduct Property Inclusion surveys.
- o Prepare inclusion reports and recommendations to DOE.
- o Provide data inputs for the VPDMS and provide status reports as required.

The Technical Measurements Center (TMC) supports the environmental measurement requirements of the UMTRA Project. The technical support of the TMC to the UMTRA Project consists of:

- o Providing and/or identifying calibration facilities and procedures.
- o Standardization of field and laboratory measurements.
- o Development of measurement procedures for field and laboratory use.
- o Measurements comparison and data verification.
- o Instrument evaluation.





**FIGURE 1.2**  
**VICINITY PROPERTIES**  
**ROLE IDENTIFICATION CHART**

DATE May 27, 1983

The Vicinity Properties Role Identification Chart (Figure 1.2) illustrates the relationship of the UMTRA Project participants to the PO.

### 1.3.2 Vicinity property tasks

The UMTRA PO has established a sequential order of events for accomplishing remedial actions on UMTRA vicinity properties. The procedures described herein are generic in nature and the sequence may change slightly depending upon the specific task or circumstance. A brief description of the established series of events is provided below. A detailed discussion of these tasks is presented in Sections 2.0 through 8.0. A flow diagram is presented in Figure 1.3.

#### a. Historical/baseline data use

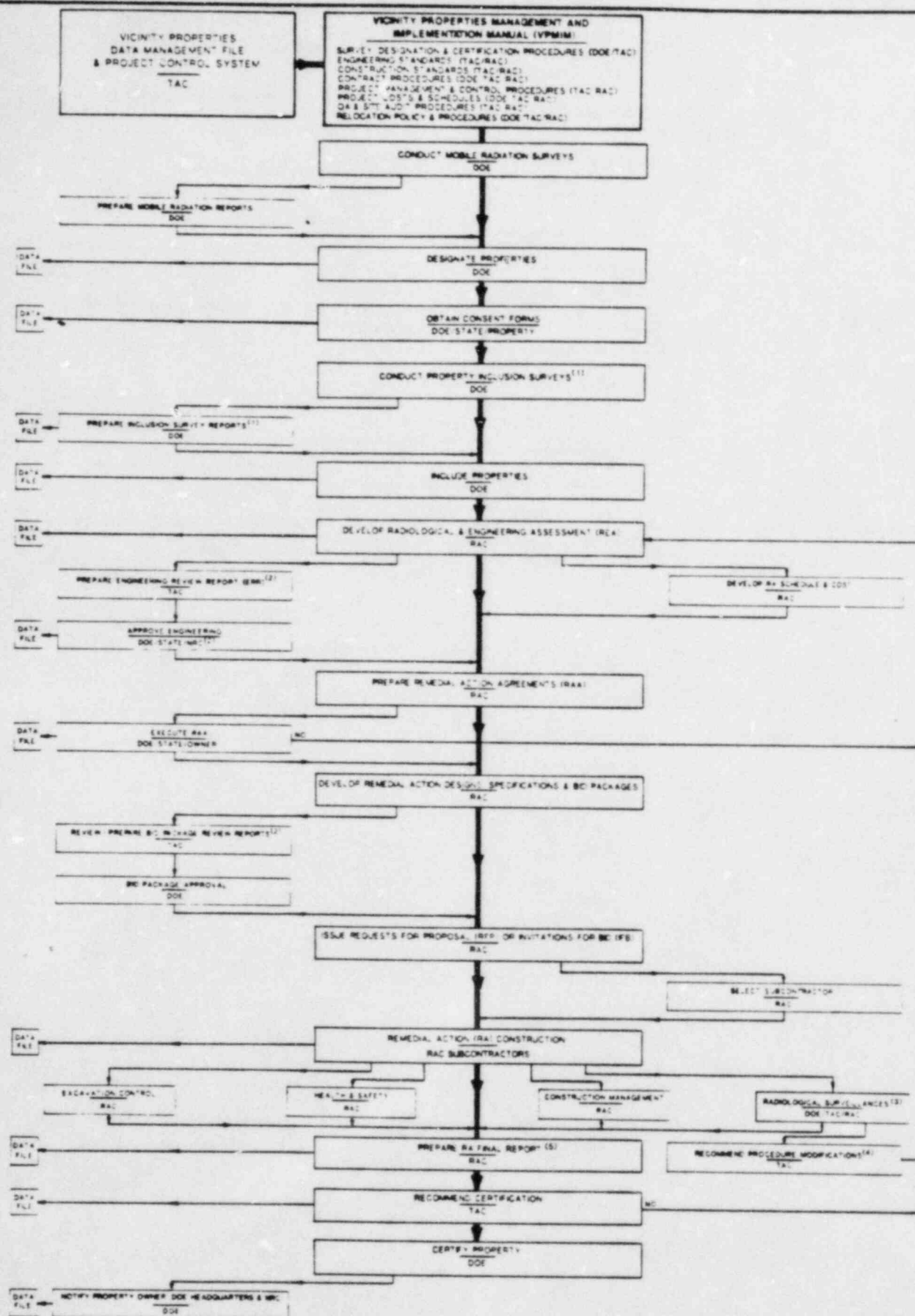
Radiological data, developed between 1970 and the present, have been used to establish a preliminary record of each vicinity property's history of contamination. These records have been documented and are stored on a computer file within the Vicinity Property Data Management System (VPDMS). The VPDMS will be utilized in the inclusion process to screen priority properties for inclusion evaluation (See Section 2.4), and to sort and select contaminated vicinity properties by geographic location. These historical data are the basis for designating vicinity properties. "Designated" properties are those which have been identified by baseline surveys as being contaminated to some degree by tailings and consequently are candidates for UMTRA inclusion. (For a detailed description of the designation process, see Appendix A, Exhibit 1).

#### b. Site surveys and inclusion

Prior to beginning remedial action activities on vicinity properties, each property is evaluated to determine its eligibility for inclusion in the UMTRA Project. "Included" properties are those properties, both designated and undesignated, which have been found to be contaminated with residual radioactive contamination in excess of EPA standards. This inclusion evaluation consists of either on-site radiological surveys, or mobile radiation surveys, complimented with detailed evaluations of the baseline radiological information (Section 2.4). This survey information will be evaluated by the Inclusion Contractor and a recommendation will be made to the DOE for inclusion or exclusion. Once a decision regarding inclusion or exclusion is made by DOE, the Inclusion Survey Contractor is required to transfer all pertinent property data to the RAC for his use in REA development.

#### c. Site engineering and design

Once a property has been included, a Radiological and Engineering Assessment (REA) will be developed by the RAC for



(11) DENOTES HOW CONDUCTED BY RADIATION SURVEY TEAM

(12) FUNCTIONS VALUE ONLY FOR EXCEPTIONALLY LARGE OR COMPLEX PROPERTY ACTIONS

(13) AUDITS WILL BE CONDUCTED ON A PERIODIC BASIS AS REQUIRED

(14) FUNCTION ONLY VALID IF INITIAL RA DOES NOT ACHIEVE EPA CLEANUP STANDARDS 40 CFR 192

(15) PREPARATION OF THESE REPORTS WILL INCLUDE RADIOLOGICAL MEASUREMENTS FOR VERIFICATION OF CONFORMANCE TO EPA CLEANUP STANDARDS 40 CFR 192

**FIGURE 1.3  
VICINITY PROPERTIES  
FLOW DIAGRAM**



each property. This assessment involves some or all of the following:

- o Review of engineering surveys including as-built drawings, property records, and utility networks.
- o On-site radiological surveys, including soil borings if necessary.
- o Preliminary (Title I) design of the recommended remedial action options.
- o Estimates of volumes of contaminated materials.
- o Costs of remedial action options.
- o Relocation requirements and other costs.

The REA specifies remedial action options and will be transmitted by the RAC to the DOE and states or tribes, for review and selection of a remedial action option. The detailed design and contract specifications may be submitted with the draft REA, provided the property is considered non-complex (i.e., housing only two options--action and no action). Under certain conditions the DOE will also distribute REAs to the NRC for their review and approval (Section 3.2.4). On selected vicinity properties, the TAC will be requested to prepare an Engineering Review Report (ERR) on the REA. Once approved by DOE and the state or tribe, a description of the remedial action will be derived from the REA and incorporated into a Remedial Action Agreement (RAA). This agreement, reviewed and approved by the DOE, State, (and NRC in some situations), will be transmitted by the RAC to the property owner, and any tenants, for their execution indicating their consent to the proposed remedial action (Section 3.3). Once approved by the property owner, and any tenants, the RAA will be transmitted to the State/Indian tribe and DOE (and NRC, as appropriate) for execution. Once finally executed, the detailed property remedial action design will be provided to the property owner prior to remedial action, if requested.

For a complex property having two or more options, the last step in the site engineering and design phase involves the development of design drawings and contract specifications by the RAC. These plans and specifications are considered to be Title II design and will be incorporated into a construction bid package (Section 3.4). The bid packages will be developed in accordance with approved DOE procurement procedures and, on selected vicinity properties, the TAC will be requested to provide Bid Package Review Reports (BPRR).

Once approved, the bid packages will be issued by the RAC to construction subcontractors for competitive bids.



d. Remedial action

The construction bid packages will be awarded in accordance with DOE-approved procurement procedures. Subcontractors will be required to perform the remedial action in a manner consistent with excavation control, health and safety, and restoration criteria outlined in this document (Section 4.0). The RAC will be responsible for incorporating this manual's procedures into bid documents to verify subcontractors' compliance with this manual and to ensure that the EPA standards are met. The RAC will also be responsible for vicinity property construction management and the implementation of approved UMTRA Quality Assurance procedures (Section 4.4).

e. Remedial action documentation and certification

Once remedial action is complete, the RAC will prepare a Property Completion Report. The principal intent of this report is to determine if the property, upon which remedial action was performed, meets the EPA standards. This report will be transmitted to the PO for review (Section 5.0). The report will contain the results of remedial action and radiological measurements taken after remedial action and will have a general summary of remedial action activities performed on that property, including cost and schedule information. The TAC will evaluate this report and make recommendations to the PO regarding property certification. The PO will certify a property's compliance with the EPA standards based upon a review of the information contained in the Completion Report and the TAC's recommendations. Once a property is certified, the proper identification and documentation will be prepared.

The TAC will perform Effectiveness Audits on selected properties during various stages of remedial action. The Effectiveness Audits may involve field sampling and analysis and will be conducted to provide DOE with an objective assessment of procedures being employed by the RAC to verify conformance to EPA standards during remedial action (Section 5.3).

#### 1.4 SUMMARY

As illustrated in the Flow Diagram (Figure 1.3) and in the preceding text, a number of distinct tasks will be performed by various project participants, to ensure that remedial action on vicinity properties is accomplished in a manner which is consistent with UMTRA PO objectives and which is in compliance with EPA standards. The following sections of this manual further define the sequence of events for implementing vicinity property remedial action, and outline in detail the responsibilities and reporting requirements of the principal project participants.