Nevada
Environmental
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Project

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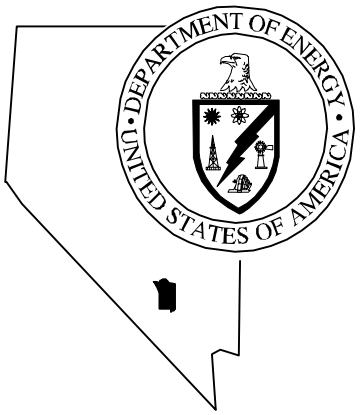

Underground Test Area Subproject Project Management Plan

Controlled Copy No.: Uncontrolled
Revision No.: 1

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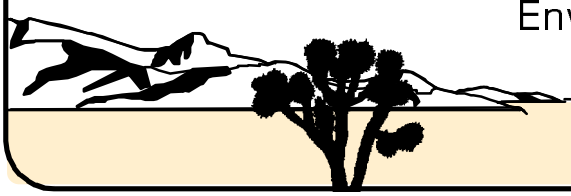

Environmental Restoration
Division

U.S. Department of Energy
Nevada Operations Office

DOE/NV--385
UC-700

UNDERGROUND TEST AREA SUBPROJECT PROJECT MANAGEMENT PLAN

DOE Nevada Operations Office
Las Vegas, Nevada

Controlled Copy No.: Uncontrolled

Revision No.: 1

June 1998

UNDERGROUND TEST AREA SUBPROJECT
PROJECT MANAGEMENT PLAN

Approved by: Robert M. Bangerter Jr. Date: June 3, 1998

Robert M. Bangerter, Jr., Project Manager
Underground Test Area Subproject

Approved by: Runore Wycoff Date: June 3, 1998

Runore C. Wycoff, Project Manager
Nevada Environmental Restoration Project

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List of Acronyms and Abbreviations

A-E	Architect-Engineer
AIP	Agreement(s) in Principle
AMEM	Assistant Manager for Environmental Restoration and Waste Management
BCC	Baseline Change Control
BN	Bechtel Nevada
CAB	Community Advisory Board
CADD	Corrective Action Decision Document
CAI	Corrective Action Investigation
CAIP	Corrective Action Investigation Plan
CAP	Corrective Action Plan
CAS	Corrective Action Site
CAU	Corrective Action Unit
CFR	*Code of Federal Regulations*
COR	Contracting Officer's Representative
CR	Closure Report
CWBS	Contractor Work Breakdown Structure
EM-40	U.S. Department of Energy, Headquarters, Office of Environmental Restoration
EM-45	U.S. Department of Energy, Headquarters, Office of Southwestern Area Programs
ER	Environmental Restoration
D&D	Decontaminated and decommissioned
DAR	DOE Acquisition Regulation
DoD	U.S. Department of Defense
DOE/HQ	U.S. Department of Energy Headquarters
DOE/NV ERD	U.S. Department of Energy, Nevada Operations Office, Environmental Restoration Division
DOE/NV ERP	U.S. Department of Energy, Nevada Operations Office, Environmental Restoration Program

List of Acronyms and Abbreviations *(Continued)*

DOE/NV	U.S. Department of Energy, Nevada Operations Office
DP	DOE Defense Program
DQO	Data Quality Objective(s)
DRI	Desert Research Institute
EPA	U.S. Environmental Protection Agency
ES&H	Environment, Safety, and Health
ESA	*Endangered Species Act*
FAR	Federal Acquisition Regulation
FFACO	*Federal Facility Agreement and Consent Order*
FY	Fiscal Year
GIS	Geographical Information System
HASP	Health and Safety Plan
IT	IT Corporation
LANL	Los Alamos National Laboratory
LCAM	Life Cycle Asset Management
LLNL	Lawrence Livermore National Laboratory
LOA	Letters of Accomplishment
NAFR	Nellis Air Force Complex
NCR	Nonconformance Report
NDEP	Nevada Division of Environmental Protection
NEPA	*National Environmental Policy Act*
NPMIS	Nevada Project Management Information System
NTS	Nevada Test Site
NTS EIS	*Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*
NV/ERP	Nevada Environmental Restoration Project
PAI	Professional Analysis, Inc.

List of Acronyms and Abbreviations (Continued)

PCN	Procedure Change Notice
PMP	Project Management Plan
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
OSHA	Occupational Safety and Health Administration
RCRA	*Resource Conservation and Recovery Act*
RTC	Record of Technical Change
S&S	Safeguards and Security
SDWA	*Safe Drinking Water Act*
SOP(s)	Standard Operating Procedure(s)
SOW	Statement of Work
SSHASP	*Site-Specific Health and Safety Plan*
TTR	Tonopah Test Range
TWG	Technical Working Group
UGTA	Underground Test Area
UNLV	University of Nevada, Las Vegas
UNR	University of Nevada, Reno
USGS	U.S. Geological Survey
VOIA	Value of Information Analysis
WBS	Work Breakdown Structure
WMD	DOE/NV Waste Management Division
WMP	Waste Management Plan

1.0 INTRODUCTION

This Project Management Plan (PMP) describes the manner in which the U.S. Department of Energy Nevada Operations Office (DOE/NV) will manage the Underground Test Area (UGTA) Subproject at the Nevada Test Site (NTS). It provides the basic guidance for implementation and the organizational structure for meeting the UGTA objectives.

The DOE Nevada Environmental Restoration Project, including the UGTA Subproject, is managed in accordance with the Joint Program Office Direction on Project Management developed by the Office of Environmental Management. This direction was developed to address the minimum program requirements expected to be fulfilled as U.S Department of Energy Headquarters (DOE/HQ) implements the project management aspects of Life Cycle Asset Management (LCAM) of DOE Order 430.1 (DOE, 1995b). This PMP for the UGTA Subproject is considered to be a subtiered document of the *Nevada Environmental Restoration Project Management Plan* (DOE/NV, 1994). Consequently, some elements of the Nevada Environmental Restoration Project Management Plan apply to all Nevada Environmental Restoration Project activities and, therefore, are not repeated in this UGTA Subproject PMP.

An inherent assumption of this PMP is that the reader is familiar with the UGTA Subproject. Aspects critical to the understanding of the subproject include the physical setting of the NTS, potential contaminant sources and migration pathways from these sources, the corrective action strategy for UGTA sites, and the scope of work for the UGTA Subproject.

1.1 Purpose and Scope

This PMP describes the DOE/NV UGTA Subproject responsibilities and management structure, the Work Breakdown Structure (WBS), and funding requirements as well as the subproject management, measurement, planning, and control systems. The technical, schedule, cost, and other objectives of the subproject are provided in Section 2.0. Section 3.0 describes the roles and responsibilities of the various organizations involved in the subproject, including DOE/NV, contractors, and other participating parties. Section 4.0 provides the UGTA Subproject corrective action strategy and its WBS. Section 5.0 describes the UGTA Subproject schedule. Section 6.0 describes the requirements for the UGTA Subproject management, measurement, planning, and control systems.

1.2 Participants

The UGTA Subproject participants include U.S Department of Energy Headquarters (DOE/HQ), DOE/NV Environmental Restoration Division (DOE/NV ERD), IT Corporation (IT), Bechtel Nevada (BN), Desert Research Institute (DRI), the U.S. Geological Survey (USGS), Lawrence Livermore National Laboratory (LLNL), and Los Alamos National Laboratory (LANL). Their roles and responsibilities are presented in Section 3.0 of this PMP.

1.3 Subproject Description

The UGTA Subproject is charged with the investigation of the extent, magnitude, and duration of groundwater contamination both on and off the NTS. The strategy is to use computer models to define boundaries around each UGTA Corrective Action Unit (CAU) that establish areas which contain water that may be unsafe for domestic and municipal use.

Nevada stakeholders have placed a high priority on understanding the extent of subsurface contamination through the UGTA Subproject. The need to understand the effects of nuclear weapons testing on the groundwater flow system is paramount.

Corrective action activities began in FY 1996 and include the development of specific groundwater flow and solute transport modeling for six geographic areas or CAUs (Corrective Action Units). The CAUs are (1) Frenchman Flat, (2) Western Pahute Mesa, (3) Yucca Flat, (4) Central Pahute Mesa, (5) Climax Mine, and (6) Rainier Mesa/Shoshone Mountain. These are identified in the UGTA Subproject detailed plans. Field activities in each area will provide data collection in the near-field environment, including installation of monitoring wells in locations specified by modeling results. The effort will include near-field groundwater flow and solute transport modeling, risk assessment, stakeholder/regulatory concerns, and a monitoring network design.

Activities within the UGTA program will follow the *Federal Facility Agreement and Consent Order* (FFACO, 1996) Corrective Action Strategy outline which currently assumes that existing data combined with new data from existing wells is sufficient to model all CAUs and to define contaminant boundaries.

2.0 OBJECTIVES

2.1 Accelerating Cleanup: Paths to Closure - Objectives

In July of 1996, DOE/HQ developed a vision for its Environmental Management Program to remediate as many of the contaminated sites as possible within the Department's control in a ten-year time period. To implement this vision, programmatic assumptions were developed to guide all sites in developing their specific plans. Each site then developed its own site-specific assumptions in consultation with stakeholders.

2.1.1 Overall Assumptions

The overall assumptions are as follows:

A. Complete corrective action of all contaminated sites by the year 2006, yet realize DOE landlord responsibilities for surveillance and monitoring would extend past the ten-year period.

   - The nature and extent of contaminated CAUs must be adequately understood to avoid developing overly-prescriptive, long-term surveillance and maintenance/monitoring requirements based on worst-case scenarios. For the UGTA Subproject, this means definition of the contaminant boundary and design of the monitoring well network for each CAU will be completed within the ten-year window. However, full definition of the components of the proof-of-concept monitoring and subsequent post-closure monitoring programs will be developed outside of the ten-year window.

B. Recognize the value of strong stakeholder involvement in the planning and understanding of the decisions to be made.

C. Eliminate the most urgent risks first.

D. Optimize integration across programs and sites.

E. Use innovative technology to reduce costs and improve effectiveness.

F. Maximize use of cost-effective privatization.

2.2 Technical Objectives

The main technical objective of the UGTA Subproject is to define the regional and site-specific hydrologic boundaries encompassing groundwater resources that may be unsafe for domestic or municipal use. This is accomplished through the collection of data and its evaluation to allow informed decisions that will ensure that risks to public health and the environment posed by impacted groundwater are, and will remain, within protective levels or are eliminated or reduced to those levels established through the FFACO.

Regulatory guidelines that affect the technical objectives include, but are not limited, to the *Resource Conservation and Recovery Act* (RCRA) (40 CFR 261, 1996b); hazardous and solid waste amendments to RCRA; the *National Environmental Policy Act of 1969* (NEPA) (10 CFR 1021, 1995); the *Safe Drinking Water Act* (SDWA) (ES, 1988); and applicable state statutes and administrative codes. Effective completion of the UGTA

Subproject objectives will result in the selection and documentation of the corrective action as well as its implementation.

2.3 Schedule Objectives

The schedule objective for the UGTA Subproject is to identify the contaminant boundary and monitoring well network for all the CAUs by the year 2006. The schedule assumes that adequate funding will be continuous throughout the corrective action activities. Environmental restoration activities are phased according to regulatory processes and priorities established in the FFACO to facilitate successful completion of this objective. Work will be performed to correspond with regulatory and FFACO requirements. Postclosure surveillance and monitoring are assumed for 100 years because underground test areas cannot be cost-effectively remediated using existing technologies.

2.4 Cost Objectives

All subproject activities will be conducted in the most cost-effective manner using cost-control management techniques and systems required by DOE, while ensuring that the technical and schedule objectives are being met. The current estimated UGTA Subproject costs by fiscal year through FY 2006 are given in FY 1997 dollars in Table 2-1. The cost values given in the table are based on the current understanding of site conditions and the anticipated scope to meet those objectives. The estimated costs are, therefore, highly dependent on future findings, the eventual full scope of the UGTA Subproject, regulatory interpretations and negotiations, and the prioritization of other elements of the Nevada Environmental Restoration Project strategy. Necessary changes to both the estimated costs and associated cost objectives will be monitored and processed using the management, measurement, and planning control systems described in Section 6.0.

Table 2-1
Underground Test Area
Estimated Costs by Fiscal Year

Fiscal Year	Estimate ($Thousands)
1997	$16,348
1998	$20,914
1999	$39,582
2000	$40,874
2001	$40,761
2002	$32,252
2003	$25,593
2004	$20,711
2005	$18,252
2006	$11,484
Total	**$266,807**
To complete (through FY 2070)	**$1,184,423**

Annual updates of the estimated costs will be provided as part of the task planning and baselining process.

2.5 Subproject Management Objectives

The DOE Joint Program Office "Direction on Project Management" was issued for implementation by the DOE Office of Environmental Management in February 1996. This direction was developed to address the minimum program requirements expected to be fulfilled as DOE/HQ implements the project management aspects of Life Cycle Asset Management of DOE Order 430.1 (DOE, 1995b). The LCAM is the DOE's directive on implementing project management. It transitions the management of projects from a compliance-based system to a performance-based system. However, the basic principles of project management in planning, decision approvals, change control, and reporting remain and have been implemented within the Environmental Restoration Division (DOE/NV ERD), and therefore, the UGTA Subproject.

In support of the LCAM, the Nevada Project Management Information System (NPMIS) has been developed to monitor the activities in the UGTA Subproject. The Work Breakdown Structure establishes the foundation for necessary project management and control systems. Project progress is measured against cost and schedule parameters developed within the framework of the WBS, which are subject to approval levels established in the Project Control System, *Baseline Change Control (BCC) Process* (DOE/NV, 1997). These parameters will be used as the criteria for measuring performance and determining the need for control actions by successively higher levels of management. Details of the system are contained in Section 6.3 of this document.

2.6 Environmental, Health, and Safety Objectives

The UGTA Subproject is committed to ensuring that risks to the environment and to human health and safety are either eliminated or reduced to acceptable levels. All work performed will be consistent with DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Program for DOE Operations* (DOE, 1993); Title 29 *Code of Federal Regulations* (CFR) Part 1910 (CFR, 1996a); Title 40 CFR Parts 260-271 (CFR, 1996b); Title 40 CFR Part 300 (CFR, 1997); and the *Nevada Environmental Restoration Project Health and Safety Plan*, Rev. 2 (DOE/NV, 1996a).

2.7 Quality Assurance Objectives

The overall Quality Assurance (QA) objective of the UGTA Subproject is to ensure compliance with applicable QA requirements. All QA manuals and procedures will be consistent with DOE Order 5700.6c, *Quality Assurance* (DOE, 1996b) and the *Nevada Environmental Restoration Project Quality Management Plan* (QMP) (currently under development) which outlines the QA standards that will be applied to project activities.

3.0 MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

Figures 3-1 through 3-3 depict the schematic organizational structure for DOE/NV and its contractors. These figures present only those DOE/NV offices and divisions commonly involved in the management of environmental projects and subprojects. The DOE/NV Manager has delegated authority for management of the Nevada Environmental Restoration Project to the DOE Assistant Manager for Environmental Restoration and Waste Management (AMEM). Coordination with other DOE/NV assistant managers is vital to the success of the Nevada Environmental Restoration Project; descriptions of their responsibilities are provided below.

3.1 DOE Headquarters

The DOE/HQ Office of Environmental Restoration (EM-40) is responsible for establishing DOE environmental policy and approving budget submittals and changes to scope, budget, and schedule above thresholds designated by EM-40. Responsibility for the UGTA Subproject falls within the EM-40 Office of Southwestern Area Programs (EM-45).

3.2 Office of the Manager

The Office of the Manager oversees management and operations of the NTS. DOE/NV also has environmental restoration responsibility for eight inactive U.S. off-site test locations. The Manager is responsible for safeguarding the environment and ensuring the safety and health of all participants in DOE/NV programs. The Manager has overall authority and responsibility to ensure that an effective Nevada Environmental Restoration Project is maintained consistent with EM-40 guidance, including responsibility for approving both budget and schedule objectives.

Assistant Manager for Technical Services - Develops, interprets, and provides matrix support for Environment, Safety, and Health (ES&H) and Safeguards and Security (S&S) policies, procedures, and practices. This office ensures that DOE/NV operations are conducted in a manner that complies with statutes, regulations, orders, mandated standards, and DOE/HQ program direction.

Assistant Manager for Environmental Management - Develops policies and procedures and provides the programmatic planning and centralized management for all DOE/NV Environmental Management Program activities assigned to DOE/NV by the DOE/HQ Assistant Secretary for Environmental Management, including assessments, remediations, and facility transitions at former operational locations, both on and off the NTS.

Assistant Manager for Business and Financial Services - Responsible for ensuring the financial integrity of DOE/NV by developing and implementing appropriate policies and procedures to provide advice and assistance for effective management of DOE/NV finances and related activities. In addition, this office develops and maintains integrated financial accounting and financial management systems and provides oversight of all financial management activities related to programs and operations.

Assistant Manager for National Security - This is the landlord program for DOE at the NTS.

Office of Chief Counsel - Provides legal advice and assistance on matters of law and

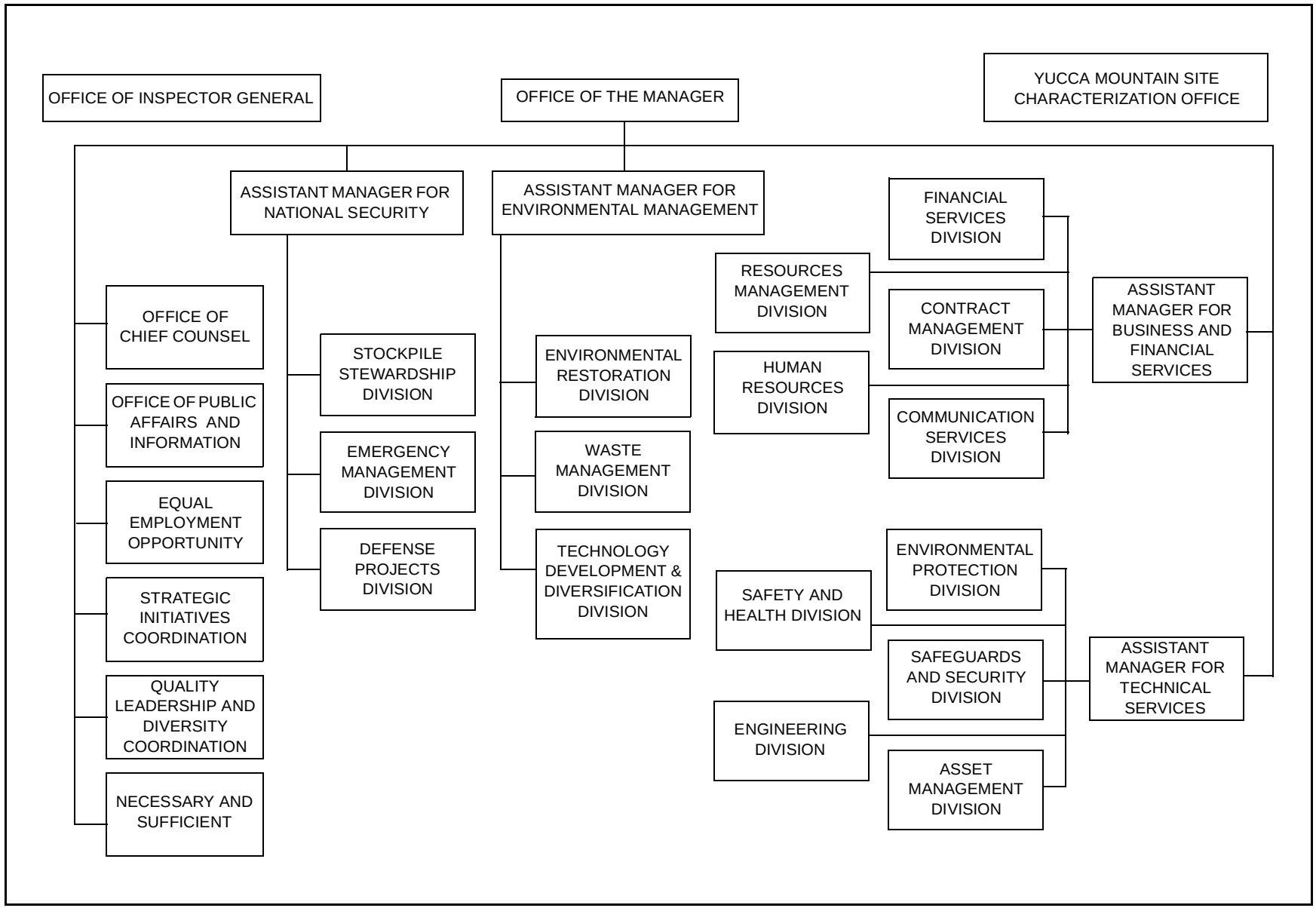

Figure 3-1
DOE Nevada Operations Office Organizational Structure

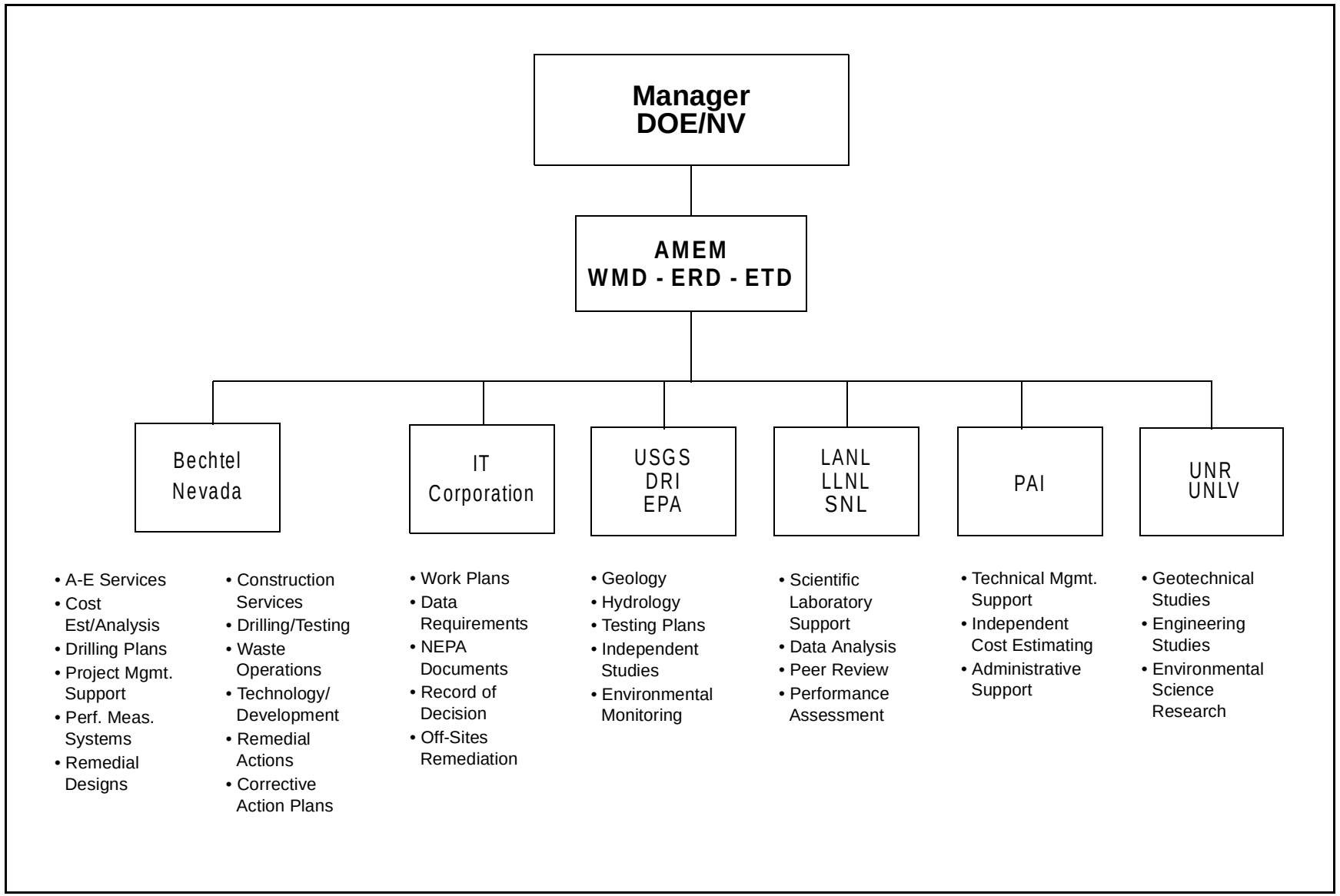

Figure 3-2
Contractors' Roles and Responsibilities

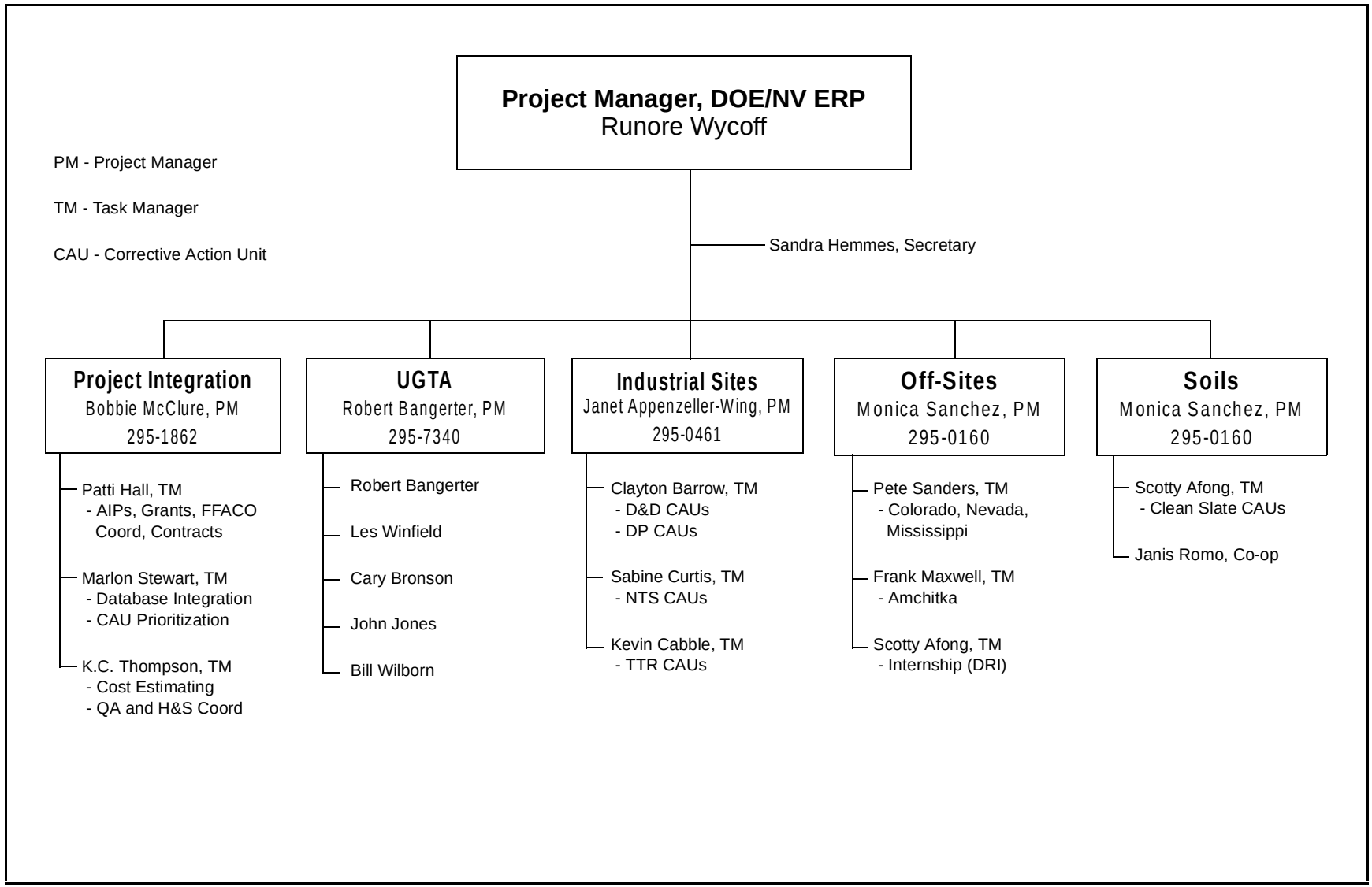

Figure 3-3
DOE Nevada Environmental Restoration Project Organizational Structure

legal policy which arise in connection with functions administered by DOE/NV. This office also assists in developing solutions for technical and administrative problems in accordance with legal policies and responsibilities. It coordinates the investigation and resolution of complaints and claims.

Office of Public Affairs and Information - Develops and administers programs for public information and education and serves as the primary interface with the media and the public. This office coordinates all external interviews, community meetings, and public outreach programs.

3.2.1 Assistant Manager for Environmental Management

The AMEM organization consists of three divisions: the Environmental Restoration Division, described in Section 3.2.1.3 of this Project Management Plan; the Waste Management Division; and the Energy Technologies Division.

3.2.1.1 Waste Management Division

Among the responsibilities of the WMD that could affect the UGTA Subproject are management of low-level radioactive, mixed, and hazardous waste operations at the NTS; performance of audits of waste generators to ensure compliance with DOE/NV waste-disposal requirements; oversight of the development of the data, information, and documentation necessary to obtain state and federal permits to operate WMD waste management facilities; oversight of the NTS shipping and receiving programs for radiological and nonradiological hazardous materials; and management of the radiological and hazardous waste minimization program. The WMD is also responsible for the design and construction of any facilities required for the treatment, storage, or disposal of UGTA Subproject-generated wastes.

3.2.1.2 Technology Development and Diversification Division

The Division provides technical guidance for the DOE/NV applied research and technology development program to improve the techniques for environmental remediation and characterization of the NTS. This responsibility includes work to resolve technical issues related to minimizing the volume of radioactive and hazardous waste handled and generated at the NTS.

3.2.1.3 Environmental Restoration Division

The AMEM has delegated responsibility for day-to-day management of the Nevada Environmental Restoration Project to the Director of the Environmental Restoration Division. The following provides a summary of Environmental Restoration Division functions:

- Preparation and monitoring of performance against the Environmental Restoration Project management plans and programmatic control documents, including the baseline
- Tracking of cost and schedule status associated with the Environmental Restoration Project
- Management and oversight of contractors in the conduct of subproject activities
- Integration of Environmental Restoration Project activities into DOE/HQ and DOE/NV planning documents

- Determination of the need for and development of proper *National Environmental Policy Ac*t (NEPA) documentation for Environmental Restoration activities

- Coordination with the Office of Public Affairs and Information for community relations programs and external agency contacts associated with the Environmental Restoration Project

- Management of the UGTA Subproject as a principal subproject within the overall scope of the Nevada Environmental Restoration Project.

The Director of the Environmental Restoration Division delegates responsibility and authority for the day-to-day management of individual subprojects within the DOE Nevada Environmental Restoration Project to Environmental Restoration Division managers. The Director of the Environmental Restoration Division maintains communication with the AMEM, and other division directors and DOE/NV ERD managers through staff meetings, informal meetings, memoranda, and telecommunications.

3.2.1.4 Underground Test Area Subproject Manager

The manager for the UGTA Subproject reports directly to the DOE Director of the Environmental Restoration Division and is responsible for maintaining accountability, subproject planning, and execution within approved cost and schedule objectives and for maintaining the UGTA Subproject PMP. The UGTA Subproject manager is responsible for the following activities for the UGTA Subproject:

- Direction, development, implementation and management of the UGTA corrective action strategy

- Coordination of scientific and engineering experts responsible for the management of scientific and technical design as well as the engineering and construction elements of the corrective action strategy

- Development, review, and consolidation of budget and financial plans, including monitoring compliance with budget and financial constraints and allocation of contingency funds

- Implementation of a management control system and applicable reports for control and evaluation of technical, schedule, and cost performance of all involved contractors pursuant to LCAM of DOE Order 0 430.1 (DOE, 1995b)

- Development of technical, cost, and schedule objectives and the baseline

- Consolidation and submission of periodic subproject assessment reports to the AMEM and EM-40 through the Director, Environmental Restoration Division

- Development of quality assurance project plans (QAPPs) and health and safety plans (HASPs) in accordance with DOE and other regulatory program requirements

- Development of functional subproject performance criteria consistent with DOE Order S0420.1, *Facility Safety,* (DOE, 1995a) and LCAM 0 430.1 (DOE, 1995b), as well as applicable codes, regulations, and standards referenced therein

- Coordination of the development and approval of required safety and environmental plans and documentation, including the preliminary and final Safety Analysis Reports, as required
- Development of designs that are consistent with acceptable construction practices, thereby minimizing the risks to construction personnel's health and safety during well construction, testing, and completion
- Approval of changes to scope, schedules, and budgets within the limits established by EM-40 and the AMEM, and coordination of the required approvals for changes to scope, schedules, and budgets that will impact the subproject technical objectives, total estimated costs, or schedules
- Concurrence of contract and subcontract actions consistent with DOE Acquisition Regulation (DEAR) and Federal Acquisition Regulation (FAR) policies and DOE/NV directives.

The UGTA Subproject Manager, with assistance from other DOE/NV ERD divisional staff matrix support, is also responsible for the following:

- Tracking of accrued costs associated with the UGTA Subproject
- Review of design documents
- Periodic design review meetings
- Approval of design documents
- Maintenance of technical and administrative overview of the UGTA Subproject activities.

3.3 Contractors and Other Underground Test Area Subproject Participants

Table 3-1 is an activities matrix listing the primary and secondary responsibilities of the participants discussed in the following sections.

3.3.1 IT Corporation

IT provides assessment/characterization and environmental architect-engineering (A-E) services for work performed at the NTS, TTR, NAFR and other locations in and out of the State of Nevada. These services include: assessing/characterizing CAUs to adequately determine the extent, source, and concentration of contamination; supporting assessment/characterization studies and each site's corrective action method; and preparing documentation. IT also prepares draft permit documentation for CAUs; determines the physiography, geography, and hydrology of each CAU; determines the nature (including physical, chemical, and radiological constituents), extent, volume of contamination, and contaminant concentration in soil or groundwater. IT identifies and evaluates candidate technologies for treatability studies.

In addition, IT provides project planning and management support including preparation of Corrective Action Investigation Plans (CAIPs), Corrective Action Decision Documents (CADDs), Technical Strategy Plans, Quality Assurance Plans, and Health and Safety Plans. IT develops the total project cost and schedule baseline and budget submittals, prepares the environmental restoration components of DOE/HQ planning initiatives, and provides technical expertise and support in the development of associated, project-related technical and management plans. Other services include: supporting the

Table 3-1
Underground Test Area Contractor Roles and Responsibilities

Contractor	Geology	Surface/Borehole Geophysics	Water Quality Sampling	Water Level Measurement	Hydrogeology	Expert Consultation	Source-Term Analysis	Modeling	Risk Assessment	Recharge/Discharge Analysis	UGTA Database Transfer	Construction Drilling	A&E Services	Technology Applications	Well Siting/Clearance
IT Corporation	P	S	P	S	P	P	S	P	P		P			S	P
Bechtel Nevada	P	P	S	S		P		S			S	P	P		P
U.S.Geological Survey/Geologic Division	P	P				P		S			S				
U.S.Geological Survey/ Water Resource Division			S	P	P	P		S		P	S				
Desert Research Institute		S	S	S	S	P		S		P	S			P	P
Lawrence Livermore National Laboratory	S	P	S		S	P	P	S	S		S				
Los Alamos National Laboratory	S		S		S	P	P	S	P		S				

P = Primary responsibility
S = Secondary responsibility

development of NEPA documents, regulatory agreements, and Agreements in Principle; creating an Environmental Restoration Site Inventory; providing support for community relations and public involvement activities; acquiring, integrating, managing, and analyzing technical and nontechnical project data; developing remedial criteria; and verifying remedial actions.

3.3.2 Bechtel Nevada

Bechtel Nevada's primary role is to provide the corrective action portion of the UGTA Subproject for sites located in Nevada. Bechtel Nevada also provides architectural, engineering, and inspection services, including design drawings and detailed cost estimates for corrective action and decontamination and decommissioning of inactive facilities. Bechtel Nevada provides support for the drilling, completion, and testing of characterization and monitoring wells and provides site development activities. Other support includes field survey and materials-testing laboratory services for design and construction activities, as well as project management control and reporting support. Bechtel Nevada implements the DOE/NV reporting process into the DOE/HQ Project Tracking System.

Bechtel also provides overall operations support at the NTS such as: radiological monitoring and control; maintenance, operations, and drilling support services as required during drilling, completion, and testing of wells; construction services including roads and utilities; closure or remediation of RCRA treatment, storage, and disposal units; removal of underground storage tanks; support in the assessment and remediation of decontamination and decommissioning facilities; preparation of Corrective Action Plans (CAPs), and construction management for conducting remedial actions.

Bechtel Nevada is also responsible for endangered species surveys; airborne, ground, and multispectral remote sensing services; soil stabilization; and revegetation studies. The organization is the interface between the existing NTS Geographic Information System and the comprehensive database management system being developed for the project. Bechtel Nevada develops remedial criteria and verifies remedial actions.

3.3.3 Desert Research Institute

Provides technical support and consultation including laboratory and field analytical support, specialty borehole geophysical logging and field liaison support, cultural resource surveys, and studies prior to any ground disturbing activities. Desert Research Institute is also involved in technology development activities such as optimized well-siting research, development of *in situ* moisture and tritium sensors, and tritium removal technologies.

3.3.4 DOE National Laboratories

Lawrence Livermore National Laboratory and Los Alamos National Laboratory provide technical assistance, independent review, parallel investigations, and radiochemistry analysis support to corrective action activities.

3.3.5 U.S. Geological Survey

Provides technical support for hydrologic measurements of water-table depth, aquifer characterization, borehole geophysical logging, field geophysics, and regional and local geologic interpretations of groundwater characterization activities.

3.3.6 Community Advisory Board

This stakeholder organization provides recommendations and advice for resolving environmental restoration activities issues. This includes site-specific cleanup criteria and risk assessment, land use, priority setting, management effectiveness, cost-versus-benefit analysis, and strategies for site work management and disposal facilities.

3.3.7 Technical Working Group

The TWG is a committee tasked to evaluate and prioritize identified data needs in consideration of subproject objectives and plans. The committee is chaired by DOE/NV and is composed of representatives from the IT, DRI, USGS, BN, LLNL, and LANL. The TWG recommendations are limited to technical scope within the constraints of project plans endorsed by DOE/NV. DOE/NV is responsible for managing the subproject, including planning, setting priorities, allocating funding, and authorizing work.

4.0 UNDERGROUND TEST AREA STRATEGY AND WORK BREAKDOWN STRATEGY

4.1 Background

Between 1951 and 1992, various underground nuclear tests were conducted at the NTS in southern Nevada by the DOE and the U.S. Department of Defense, which resulted in groundwater contamination. To ensure protection of the public and the environment, the DOE/NV has established a long-term program to monitor the groundwater quality for radionuclides. Although the sampling results show that no contamination from the underground test areas has been found at off-site locations, contamination has been found in groundwater samples from wells located near the nuclear test locations on the NTS.

The technical objective of the UGTA Subproject is to define the regional and site-specific hydrologic boundaries encompassing groundwater resources that may be unsafe for domestic or municipal use. The first part of the investigation is a regional evaluation. The overall objectives of the regional evaluation are to estimate current and near-term risk to the public and environment from potential groundwater contamination downgradient from the underground nuclear testing areas, to determine if interim actions are needed, and to provide focus and priorities for ongoing local investigations. Secondly, these local investigations will focus on estimating contaminant movement and site-specific boundaries that encompass the extent of contamination from the underground testing areas.

The 908 historical nuclear detonations in shafts or tunnels at the NTS have been categorized into 878 Corrective Action Sites (CASs) assigned to the UGTA Subproject. These CASs are located near each other and are grouped into six Corrective Action Units (CAU). The CAUs are geographically distinct with different contaminant sources and with geologic characteristics related to their location. The CAUs are depicted in Figure 4-1 and discussed in the following text.

4.1.1 Frenchman Flat

Frenchman Flat CAU consists of 10 CASs located in the northern part of NTS Area 5 and the southern part of Area 11. The events were conducted in vertical emplacement holes and mine shafts and were located in alluvium of great depth. The deeper geology is not well known. Lateral transport in the alluvium is very slow due to the low lateral gradient.

4.1.2 Western Pahute Mesa

Western Pahute Mesa CAU consists of 18 CASs along the western edge of NTS Area 20. The events were all conducted in vertical emplacement holes. This CAU is separated from Central Pahute Mesa by the Boxcar Fault and is distinguished by the relative abundance of tritium. Transport of contaminants on and from Western Pahute Mesa involves groundwater flow in welded and vitric tuffs in the rock matrix and in the fracture system.

4.1.3 Yucca Flat

Yucca Flat CAU consists of 717 CASs located in NTS Areas 1, 2, 3, 4, 6, 7, 8, 9, and 10. These events were conducted in vertical emplacements holes. Contaminant transport in Yucca Flat may involve alluvium, welded and vitric tuffs, and carbonate rocks.

4.1.4 Central Pahute Mesa

Central Pahute Mesa CAU consists of 64 CASs in Areas 19 and 20 of Pahute Mesa.

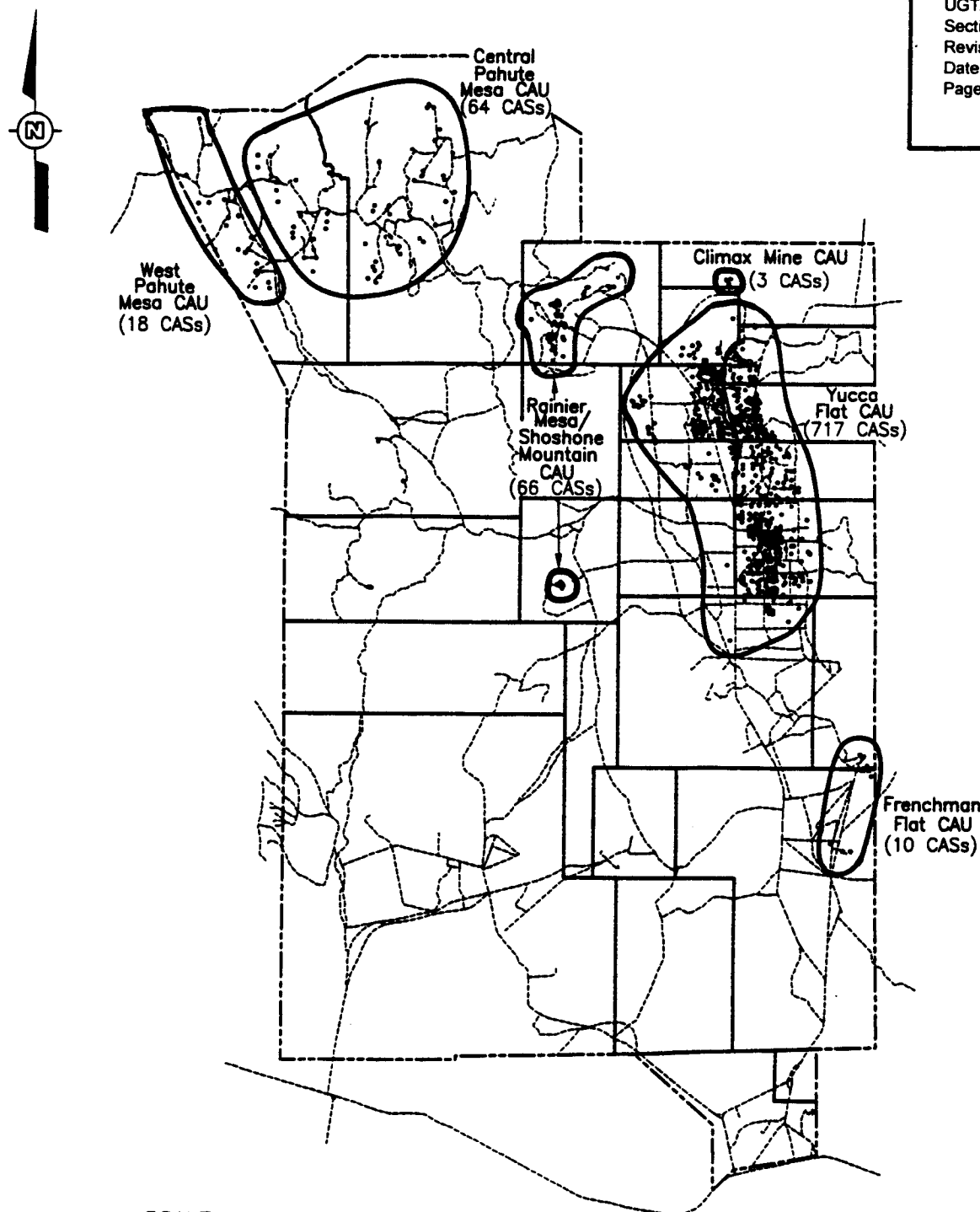

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Figure 4-1
Underground Test Area Corrective Action Units

These events were all conducted in vertical emplacement holes. Transport of contaminants on and from Central Pahute Mesa involves the rock matrix, groundwater flow in fractures, welded and vitric tuffs, and lava flow aquifers. The influence of the large-scale block faulting is not well-known.

4.1.5 Rainier Mesa/Shoshone Mountain

Rainier Mesa/Shoshone Mountain CAU consists of 60 CASs on Rainier Mesa and six CASs on Shoshone Mountain which are located in NTS Areas 12 and 16. These events were conducted in tunnels.

4.1.6 Climax Mine

Climax Mine CAU consists of three CASs. These events were conducted in tunnels. The considerations for this CAU are similar to the Rainier Mesa/Shoshone Mountain CAU.

4.2 Corrective Action Strategy

The corrective action strategy for UGTA is based on the complex corrective action process. The objective of the Corrective Action Investigation (CAI) process is to define boundaries around each UGTA CA, that establish areas that contain water that may be unsafe for domestic and municipal use.

4.2.1 Modeling and Analysis

A regional flow model encompassing the NTS and the groundwater flow systems, extending to downgradient discharge has been completed. Regional modeling cuts across several activities, supports the entire UGTA program (which provides the initial basis for assessing flowpaths from CAUs), determines potential receptors, evaluates isolation or interaction of CAUs, and creates a consistent hydrogeologic framework across all the CAUs. Regional transport modeling provides the initial basis for determining the magnitude of risk from this source to potential receptors and for scaling individual CAU work.

The second phase of the CAI process focuses on refining CAU boundaries through specific models that include CAU-specific data. The CAU-specific modeling will estimate the movement of contaminants and will focus on the acquisition and evaluation of CAU-specific hydrogeologic data. It will define boundaries that encompass the extent of contamination. If CAU-specific modeling fails to achieve CAU objectives, this strategy will be reevaluated. If it is not possible or feasible to achieve the CAU objectives, it may be necessary to consider alternative approaches.

Figure 4-2 charts the generalized decision process that will lead to the closure of the CAUs. Three of four major decision points involve data review and consensus attainment before proceeding with the next phase of corrective action activities and decision points. The first decision is a review of the CAU model. If DOE accepts the model, it will propose contaminant boundaries. The Nevada Division of Environmental Protection (NDEP) will then review the CAU model and proposed contaminant boundaries as shown in the second decision box. If the NDEP accepts the proposed contaminant boundaries, DOE/NV will issue the Corrective Action Decision Document (CADD). If the CADD results are satisfactory, a decision will be made to evaluate the need for contaminant control or containment and implementation, as appropriate, or to initiate a five-year monitoring program. If the third decision indicates that contaminant control is not required, then DOE/NV will develop a Corrective Action Plan (CAP) and/or monitor the contaminant boundary for five years. The fourth decision occurs after a review of the

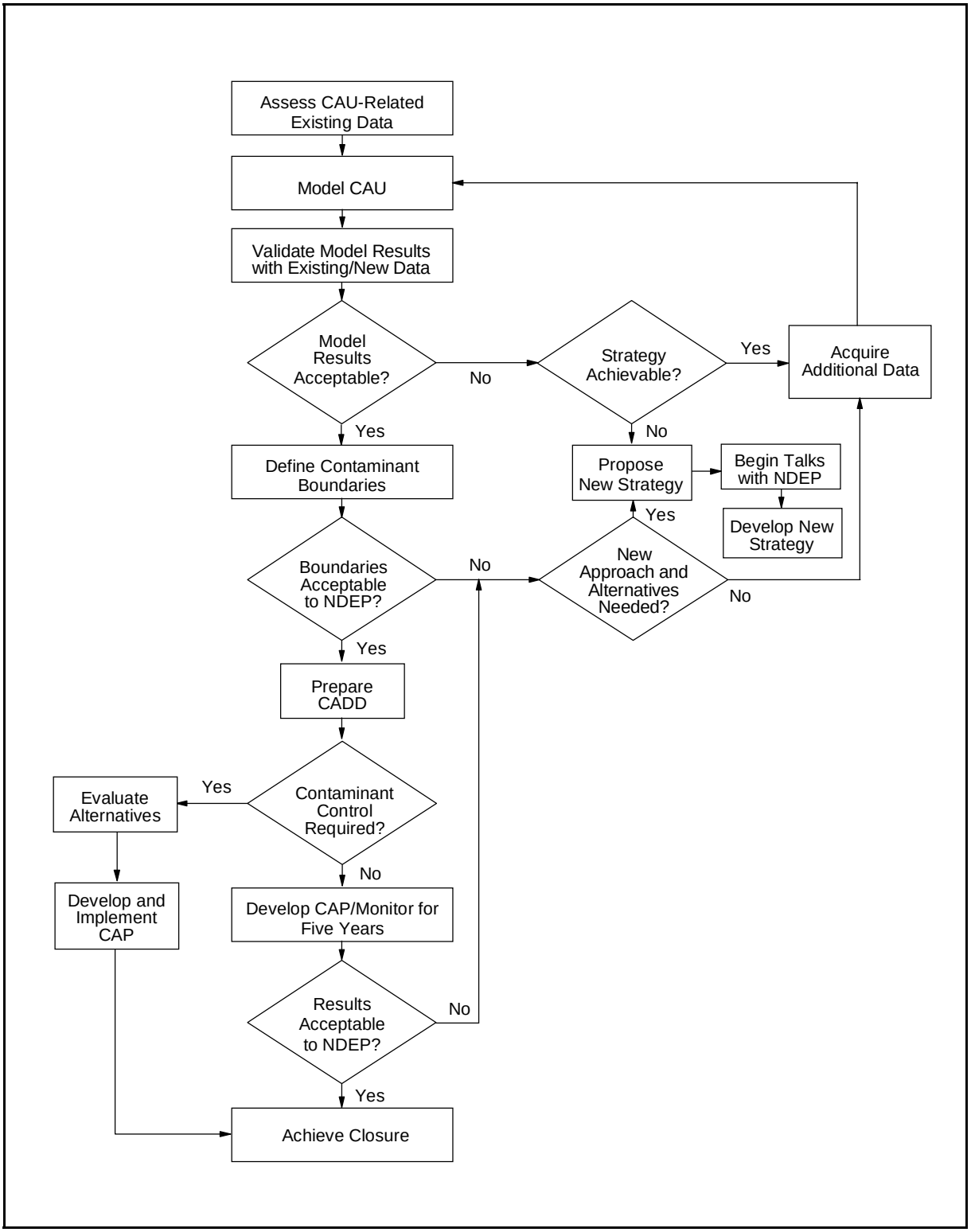


Figure 4-2
Process Flow Diagram for Underground Test Area Corrective Action Units

monitoring results. If DOE and NDEP are confident of the results, the closure process will begin. If the results of any of these decision points are not acceptable, contingency activities will be initiated and evaluated, as appropriate, to correct the deficiencies.

4.2.2 Contaminant Transport and Boundaries

For saturated conditions, a flow model of each CAU will be constructed to provide local three-dimensional flow, to evaluate the range of flow conditions in the CAU that may be important in determining the maximum extent of transport of contaminants at a concentration of concern, and to provide boundary conditions for modeling transport. Saturated conditions are planned to be modeled for Frenchman Flat, Yucca Flat, Western Pahute Mesa, and Central Pahute Mesa CAUs.

For CAUs where unsaturated groundwater conditions prevail (Rainier Mesa/Shoshone Mountain and Climax Mine CAUs), saturated zone flow and transport modeling results will be evaluated based on field data to determine if the saturated zone has been affected. If the saturated zone has been affected, the need for further examination of the unsaturated zone will be evaluated. The CAU models that use tritium as the source term will establish the contaminant boundary for each CAU, which includes both a perimeter boundary and a lower hydrostratigraphic unit boundary.

The perimeter boundary will define the aggregate maximum extent of contamination transport at or above the concentration of concern for the CAU. The lower hydrostratigraphic unit boundary will define the lowest aquifer unit affected by the contamination. Long-lived radionuclides, excluding tritium, will be included to evaluate the relative extent of migration for various radionuclides in the future. If predictions show that another radionuclide will migrate further than tritium at concentrations of concern, the contaminant boundary will include that prediction.

Measuring appropriate physical and chemical parameters in wells within the modeled region will monitor compliance with the CAU boundaries. Appropriate physical and chemical parameters that stay within the measurements used in the flow model will indicate that the conditions have not significantly changed. Sensitivity analysis of parameters related to the groundwater gradient will indicate how much appropriate physical and chemical parameters can vary before they exceed the acceptable confidence limit for the model.

4.2.3 Plans and Documentation

As part of the CAI process, several types of plans and reports will be developed. These include a Corrective Action Investigation Plan (CAIP), Corrective Action Decision Document, a Corrective Action Plan, and a Closure Report. These plans/reports are briefly described below.

- The CAIP is a work plan that describes the data analysis activities and modeling tasks as well as any new data collection tasks. A Value of Information Analysis (VOIA) which precedes the CAIP evaluates data analysis, modeling, and any new data collection activities to determine what data will be required for the modeling to achieve the most cost-effective result.
- The CADD will present the conclusions of the workscope described in the CAIP and propose the CAU boundary. This document will include a complete report on the CAU model to document knowledge of the CAU flow system and

contaminant transport predictions. This information will provide the basis for developing CAU-specific corrective actions.

- The CAP for CAUs where contaminant control is not required will consist of a two-phase program. The first phase will be a verification program including a five-year, proof-of-concept period that further verifies the model's predictions. The second phase will start after acceptable results from Phase I verify that the contamination will be controlled within the agreed-to-areal extent of contamination. The current assumption is that sufficient wells currently exist or will exist as a result of data acquisition points (or wells) that are developed in the course of conducting the CAI. If additional monitoring wells are necessary, plans for their installation will be detailed in the CAP. The CAP will include maintenance plans for the monitoring system during the monitoring period.
- Once the proof-of-concept monitoring is completed, the results of that monitoring will be assessed. If the results fall within limits previously defined in the CAP, a Closure Report (CR) will propose that the CAU be designated as a closed site. The CR will also establish long-term monitoring requirements for the CAU, including contingency plans for actions to be taken if long-term monitoring results are not acceptable.

These plans are described in greater detail in Section 6.1.3, Subproject Plans.

4.2.4 Surveillance and Monitoring

A part of the modeling effort is groundwater monitoring of the sites; this monitoring does not become long-term surveillance and monitoring until final agreement is reached with the State of Nevada as to the appropriate, final remedial actions. These areas will be actively monitored for regional water use and development. Changes in patterns of water use or increased development will require that the potential for contaminant migration be reevaluated. The areas will be closed in place, assuming there is no threat to the environment or natural barrier failure.

4.3 Work Breakdown Structure (WBS)

The DOE/NV Environmental Restoration WBS used for project control at the Environmental Restoration Division level is complete to Level Six, corresponding to the subproject level. The UGTA Subproject WBS begins at this level and tiers downward from Level Six of the Environmental Restoration WBS. The following discussion of the UGTA Subproject WBS addresses the varying levels shown on Figure 4-3.

Level Seven of the UGTA Subproject WBS consists of the six CAUs called Frenchman Flat, Western Pahute Mesa, Yucca Flat, Central Pahute Mesa, Climax Mine, and Rainier Mesa/Shoshone Mountain. Level Eight elements consist of work culminating in identifiable subproject plans supporting the previously described corrective action strategy for each CAU. Workscope descriptions of Level Eight elements for each CAU are discussed in the following text.

4.3.1 Corrective Action Investigation Plan (CAIP)

Workscope activities for the CAIP process include the development and preparation, as well as approval from DOE and NDEP, of a CAIP. A value-of-information analysis will evaluate any new-data collection for the CAIP.

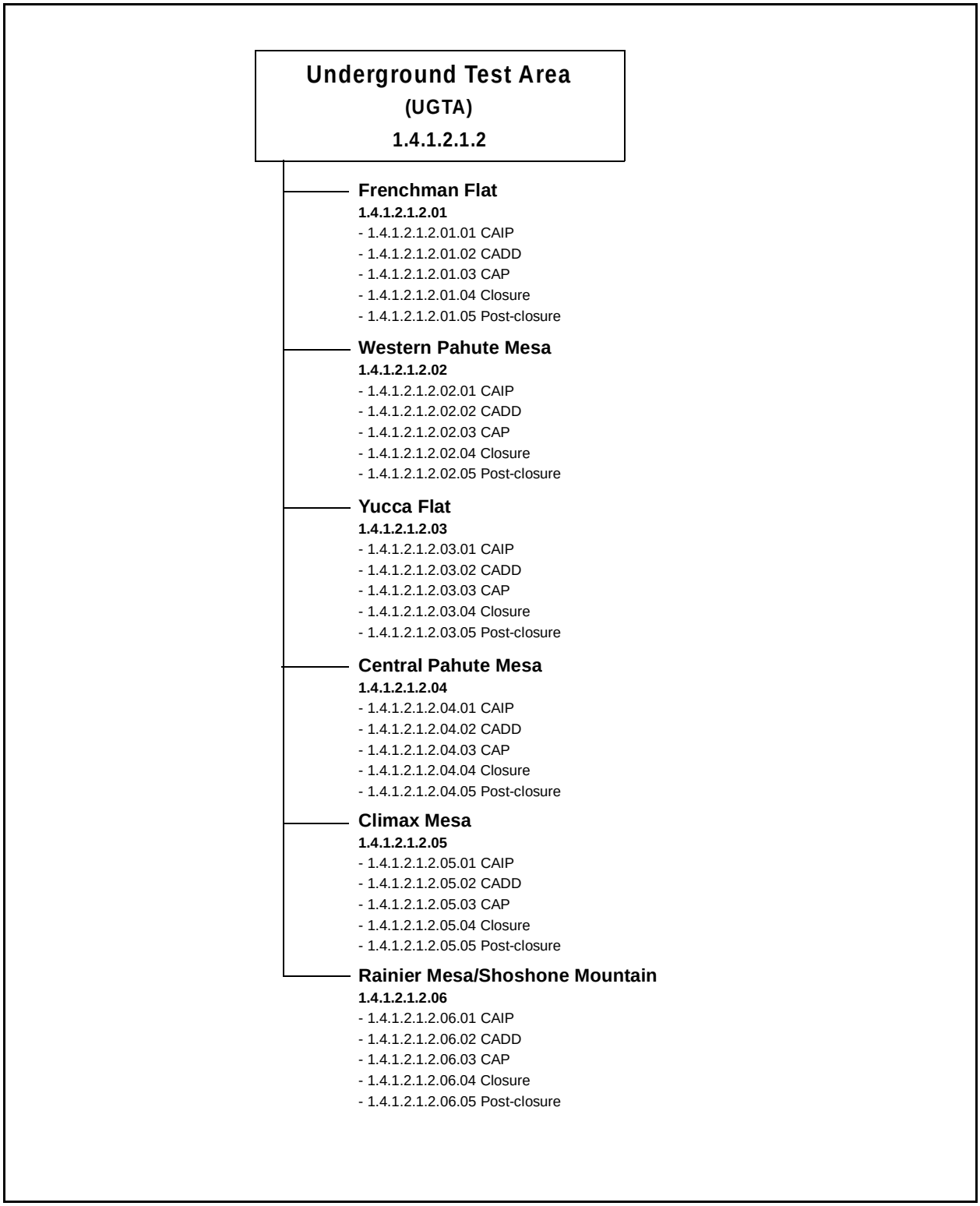


Figure 4-3
Underground Test Area Work Breakdown Structure

DOE will review and approve proposed new-data collection activities prior to their inclusion in the CAI Plan. This CAIP will be consistent with requirements of the FFACO and will go through formal review by DOE and NDEP for approval.

4.3.2 Corrective Action Decision Document

The scope of the Corrective Action Decision Document process involves data analysis, determination of the location of the contaminant boundary, design of a monitoring well system, and new-data collection, if necessary. Data analysis includes the compilation and processing, or reprocessing, as required, of existing data, and, if appropriate, the collection and processing of new data. Computer modeling predictions will be the primary basis for determining the location of contaminant boundaries and designing the monitoring well network. Results of the corrective action investigation will be summarized in the CADD, specifying a corrective action alternative.

The Corrective Action Decision Document involves the definition of the corrective action to be taken and provides the rationale for the choice. Elements of this task are to prepare a CADD consistent with FFACO requirements for DOE and NDEP review and approval.

4.3.3 Corrective Action Plan

The Corrective Action Plan (CAP) preparation task includes all work to write the CAP that contains all information required to describe the tasks needed to execute the corrective action. Specifically, the report will contain the data and technical justification derived from the CADD to implement the corrective action as well as the descriptions of the work scope to be implemented. The CAP will be consistent with FFACO requirements. DOE and NDEP will review and approve the CAP.

4.3.4 Closure Plan

Workscope includes the performance of an initial 5-year preclosure monitoring according to the requirements described in the CAP. This scope includes all field work, including logistical and technical support for the measurement of groundwater levels from the monitoring well system; contaminated well sampling; and Environmental Restoration clean-well sampling.

Following the 5-year proof of concept monitoring program, a draft Closure Report will be prepared to document compliance to standards during the corrective action using the initial 5-year monitoring program analytical results. The report will also contain a listing of the monitoring requirements and standards for long-term (i.e., 50 years) monitoring compliance. The effort is to prepare a closure report consistent with FFACO requirements for DOE and NDEP review and approval. The report will contain the data and technical justification to achieve closure. The report will also include the postclosure plan.

4.3.5 Post Closure

The scope of work for postclosure monitoring will be driven by the postclosure monitoring plan in the Closure Report. Generally included are all activities required to conduct and maintain the monitoring program including monitoring activities, data analysis activities, equipment and well-related activities, documentation and reporting activities.

The total monitoring period covers a 100-year period and involves the use of the same monitoring well system used for the initial 5-year monitoring period, operated in a similar fashion.

4.3.6 Contractor Work Breakdown Structure

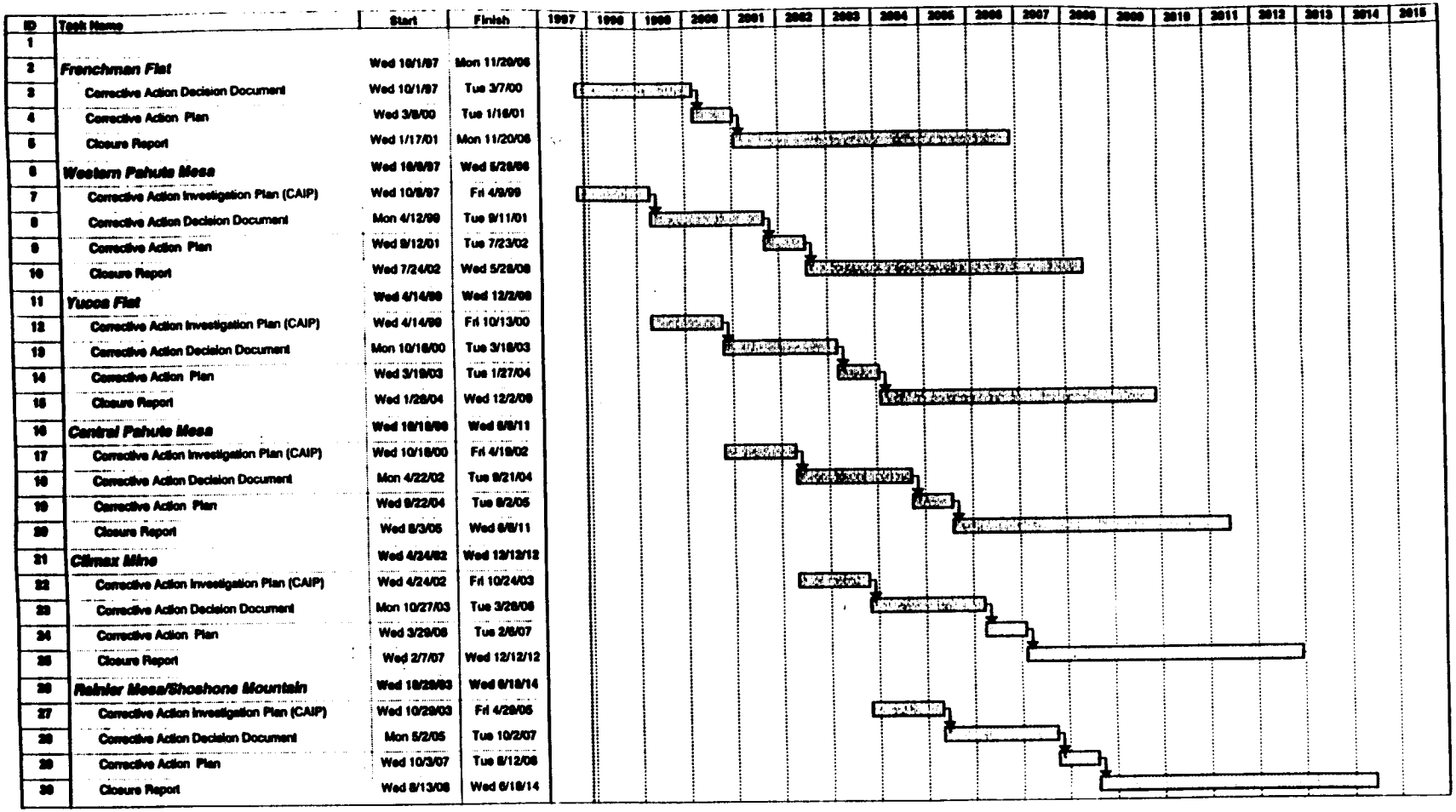
All organizations providing services to the UGTA Subproject shall prepare a Contractor WBS (CWBS) and CWBS dictionary that interface with the eighth level of the UGTA Subproject WBS in accordance with DOE Order 0 430.1 (DOE, 1995b). The CWBS will be submitted to the UGTA Subproject Project Manager for approval, which will ensure that CWBS elements are consistent with the cost-reporting needs of DOE/NV.

5.0 SCHEDULE

Under current funding levels, the completion of postclosure monitoring of the CAUs will likely extend to the year 2070. The schedule for the completion of UGTA activities developed for the total cost, schedule, and technical baseline for Fiscal Year (FY) 98 is reproduced in Figure 5-1. The FFACO with the State of Nevada commits the DOE/NV to meeting key milestones according to the schedule depicted in Table 5-1. Provided below is the Summary Milestone Log that focuses on the current FFACO milestones for the entire duration of the UGTA Subproject.

Table 5-1
Underground Test Area Summary Milestone Log

Description	Target Date
Complete Western Pahute Mesa CAIP	9/98
Complete Frenchman Flat CADD	9/99
Complete Yucca Flat CAIP	7/00
Complete Western Pahute Mesa CADD	4/01
Complete Rainier Mesa/Shoshone Mtn. Closure Report	3/14



ID	Task Name	Start	Finish
1			
2	*Frenchman Flat*	Wed 10/1/97	Mon 11/20/06
3	Corrective Action Decision Document	Wed 10/1/97	Tue 3/7/00
4	Corrective Action Plan	Wed 3/8/00	Tue 1/16/01
5	Closure Report	Wed 1/17/01	Mon 11/20/06
6	*Western Pahute Mesa*	Wed 10/8/97	Wed 5/28/08
7	Corrective Action Investigation Plan (CAIP)	Wed 10/8/97	Fri 4/9/99
8	Corrective Action Decision Document	Mon 4/12/99	Tue 9/11/01
9	Corrective Action Plan	Wed 9/12/01	Tue 7/23/02
10	Closure Report	Wed 7/24/02	Wed 5/28/08
11	*Yucca Flat*	Wed 4/14/99	Wed 12/2/09
12	Corrective Action Investigation Plan (CAIP)	Wed 4/14/99	Fri 10/13/00
13	Corrective Action Decision Document	Mon 10/16/00	Tue 3/18/03
14	Corrective Action Plan	Wed 3/19/03	Tue 1/27/04
15	Closure Report	Wed 1/28/04	Wed 12/2/09
16	*Central Pahute Mesa*	Wed 10/16/99	Wed 8/9/11
17	Corrective Action Investigation Plan (CAIP)	Wed 10/16/00	Fri 4/19/02
18	Corrective Action Decision Document	Mon 4/22/02	Tue 9/21/04
19	Corrective Action Plan	Wed 9/22/04	Tue 8/2/05
20	Closure Report	Wed 8/3/05	Wed 8/9/11
21	*Climax Mine*	Wed 4/24/02	Wed 12/12/12
22	Corrective Action Investigation Plan (CAIP)	Wed 4/24/02	Fri 10/24/03
23	Corrective Action Decision Document	Mon 10/27/03	Tue 3/28/06
24	Corrective Action Plan	Wed 3/29/06	Tue 2/6/07
25	Closure Report	Wed 2/7/07	Wed 12/12/12
26	*Rainier Mesa/Shoshone Mountain*	Wed 10/29/03	Wed 6/18/14
27	Corrective Action Investigation Plan (CAIP)	Wed 10/29/03	Fri 4/29/05
28	Corrective Action Decision Document	Mon 5/2/05	Tue 10/2/07
29	Corrective Action Plan	Wed 10/3/07	Tue 8/12/08
30	Closure Report	Wed 8/13/08	Wed 6/18/14

Figure 5-1
UGTA Total Project Schedule

6.0 SUBPROJECT MANAGEMENT, MEASUREMENT, PLANNING, AND CONTROL SYSTEMS

Subproject management, measurement, planning, and control systems for the UGTA Subproject are divided into the following four requirement components:

- Planning
- Procedural
- Performance
- Technical Management

The planning component encompasses the requirements from EM-40, DOE/HQ, and DOE/NV that affect the UGTA Subproject. Such requirements include development of a total cost, schedule, and technical baseline, and preparation of task agreement plans, subproject plans, as well as the operational readiness program.

The procedural component encompasses the requirements of the UGTA Subproject. Records of verbal communication, audits, nonconformance reports, and occurrence reports make up these requirements.

The cost management component consists of performance measurement and control, specifically monitoring progress against the established baseline prepared under the planning component and analyzing variances and the impact of those variances. To do performance measurements, the UGTA Subproject will use the Nevada Project Management Information System, together with work orders, cost reports, and change orders to manage UGTA Subproject costs.

The technical management component encompasses DOE/NV coordination of the subproject, including meetings, project progress, and reporting requirements.

6.1 Planning Requirements

The UGTA Subproject planning requirements specify the subproject activities that will take place and their rationale, timing, and cost. The planning requirements set strategies to achieve goals and objectives and address issues that may impact the achievement of those objectives.

6.1.1 Baseline

The total cost, schedule, and technical baseline is a subproject life cycle, bottom-up estimate containing integrated scope, cost, and schedule that forms the basis for year-to-year subproject planning. The document presents a clear path from the Statement of Work (SOW) at the lowest level of the WBS to the cost and schedule resources required accomplishing the SOW.

Contractors involved in the UGTA Subproject support DOE/NV in preparation of the UGTA Total Cost, Schedule, and Technical Baseline document. Each contractor prepares cost estimates, schedules, and assumptions that define the bounds for the cost estimate to accomplish their portion of the SOW. This information from UGTA Subproject contractors is compiled into a DOE/NV format.

6.1.2 Task Agreement Plans

Work scope at the contractor level is accomplished through task agreement plans which establish the scope, costs, schedule, milestones, and spending plan for specific work to be accomplished by a contractor. DOE/NV initiates the task agreement plan process by generation of a SOW, predicated on the total cost, schedule, and technical baseline.

Upon receipt of the SOW from the DOE/NV, all contractors involved in the UGTA Subproject must first develop a CWBS. The CWBS provides the framework for detailed planning and control of the work that must be performed to accomplish the contractor portion of the SOW described in the WBS. Once this is accomplished, contractors must plan their work in a work-package and describe it in a Task Agreement Plan. The documentation of work-package detail is set forth in the *Nevada Environmental Restoration Project Management Plan* (DOE/NV, 1994).

6.1.3 Subproject Plans and Reports

Subproject plans for the UGTA Subproject are essential to implement, direct, and control the activities planned for the entire subproject. These plans and reports include a Corrective Action Investigation Plan, Corrective Action Decision Document, Corrective Action Plan, and a Closure Plan. Additional plans include a Quality Assurance Project Plan (QAPP), a Site-Specific Health and Safety Plan (SSHASP) Addenda if required, and a Waste Management Plan (WMP). The plans will first be compiled at the beginning of the work to provide direction and control of the UGTA Subproject activities. The plans may be modified through addenda as new work elements and procedures are identified. The UGTA Subproject plans and reports will be submitted to appropriate regulatory agencies for review and concurrence.

6.1.3.1 Corrective Action Investigation Plan

The CAIP will be consistent with the FFACO (FFACO, 1996) and will describe the data analysis and modeling tasks as well as any new data collection tasks. The plan will include information on project management, waste management, quality assurance, health and safety, and the following elements:

- The results of the VOIA analysis.
- Workscope, describing the required data analysis activities, modeling and new data collection activities.

6.1.3.2 Corrective Action Decision Document

This report will contain the data and technical justifications derived from the work associated with data analysis, and modeling contaminant boundary and monitoring well system design tasks to specify the type of corrective action to be taken. Specifically the report will include:

- Results of all previous data analysis, modeling, contaminant boundary and well system design work that describe the specific corrective action to be implemented.
- Include technical rationale and justification for the selection of the corrective action.
- Also includes monitoring system design concept, an analysis of the confidence in the location of the contaminant boundary, and the conceptual monitoring scheme.

6.1.3.3 Corrective Action Plan

The Corrective Action Plan will contain the data and technical justification derived from the CADD to implement the corrective action in addition to the descriptions of the work scope to be implemented. Specifically the plan includes:

- Description of the corrective action tasks and their justifications. Results from the CADD will be included as necessary. Elements of the plan include the detail design of the monitoring system and

monitoring wells, specifications for operation of monitoring, sample collection schedule, required record keeping and reporting, analysis of uncertainty and standards for compliance, specifications for monitoring wells, and summary of required construction.

6.1.3.4 Closure Report

This report documents compliance to standards during the corrective action using the initial 5-year monitoring program analytical results. The report will also contain a listing of the monitoring requirements and standards for long-term (i.e., 100 years) monitoring compliance. The report will contain the data and technical justification to achieve closure and the postclosure plan. Specifically the report will include:

- Summarization of the 5-year monitoring program results, including interpretations and analyses of data and conclusions. A review of the monitoring well system for adequacy relative to meeting compliance with NDEP compliance requirements.
- A postclosure monitoring plan that describes the work scope to be performed during the Post Closure Monitoring period includes requirements for maintaining compliance to standards.

6.1.3.5 Quality Assurance Project Plan

The UGTA Subproject QAPP will describe all quality assurance and quality control (QA/QC) requirements, methods, responsibilities, and procedures to be implemented throughout the subproject to ensure that quality is achieved and properly maintained. These quality measures will apply to modeling, field data collection, laboratory sample analysis, data validation, and data management. The UGTA QAPP supplements the *ER Quality Management Plan* (currently under development).

Work performed under this QAPP by NTS contractors will be of the quality to satisfy subproject objectives. The QA/QC requirements, methods, responsibilities, and procedures will be described to a sufficient level of detail so that the precision, quality, accuracy, representativeness, comparability, and completeness of the environmental data generated during the subproject comply with DOE/NV requirements.

The UGTA Quality Assurance Project Plan preparation will be according to the format and requirements established in DOE Order 5700.6C, *Quality Assurance* (DOE, 1996b). Additionally, each NTS contractor designated to perform subproject activities will be required to comply with the requirements of the QAPP in order to participate on the subproject.

6.1.3.6 Underground Test Area Subproject Health and Safety Plan (HASP) Addenda

A Nevada Environmental Restoration Project-wide HASP has been prepared and will be administered for the UGTA Subproject. The HASP contains all baseline information and protocols to satisfy the requirements of the DOE, the U.S. Environmental Protection Agency, and the Occupational Safety and Health Administration (OSHA), which include provisions for field activities that achieve compliance with OSHA requirements for work at hazardous waste sites. The Nevada Environmental Restoration Project HASP will also govern field activities under the UGTA Subproject. However, specific Subproject field activities are expected to have additional procedural requirements commensurate with

site-specific factors at each well sampling or well installation location that potentially affect health and safety. Consequently, a Site-Specific Health and Safety Plan (SSHASP) is required and will be compiled before any sampling or drilling activities occur at each site. The SSHASP will include any additional procedural requirements incorporating well-specific factors potentially affecting health and safety.

6.1.3.7 Waste Management Plan (WMP)

The goal of environmental compliance and waste management operations is to provide guidelines to minimize waste generation and properly manage the wastes that are produced. There are four classifications of waste that may be generated by UGTA Subproject activities: nonhazardous, hazardous, low-level radioactive, and mixed waste. The WMP addresses the methods that will be used to minimize, contain, and ultimately dispose of waste materials. The majority of the waste will be generated during well drilling, testing, and sampling.

The regulatory drivers for environmental compliance and waste management are discussed in the WMP. DOE Orders, State of Nevada regulations, and DOE/NV regulatory guidance are referenced. Most notable are those for the management of radioactive and hazardous waste.

DOE/NV provides the *Nevada Test Site Waste Acceptance Criteria, Certification, and Transfer Requirements* (DOE/NV, 1996b), current revision, as the requirements, terms, and conditions under which the (NTS) will accept low-level radioactive and mixed waste for disposal. The UGTA Subproject incorporates these requirements into a DOE-approved radioactive waste management program that allows for the disposal of low-level radioactive waste when generated. The EPA *Resource Conservation and Recovery Act* (CFR, 1996b), as adopted and added to by the State of Nevada, governs the management of any hazardous waste that is generated.

Attached to the WMP is the *Fluid Management Plan for the UGTA Subproject* (FMP) (DOE/NV, 1995). This document defines the conditions set by the State of Nevada regarding the management of fluids generated during the drilling and testing of near- and far-field wells, including routine monitoring. This plan was prepared for the UGTA Subproject with the concurrence of the State of Nevada and includes reporting requirements to the State for various UGTA Subproject activities. These reporting criteria are provided to the State for meeting the requirements of a general water pollution control permit for the UGTA. Fluid management decision limits in the FMP are based on the Nevada Safe Drinking Water Standards.

6.1.4 Operational Readiness

Operational readiness is a systematic, documented review of the readiness for startup of a facility, process, or activity. The purpose is to provide a framework for an integrated team effort to effectively complete the task workscope. The UGTA Subproject Manager is responsible for ensuring that operational readiness reviews are properly developed, conducted, and documented.

6.1.4.1 Planning Documents and Systems

Readiness reviews will verify that all planning documents and systems are formally approved

and in place for the successful and efficient accomplishment of the project objectives. At a minimum, the Project Manager or a designee will accomplish the following:

- Review the project plans (CAIP, CAP), the Site-Specific Health and Safety Plan, the Quality Assurance Project Plan, and any applicable procedures to ensure that they are appropriate for the planned activities.
- Verify that variances to procedures and plans are documented on either a Procedure Change Notice (PCN) or on a Record of Technical Change (RTC). Appropriate personnel must approve variances. The Health and Safety Manager or a designee must approve any variance to the SSHASP.
- Review the qualifications of both potential field and office personnel to verify that the personnel selected are qualified to perform their assigned duties and that documentation of their qualifications is on file.
- Verify that subcontractors have been prequalified by Health and Safety and Quality Assurance.
- Verify that subcontractors have had the necessary training and that any required certifications/documentation are in the project files.

6.1.4.2 Field Preparations

The UGTA Subproject Manager or designee will conduct a site survey to ensure that plans and procedures are appropriate and that the stated requirements contained therein can be implemented. At a minimum, the following activities will be performed prior to initiation of fieldwork:

- Identify required resources (e.g., personnel, equipment, and material) and ensure availability. Coordinate with any external support agencies.
- Verify that personnel performing the work have a copy of all appropriate work instructions and procedures, including any applicable PCNs and/or RTCs.
- Prepare a required reading checklist for project personnel. The contractor will determine documents pertinent to project personnel based upon each individual assignment. These documents will be listed on a required reading checklist, and signed and dated by the responsible manager. Personnel must complete the reading list prior to the prefield briefing.
- Verify that all-periodic calibration and calibration standards used for measuring and test equipment are current and that all calibration and maintenance documentation is on file.
- Verify that proper work authorizations, permits, and site access have been obtained.
- Assemble the necessary equipment, material, and forms.
- Assemble copies of the approved project plans, the SSHASP, the project-specific QAPP, Material Safety Data Sheets, a controlled copy of procedures, and all necessary forms for transport to the field.

6.1.4.3 Prefield Briefing

A prefield briefing shall be conducted prior to commencement of field activities. At a minimum, the prefield briefing will be attended by project management, project field personnel, any subcontractors involved in the project, a Health and Safety representative, and

a QA representative. The prefield briefing may include the following:

- Present a brief overview of the project and the objectives of the upcoming field activity.
- Establish a clear line of communication for questions or problems that may arise in the field.
- Review the SSHASP and ensure that all personnel sign the plan.
- Identify the means of emergency communication and "walk through" emergency actions as identified in the SSHASP.
- Review QA requirements and quality control activities to be performed.
- If appropriate, conduct dry runs or mock-ups to demonstrate that Health and Safety, QA, and activity-related procedures are suitable.
- Define what activities each team or individual will be responsible for performing. Include contingency plans for reassignment of duties.
- Discuss the work site (a map is desirable) and each location where activity is to take place. Discuss any constraints the site may present.
- For sampling activities, identify what samples are to be collected at each sample location, the number of samples to be collected, and the sample types and analytes. Review the sampling technique to be implemented.
- Identify what equipment requires field decontamination, where decontamination will take place, and the logistics of the field decontamination process.
- Discuss any waste management issues.
- Identify, to the extent possible, any potential problems that may be encountered, and discuss possible contingencies.
- Discuss any lessons learned from prior field activities or similar events involving other projects.
- Review information required on field documentation, and discuss how field variances to plans and procedures should be excavated.

6.2 Procedural Requirements

Once the work is planned, implementation requires policies and procedures that allow the accomplishment of the work. These procedural requirements are designed to assist UGTA Subproject personnel by attaining data quality objectives and efficiency in the performance of the work.

6.2.1 Standard Operating Procedures

The DOE/NV Environmental Restoration Division procedures exist to guide UGTA Subproject work. DOE/NV Environmental Restoration Division-level Standard Operating Procedures (SOPs) provide broad-based policy guidance, directives, and requirements that are applicable to the multiple DOE/NV ERD subprojects and participants. These SOPs may also provide criteria for the development of subproject-specific SOPs.

6.2.2 Records of Verbal Communication/Technical Change Notices

Conditions in the field that cause changes to activities and/or designs or costs from those specified in planning documents will be documented through a Record of Verbal Communication. All Records of Verbal

Communication are prepared by Bechtel Nevada and approved by DOE/NV with concurrence from the IT Corporation. Cost, schedule, and scope impacts must be clearly identified on the Record of Verbal Communication.

6.2.3 Assessments

An assessment is an activity that evaluates a task. Assessments will be performed to determine compliance with UGTA Subproject requirements and applicable DOE Orders. Assessments may examine the availability, adequacy, and implementation of work instructions and assess the effectiveness of management and work process controls.

Operations assessments evaluate the adequacy of and compliance with established procedures, work instructions, and other applicable documents. Procedures, facilities, instrumentation, analytical measurements, calibration, data validation, data reporting, subcontractors, personnel knowledge and understanding of project requirements, and QC systems are all subject to this type of audit.

Laboratory-performance evaluation audits refer to the quantitative evaluation of the laboratory analytical systems. The evaluations will include the review of any existing and/or ongoing performance-evaluation results from outside programs, such as the DOE and EPA performance-evaluation programs, as well as internal performance-evaluation checks using standard reference materials.

6.2.4 Nonconformance

A nonconformance is a deficiency in characteristic, documentation, or procedure instruction that renders the quality of an item or activity unacceptable or indeterminate (ASME, 1994). Contractor field participants shall have approved implementing procedures that are in compliance with the DOE/NV requirements for the identification, documentation, and resolution of nonconforming conditions. Specifics of nonconformances are contained in the UGTA Subproject QAPP.

6.2.5 Occurrence Reporting

Occurrence Reporting (DOE Order -232.1A [DOE, 1997]) is a formal reporting process to describe any unusual occurrence encountered during the subproject. All UGTA Subproject participants must comply with the requirements in this DOE Order.

6.3 Performance Requirements

In general, performance requirements include monitoring progress against the established baseline scope, budget, and schedule; analyzing variances and the impacts of variances; and, most importantly, implementing corrective actions, including change control. The DOE/NV Performance Measurement System and individual Task Agreement Plan provide the respective baselines against which UGTA Subproject performance is measured and controlled.

6.3.1 Performance Measurement System

The DOE/NV uses its Performance Measurement System to monitor performance of the UGTA Subproject at Level Seven of the WBS. The UGTA Subproject baseline, task agreement plans, and individual contractor work authorization documents provide the basis against which performance is measured and controlled. The Performance Measurement System provides the foundation for reporting information to the Project Tracking System (PTS), managed by Bechtel Nevada, the two systems are linked to ensure the integrity of data in both systems.

All UGTA Subproject contractors with work authorization contribute to the Performance Measurement System. Contractors are responsible for monitoring their performance of assigned tasks and for reporting to the DOE/NV on a monthly basis. Contractor performance measurement and control systems may retain flexibility, but must be capable of providing, as a minimum, the following information:

- Cost performance
  - Budgeted cost of work schedule
  - Actual cost of work performed
  - Budgeted cost of work performed (earned value)
  - Cost variances
  - Estimates at completion
  - Earned value analysis.
- Schedule performance
  - Approved baseline schedule
  - Schedule variances
  - Major commitment tracking
  - Milestone tracking.

Specific performance measurement and control requirements are itemized in DOE Order 0430.1 LCAM (DOE, 1995b) and further defined in the *Joint Program Office Directive on Project Management* (DOE, 1996a).

All contractor reporting must be consistent with the UGTA Subproject WBS. Variances from baseline budgets and schedules are reported using a Variance Analysis Report along with a recommended corrective action or proposed change control action.

6.3.2 Progress Tracking System

DOE/NV uses its PTS to monitor performance at Level Six of the WBS. The PTS is the performance reporting module used by the DOE/EM-1, Environmental Restoration and Waste Management Program, to provide comprehensive reporting that addresses technical, cost, and schedule progress for all DOE/EM-1 activities. The PTS is the major vehicle for providing information concerning DOE/EM-1 Programs to the Office of Management and Budget and to Congress. In addition, the PTS is the DOE/HQ management-reporting module for DOE/EM-1 programs.

Bechtel Nevada is responsible for the DOE/NV contribution to the PTS Report each month. Bechtel Nevada prepares the PTS Report using Level Six data from the Performance Measurement System reporting process. The PTS Report is prepared in parallel with the Performance Measurement System Report. The PTS Report must be delivered to DOE/HQ by the twentieth calendar day of each month.

6.3.3 Change Control

Change control must be consistent with the DOE/NV *Baseline Change Control Process* (DOE/NV, 1997b). Baseline management is part of a planned program to monitor and control subproject performance. The process designates variance thresholds above which approvals must be secured, as well as the procedural requirements for securing the approvals. Thresholds and approvals vary for the level of the WBS at which the change occurs.

6.4 Technical Management Requirements

Efficient implementation of the UGTA Subproject requires the effective involvement of many contractors and regulatory agencies. These technical management requirements provide the mechanism for the DOE/NV to coordinate the project effectively with the various work activities and participants.

6.4.1 Meetings

Meetings are held to provide a forum in which to exchange ideas and specify subproject directives in a group setting.

6.4.1.1 State Regulatory Meetings

These meetings provide initial guidance in the development of planning documents prior to formal review and allow the exchange of information to establish strategies and priorities to approximately reflect client requirements in the planning process.

6.4.1.2 Technical Working Group Meetings

The TWG assists the DOE in determining work tasks for the execution of the project. The group is comprised of subproject participants with particular technical expertise. DOE advises the TWG of budget constraints and programmatic DOE directives to allow the TWG to recommend the most appropriate work tasks within the above constraints. Recommended work tasks are then submitted for approval by DOE via change control or as part of task agreement plans.

6.4.1.3 Plan Review Conference Calls

Participant comments on planning documents (especially drilling, testing, and completion plans) are informally resolved through conference calls prior to formal response documentation and plan revisions. These meetings assist in streamlining the review process.

6.4.1.4 Activity Kick-Off or Prefield Briefing Meetings

Prior to the execution of data analysis/modeling activities, a kick-off meeting is conducted to confirm the scope, technical requirements, budget, QA/QC, and logistics. The meetings provide accountability that the planned objectives will be met by execution of the activity.

A prefield briefing will be conducted prior to commencement of field activities. As in the activity kick-off meeting, the prefield briefing is conducted to confirm the scope, technical requirements, budget, QA/QC, and logistics of the field activity. Specifics of the briefing have previously been identified in this report.

6.4.2 Progress Reporting

Subproject progress reporting is conducted on a regular basis and consists of EM-40 updates, weekly updates, weekly progress reports, and field reports when fieldwork is ongoing. The various mechanisms of progress reporting are discussed below. Additionally, conference calls may be conducted by DOE to report on subproject performance.

6.4.2.1 EM-40 Updates

Subproject progress updates with EM-40 are conducted weekly. The purpose of the update is to discuss priorities and progress from an upper-level perspective.

6.4.2.2 Daily Field Reports

Bechtel Nevada will prepare daily field reports when field activities are performed. The Bechtel Nevada engineer will forward the report to the UGTA Subproject Manager, and

the Nevada Division of Environmental Protection. These reports cover activities conducted over the previous 24-hour period, including problems, projected daily and cumulative costs, and delays. The report is due before 7:00 a.m. on the day immediately following the reporting day. All locations where field, drilling or testing activities are taking place are to be covered in the daily drilling reports.

6.4.3 Technical Reporting

Technical reports include well-specific NEPA activities and general data analysis findings. The types of reports are discussed in the following text.

6.4.3.1 Position Papers

Position papers are reports to communicate the resolution of a subproject issue. This deliverable serves as the basis for implementing a new procedure, equipment procurement, or a change in subproject strategy.

6.4.3.2 Well Completion Reports/Hydrologic Letters of Accomplishment

Bechtel Nevada will prepare completion reports for each UGTA Subproject well. The reports are a compilation of field data for each well and contain a summary of the analyses performed. Content is based on information submitted by participants performing the testing and analysis. The reports will be submitted to the DOE UGTA Subproject Manager. Reports will consist of the following topics:

- The drilling summary for the well (which includes drilling history and process), geologic data collection (cutting, cores, and geophysical data)
- Well completion (design and methods)
- Deliverables required to complete the well completion reports which include the following:

  - Geophysical log distribution

  - As-built well reports

Bechtel Nevada will distribute final geophysical log data for each characterization well to the contractors within five working days following receipt from the logging contractor. Bechtel Nevada maintains an archive of data, to which it was distributed, and the date of distribution. Bechtel provides two copies of each log, as it is generated, to the on-site subproject scientist as they are generated.

Bechtel Nevada will prepare an as built and drilling history report for each well, detailing the drilling and completion activities of the well. Detail will be sufficient to document all construction material and hardware introduced into the borehole, both temporary and permanent. A preliminary report will be issued within 90 days after the well has been drilled to total depth. A final report is due 120 days following completion of the well.

IT Corporation will prepare hydrologic Letters Of Accomplishment (LOA) for each UGTA Subproject well that is sampled or tested. The LOAs are a compilation of field data for each well, with a summary of the analyses performed. The LOAs will consists of well development (methods and monitoring); hydrologic data collection (water levels, aquifer tests, and geophysical logs); and groundwater chemistry data (types, methods, and analytical results).

6.4.3.3 Technical Analysis/ Interpretation Reports

The analysis/interpretation reports will include a technical background of the well and the analysis and interpretation of geologic, hydrologic, and groundwater chemistry data.

Participants who perform well-specific technical analyses for geology, hydrology, hydrochemistry, and radiochemistry are required to compile an analysis report which must be submitted to the DOE UGTA Subproject Manager.

6.4.3.4 Threatened and Endangered Species Act Survey Reports

Bechtel Nevada will submit copies of *Endangered Species Act* (CFR, 1973) survey reports to be incorporated into individual well files. Bechtel Nevada will also submit a copy of each survey to the DOE/NV UGTA Subproject Manager and IT Corporation for the DOE/NV permanent well file.

6.4.3.5 National Historic Preservation Act Survey Reports

The Desert Research Institute shall submit copies of *National Historic Preservation Act* (CFR, 1992) survey reports to be incorporated into individual well files. The DOE UGTA Subproject Manager will also receive a copy of each survey for the DOE/NV permanent well file.

6.4.3.6 Data Analysis Reports

Participants performing non-well-specific investigations and/or technical analyses for geology, hydrogeology, chemistry, modeling, and risk assessment are required to compile reports at the direction of the DOE UGTA Subproject Manager.

All participants are contractually responsible for compiling an annual report covering the previous fiscal year's (FY) activities. UGTA Subproject activities must be clearly identified in the annual report, including milestones completed, in progress, or planned. The annual report is due 90 days following completion of the reporting fiscal year.

6.5 Public Participation

The following is a summary of public participation in the DOE/NV ERD.

6.5.1 Current Activities

The public's interest in past, current, and future activities at the NTS has increased. To keep interested parties informed of DOE/NV environmental issues, a Community Advisory Board (CAB) representative of affected and concerned stakeholders has been established. The CAB addresses and provides advice to the DOE on environmental, waste management, and technology development issues regarding NTS projects and programs.

Numerous fact sheets are available to the public, which explain environmental restoration, waste management, and technology development activities.

The *Environmental Restoration and Waste Management Update*, a publication dealing with environmental restoration and waste management activities, is published as needed and distributed to stakeholders in Nevada and other affected areas.

Tours of the NTS are conducted for environmental groups; leadership groups; legislative bodies; media; local, state, and federal agencies; and other members of the public.

A DOE/NV Environmental Management Exhibits Program provides portable displays at a variety of locations including libraries, shopping malls, city halls, and other locations.

The DOE/NV Speakers Bureau provides audiences with information about environmental restoration and waste management activities.

Community interviews were conducted in the spring of 1994 to gain a better understanding of the public's attitudes, opinions, and knowledge of DOE/NV environmental management activities.

Public meetings and workshops are periodically held to discuss the DOE/NV Environmental Management Program including such issues as the budget and transportation of waste. DOE also communicates information on environmental issues to the public through news releases and periodic briefings to elected officials.

6.6 Agreements

Agreements are commitments between DOE and the affected states and local governments.

6.6.1 Agreements in Principle

This effort funds the states of Alaska, Mississippi, and Nevada to provide oversight of Nevada Environmental Restoration activities in off-site locations. The Agreements in Principle describe the understandings and commitments regarding DOE's provision of technical and financial support for state activities in environmental oversight, monitoring, site access, and emergency response initiatives. Activities in Colorado and New Mexico will be addressed in amendments to existing Agreements in Principle managed by other DOE offices.

6.7 Grants

This effort provides educational and research opportunities for students and faculty at the University of Nevada, Reno and the University of Nevada, Las Vegas in support of technical programs being conducted at the NTS.

6.8 Stakeholder Issues Relating to DOE/NV ERD

Stakeholders in numerous workshops have worked to identify and refine their issues regarding EM activities. There are six issues identified to EM as part of this plan, and two are directly related to DOE/NV ERD. As part of the Accelerating Cleanup: Paths to Closure process, federal staff are working with stakeholders to develop resolution approaches. Issues relating to the DOE/NV ERD are defined as follows:

6.8.1 Definition of Complete Cleanup

The definition of cleanup implied to stakeholders that an area would be made contamination free and safe to use for a variety of future activities. In the Accelerating Cleanup: Paths to Closure, contaminated areas will be remediated to an acceptable regulatory level and/or closed in place with restrictions for future land-use activities. Nevada stakeholders recommended that DOE use the term "remediate" instead of the word "cleanup," and the public should be educated to understand the entire environmental restoration process.

Nevada stakeholders are skeptical that the contaminated areas of the NTS and off-site locations will ever reach a state of "complete cleanup." The large-surface contamination of soils in Nevada is so great, areas cannot be cleaned in the traditional meaning of cleanup within existing budget parameters.

The DOE will characterize and model the underground testing areas in order to set contaminant boundaries around those areas of known-predicted contamination.

The DOE and the State of Nevada have an agreement to remediate contaminated areas resulting from nuclear weapons testing at the NTS and elsewhere in Nevada. Because the federal government retains the ultimate authority and responsibility for any and all radioactive materials in the nation, the State of Nevada cannot supersede the authority of the DOE to remediate radioactively contaminated areas.

The DOE has agreed to negotiate cleanup levels; however, they retain the federal government primary authority over materials that are radioactive.

6.8.2 Environmental Contamination at the Nevada Test Site is Still Largely Unknown

Another stakeholder issue concerns the sheer size of the site and the immense number of individual sites slated for remediation, which limit the current knowledge and extent of contamination on the NTS. Many sites are still at the conceptual stage of characterization, remediation, and monitoring and surveillance.

Assessment and remediation of the NTS is divided into three project categories: Industrial Sites, Soils Sites, and the Underground Test Area.

The UGTA Subproject has responsibility for the 908 underground nuclear detonations conducted in shafts and tunnels at 878 locations.

The UGTA Subproject is charged with the investigation of the extent, magnitude, and duration of groundwater contamination on and off the NTS. The UGTA strategy is to use computer models to define contaminant boundaries.

Nevada stakeholders have placed a higher priority on understanding the extent of subsurface contamination through the UGTA Subproject than the Industrial and Soils Sites because the need to understand the effects of nuclear weapons testing on the groundwater flow system is paramount.

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