

**ENVIRONMENTAL
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**Project Management Plan
for Waste Area Grouping 5
Old Hydrofracture Facility Tanks
Contents Removal
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

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DEPARTMENT OF ENERGY

CDM Federal Programs Corporation

contributed to the preparation of this document and should not be considered and eligible contractor for its review.

**Project Management Plan
for Waste Area Grouping 5
Old Hydrofracture Facility Tanks
Contents Removal
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

Date Issued—June 1998

Prepared by
Engineering Division
Oak Ridge National Laboratory
and
CDM Federal Programs Corporation
Oak Ridge, Tennessee
under subcontract 13B-99313C

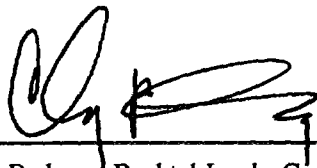
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Environmental Management Activities at
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Oak Ridge, Tennessee 37831
managed by
BECHTEL JACOBS COMPANY LLC
for the
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under contract DE-AC05-98OR22700

APPROVAL

**Project Management Plan
for Waste Area Grouping 5
Old Hydrofracture Facility Tanks
Contents Removal
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

(BJC/OR-53)



C. A. Bednarz, Bechtel Jacobs Company Project Manager



Date

**PAGES ARE MISSING IN
THE ORIGINAL DOCUMENT**

PREFACE

This project management plan was prepared to describe the organizational responsibilities, schedules, and management controls needed to remove the contents from the five inactive, liquid low-level radioactive waste tanks located at the Old Hydrofracture Facility Waste Area Grouping 5 at Oak Ridge National Laboratory. The *Program Management Plan for the Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory Site Environmental Restoration Program, ORNL/ER-167* (Energy Systems 1994) provided the guidance for preparation of this project management plan. The previous version of this project management plan was issued as document number ORNL/ER-375/R1.

ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
CDM Federal	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EE/CA	engineering evaluation and cost analysis
EM	Environmental Management
EMEF	Environmental Management and Enrichment Facilities
Energy Systems	Lockheed Martin Energy Systems, Inc.
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
HAZWOPER	Hazardous Waste Operations and Emergency Response
ITO	Incentive Task Order
Jacobs	Jacobs Engineering EM Team
LLLW	liquid low-level (radioactive) waste
LMER	Lockheed Martin Energy Research Corp.
NCSA	Nuclear Criticality Safety Approval
NEPA	National Environmental Policy Act
OHF	Old Hydrofracture Facility
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations Office (DOE)
P&E	Plant and Equipment
PNNL	Pacific Northwest National Laboratory
TDEC	Tennessee Department of Environment and Conservation
TWA	Task Work Agreement
WBS	work breakdown structure
WMRAD	Waste Management and Remedial Action Division

EXECUTIVE SUMMARY

This revision (Rev. 2) updates the schedule and designation of responsibilities for the Old Hydrofracture Facility (OHF) tanks contents removal project. A number of project activities identified in the original plan have been completed and other activities remain in progress. Completed activities include:

- sampling and analysis of tanks contents (January 1997);
- preparation of a tanks contents characterization report (see Keller, Giaquinto, and Meeks 1997);
- evaluation of tank integrity (see Energy Systems 1996);
- installation of new risers on tanks (1996);
- modification of liquid low-level (radioactive) waste system valve box (1997);
- preparation of an engineering evaluation and cost analysis (see DOE 1996b);
- preparation of an action memorandum (see DOE 1996a);
- final configuration of a sluicing and pumping system (see CDM Federal Programs Corporation 1997);
- fabrication of the sluicing and pumping system;
- cold testing of the sluicing and pumping system (April 1998); and
- equipment relocation and assembly (June 1998).

Ongoing and planned future activities include:

- readiness assessment;
- isotopic dilution of fissile radionuclides;
- sluicing and transfer of the tanks contents; and
- preparation of the Removal Action Completion Report.

This revision to the plan updates the schedule and designation of responsibilities for the activities not yet completed. The major change in the project since publication of the earlier project management plan relates to the designation of the new management and integration contractor (Bechtel Jacobs Company LLC). In addition, a new technical lead has been designated within Lockheed Martin Energy Systems, Inc. and Lockheed Martin Energy Research Corp. The schedule for tanks contents removal has been accelerated, with transfer of the final batch of tank slurry now scheduled for July 1998 (instead of November 10, 1998).

The OHF sluicing and pumping project is proceeding as a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act. The purpose

of the project is to remove the contents from five inactive underground storage tanks, designated T-1, T-2, T-3, T-4, and T-9. The tanks contain an estimated 52,700 gal of liquid and sludge, together comprising a radioactive inventory of approximately 30,000 Ci.

This plan was prepared under the guidance of the *Program Management Plan for the Martin Marietta Energy Systems, Inc., Oak Ridge National Laboratory Site Environmental Restoration Program* (Energy Systems 1994).

1. INTRODUCTION

The purpose of this revision (Rev. 2) is to update the schedule and designation of responsibilities for the Old Hydrofracture Facility (OHF) tanks contents removal project.

1.1 SCOPE

On January 1, 1992, the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA) Region IV, and the Tennessee Department of Environment and Conservation (TDEC) signed a Federal Facility Agreement (FFA) concerning the Oak Ridge Reservation. The FFA requires that inactive liquid low-level (radioactive) waste (LLLW) tanks at Oak Ridge National Laboratory (ORNL) be remediated in accordance with requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The scope of this project is to transfer inventory from the five inactive LLLW tanks at the OHF into the active LLLW system. The project includes several activities, some of which have been completed and some of which are ongoing. Completed project activities include the following:

- sampling and analysis of tanks contents (January 1997);
- preparation of a tanks contents characterization report (see Keller, Giaquinto, and Meeks 1997);
- evaluation of tank integrity (see Energy Systems 1996);
- installation of new risers on tanks (1996);
- modification of LLLW system valve box (1997);
- preparation of an engineering evaluation and cost analysis (EE/CA) (see DOE 1996b);
- preparation of an action memorandum (see DOE 1996a);
- final configuration of a sluicing and pumping system (see CDM Federal 1997);
- fabrication of the sluicing and pumping system;
- cold testing of the sluicing and pumping system; and
- equipment relocation and assembly.

Ongoing and planned future activities include:

- readiness assessment;
- isotopic dilution of fissile radionuclides;
- sluicing and transfer of the tanks contents; and
- preparation of the Removal Action Completion Report.

1.2 JUSTIFICATION

The OHF LLLW tanks contain approximately 52,700 gal of low-level radioactive waste consisting of both supernate and sludge. The primary human health risks are the presence of approximately 30,000 Ci of radioactive material in the tanks, the fact that the single-wall tanks are constructed of carbon steel and buried without active corrosion protection (the tanks were buried in the early 1960s and the cathodic protection system was found to be inoperative in the early 1990s),

and the existence of an expedient pathway to public receptors via the under-tank drain system that discharges into Melton Branch and White Oak Creek.

A substantial future off-site risk is posed to human health and the environment by the contents of these five tanks. According to the Action Memorandum (DOE 1996a), the risk from each tank exceeded the EPA target risk range of 1×10^{-6} to 1×10^{-4} . Removing and disposing of the contents from the inactive OHF LLLW tanks will reduce the consequences of a potential uncontrolled release from the tanks and, therefore, reduce this future off-site risk potential.

2. OBJECTIVES

2.1 MISSION AND GOALS

The mission of the DOE Environmental Management (EM) Program is to either eliminate or reduce to prescribed safe levels the risks to the environment and to human health and safety posed by inactive or surplus DOE-managed sites and facilities that have been contaminated by radioactive, hazardous, or mixed wastes. This mission is to be accomplished in conformance with all federal, state, and local environmental statutes and regulations.

The goal of the OHF Tanks Contents Removal project team is to sluice, to the extent practicable, the current inventory (both liquid and sludge) in the inactive OHF tanks and transfer the inventory to the Melton Valley Storage Tanks for ultimate treatment and disposal. Transfer will be accomplished by using a sluicing and pumping system configured and fabricated by CDM Federal Programs Corporation (CDM Federal). The sluicer spray nozzle to be used with the system has been configured and fabricated by Waterjet Technology, Incorporated, under contract to the Pacific Northwest National Laboratory (PNNL). A high pressure pump provided by PNNL may also be used with the system if required to dislodge hardened sludge. The sluiced tank contents will be transferred to the active LLLW system via a new above-ground pipeline that will tie into an existing pipeline at the existing valve box located northwest of the OHF site. Work activities will be performed in compliance with all applicable DOE Orders; Bechtel Jacobs Company LLC procedures; and environmental, safety, and health regulations.

2.2 TECHNICAL OBJECTIVES

The technical objectives of the OHF tanks contents removal project are to remove the contents from the OHF tanks and transfer the contents to the active LLLW system. The project consists of the following major tasks:

- establish clear and concise data quality objectives for all sampling and analyses needed to satisfy the active LLLW system waste acceptance criteria and engineering design considerations (completed);
- sample and analyze the contents of the OHF tanks (completed);
- prepare an EE/CA and an action memorandum (completed);
- perform preliminary engineering work and prepare the system configuration (completed);

- fabricate piping and ancillary equipment and systems to transfer the OHF tanks contents to the active LLLW system (completed);
- cold test the sluicing and pumping system (in progress);
- perform a readiness assessment (future);
- disassemble, relocate, and assemble equipment at the OHF site (future);
- isotopically dilute fissile radionuclides in tanks (future);
- sluice and transfer tank contents (future); and
- prepare Removal Action Completion Report (future).

2.3 SCHEDULE

The proposed schedule for completion of the remaining project activities is as follows:

- readiness assessment by June 1998;
- isotopic dilution of fissile radionuclides by June 1998;
- sluicing and transfer of the tank contents by July 1998; and
- preparation of the Removal Action Completion Report by September 15, 1998.

To ensure adherence to the overall project schedule, more detailed activities and milestones have been established. The project summary schedule is shown in Sect. 6 and important project control milestones are listed in Sect. 7.

2.4 COST OBJECTIVE

The proposed cost objective for this project is to accomplish tanks contents removal at minimum cost while meeting all regulatory requirements. Cost and schedule performance will be evaluated against the incentive fee schedule established in the Energy Systems contract, X-04, with CDM Federal.

3. MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

The project will be managed by the Bechtel Jacobs Company on behalf of DOE-Oak Ridge Operations Office (DOE-ORO). Support activities will be provided to the Bechtel Jacobs Company from Lockheed Martin Energy Research Corporation (LMER) personnel and from Energy Systems subcontractors, including MK-Ferguson of Oak Ridge Company. The Jacobs Engineering EM Team (Jacobs) has prepared the decision documents for the project. The following sections identify specific individuals, describe more fully the responsibilities of these individuals and the various organizations involved, and provide information on reporting requirements. Figure 1 summarizes project responsibilities.

Old Hydrofracture Facility Project

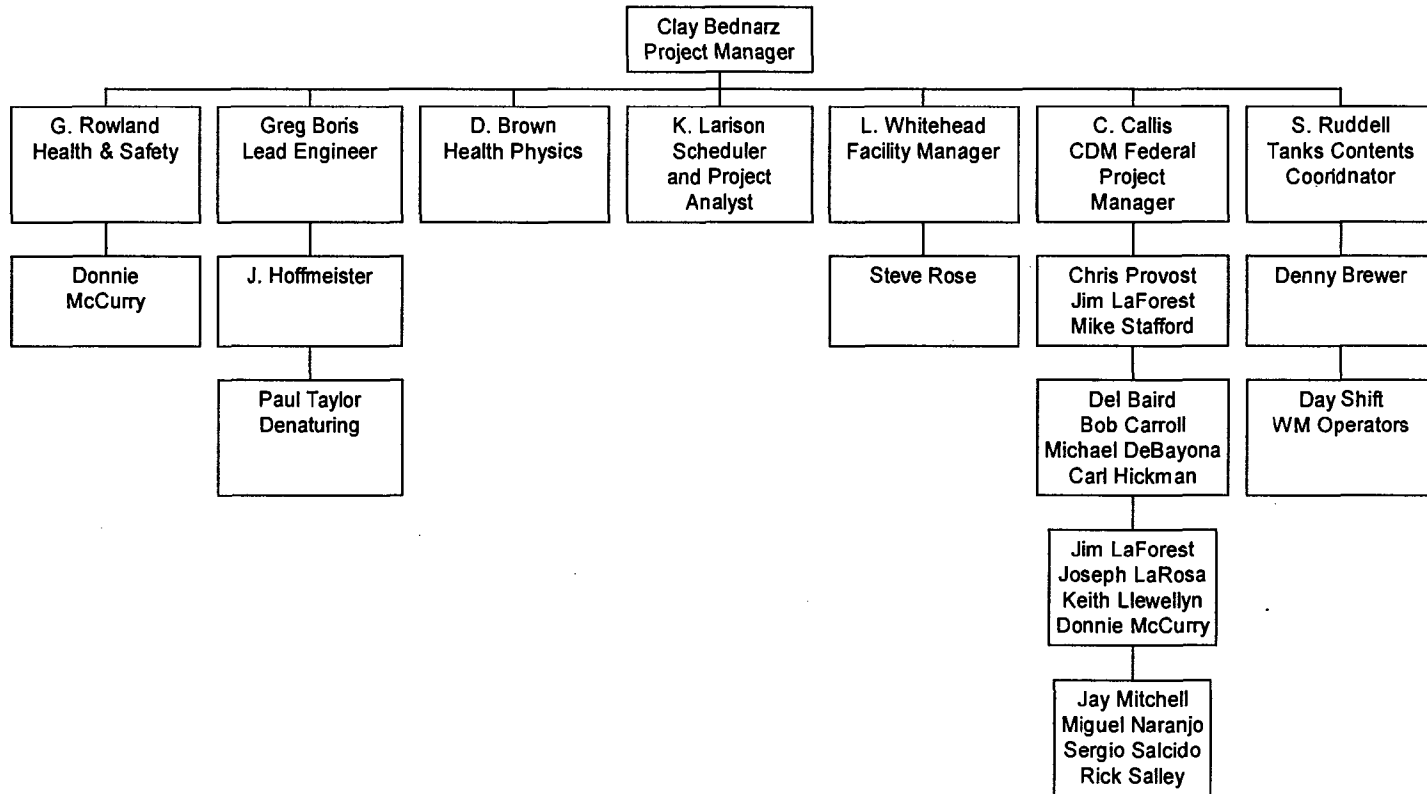


Fig. 1. Project responsibilities.

3.1 U.S. DEPARTMENT OF ENERGY-OAK RIDGE OPERATIONS OFFICE

DOE-ORO is ultimately responsible for all activities on the Oak Ridge Reservation. DOE-ORO will provide overall project management and administration of all prime contracts. All participants will be under contract to DOE-ORO or its contractors. Coordination with EPA and TDEC is DOE's responsibility.

3.2 BECHTEL JACOBS COMPANY LLC

The Bechtel Jacobs Company is the current management and operating prime contractor to DOE-ORO for environmental management at ORNL under an existing cost-plus-award-fee prime contract. The Bechtel Jacobs Company will have overall responsibility for project management and integration; systems configurations; provision of environmental, safety, and health support services and plans for the fieldwork (e.g., waste management plan); and provision of project and subcontractor management services.

The Bechtel Jacobs Company project manager is **Clay Bednarz**, who will have overall responsibility for ensuring that the project's scope is accomplished within the specified budget and schedule. He will have the primary responsibility for interfacing with DOE and the regulatory community. Within the Bechtel Jacobs Company organization, the following individuals will report to Mr. Bednarz for this project and will be responsible for accomplishing the described activities.

- **Greg Boris, Bechtel Jacobs Company**, is the technical lead for the project and will coordinate the cold test mock-up activities, nuclear criticality evaluations, development of the 50% and 100% system configurations, and sampling and analytical laboratory work. He will also coordinate technical baseline control (prime responsibility of CDM Federal) and provide interface for the Technical Demonstration and Site Technology Demonstration Program. Mr. Boris will coordinate all work performed by ORNL Plant and Equipment and by CDM Federal.
- **Dan Brown, Lockheed Martin Energy Research Corporation**, will provide radiation monitoring and protection oversight for activities conducted in the radiological zone.
- **Ken Larison, Bechtel Jacobs Company**, is the project analyst and will maintain the budget and reporting requirements for the project. He is also the project scheduler and will maintain and update the schedule for the project and all scheduled activities within the project. He is responsible for baseline maintenance and work funds authorization.
- **Lynn Whitehead, Bechtel Jacobs Company**, is the facility manager for the OHF and has site landlord responsibilities for all activities conducted on-site. These responsibilities include lockout/tagout control; surveillance and maintenance activities; Price-Anderson Amendments Act duties; and serving as an interface for Nuclear Criticality Safety Assessments, Unreviewed Safety Questions Determination, the readiness assessment, and site access control.
- **Charles Callis, CDM Federal**, is the CDM Federal project manager and is responsible for configuring and fabricating the sluicing/pumping system, conducting the cold test, and conducting the sluicing/pumping operations. Work instructions will be developed from the cold test for use during the actual sluicing. This will ensure that the readiness assessment requirements for a category 3 nuclear facility are met. Mr. Callis is also responsible for preparation of project documentation and value engineering.

- **Steve Ruddell, LMER**, will coordinate all Waste Management and Remedial Action Division (WMRAD) activities on behalf of the project. These activities will include conduct of all sampling of the tanks, waste certification and disposal of all remedial action-derived waste, waste evaluation criteria review, and all facility integrity tests.

3.3 MANAGEMENT PLANS

3.3.1 Configuration Management Plan

A project-specific configuration management plan has been issued, *Configuration Management Plan for the Old Hydrofracture Tank Contents Removal Project Sluicing and Pumping System at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Energy Systems 1997a).

3.3.2 Project Plans and Documents

Bechtel Jacobs Company and CDM Federal have prepared a number of plans and documents to guide the project. The major plans and documents are listed in Table 1.

Table 1. Major project plans and documentation

Documentation	Designation	Date issued
<i>ORNL Old Hydrofracture Facility Tanks Contents Removal Action Project Plan</i>	ITO-FY97-049/R0	June 30, 1997
<i>Project Management Plan for Waste Area Grouping 5, Old Hydrofracture Facility Tanks Contents Removal at Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	BJC/OR-53	June 1998
<i>Oak Ridge National Laboratory Old Hydrofracture Facility Tanks Contents Removal Project 100% Configuration</i>	N/A	May 20, 1997
<i>Cold Test Plan for the Old Hydrofracture Facility Tank Contents Removal Project, Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	ORNL/ER-423	November 1997
<i>Configuration Management Plan for the Old Hydrofracture Facility Tank Contents Removal Project Sluicing and Pumping System at Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	ORNL/ER/MS-11	December 1997
<i>Project Waste Management Plan for the Old Hydrofracture Tanks Contents Removal Project Cold Test</i>	971203	December 1997
<i>Safety Analysis Report for the Old Hydrofracture Facility Tanks Contents Removal Action Project at Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	ORNL/SAR/7852-ER/ER-R0	October 1997
<i>Quality Assurance Project Plan for Old Hydrofracture Facility Tanks Content Removal at Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	BJC/OR-52	March 1998
<i>Work Plan for Denaturing Waste in the Old Hydrofracture Tanks</i>	BJC/OR-15	October 1997

Table 1 (continued)

Documentation	Designation	Date issued
<i>Old Hydrofracture Facility Tanks Contents Removal Action Operations Plan at the Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	ORNL/ER-433	May 1998
<i>Site-Specific Health and Safety Plan for the Old Hydrofracture Facility Tanks Contents Removal Project at Oak Ridge National Laboratory, Oak Ridge, Tennessee</i>	ORNL/ER-427	December 1997
<i>Project Waste Management Plan for Contents Removal of the Old Hydrofracture Facility Tanks</i>	971212	December 1997
<i>Readiness Assessment Plan for the Old Hydrofracture Facility Tanks Contents Removal Project</i>	BJC/OR-25	May 1998

3.3.3 Project Records

Project records will be handled in accordance with procedure ERWM/ER-P1110, Rev. 1, *Identification, Distribution, and Maintenance of Environmental Restoration Records* (Energy Systems 1995).

4. WORK PLAN AND PERFORMANCE CRITERIA

Sluicing and pumping system components will be cold tested at the ORNL Robotics and Process Systems complex, following the *Cold Test Plan for the Old Hydrofracture Facility Tank Contents Removal Project, Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Energy Systems 1997d). The components will then be disassembled, moved to the OHF site, and reassembled. Fissile components of the tanks contents will be isotopically diluted in accordance with the *Denaturing Plan* (Bechtel Jacobs Company 1998c). A readiness assessment will be conducted, following the *Readiness Assessment Plan* (Bechtel Jacobs Company 1998b). Sluicing and pumping of the OHF tanks will then proceed in accordance with the *Old Hydrofracture Facility Tanks Contents Removal Action Operations Plan at the Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Energy Systems 1998).

5. PROJECT SUMMARY WORK BREAKDOWN STRUCTURE

The project summary work breakdown structure (WBS) is shown in Fig. 2. All project participants will manage and schedule work, collect costs, and report at the project summary WBS level 6 or lower.

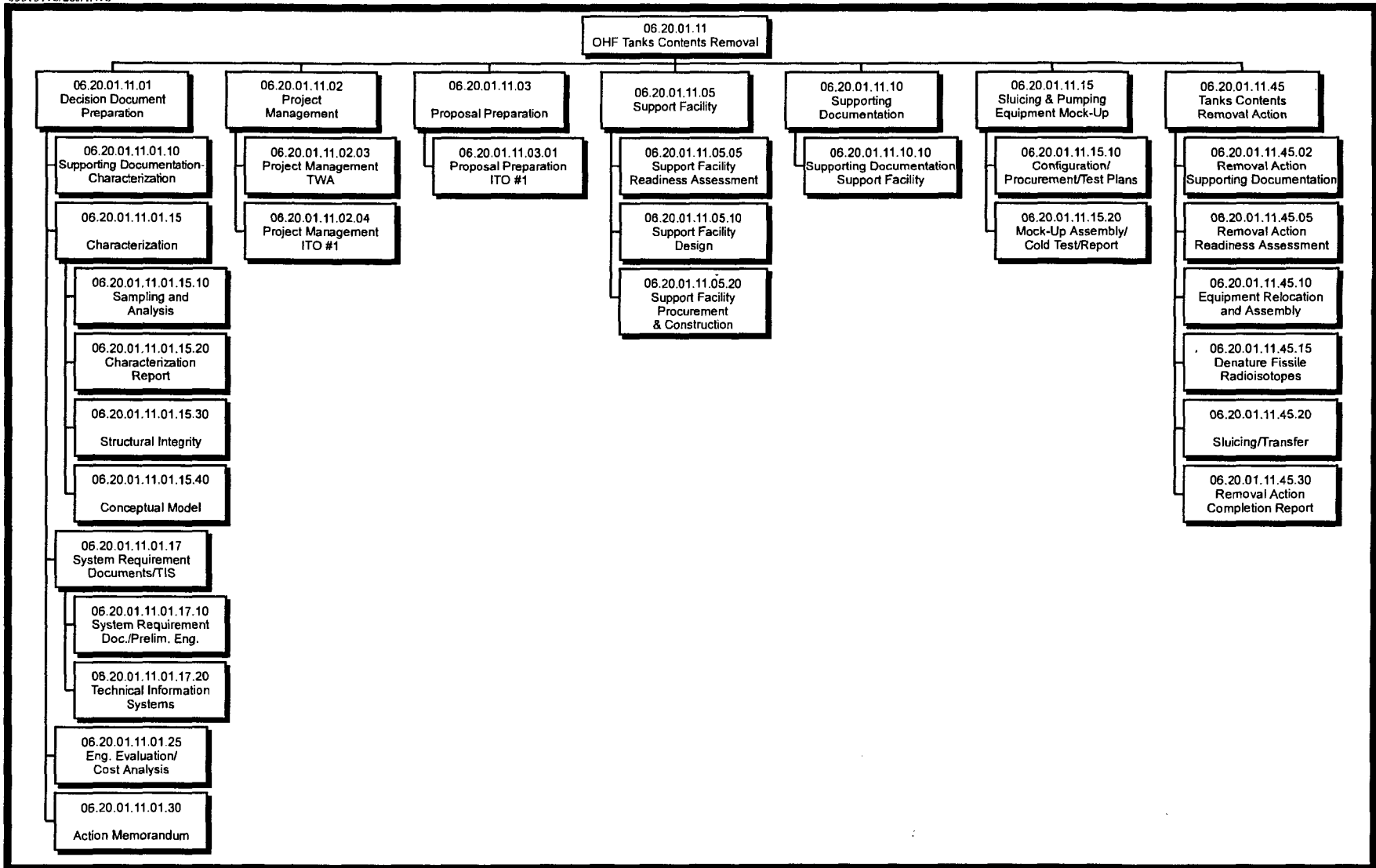


Fig. 2. Summary work breakdown structure.

6. SCHEDULE

The project schedule is displayed in Table 2.

7. MILESTONE SCHEDULE

Project control milestones are listed in Table 2.

Table 2. Remaining milestones for the OHF tanks contents removal project

Milestone	Date
Cold test the sluicing and pumping system	04/09/98
Complete readiness assessment	06/22/98
Complete equipment relocation and assembly	06/13/98
Complete isotopic dilution of fissile radioisotopes	06/26/98
Complete sluicing and transfer of the tank contents	07/29/98
Prepare Removal Action Completion Report	08/13/98

8. COST ESTIMATES

A cost estimate of approximately \$8.4M was derived by using Automated Estimating System Standard Value Files ERAUG95A.VAL, August 1995 (Decision Documentation and Support Facility Activities), and OER1577X.VAL, September 15, 1997 (Removal Action Phase). Estimates are made on the basis of assumptions by the project team members who are familiar with the size, history, and character of the facilities and the most probable cleanup approaches.

9. COST AND SCHEDULE CHANGE PROCEDURES

The baseline cost estimate will be regularly reviewed and updated, as required, to ensure that the estimate reflects the latest authorized scope, schedule, and method of accomplishment in accordance with DOE-ORO change control policy.

Cost and schedule change procedures will be consistent with both DOE Management Control Systems and Bechtel Jacobs Company requirements. All changes in the estimated cost and schedule will be documented to provide continuity between estimates and schedules.

10. PROJECT MANAGEMENT, MEASUREMENT, AND PLANNING AND CONTROL SYSTEMS

Integrated DOE and Bechtel Jacobs Company cost accounting and the Management Control Information System will be used to manage, evaluate, and provide reports concerning the cost, schedule, and technical performance of this project.

11. INFORMATION AND REPORTING

Typical data to be received by the Bechtel Jacobs Company project manager from other contractors and integrated into the actual cost and schedule performance data include the following:

1. cost performance reports;
2. status reports containing funding information to track budget authorizations and budget outlays, commitments, and accrued costs; and
3. reports of progress, accomplishments, problems, impacts, and corrective actions.

The Bechtel Jacobs Company project manager and project analyst will prepare the project monthly status report and issue the report.

12. QUALITY, RISK, SAFETY, AND NEPA DOCUMENTATION

A quality assurance plan was developed for the project at the time the tank risers were installed (Fall 1996). See *Quality Assurance Project Plan for Old Hydrofracture Facility Tanks Content Removal at Oak Ridge National Laboratory, Oak Ridge, Tennessee* (Energy Systems 1996a). That plan is currently under revision and will be issued before sluicing and pumping activities begin at the OHF site. In addition, a safety analysis report (Energy Systems 1997c), a nuclear criticality safety approval (NCSA 56), and a risk assessment (see Sect. 3.4 of the *Engineering Evaluation/Cost Analysis for the Old Hydrofracture Facility Tanks at the Oak Ridge National Laboratory, Oak Ridge, Tennessee*, DOE 1996b) have been completed. National Environmental Policy Act (NEPA) requirements will be addressed as part of the CERCLA process, under which the OHF tanks contents removal project is proceeding as a non-time-critical removal action (DOE 1996a and DOE 1996b).

13. REFERENCES

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