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INEL D&D Long-Range Plan

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ABSTRACT

This Long-Range Plan presents the Decontamination and Decommissioning (D&D) Program planning status for facilities at the Idaho National Engineering Laboratory (INEL). The plan provides a general description of the D&D Program objectives, management criteria, and philosophy; discusses current activities; and documents the INEL D&D Program cost and schedule estimate projections for the next 15 years. Appendices are included that provide INEL D&D project historical information and a comprehensive descriptive summary of each current surplus facility.

ACKNOWLEDGMENTS

This plan was first published in 1978 and has received 9 revisions to date. The authors are indebted to all those individuals who have contributed information in past revisions that is still included in the current document.

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ACRONYMS/ABBREVIATIONS

ADS	Activity Data Sheets
ANL-W	Argonne National Laboratory-West
ARA	Auxiliary Reactor Area
ATR	Advanced Test Reactor
B&W	Babcock & Wilcox Company
BORAX	Boiling Water Reactor Experiment
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CPP	Chemical Processing Plant
CRS	Chloride Removal System
CWA	Clean Water Act
CX	categorical exclusion
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy, Idaho Operations Office
DOE-HQ	U.S. Department of Energy, Headquarters
EA	environmental assessment
EBR-I	Experimental Breeder Reactor-I
EBR-II	Experimental Breeder Reactor-II
EC	environmental checklist
EIS	environmental impact statement
ER&WM	environmental restoration and waste management
FFA/CO	Federal Facilities Agreement/Consent Order
HQ	headquarters
ICPP	Idaho Chemical Processing Plant
IET	Initial Engine Test
IFSF	Irradiated Fuel Storage Facility
INEL	Idaho National Engineering Laboratory
IVC	Independent Verification Contractor
LLW	low-level waste
LOFT	Loss-of-Fluid Test
MTA	mobile test assembly
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NRF	Naval Reactor Facility
ORR	Operational Readiness Review
PBF	Power Burst Facility
RCRA	Resource Conservation and Recovery Act
RWMC	Radioactive Waste Management Complex
SAA	Satellite Accumulation Area
SAR	Safety Analysis Report
SFE	Stored Fuel Exterior
SPERT	Special Power Excursion Reactor Test
TAN	Test Area North

TRA	Test Reactor Area
TSF	Test Support Facilities
WAG	waste area group
WERF	Waste Experimental Reduction Facility
WINCO	Westinghouse Idaho Nuclear Company, Inc.
WRRTF	Water Reactor Research Test Facility

INEL D&D Long-Range Plan

1. INTRODUCTION

The Department of Energy (DOE) program for decontamination and decommissioning (D&D) of excess facilities is driven by *DOE Order 5820.2A, Chapter V, "Decommissioning of Radioactively Contaminated Facilities."*[1] This order establishes policies and guidelines for the management, decontamination, and decommissioning of radioactively-contaminated facilities under DOE ownership or control. The Department of Energy Idaho Operations Office (DOE-ID) has assigned responsibility for D&D of Idaho National Engineering Laboratory (INEL) surplus facilities under DOE-ID management, to EG&G Idaho, Inc. (EG&G Idaho) and Westinghouse Idaho Nuclear Company, Inc. (WINCO).

The Surplus Facilities Management Program, which in the past provided management of the national D&D Program, no longer exists, and national management is now provided by DOE Headquarters (HQ). However, the *Surplus Facilities Management Program Resource Manual*[2] remains as a guide for conducting the INEL D&D Program. It identifies requirements and provides the procedural basis for D&D Program management controls instituted by INEL contractors.

The INEL D&D Program was established in late 1977 and has remained active. Of the original 45 surplus contaminated facilities originally identified, 24 have been decommissioned to date. Appendix A provides a summary of the INEL D&D project history including a project documentation reference list (Table A-1) and a summary table providing project completion dates, D&D costs, waste volumes, and decommissioning modes (Table A-2). In the past several years, the DOE D&D Program has undergone significant organizational changes including the elimination of the "lead lab" concept and the combining of the defense and civilian offices under the D&D branch of the Office of Environmental Restoration.

1.1 Scope

The INEL D&D Program currently involves two contractors: WINCO and EG&G Idaho. D&D of surplus facilities at the Idaho Chemical Processing Plant (ICPP) is managed by WINCO. EG&G Idaho is responsible for surplus facilities located at Test Area North (TAN), Test Reactor Area (TRA), Central Facilities Area (CFA), Power Burst Facility (PBF), Auxiliary Reactor Areas (ARAs), and the reactor experimental areas located near the Radioactive Waste Management Complex (RWMC). Schedules and facility descriptions are provided for both the ICPP surplus facilities and those controlled by EG&G Idaho. Both programs report to the Waste Management and Environmental Restoration Office of DOE-ID. Areas of the INEL excluded from this plan are the areas assigned to Argonne National Laboratory-West (ANL-W) and the Naval Reactors Facility (NRF), operated by Westinghouse Electric Corporation. However, the INEL D&D Program does interface with ANL-W and NRF D&D Programs to share technology and planning.

All radioactive contaminated areas, facilities, and components that have been declared surplus and for which DOE-ID is responsible are included in this plan. Uncontaminated facilities and those contaminated soil areas listed as part of the INEL Federal Facility Agreement and

Consent Order (FFA/CO) are not included in the INEL D&D Program. Remediation of the FFA/CO areas are driven by the requirements of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and is managed by the Environmental Restoration Group of EG&G Idaho. In some cases, it may be expedient or cost effective to satisfy the requirements of the FFA/CO for the remediation of soil areas adjacent to surplus facilities undergoing D&D.

1.2 Objectives

D&D Program activities for surplus facilities encompass radiological, chemical, and physical characterization; decision analyses, which guide the selection of preferred D&D alternatives; detailed project planning for D&D performance and disposition of waste streams; and establishment and maintenance of project documentation. In addition, the requirements for surveillance and maintenance of contaminated surplus facilities are addressed. These efforts support the following D&D objectives:

- Provide for surveillance and maintenance of contaminated surplus facilities awaiting decommissioning to assure the health and safety of both onsite personnel and the public, and to reduce the potential risk to the environment

- Implement a structured decommissioning program for the appropriate disposition of all present and future INEL surplus facilities in compliance with applicable Federal and state standards and any other contractual or legal requirements

- Conduct financial estimating, budgetary project management, integrated planning and scheduling, and facility engineering to support cost-effective and priority-based decommissioning activities on a long-term basis

- Identify and make available surplus materials, equipment, facilities, and property for potential reuse.

1.3 Long-Range Plan Structure

The function of this plan is to guide the selection and priority scheduling of INEL D&D activities involving contaminated areas, components, and facilities under the jurisdiction of EG&G Idaho and WINCO. The plan and subsequent revisions provide a general description of the INEL D&D Program, serve as ready references of past accomplishments, provide a comprehensive descriptive summary of each current surplus facility, and document the most recent cost and schedule estimates at the INEL for the next 15 years.

Revisions to this Long-Range Plan are anticipated to be required every two years. The revisions will contain updated schedule and priority listings and revised cost estimates. Additional appendix information will be generated as projects are completed and new projects are identified. Additional guidance will be integrated into this document as required by new or revised regulations and as expertise is developed in the performance of D&D activities.

An overall description of the INEL is provided in Section 2. Elements of program management for the INEL D&D Program are discussed in Section 3. These elements include (a) criteria and priorities for selecting D&D projects, (b) procedural requirements and decommissioning methodology for completing all phases of D&D work, (c) release criteria and material reclamation, and (d) compliance issues. Section 4 provides a discussion of accomplishments since the last long-range plan revision and status of the currently active projects. The INEL D&D Program cost and schedule plan for the next 15 years is contained in Section 5. Appendix A provides a summary of INEL D&D project history and Appendix B contains detailed description forms for each uncompleted D&D project.

2. DESCRIPTION OF THE IDAHO NATIONAL ENGINEERING LABORATORY

2.1 INEL

The INEL, formerly the National Reactor Testing Station, was established in 1949 by the U.S. Atomic Energy Commission to build, test, and operate various nuclear reactors and fuel reprocessing plants with maximum isolation. In addition to its nuclear reactor research, other facilities have been constructed and operated to support the reactors and other government programs. These facilities include high- and low-level waste processing and storage sites, hot cells, analytical laboratories, machine shops, contaminated laundry, railroad, and administrative facilities.

The INEL, bordered by mountains on the west and north, covers approximately 2,315 km^2 of sagebrush-covered basalt on the Snake River Plain in southeastern Idaho, at an average elevation of 1,483 m. It is nearly 63 km long north to south, and about 58 km across at its southern end. Although basalt flows are exposed over much of the land, considerable gravel and sand deposits exist. Depths to the basalt or lava rock vary, providing a variety of footing conditions. In general, construction of roads, railroads, etc., requires only stripping the overburden and brush, adding gravel to the required depth, and grading. Construction of basement portions of facility buildings has required the blasting and removal of basalt.

Annual precipitation averages less than 25 cm. Underlying the area within the basaltic lava rock is a large aquifer. The lateral, southwesterly flow rate of this water ranges from 1.5 to 6 m/day. Depth to the water table from land surface ranges from about 60 m in the northeast corner of the INEL to 300 m in the southeast corner. The aquifer is mainly supplied from the North Fork of the Snake River. Additional water comes from the Big and Little Lost Rivers, Camas Creek, and Birch Creek, which start in the mountains to the north and west and sink into the porous soils and fractured basalt. The average annual temperature is 6°C, with extremes of 38°C and -43°C.

Personnel do not reside at the INEL. Permanent employees live in adjacent communities, with the largest percentage in Idaho Falls. The nearest INEL boundaries are 11 km southeast of Arco, 47 km west of Idaho Falls, 52 km northwest of Blackfoot, and 80 km northwest of Pocatello. The location of the INEL in relation to surrounding states is shown in Figure 1; and its relation to nearby communities is shown in Figure 2.

2.2 Facilities

There are several major facility complexes located across the INEL. Most of the complexes originally supported the testing and operation of various types of nuclear facilities. Since 1949, 53 reactors have been constructed on the INEL. Two reactors at the Test Reactor Area, two at the Naval Reactor Facility, and four at Argonne National Laboratory-West are still operational,

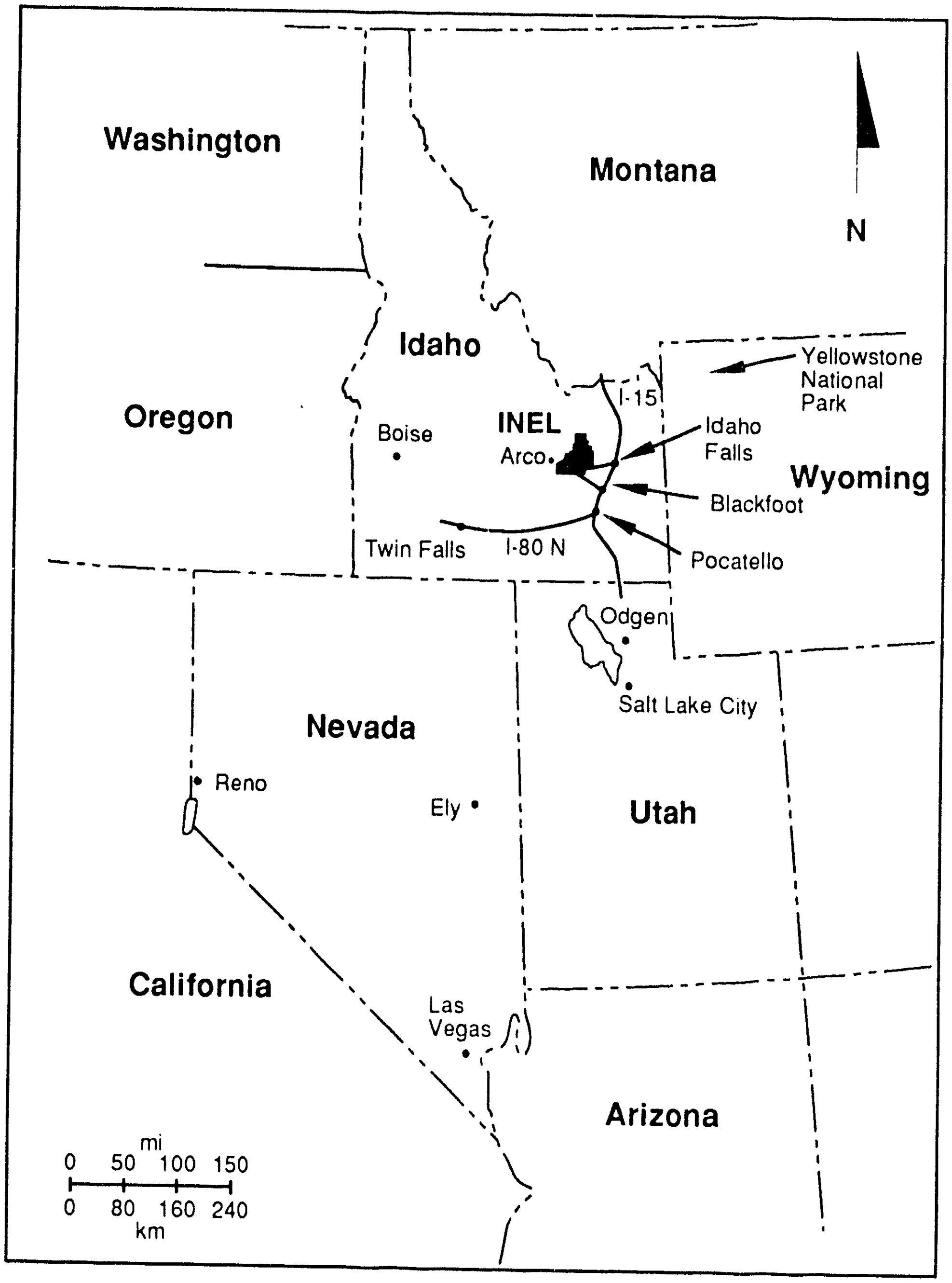

Figure 1. Location of INEL in relation to surrounding states.

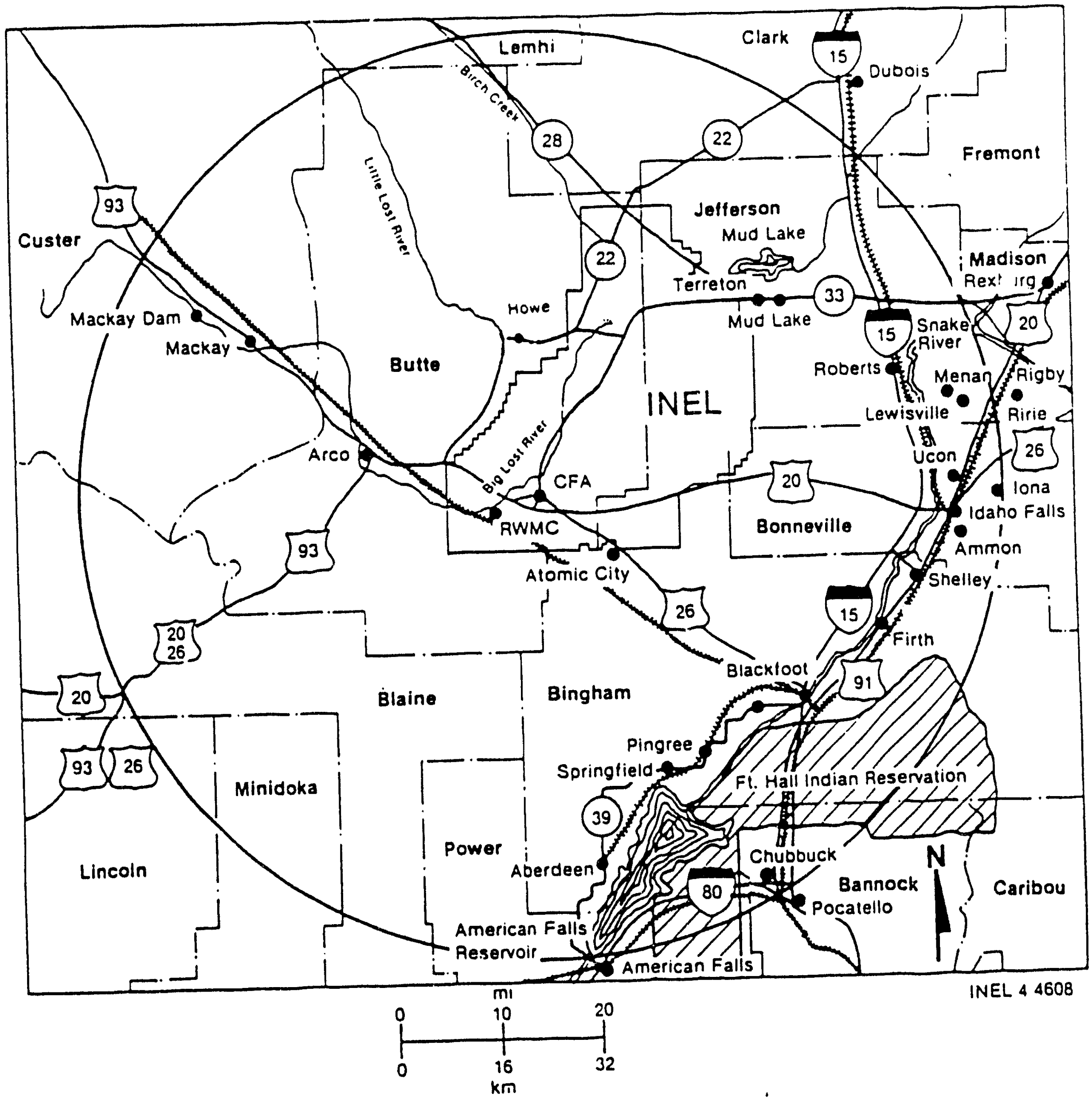

Figure 2. INEL vicinity map (50-mile radius).

but most have been deactivated or decommissioned to varying degrees. The present facilities of the INEL Site are illustrated in Figure 3. The major facility areas are as follows:

- TAN: Several past programs, including the Loss of Fluid Test (LOFT), the Initial Engine Test (IET), and the Water Reactor Research Test Facility (WRRTF), have been located at TAN the past 40 years. Current, active programs include the Special Manufacturing Capability facilities and a large hot cell facility, which is currently storing Three-Mile Island fuel.

- NRF: This area comprises nuclear powered prototype facilities used to provide training to Navy personnel. Two remain operational, the Large Ship Reactor (A1W) and the Natural Circulation Submarine Prototype (S5G).

- TRA: The primary programs at TRA support the operation of the Advanced Test Reactor (ATR), which conducts materials testing for U.S. Navy fuel systems. The ATR Critical Facility is an adjacent pool reactor operated in direct support of the ATR. In past years, the area also supported the operation of two other large test reactors, the Materials Test Reactor and the Engineering Test Reactor, which have been deactivated.

- ICPP: The ICPP is a complex of facilities constructed over the last 40 years to store and reprocess reactor fuels and to provide radioactive waste processing capability.

- CFA: The CFA serves as the centralized support area for programmatic and nonprogrammatic activities involving all INEL areas. Support services provided include transportation, warehouse storage, personnel services, and radiation monitoring.

- PBF: The PBF area is currently utilized by the Waste Experimental Reduction Facility (WERF) and other related programs dealing with the storage and treatment of both radioactive and mixed waste forms. The area initially supported the operation of the four Special Power Excursion Reactor Test (SPERT) reactors and PBF. The SPERT reactors have been deactivated and decommissioned to varying degrees, and the PBF test reactor is currently in standby.

- ARA: This area is not currently utilized. In past years, it has supported a variety of programs involving smaller-scale military reactors and a hot cell area.

- ANL-W: The Experimental Breeder Reactor II (EBR-II) is operated at ANL-W to support liquid metal breeder reactor development and reactor research. The Transient Reactor Test Facility, the Zero Power Physics Reactor, and the Neutron Radiography Reactor remain operational in support of ANL-W programs.

- RWMC: The RWMC contains the facilities and land required for disposal of low-level radioactive waste and storage of retrievable transuranic waste. Several reactor experiments involving the first nuclear generation of electricity were located near the RWMC. These early reactor experiments were performed at the Experimental Breeder

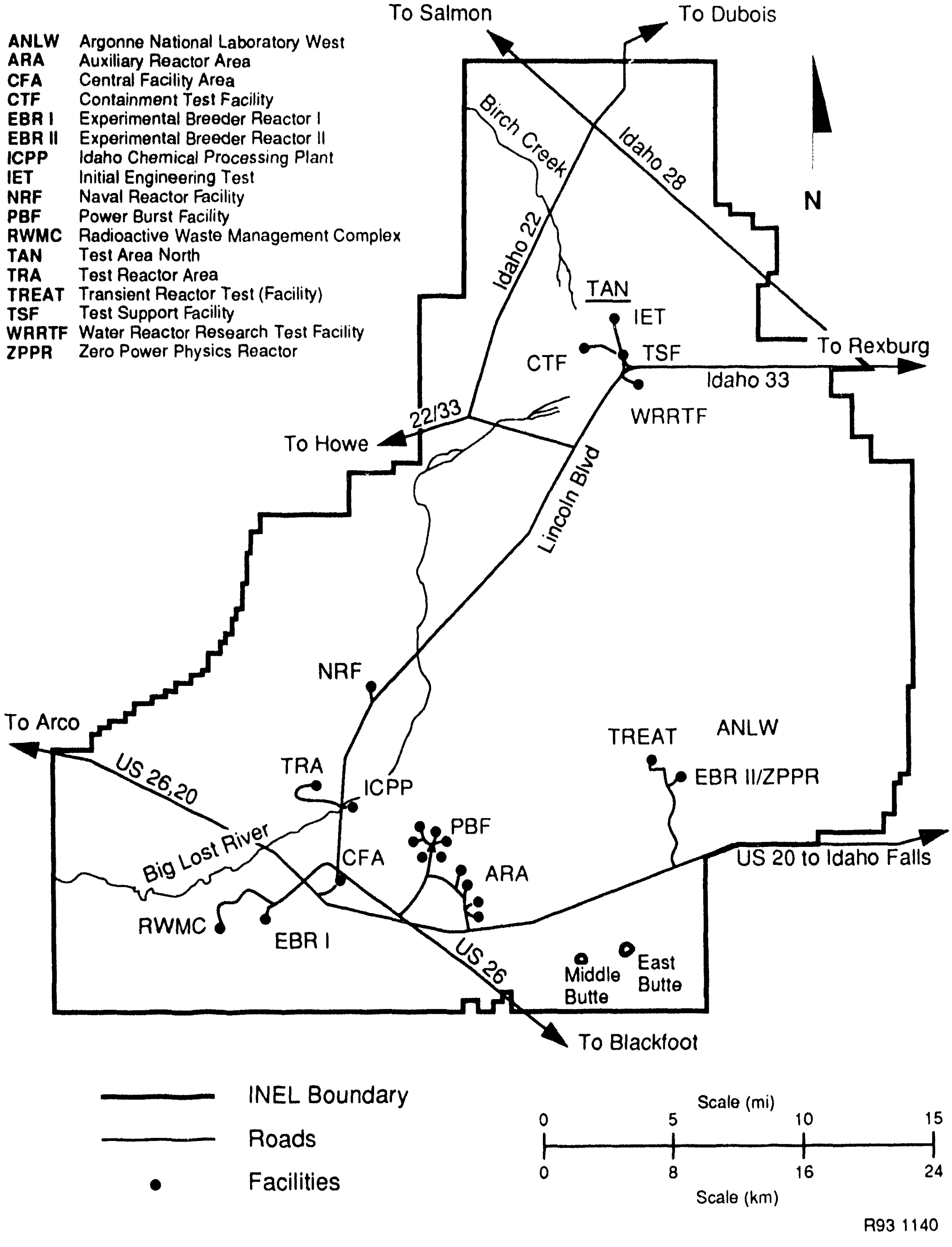

Figure 3. INEL primary facilities.

Reactor I (EBR-I) and the Boiling Water Reactor Experiments (BORAX) I through V.

Contaminated surplus facilities, managed by EG&G Idaho and WINCO, for which D&D has been designated but not completed are listed in Table 1. A listing of the facility buildings/structures common to a project are grouped into a single D&D project title. The D&D projects are listed in order of priority ranking according to the criteria discussed in Section 3.4.

Facility description forms have been completed for each D&D project and provide condensed information, in the format recommended by the U.S. Department of Energy, Headquarters (DOE-HQ) D&D Program, regarding project identification, facility description, current status, special circumstances, safety/environmental considerations, estimated costs, and estimated waste volumes. The INEL D&D Project facility description forms are included as Appendix B.

2.3 Security

All INEL surplus facilities are within the physical boundaries of the INEL, which is a government-controlled area with restricted public access. Security personnel provide regular patrols and surveillance of the area. In addition to regular security practices, most unoccupied surplus facilities are locked or are within fenced and locked areas. Keys are controlled by security personnel or the operational contractor of nearby or associated facilities.

Table 1. INEL D&D surplus facility list.

Priority	Project title/facility	Structures
	EG&G Idaho D&D Projects	
1	ARVFS Site	ARVFS NaK Barrels
		ARVFS Bunker
2	Test Train Assembly Facility	MTR-603 Canal Contents
3	Auxiliary Reactor Area I	ARA-626 Hot Cell
		ARA-627 Maintenance Building
		ARA-628 Guardhouse
		ARA-629 Pumphouse
		ARA-631 Hydraulic Facility
4	Auxiliary Reactor Area II	ARA-601 Well House
		ARA-602 Office Building
		ARA-604 Guardhouse
		ARA-605 Chlorination Building
		ARA-606 Technical Support Building
		ARA-613 Office Building
		ARA-614 Laydown Building
		ARA-615 Power Extrapolation Building
5	CFA Hot Laundry	CFA-699 Hot Laundry
6	Materials Testing Reactor	TRA-603 Reactor Building
		TRA-604 Reactor Building
		TRA-605 Process Water Building
		TRA-607 Auxiliary Building
		TRA-610 Fan House
		TRA-611 Plug Storage Facility
		TRA-612 Sump Pumphouse
		TRA-613 Hot Waste Pumphouse
		TRA-626 Compressor Building
		TRA-630 Catch Tank Pumphouse
		TRA-635 Services Building
		TRA-636 Monitoring Station
		TRA-641 Gamma Facility
		TRA-651 Maintenance Building
		TRA-665 Neutron Chopper Building
		TRA-710 MTR Stack
		TRA-712 Retention Basin
7	Engineering Testing Reactor	TRA-642 Reactor Building
		TRA-643 Process Building
		TRA-644 Heat Exchanger Building
		TRA-648 Electrical Building

Table 1. (continued).

Priority	Project title/facility	Structures
		TRA-644 Heat Exchanger Building TRA-648 Electrical Building TRA-704 Primary Filter Pit TRA-705 Secondary Filter Pit TRA-706 Exhaust Delay Tanks TRA-753 ETR Stack
8	Auxiliary Reactor Area III	ARA-608 Reactor Building ARA-612 Pumphouse and Waste Tank
9	BORAX V Facility	ANL-717 Reactor Building
10	TAN Technical Support Facilities	TAN-606 Calibration Well TAN-616 Waste Treatment Building TAN/TSF-7 Sewage Disposal Plant
11	LOFT Ancillaries	LOFT Mobile Test Assembly
12	SPERT IV Ancillaries	PFB-714 Waste Holdup Tank
13	TAN Decontamination Shop	TAN-607 Decontamination Shop
	WINCO D&D Projects	
1	Waste Calcining Facility	CPP-633 Waste Calcinating Building
2	Fuel Processing Complex	CPP-601 High Building
3	Fuel Receipt and Storage Facility	CPP-740 Settling Basins SFE-20 Waste Tank & Vault CPP-642 Compressor Building
4	Headend Processing Plant	CPP-640 Headend Processing Building
5	Fuel Element Cutting Facility	CPP-603 Fuel Storage Building
6	Headend Off-Gas Cell	CPP-631 RaLa Off-Gas Building
7	Eastside Service Waste Diversion System	CPP-709 East Waste Monitor Building
8	High-Level Waste Tank Farm	Storage Tanks (11) nd Vaults

Table 1. (continued).

Priority	Project title/facility	Structures
9	Westside Service Waste Diversion System	CPP-734 West Waste Monitor Building
10	Chloride Removal System	CPP-603 Chloride Removal System Annex

3. PROGRAM MANAGEMENT

The successful D&D of a facility involves the structured and sequential completion of several project phases. These include project acceptance; surveillance and maintenance; planning and budget requests; radiological, chemical, and physical characterization; environmental and safety documentation; prioritization; field operations; and site or facility release. Depending upon project size, it will normally require 2 to 5 years of planning and document approvals before actual D&D field activities can begin. Figure 4 is a process flow diagram for the D&D of INEL surplus facilities.

3.1 Organization

The D&D activities for all radioactively and chemically contaminated areas, components, and facilities on the surplus inventory that DOE-ID has responsibility for and that are under the jurisdiction of EG&G Idaho and WINCO are administered by the respective organizations in accordance with established interface agreements. Areas of the INEL excluded from this Long-Range Plan are those assigned to ANL-W and NRF.

Figures 5 and 6 provide the organizational structure and interfaces involving DOE-HQ, DOE-ID, and the operating contractors managing D&D activities at the INEL. WINCO retains responsibility for the planning and management of ICPP D&D Projects and receives direct funding through DOE-ID. EG&G Idaho provides integrated planning and administrative reporting for the program, including the ICPP projects.

For INEL D&D activities, program requirements have been implemented to ensure compliance with DOE Order 5820.2A, Chapter V,[1] and the DOE-HQ D&D Program guidelines. Project documentation requirements, including review and approval levels, are specified by contractor directives to ensure that the appropriate level of management and DOE concurrence are in each D&D project.

3.2 Surplus Facility Acceptance

The initial step in the D&D of any candidate facility is inclusion on the surplus facilities list. This list is currently documented by DOE-HQ through the authorization budget document termed an Activity Data Sheet (ADS). Each accepted facility has a corresponding ADS providing a summary description of project activities, and a projected estimate of schedule and funding requirements. The original requirements for acceptance and transfer of facilities to the surplus facilities list were specified in the *Surplus Facilities Management Program Resource Manual.*[2] The DOE-HQ D&D Program guidelines direct that any DOE nuclear facility declared excess after October 1, 1976, must have provisions for its D&D included in its overall operations plan.

The program office responsible for the operation of a facility identifies and requests funding for the D&D of the facility. To qualify for acceptance into the D&D Program, the following requirements must be met:

- The facility status shall be identified as radiologically contaminated

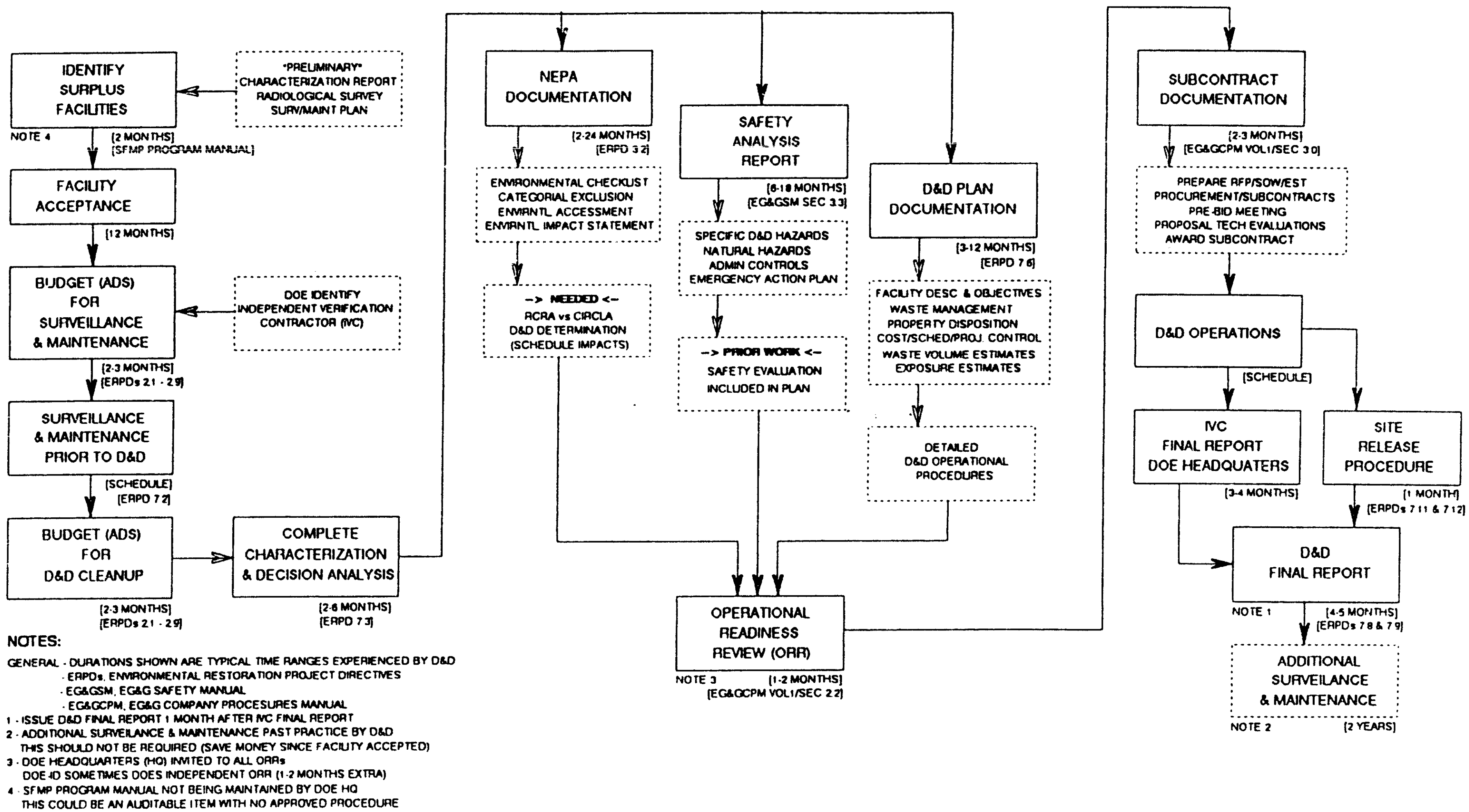

Figure 4. Decontamination and Decommissioning (D&D) process flow diagram.

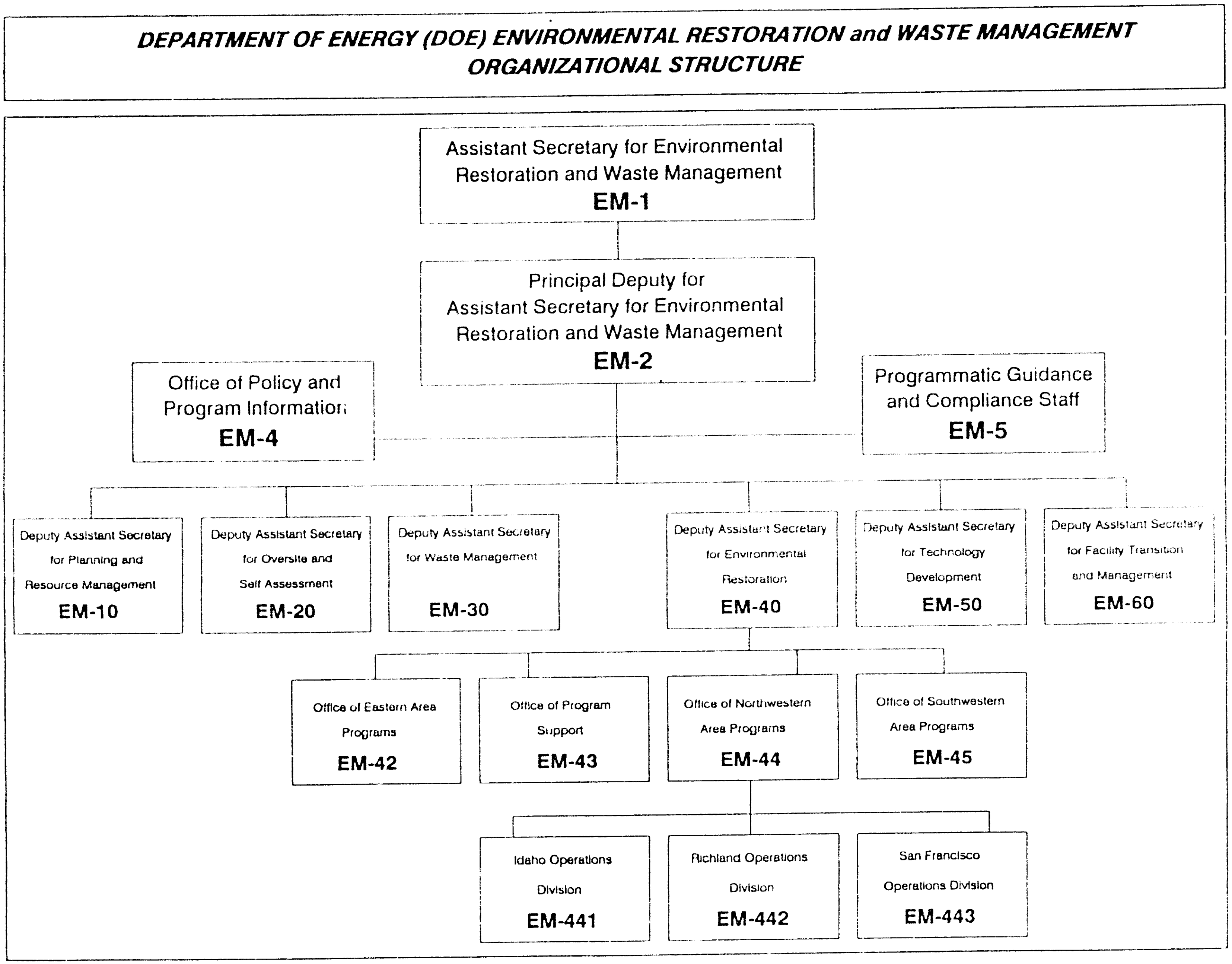

Figure 5. DOE Environmental Restoration and Waste Management organizational structure.

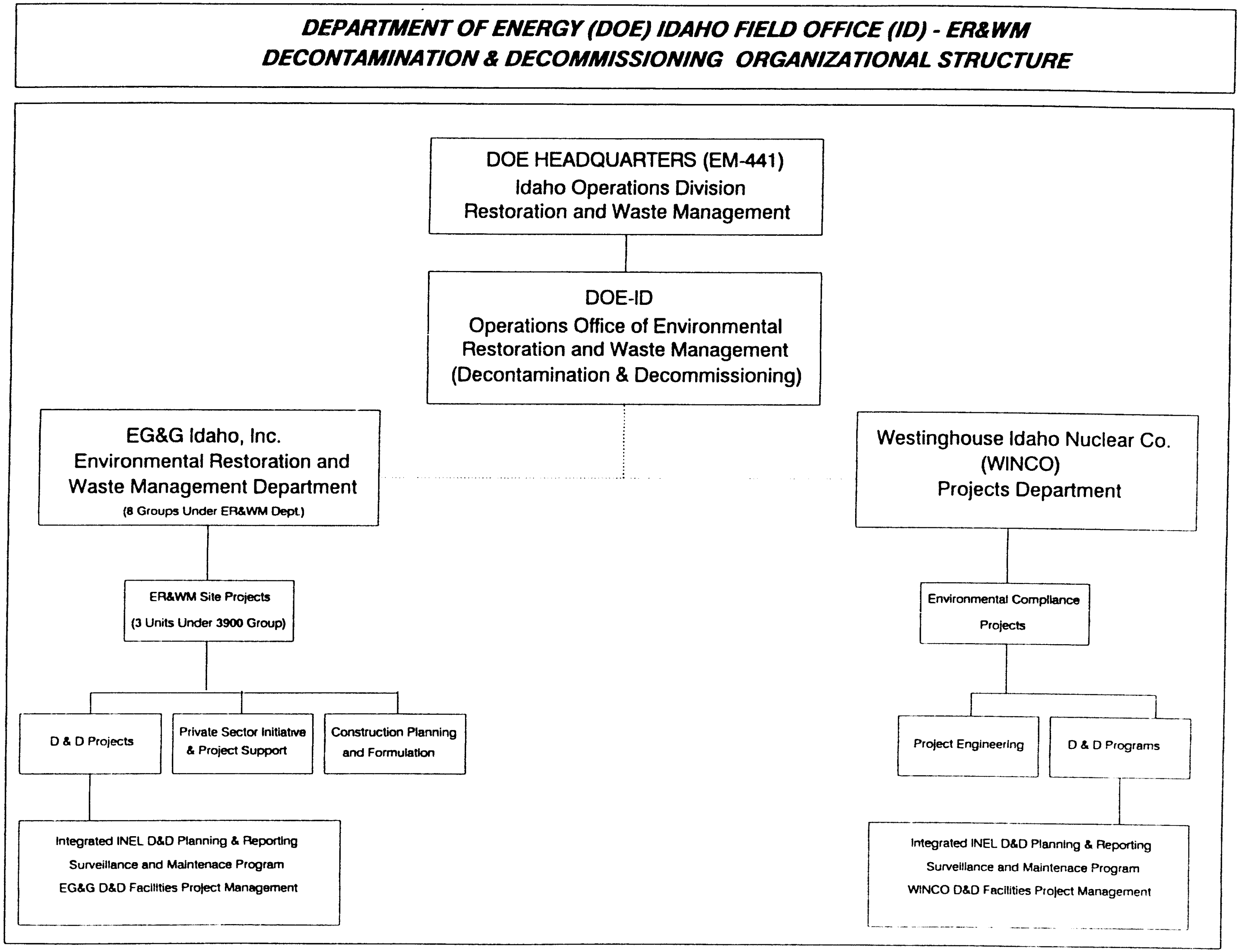

Figure 6. DOE-ID ER&WM Decontamination and Decommissioning organizational structure.

- The deactivation or shutdown of the facility shall be established and documented
- The facility shall be in compliance with all current environmental regulations
- All nuclear fuel and stored hazardous material shall be removed from the facility
- All actions required to protect personnel and public health and safety shall be completed.

The program office responsible for facility operation is required to maintain a file of as-built drawings, photographs, operational history, etc., for use during the D&D characterization and planning phases. Periodic decontamination will have been provided as normal operational cleanup over the life of the program. Once deactivated, facility Safety Analysis Reports (SARs) will require revisions to reflect the new shutdown status. These activities will be funded through yearly operating funds and managed by the operating program.

In 1989, the Defense Facilities Decommissioning Program Office developed the Non-Orphan Facility Incorporation Plan.[3] This plan was intended to begin transfer of inactive contaminated Defense Program facilities to either the Defense D&D Program or the Remedial Actions Program. The program has since undergone substantial changes at the DOE-HQ level. In 1992, EM-60 was formed by DOE-HQ to take control of the "Non-Orphaned" facilities and eliminate the Non-Orphan Facility Incorporation Plan. This includes the necessary reconditioning of the facility to meet safe-store conditions and the surveillance and maintenance as required until accepted into the Environmental Restoration Program, directed by EM-40.

To add a candidate facility onto the surplus facilities list, acceptance is requested through the Deputy Assistant Secretary for Facility Transition and Management, EM-60. When a facility is accepted into the D&D Program, a transition period will be required to allow time to appropriate funds for D&D. Activities required for facility turnover during this period, including surveillance and maintenance, will be the responsibility of the operating program. Beyond this period, surveillance and maintenance and the ultimate D&D costs will be provided by the DOE-HQ D&D Program.

3.3 Surveillance and Maintenance Program

A surveillance and maintenance program is required by DOE Order 5820.2A, Chapter V.[1] This activity manages the inspection and maintenance of surplus facilities identified for D&D and assures compliance of all applicable safety, environmental, and procedural standards while these facilities are under D&D Program control. The purposes of the surveillance and maintenance function for surplus facilities awaiting D&D are (a) to ensure adequate containment of contamination and (b) to provide physical safety and security controls and regulated surveillance to maintain the facilities in a manner that will minimize potential hazards to the public. The elements of the D&D surveillance and maintenance program are

- Surveillance and maintenance planning to accomplish the appropriate integration of facility conditions, surveillance frequencies, security requirements, routine maintenance, and major facility repair

- The performance and documentation of periodic inspections at each surplus facility
- A deficiency control system that provides for the prioritization, tracking, resolution, and documentation of identified deficiencies
- The performance of maintenance, repair, and cleanup tasks required to (a) correct deficiencies and (b) complete routine scheduled maintenance.

3.4 Priority Determination

All current and future D&D projects listed on the INEL surplus facilities list have been assigned a priority and listed accordingly in Table 1. The factors that are considered when determining priority ranking of the INEL D&D projects are

- Hazards reduction
    - Current hazards
    - D&D hazards
    - Advantages of relocating contamination to approved storage or disposal
    - Weather effects
- DOE legal and contractual obligations
    - Tri-party or state agreements
    - Environmental drivers
    - DOE Orders
- Cost/benefit
    - D&D costs
    - Surveillance and maintenance costs
    - Alternative costs and benefits
    - Completion time
    - Associated development and training costs
    - Labor availability
    - Knowledge of the facility
    - Impact on other programs
- Unrestricted/restricted reuse
    - Planned reuse
    - Contamination type and location
    - Achievable decontamination versus offsite background radioactivity
    - Potential public reactions.

In addition to consideration of these factors, it is also important to implement a weighting system that places more or less emphasis on certain factors. Priority weighting guidance is provided by Table 2.

These guidelines are reviewed and used for assigning priorities to INEL surplus facility's projects, recognizing that the results are subjective and are based on available facility data and the experience of D&D personnel. The priorities identified in this plan are subject to change. In the interval between facility identification as a surplus facility and the initiation of D&D operations, a facility may be evaluated several times for alternate uses, or factors previously considered may change, for example, regulatory changes in law.

Project prioritization analysis has been performed on the current D&D projects. Table 3 is a matrix summarizing this analysis process.

3.5 Decommissioning Procedure

The INEL decommissioning activities are performed in a documented and structured manner, consistent with the DOE D&D Program guidelines and DOE Order 5820.2A, Chapter V.[1] This management approach includes a facility characterization, a decision analysis aided by a cost-risk-benefit assessment, a D&D plan, generation of a project data file, a post D&D characterization, and a final report. Several key documents are required and prepared during the assessment and cleanup phases of a D&D project. Table 4 provides a list and a brief requirements description of required D&D documents.

A D&D Project Manager Handbook is currently being prepared by EG&G Idaho and will be issued early in FY 1994. This handbook will serve as a resource manual for the INEL D&D

Table 2. Priority weighting guidance.

Consideration	Determination	Weighting factor[a]
Hazard to the public	Pathways analysis	10
DOE legal or contractual requirements	Requirements search	9
Hazard to INEL personnel	Pathways analysis	8
Facility conditions/surveillance and maintenance requirements	Characterization	7
Facility or space reuse need	Programmatic need	6
Estimated cost vs. cleanup benefits	Cost-benefit analysis	4

a. The weighting factor is an arbitrary scale from 0 to 10, with 10 being the highest priority.

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Prepared by RJ Buckland & DJ Kenoyer

Table 3. EG&G Idaho, Inc., ER&WM D&D project prioritization analysis.

Priority Weighting Factors (1 Low to 10 High)

Hazard to the Public	==> 10	Facility Condition / S&M Costs	==> 7
DOE-ID Legal Driver	==> 9	Facility or Space Reuse Need	==> 6
Hazard to INEL Personnel	==> 8	Estimated Cost vs Cleanup Benefit	==> 4

D&D Project	ADS No.	M&O Company	Notes	Public Hazard	Legal Driver	Personnel Hazard	S&M Costs	Facility Reuse	Cost Benefit	Weighted Totals	D&D Priority
ARVFS	46-EG	EG&G		8	3	7	4	1	6	221	1
TTAF	67-EG	EG&G		8	1	7	5	4	3	216	2
ARA-I	52-EG	EG&G		5	7	2	7	1	5	204	3
ARA-II	48-EG	EG&G		3	7	2	7	1	5	184	4
CFA-669 Hot Laundry	58-EG	EG&G		6	0	5	7	1	7	183	5
MTR	54-EG	EG&G		7	3	6	3	5	3	208	6
ETR	60-EG	EG&G		7	3	6	3	5	3	208	7
ARA-III	49-EG	EG&G		2	7	2	7	1	4	170	8
BORAX V	63-EG	EG&G		5	2	3	7	1	5	167	9
TAN/TSF	51-EG	EG&G		3	0	5	6	1	4	134	10
LOFT Ancillaries (MTA)	65-EG	EG&G		2	2	3	6	1	6	134	11
SPERT IV Ancillaries	64-EG	EG&G		2	2	2	7	1	6	133	12
TAN-607 Decon Shop	53-EG	EG&G		1	2	3	3	3	5	111	13
Waste Calcining Facility	1309	WINCO	4	8	10	9	10	0	10	352	1
CPP-601	1308	WINCO	4	8	4	8	9	3	9	297	2
CPP-740 SFE-20 Waste Tank	1305	WINCO		8	10	8	6	0	5	296	3
CPP-640	1307	WINCO	4	6	0	6	5	8	8	223	4
CPP-603	1304	WINCO	4	5	4	4	6	0	7	188	5
CPP-631	1306	WINCO		7	4	4	4	0	5	186	6
CPP-709	1306	WINCO		4	3	6	3	0	5	156	7
Tank Farm	1310	WINCO	4	3	2	2	2	0	2	86	8
CPP-734	1306	WINCO		1	1	2	3	0	4	72	9
CRS	1306	WINCO	5	0	1	1	1	4	0	48	10

NOTES:

1 - Prioritization Analysis Matrix based upon "Relative Rankings" of each D&D Project (1 Low to 10 High).
2 - Prioritization Analysis Matrix Weighted Totals based upon the "Relative Rankings" multiplied by the Priority Weighting Factors.
3 - There is no written history on the development of the INEL D&D Program Ranking or Prioritization System from previous reports.
4 - Facilities not yet transferred to EM-40 but expected in the next few years. Advanced planning & scheduling has been started. Priority based upon expected post transition condition.
5 - Completed Project. Now in Post D&D S&M Program

Table 4. Key D&D program documents.

Document	Responsible organization	Facility status[a]	Criteria and purpose
Characterization Report	Operating[b] Program	At program termination	Required for facility acceptance. Comprehensive radiological, chemical, and physical description of facility.
SAR	Operating Program	At program termination	Revised SAR reflecting the inactive status of the facility. Required for all nuclear facilities awaiting D&D.
SAR—D&D Phase	D&D Program	Initiation of D&D	Revised SAR to include the D&D process to be utilized in the completion of the D&D project. Based upon the D&D Plan.
National Environmental Policy Act (NEPA) [Categorical Exclusion (CX), Environmental Assessment (EA), or Environmental Impact Statement (EIS)]	D&D Program	Initiation of D&D	Preparation and DOE approval of appropriate project NEPA documentation.
Decision Analysis Report	D&D Program	Completion of characterization	Utilizes cost-risk-benefit analysis to compare alternatives and select the preferred mode of D&D.
D&D Plan	D&D Program	Initiation of D&D	Comprehensive project management plan that defines and develops a planned sequence strategy for achieving D&D objectives. Based on the characterization and decision analysis results.
Final Report	D&D Program	Project completed	Formal overview of project activities, accomplishments, final status, and lessons learned.

Table 4. (continued).

Document	Responsible organization	Facility status[a]	Criteria and purpose
Data File	D&D Program	D&D phase	Archive of all pertinent records for each D&D project.

a. Status of facility at the time when the document is required.

b. Responsibility of the D&D Program for facilities currently on the surplus inventory.

Project Manager by providing in-depth descriptions and requirement discussions of documents and activities related to each phase of a D&D project. An invaluable part of this handbook will be the continuing documentation of "lessons learned" from completed D&D projects.

3.5.1 Characterization

A significant objective of the program is the orderly characterization of all surplus contaminated facilities. A detailed radiological, chemical, and physical characterization of each facility must be performed and documented. Baseline data for each project includes

- Drawings, photographs, and other records reflecting the as-built and as-modified condition of the facility and grounds

- The condition of all structures, existing protective barriers, and systems installed to ensure public, occupational, and environmental safety

- The type, form, quantity, and location of hazardous chemical and radioactive material from past operations at the site

- Information on factors that could influence the selection of decommissioning alternatives such as potential future use, long-range site plans, facility condition, and potential health, safety, and environmental hazards.

Facility characterization activities and objectives, with respect to hazardous waste are subject to the requirements of the Resource Conservation and Recovery Act (RCRA), and in some instances CERCLA, depending upon the facility operational date and the requirements of the INEL FFA/CO.

3.5.2 Decision Analysis

Following characterization, a decision analysis is performed and documented for each facility. The decision analysis identifies disposition alternatives and assesses those alternatives to provide a basis for selecting the preferred decommissioning mode. A discussion of decommissioning alternatives is provided in Section 3.6. Drawings, photographs, and comparative tables are used whenever possible to enhance clarity of the report. The information required for assessment of alternatives includes as follows:

- The impact of each alternative on the public and INEL personnel

- Hazards that each alternative would present to D&D workers, including dose estimates

- The potential for facilities and material reuse

- The cost and schedule of each alternative

- The waste volumes expected to result from each alternative

A cost-risk-benefit methodology, to a level of detail consistent with the complexity of the project, is utilized in the comparative analysis. In general, the analysis considers all operational costs including those associated with waste disposal, surveillance and maintenance costs, the dollar value of the estimated radiation dose D&D workers will receive, the dollar value of the dose reduction to INEL personnel and the public, and the reuse value of the facility and the materials and equipment it may contain. The resulting data are tabulated and analyzed for each alternative considered. Generally, the alternative with the best ratio is selected as the preferred alternative for further planning. In some instances, nonquantifiable considerations indicate that an alternative be selected that is less favored in the quantitative basis (e.g., DOE programmatic considerations and guidance).

The alternative selected in the decision analysis is for planning purposes only. No decommissioning mode is considered final until NEPA and RCRA requirements are satisfied and DOE approves the D&D process defined by the project D&D Plan.

3.5.3 D&D Planning

An approved D&D Plan is required before initiating the actual D&D tasks on a project. Based on the characterization and decision analysis results, the D&D Plan defines and develops the preferred decommissioning mode into a planned sequence strategy for achieving project objectives.

This comprehensive project management plan addresses the project management philosophy and control methods and establishes the technical baseline for all planned project D&D activities. Essential elements of the D&D Plan are as follows:

- Project objectives and completion criteria
- Facility description and history
- Management and operational control requirements
- Technical plan identifying and defining the total work breakdown structure for the D&D operation
- Cost and schedule
- Estimates of waste volumes and worker exposures
- Quality assurance
- Safety and environmental documentation requirements.

Approval of the D&D Plan by DOE-ID provides authorization to proceed with the project as defined. A formal project readiness review is then performed to ensure that all requirements for initiation of the field activities have been completed.

3.5.4 Project Operations and Documentation

Project operations are performed in accordance with the approved D&D Plan. D&D field operations generally include decontamination, dismantlement, demolition, transportation, recycle and/or reuse, waste reduction and disposal, and excavation and backfill activities. All field activities are conducted in accordance with task specific, approved procedures.

The information generated over the life of the project is retained and archived in the project data file. This data file will provide the documentation necessary to support the release of the facility/area or final facility status. Typical contents of a project data file include all project reports, safety analysis documents, environmental documents, readiness or design review results, completed procedures, waste disposal records, property disposition records, supporting engineering documents, photographs, incident reports, cost and schedule performance, and all survey and sampling data. The completed project data package is assigned an identification number for retrieval from the INEL permanent records storage system. This identification number is included in the final report.

At the conclusion of D&D activities, a final report is required for each project. The project final report formally documents an overview of the project activities, accomplishments, final facility/area status, and lessons learned. The primary sections of a D&D Final Report are as follows:

- Facility description before D&D
- Objectives and work scope
- Work performed
- Cost and schedule
- Volume of waste generated
- Personnel exposure
- Post-D&D condition
- Lessons learned.

3.5.5 Independent Verification

An independent verification is required to validate the accuracy and completeness of post cleanup field measurements to ensure that the facility/site meets the established release criteria (see Section 3.8).

The level of verification required by the Independent Verification Contractor (IVC) may range from a simple review of the D&D plans and post cleanup characterization results to onsite visits involving direct measurements and sampling. The level of verification is determined by

DOE with input from the IVC. Verification activities may be required throughout the cleanup effort and are therefore integrated into overall project planning.

The IVC currently providing independent review of INEL D&D projects is Oak Ridge National Laboratory, Grand Junction.

3.6 Decommissioning Alternatives

A decommissioning mode is defined as the method selected for the D&D of a surplus contaminated facility. The four general decommissioning modes applicable to INEL facilities are (1) safe storage, (2) in place stabilization, (3) decontamination for reuse, and (4) dismantlement. The characteristics of each mode are summarized in Table 5. Combinations or variations of these modes are considered for each facility, along with the priority factors specified in Section 3.4. Subsection 3.5.2 describes the decision analysis process used to determine the preferred decommissioning mode.

The INEL uses safe storage of a surplus facility until the facility is decommissioned. During this period, surveillance and maintenance must be performed to ensure the containment of radioactive or chemical contaminants. Safe storage is possible because of the INEL's remote location from populated areas and the presence of a permanent security patrol.

3.7 Waste Management and Disposition

Management and disposition of D&D generated wastes is an important aspect of the D&D Program at the INEL. Projected volumes of D&D waste are determined for all projects. The projections are based on preliminary engineering estimates, characterization data, or the finalized planning documented in project D&D Plans. Current estimates of all D&D project generated waste are documented in DOE-ID-10417, *Waste Stream Projections for the Environmental Restoration Program at the INEL*.[4] This report is updated and reissued semiannually and presents the most current data available. The report contains waste definitions, locations, mediums, types and projected volumes and need dates for treatment, storage, and disposal actions.

The bulk of INEL D&D generated radioactive waste is classified as low-level waste (LLW) and is disposed on-Site at the RWMC. The criteria for LLW acceptance and handling are contained in DOE-ID-10112, *INEL Low-Level Radioactive Waste Acceptance Criteria*.[5] Hazardous waste and mixed waste are also encountered on most D&D projects. Strategies for the treatment, storage, and disposal of mixed waste forms vary depending upon the material, applicable regulations, and available treatment technologies. Interim storage of hazardous and mixed waste on the INEL is provided by the Hazardous Waste Storage Facility located at CFA, and the Mixed Waste Storage Facility at PBF. Nonradioactive and nonhazardous material is reused through placement into the INEL excess material system or through the recycling process or it is buried in the INEL sanitary landfill.

Table 5. Decommissioning mode characteristics.

Mode	Facility status	Contamination control	Potential use of site
Safe storage site	Leave facility in place	Remove loose contamination, provide temporary but rigid physical barriers, operate passive protective systems, surveillance required.	Restricted use of most of exclusion area around the immediate vicinity. site is unavailable for other uses.
In-place stabilization	Leave facility in place	Remove loose contamination, provide hardened permanent physical barriers, remote surveillance and periodic direct surveillance.	Unrestricted use of much of site, exclusion area around the immediate facility, site is available for other uses with restrictions to prevent compromising the physical barriers.
Decontamination for reuse	Leave facility in place	Completely remove contamination from facility areas with potential for reuse, provide permanent physical barriers for remaining contaminated areas, surveillance required until assumed by new user.	Unrestricted use of decontaminated facility areas, exclusion restrictions established for remaining areas, which may be partially reused when considered impractical to fully decontaminate.
Dismantlement	Fully decontaminate or remove facility	Reduce contamination to unrestricted level, no surveillance	Unrestricted use.

All D&D projects are required to implement the precepts of waste minimization. Process waste assessments are performed during the planning phase of each D&D project and applicable waste minimization practices are incorporated into D&D Plan requirements. Waste volume reduction is accomplished by processing certain low-level wastes at the Waste Experimental Reduction Facility (WERF) before disposal at RWMC. WERF volume reduction capabilities include incineration, compaction, and metal component size reduction.

Reuse and reclamation of valuable equipment, material, or facilities is a major consideration factored into the planning of a D&D project. Economic savings because of resource recovery receive high priority weighting in the decision analysis. The D&D Program initiates actions required to transfer custodianship and ensure the availability of material and equipment to other facilities or users.

3.8 Release Criteria

Release of an INEL decommissioned facility or site must comply with the requirements of DOE Order 5400.5, *Radiation Protection of the Public and the Environment, Chapter IV, Residual Radioactive Material*.[6] This DOE standard requires a project-specific pathways analysis to calculate the estimated effective dose equivalent to the public. (The effective dose equivalent represents a summation of the weighted dose rates an individual will be subjected to as calculated by the pathways analysis.) A calculated effective dose equivalent of less than 100 mR/yr is required for unrestricted release. If the calculated dose is greater than 1 mR/yr, a cost-benefit analysis is performed to determine if additional cleanup is justified.

D&D release criteria specific to INEL application were developed in 1986 and are described in EGG-2400, *Development of Criteria for Release of INEL Sites Following D&D*.[7] Although not specifically applicable to each current INEL D&D project because of revised requirements (Rev. 1, 1989) in the DOE Order, Reference 6, this document provides valuable guidance in the development of project specific analyses. An additional consideration exists for those projects that are subject to, or in part satisfy, the CERCLA cleanup effort at the INEL. The limits set for residual risk to the public by the Environmental Protection Agency (EPA) are lower than the risk implied by the DOE 100 mR/yr dose limit.[8]

Post D&D radiation and contamination levels are compared to the applicable release limits. Controls are then established for each facility or area as required, depending on planned use. These controls may range from restricted access with physical and administrative barriers, to total unrestricted release. Completed D&D projects will basically fall within the following categories:

- Unrestricted release for programmatic use—The facility or area is decontaminated until no hazard exists and is considered radiologically clean, permitting unrestricted full-time occupancy.

- Restricted release for use by DOE-ID approved programs—The facility or area is decontaminated to minimize remaining hazards. However, access may be restricted, depending on cleanup success. The facility or area is removed from D&D Program responsibility and transferred to the appropriate operating program.

- Radiologically contaminated at a level that makes occupation for programmatic use impractical—These facilities or areas will remain under assigned custodianship. Long-range surveillance and maintenance planning must be included in budget appropriations.

3.9 Program Directives

The EG&G Idaho *Environmental Restoration Program Directives Manual*[9] establishes the policy, procedure, and guidance for conducting the administrative and technical processes of the EG&G Idaho D&D Program. In addition to providing general administrative, documentation control, quality, and safety procedure, the manual contains detailed guidance specific to D&D projects. This D&D section contains procedures and requirements for the following:

- D&D surveillance and maintenance program
- Preparation of D&D project characterization and decision analysis reports
- Radioactive waste disposal
- Preparation of project D&D Plans
- Decommissioned Site marker requirements
- Maintenance of D&D project data files
- Preparation of D&D project final reports
- Release criteria for INEL D&D projects
- Removal of surplus facilities from the D&D Program inventory.

Guidance for the WINCO D&D Program is provided in the *Environmental Restoration Program Implementing Project Management Plan.*[10]

3.10 Compliance

The *Quality Program Plan for the Environmental Restoration Program*, QPP-149,[11] defines the quality program for the EG&G Idaho D&D Program. This quality program plan addresses codes, standards, and regulations applicable to the D&D Program and encompasses the quality program elements of configuration control, process control, inspection, waste storage and handling, nonconformance action, and records.

The provisions of the EG&G Idaho *Safety Manual,*[12] *Radiological Controls Manual,*[13] and *Industrial Hygiene Manual,*[14] which incorporate applicable DOE directives and provide the safety requirements for industrial and radiological conditions associated with D&D activities, are invoked without exception. As low as reasonably achievable (ALARA) radiation goals are mandated by the WINCO *Radiological Controls Manual*[15] and are included in the planning of D&D projects.

Environmental compliance is a major consideration during all phases of D&D activities. D&D projects must comply with the applicable environmental protection requirements of DOE, other Federal agencies, and the State of Idaho. The unique requirements of these agencies must be identified early in the project planning to avoid project delays, penalties, and possible compromise of state and Federal environmental objectives. Implementation requirements at the INEL are provided and documented by the *Environmental Compliance Planning Manual at the INEL*, DOE/ID-10166.[16] Principal environmental regulations and statutes potentially applicable to D&D projects include the following:

- NEPA
- RCRA

- CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- National Historic Preservation Act (NHPA)
- National Emission Standards for Hazardous Air Pollutants
- State Air Permit.

4. CURRENT ACTIVITIES

This section of the INEL D&D Long-Range Plan will discuss the progress and accomplishments of the active D&D Projects at the INEL since the issuance of the last INEL D&D Long-Range Plan, Revision 8, dated September 1991, until July 1993. This section will serve to familiarize the reader with actual progress and keep the reader informed of any major changes in the planning and scheduling of the D&D projects at the INEL. The active INEL D&D projects will be discussed in the following subsections.

4.1 Auxiliary Reactor Area-I Facilities

This D&D project included assessment and cleanup and was scheduled to be worked from FY 1992 to FY 1996.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991 — None
- FY 1992 — None
- FY 1993 — Scheduled to complete the Characterization and Decision Analysis Report.

4.2 ARA-II Facilities

This D&D project included assessment and cleanup and was scheduled to be worked from FY 1992 to FY 1996 with $57K being expended through FY 1990.[17] The following is an outline of major accomplishments from FY 1991 to FY 1993:

- FY 1991 — Completed the update of the Characterization and Decision Analysis Report.[18]
- FY 1992 — Completed D&D Plan,[19] SAR,[20] and Health and Safety Plan.[21] Completed the removal of asbestos in the facilities (ARA-603 and ARA-606). Started the removal of SL-1 heavy equipment. These interim actions were performed under a separate Categorical Exclusion (CX) that was approved in 1991.
- FY 1993 — Performed Operational Readiness Review (ORR) and shipped & buried 296 tons of waste. Completed removal of SL-1 heavy equipment.

This project has had significant delays because of the extended revision and review cycles involved with the NEPA-related documents. Specifically, the Environmental Assessment (EA) for this D&D project has been in the review and approval cycle for approximately 10 months. The EA was sent by DOE-HQ to the State of Idaho July 30, 1993, 28 months after initiation. The State of Idaho has 15 days to review, comment, and approve this EA. This project was scheduled to start physical work in October of 1992. D&D work tasks have not started work yet because the lack of an "Approved EA," which has caused project delays of several months.

4.3 ARA-III Facilities

This D&D project included assessment and cleanup and was scheduled to be worked from FY 1991 to FY 1993 with $115K being expended through FY 1990.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991 — Completed the update of the Characterization and Decision Analysis Report.[18]

- FY 1992 — Completed the D&D Plan,[19] SAR,[20] and Health and Safety Plan.[22] Completed the removal of 14 sources of radioactive sources and their lead shielding containers (the lead shielding containers were recycled).

- FY 1993 — Performed ORR.

This project has had significant delays because of the extended revision and review cycles involved with the NEPA related documents. Specifically, the EA for this project has been in the review and approval cycle for approximately 10 months. This project was scheduled to start physical work in October 1992 and has not started work yet because of the lack of an "Approved EA," which has caused project delays of several months. The EA was sent by DOE-HQ to the State of Idaho July 30, 1993, 28 months after initiation. The State of Idaho has 15 days to review, comment, and approve this EA.

4.4 Army Reentry Vehicle Facility Site NaK

This D&D project included assessment, permitting, and cleanup and was scheduled to be completed in FY 1991 with $2,665K being expended through FY 1990.[17]

- FY 1991 — Safety Analysis Report approved by EG&G Idaho. Conducted nonradioactive NaK/chlorine prototype testing.

- FY 1992 — Completed Decision Analysis to proceed with NaK/water reaction testing instead of the NaK/chlorine reaction testing. Field modifications begun on equipment and facility to the NaK/water reaction process. Conducted audits and appraisals of existing treatment facility. Prototype testing halted as a result of compliance concerns with the treatment system.

- FY 1993 — Transferred the remaining noncontaminated NaK used in prototype testing from the treatment system into storage containers. Placed treatment facility in a safe standby mode. Evaluation of alternatives resulted in pursuit of private sector services for transportation and treatment of the ARVFS NaK.

4.5 BORAX V Facilities

This D&D project included assessment, permitting, and cleanup and was scheduled to be worked from FY 1991 to FY 1993 with $1,924K being expended through FY 1990.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991—Completed ORR in October of 1990. Removed three underground storage tanks, removed electrical substation and overhead power lines to BORAX-V, removed and disposed of 90% of radiologically contaminated equipment from the Turbine Building.

- FY 1992—Completed removal and disposal of radiologically contaminated equipment from the Turbine Building and decontaminated the building foundation in February of 1992. Received Independent Verification Contractor confirmation on release criteria for the Turbine Building foundations. Turbine Building dismantlement, demolition of concrete foundation to 6 ft belowgrade, backfill, and contouring of area completed in March of 1992. DOE-ID approval of CX for the INEL D&D facility characterization was received in March of 1992. Completed additional characterization sampling of BORAX-V facility sumps and vessels in August of 1992 and updated radiological data in September of 1992.

- FY 1993—Prepared environmental checklist (EC), action description memorandum, and EA in November of 1992. Received approval from DOE-ID in January of 1993 for proceeding with an EA. Completed the final report on the D&D of the BORAX-V Turbine Building in March of 1993.[23] Completed approval of the SAR for the D&D of the BORAX-V Reactor Building and remaining support facilities on April 20, 1993.[24] Revised the D&D Plan for the BORAX-V Reactor Building and submitted it to the Environmental Restoration and Waste Management (ER&WM) Independent Review Committee for review on April 23, 1993.

4.6 CFA-669 Old Hot Laundry Facility

This D&D project included assessment and cleanup and was scheduled to be worked from FY 1991 to FY 1992.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991—Prepared Sampling and Analysis Plan[25] and completed facility characterization.

- FY 1992—Prepared D&D Plan,[26] Health and Safety Plan,[27] Characterization and Decision Analysis Report,[28] and the SAR.[29]

- FY 1993—Completed the ORR, prepared CFA-669 for winter heating, started physical work on 1992 with removal of contamination and asbestos from the building.

Because of the changes in regulations and requirements and delays in the NEPA process, the CX for the accomplishment of the physical work for this project was not approved until July 21, 1992.[30] This was a significant delay to the original schedule for the D&D of the CFA-669.

4.7 LOFT Ancillaries

This D&D project included assessment and cleanup and was scheduled to be worked from FY 1991 to FY 1992.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991—Started the characterization of some of the LOFT ancillaries.

- FY 1992—Completed characterization of remaining LOFT ancillaries including the Mobile Test Assembly (MTA). Started physical work with the sizing, boxing, and disposal of some of the LOFT ancillaries.

- FY 1993–Started and completed the sizing, boxing, and disposal of the Irradiated Fuel Storage Facility. Completed the MTA D&D Plan.[31]

Because of the changes in regulations and requirements and delays in the NEPA permitting process, the CX for the accomplishment of the IFSF physical work for this project was not approved until October 5, 1992.[32]

The MTA was scheduled to be moved into the TAN-607 Hot Shop March 14, 1994. Because the TAN-607 Hot Shop shutdown for several months, the MTA window of work at the hot shop will be missed until sometime after FY 1994. Until a new hot shop work window can be scheduled for the MTA, the MTA will be maintained on the existing railroad car located west of the TAN-607 Hot Shop. Current planning does not have this work being completed until FY 1998.

4.8 SPERT IV Waste Tank

This D&D Project included assessment and cleanup and was scheduled to be completed in FY 1991 with $361K being expended through FY 1990.[17] The following is an outline of the major accomplishments from FY 1991 to FY 1993:

- FY 1991—Completed the tentative hazard classification, Health and Safety Plan, and SAR and updated the D&D Plan.

- FY 1992—Completed the Conduct of Operations, Readiness Review, and Sampling Analysis Plan[33] and held review of project documentation for restart. Started actual physical work in July of 1992, with piping removal; removed water and asbestos piping in August of 1992.

- FY 1993—Operations stopped in November of 1992 because of weather conditions. Tank material was placed in a 55-gal drum, a Satellite Accumulation Area (SAA) was established, and maintained. Comments were resolved and monthly SAA inspections updated documents as required for restart operations and mobilization of equipment in April 1993. This project was completed in June 1993.

4.9 TAN-607 Decon Shop

This D&D project included assessment and cleanup and was scheduled to be worked in FY 1994 and FY 1995.[17] Because of this country's changing military subcontract needs and the increased cooperative efforts of the INEL subcontractors, this D&D project has been revised to reflect the assessment work being scheduled for accomplishment by Babcock and Wilcox, Inc. (B&W) in FY 1993 and FY 1994 and the cleanup work being scheduled for accomplishment by EG&G Idaho in FY 1994. This new approach to utilize other INEL Site subcontractors was made in a transfer of funds from EG&G Idaho to B&W.

EG&G Idaho further recognizes that the TAN-607 Decon Shop Cleanup work tasks considered strictly as a decon or cleanup surveillance and maintenance action. This work task should be covered by the existing TAN-607 CX for surveillance and maintenance activities, would not require an EA, and should be accomplished in FY 1994.

4.10 TAN/TSF

This D&D project included the assessment and cleanup of several individual facilities at TAN and was scheduled to be worked on from FY 1998 to FY 2002.[17] The specific facilities are listed in the following:

- TAN-616 Liquid Waste Treatment Facility
- TAN-606 Calibration Well
- TAN-011 IET Valve Pit
- TAN-007 Sewage Disposal Plant.

The TAN-616 and TAN-606 D&D projects have been revised to reflect the assessment work being scheduled for accomplishment by B&W in FY 1993 and FY 1994, and the cleanup work being scheduled for accomplishment by EG&G Idaho in the following years. This new approach to utilize other INEL Site subcontractors was made in a transfer of funds from EG&G Idaho to B&W.

The TAN-011 IET Valve Pit D&D Project has been moved from the D&D Unit to the waste area groups (WAGs) projects. In this change of responsibility, WAG-1 will be performing the IET Valve Pit removal to satisfy the FFA/CO implemented per the requirements of the CERCLA and is scheduled for the summer of FY 1993.[34] This work will not include any of the underground lines beyond 20 ft from the valve pit itself.

The TAN-007 Sewage Disposal Plant D&D Project has been temporarily delayed by DOE-ID in a replanning effort to utilize, through engineering modifications, the existing sewage disposal plant for the next 10-15 years. This will maximize the cost benefits expended to maintain the TAN area sewage disposal abilities for the near future operations at TAN.

4.11 WRRTF Hot Waste Tank

This D&D project included assessment, permitting, and cleanup and was scheduled to be worked from FY 1992 to FY 1993.[17] The revised D&D Unit planning, November 1992, had rescheduled the Water Reactor Research Test Facility (WRRTF) Hot Waste Tank to have assessment work completed in FY 1994 and the cleanup work completed in FY 1995. Currently, WAG-1 is planning to do the assessment and cleanup of this hot waste tank in the summer of FY 1993.[34]

4.12 Waste Calcining Facility

This D&D Project included assessment, permitting, and cleanup and was never broken out in previous INEL D&D Long-Range Plan Reports but was lumped together with all ICPP D&D projects. This is typical of all the ICPP D&D Projects.

- FY 1991 - Completed exterior cleanup and repair of facility to allow limited occupancy.
- FY 1992 - Completed cleanup of abovegrade rooms resulting in removal and/or reduction in area restrictions.
- FY 1993 - Completed asbestos removal on all levels of the WCF. Completed out of cell assessment and remote surveys of some of the in-cell areas.

The WCF had been on the EM-40 Surplus Facility D&D list for several years with D&D Surveillance and Maintenance and Characterization starting in FY 1991. In mid FY 1993, a Memorandum-of-Agreement between EM-40 and EM-60 was signed transferring responsibility for the WCF from EM-40 to EM-60. Characterization activities started for EM-40 in FY 1993 were completed. No further significant EM-40 activities are anticipated until FY 1996 (or later) when sufficient EM-60 Transition planning will have been completed, which will establish an end point for EM-60 activities and a corresponding starting point facility condition for EM-40 D&D activities.

4.13 Chloride Removal System

- FY 1991 - Completed characterization and decision analysis of the Chloride Removal System (CRS) annex and issued the Characterization and Decision Analysis Report. Completed and issued the CRS D&D Plan.
- FY 1992 - Completed NEPA document preparation and approval, contract preparation, bid and award, and 90% of the CRS D&D activity.

- FY 1993 - Completed D&D project activity and prepared and issued the CRS D&D Final Report.

The CRS D&D project has been completed. Responsibility for the annex has been returned to the operations department.

4.14 CPP-709 East Side Service Waste System

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-709.
- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - Completed NEPA document preparation, characterized the facility and prepared an issued a facility Characterization and Decision Analysis Report.

The CPP-709 project D&D Plan preparation and decommissioning is scheduled to begin in FY 1995 and complete in FY 1996.

4.15 CPP-631 Radioactive Lanthanum (RaLa) Off-Gas System

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-631.
- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - Completed NEPA document preparation, characterized the facility and prepared an issued a facility Characterization and Decision Analysis Report.

The CPP-631 project D&D Plan preparation and decommissioning is scheduled to begin in FY 1995 and complete in FY 1996.

4.16 CPP-734 West Side Service Waste System

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-734.
- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - Completed NEPA document preparation, characterized the facility and prepared an issued a facility Characterization and Decision Analysis Report.

The CPP-634 project D&D Plan preparation and decommissioning is scheduled to begin in FY 1995 and complete in FY 1996.

4.17 CPP-740 Settling System

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-740.

- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - The facility was maintained by the S&M program for part of the year.

CPP-740 facility (CPP-740/CPP-301/MAH-048/MAH-047) was classified as a potential risk of release to the environment and a CERCLA removal action, to take the sludge out and leave the facility, started. The facility was characterized and containment structures built in FY 1993, with the removal action to be completed in FY 1994. The D&D activity is scheduled to occur in FY 1995.

4.18 SFE-20 Waste Tank System

- FY 1991 - Completed setup and utilization of a D&D S&M program for SFE-20.
- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - The facility was maintained by the S&M program.

The SFE-20 facility (SFE-20 & CPP-303) is scheduled for characterization in FY 1994 and decommissioning in FY 1995.

4.19 CPP-640 Headend Processing Plant (HPP)

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-640.
- FY 1992 - The facility was maintained by the S&M program.
- FY 1993 - The facility was maintained by the S&M program.

The CPP 640 facility contains in excess of 100 kg of highly enriched uranium. Removal of this uranium will be completed by the EM-60 Transition program sometime in FY 1997. EM-40 D&D activity related to this facility, until it is turned over to EM-40 D&D for decommissioning, will be limited to feasibility studies, schedules, and budget preparation.

4.20 Tank Farm

- FY 1991 - Completed initial budget preparation.
- FY 1992 - Completed budget activity.
- FY 1993 - Completed budget activity.

The Tank Farm is still an active facility and is expected to begin emptying tanks (tanks will be surplus) in FY 1996. As the tanks become surplus, the associated piping, valve boxes,, and ancillary equipment will be cleaned and RCRA closed. The potential for this facility being transferred into the EM-40 program will be evaluated in FY 1994.

4.21 CPP-601 Fuel Processing Facility

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-601.
- FY 1992 - Completed budget activity.
- FY 1993 - Completed budget activity.

The CPP-601 facility presently contains quantities of enriched uranium and RCRA materials used as part of uranium fuel reprocessing. The EM-60 Transition Program is cleaning out the facility and is expected to be complete at the end of FY 1994. The facility is expected to be D&D ready at this time. For the next two years the only activity expected to be completed are budget preparation, and feasibility studies in preparation for the time the facility is turned over to D&D.

4.22 CPP-603 Fuel Storage Basins

- FY 1991 - Completed setup and utilization of a D&D S&M program for CPP-603.
- FY 1992 - Completed budget activity, and a portion of the facility was maintained by the S&M program.
- FY 1993 - Completed budget activity, and a portion of the facility was maintained by the S&M program.

The CPP-603 facility presently contains many units of spent nuclear fuel. The EM-30 Program is moving the fuel units out of CPP-603 and is expected to clean the facility before turnover to the EM-40 D&D Program in FY 1999. Activities for the EM-40 Program will be limited to preparing budgets and feasibility studies in preparation for the time the facility is turned over to D&D.

5. LONG-RANGE PLAN OF ACTIVITIES

All facilities currently on the surplus inventory for the INEL were ranked using the priority factors described in Section 3.4. Based on assigned priorities, available resources, and DOE projected funding allotments, an INEL long-range plan of D&D activities is maintained and presented in Figure 7. Cost and schedule estimates are provided for each INEL D&D project out to FY 2008.

The priorities and funding identified in this plan are subject to change. Cost estimates submitted for out-year projects are preliminary and will be adjusted after a more thorough work scope is developed. Changes in project starting and completion dates are also expected because of project priority changes and funding availability. Schedules and estimates are revised annually to meet INEL D&D Program needs.

A relatively stable level of effort for D&D projects is desirable. This is consistent with DOE funding allocation and beneficial in maintaining an experienced and qualified D&D staff at the INEL.

EG&G Project	WBS #	ADS #	Actuals Thru (EAC) 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	($k)TOTAL COST THRU FY 2008
ARA-I	1.4.9.1.2.01.2	52-EG	99	445	340	852	2,295	2,311												6,342
ARA-II	1.4.9.1.2.02.2	48-EG	1,367	743	700	607	2,139	621												6,177
ARA-III	1.4.9.1.2.03.2	49-EG	401	676																1,077
WRRTF Hot Waste Tank	1.4.9.1.2.04.2	50-EG																		0
TAN-607 Decon Shop	1.4.9.1.2.05.2	53-EG		145	695															840
MTR Facility	1.4.9.1.2.06.2	54-EG			123	128	1,738	1,909	4,570	5,925	6,500	5,000	4,000	3,133						33,026
CFA-669 Hot Laundry	1.4.9.1.2.07.2	58-EG	369	1,573	852	164														2,958
ETR Facility	1.4.9.1.2.08.2	60-EG			123	128	1,605	1,909	4,570	5,925	6,500	6,500	6,000	5,000	4,000	2,714				44,974
LOFT Ancillaries	1.4.9.1.2.09.2	65-EG	295	226	0	51	12	55	1,300											1,938
TTAF	1.4.9.1.2.10.2	67-EG			854	1,644	2466	3400	3,400	2,165										13,929
SPERT IV Ancillaries	1.4.9.1.2.14.2	64-EG	865	469																1,334
BORAX V	1.4.9.1.2.15.2	63-EG	3067	500	124	896	868													5,455
TAN/TSF	1.4.9.1.2.23.2	51-EG	2	176	466	64	66	68	71	700	894	1,341	348							4,193
D&D Programmatic Support	1.4.9.1.3	III-EG	291	508	570	385	394	402	411	420	430	439	449	459	469	479	490	500	510	7,606
ARVFS	1.4.9.2.13.2	46-EG	4,199	729																4,928
EG&G Subtotals			6,754	5,460	4,847	4,919	11,583	10,675	14,322	15,135	14,324	13,280	10,797	8,592	4,469	3,193	490	500	510	129,849
WINCO Projects																				
WCF (CPP-633)	1.4.9.1.2.16.2	1309		195	102	102	102	874	946	935	1,048	1,168	1,243							6,715
SWDS (CCP-709/734/631/603)	1.4.9.1.2.17.2	1306		500	102	1,302	329													2,233
FRSF (CPP-642/740/ & SFE-20)	1.4.9.1.2.18.2	1305		75	102	1,022	2,152	648												3,999
HPP (CPP-640)	1.4.9.1.2.19.2	1307			102	102	1,441	2,768	4,219	4,134										12,766
High Level Waste Tank Farm	1.4.9.1.2.20.2	1310				102	567	870	846	1,303										3,488
FPC (CPP-601)	1.4.9.1.2.21.2	1308					1,025	1,893	3,147											6,065
FECF (CPP-603)	1.4.9.1.2.22.2	1304						21	1,088	897										2,006
WINCO Subtotals				770	480	2,630	5.616	6,874	10,246	7,269	1,048	1,168	1,243							37,272
INEL D&D Program Totals			6,754	6,230	5,255	7,549	17,199	17,549	24,568	22,404	15,372	14,448	12,040	8,592	4,469	3,193	490	500	510	167,121

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ACRONYMS:
ARA - Auxiliary Reactor Area
ARVFS - Army Reentry Vehicle Facility Site
BORAX - Boiling Water Reactor Experiment
CFA - Central Facilities Area
CPP - Chemical Processing Plant
ETR - Engineering Test Reactor
FECF - Fuel Element Cutting Facility
FPC - Fuel Processing Complex
FRSF - Fuel Receipt and Storage Facility
HPP - Headend Processing Plant
MTR - Materials Testing Reactor
SPERT - Special Power Excursion Reactor Test
SWDF - Service Waste Diversion Facility
TAN - Test Area North
TSF - Test Support Facilities
TTAF - Test Train Assembly Facilities
WCF - Waste Calcining Facility

Figure 7. INEL D&D projects listing costs and schedule.

6. REFERENCES

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2. DOE Office of Nuclear Energy. Division of Facility and Site Decommissioning, "Surplus Facilities Management Program Resource Manual," 1989.

3. Defense Facilities Decommissioning Program Office, "Non-Orphan Facility Incorporation Plan," 1989.

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5. R. M. Brown and J. D. Wells, *INEL Low-Level Radioactive Waste Acceptance Criteria*, DOE/ID-10112, Rev. 5, August 1993.

6. DOE Order 5400.5, Chapter IV, "Residual Radioactive Material," 1990.

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8. U.S. Environmental Protection Agency, *Risk Assessment Guidance for Superfund,* Volume I -- Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), 9285.7-01B, December 1991, pp. 14-15.

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13. EG&G Idaho, Inc., *Radiological Controls Manual,* 1992.

14. EG&G Idaho, Inc., *Industrial Hygiene Manual,* 1993.

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16. U.S. Department of Energy, Idaho Operations Office (DOE-ID), Environmental Compliance Planning Manual at the INEL, DOE-ID-10166,

17. R. Buckland and M. Sekot, *INEL D&D Long-Range Plan*, PR-W-005, Rev. 8, September 1991.

18. T. J. Meyer, *Abbreviated Sampling and Analysis Plan for Auxiliary Reactor Areas Waste Source Characterization*, EGG-WM-9457, Rev. 0, January 1991.

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22. D. Nims, *ARA-III Health and Safety Plan*, EGG-WM-10135, Rev. 0, October 1992.

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25. M. W. Lusk, R. S. Rice, and W. D. Schofield, *Sampling and Analysis Plan for the Hot Laundry CFA-669*, EGG-WM-10125, March 1991.

26. D. L. Smith, *D&D Plan for CFA-669 Hot Laundry*, EGG-WM-10125, Rev. 0, May 1992.

27. D. R. Lipp and D. L. Smith, *Health and Safety Plan for D&D of Central Facilities Area-669 Hot Laundry*, EGG-WM-10170, Rev. 1, November 1992.

28. K. J. Liekhus, *Characterization and Decision Analysis Report for the Hot Laundry Facility (CFA-669)*, EGG-WM-10034, Rev. 0, May 1992.

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31. D. L. Smith, *D&D Plan for the LOFT Mobile Test Assembly*, EGG-ER-10594, Rev. 0, February 1993.

32. Letter from J. L. McAnally, EG&G Idaho ER&WM Manager, to A. C. Williams, DOE-ID, "Transmittal of EC and CX Determination for LOFT Ancillary Support Equipment Decontamination and Dismantlement," JLM-668-92, October 5, 1992.

33. S. M. Thurmond, *Sampling Analysis Plan for the D&D of the SPERT-IV Waste Holdup Tank Pad and Underground Piping*, EGG-WM-9649, Rev. 1, June 1992.

34. EG&G Idaho, Inc. ER&WM Cost Account Plan (CAP) 3XNA21000, WAG 1 Track 2 Operable Units, dated January 28, 1993 and Work Package 3XNA20300, WAG 1 Track 2 OU 1-05 RAD Sites, dated January 28, 1993, signed by J. R. Zimmerle for T. J. Meyer.

Appendix A

INEL D&D Project History

Appendix A
INEL D&D Project History

Historical data for D&D activities completed at the INEL is summarized in the following tables.

Documentation developed for various phases of D&D activities is based upon DOE-HQ D&D Program guidelines and EG&G Idaho D&D Program Directives. A tabulation of INEL D&D documentation is presented in Table A-1 and provides references documenting the various D&D activities ranging from initial characterization efforts through project completion.

Table A-2 lists all INEL facilities for which D&D is currently in progress or has been completed, and provides data summaries of start and finish dates, estimated and actual costs, waste volumes, and the mode of D&D.

Table A-1. Tabulation of INEL D&D documentation.

INEL DECONTAMINATION & DECOMMISSIONING PROJECTS LISTING / DOCUMENTATION

DDPROJR4, Revision 4, Dated 18-Oct-93
Prepared by RJ Buckland, DJ Kenoyer & RH Meservey

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

D&D PROJECT DESCRIPTION	CHARCTZN REPORT	DATE	DECISION ANALYSIS	DATE	SAMP/ANALY PLAN	DATE	NEPA DOCs	DATE	H&S PLAN	DATE	TRANSPTN PLAN	DATE	SAR	DATE	D&D PLAN	DATE	D&D FINAL REPORT	DATE
COMPLETED PROJECTS																		
EBR-1 Complex	NOTE C		NOTE C												NOTE C		ANCR-1232	Jul-75
MTR Overhead Reservoir	NOTE C		NOTE C												NOTE C		ANCR-1257	Oct-75
Hallam Reactor Components													PR-W-78-013	Mar-78	WMP-77-18	Dec-77	PR-W-78-018	Sep-78
SPERT IV Reactor Facility	NOTE A		NONE												PR-W-79-002	Feb-79	TREE-1373	Aug-79
OMRE Leach Pond	PR-W-79-029	Sep-79	NOTE B												PR-W-79-003	Jan-79	NONE	
OMRE Reactor Facility	PR-W-79-037	???-79	NONE										PR-W-78-010	Apr-78	WMP-77-17	Dec-77	EGG-2059	Sep-80
SPERT II & III Reactor Buildings	NONE		NONE												NONE		EGG-2074	Feb-81
TAN Rad Liquids Evaporator (PM-2A)	PR-W-80-018	Aug-80	NONE										WM-F1-81-017	Aug-81	PR-W-78-022	Jan-82	EGG-2236	Mar-83
S1G Reactor Vessel	NONE		PG-WM-84-024	Feb-85							WM-F1-83-007	Aug-83	WM-F1-83-015	Jun-83	WM-F1-83-001	Aug-83	EGG-2298	Sep-84
MTR-657 Plug Storage Facility	WM-F1-81-020	Sep-81	WM-F1-83-005	Feb-83											WM-F1-83-008	May-83	EGG-2256	Jan-84
SPERT I Seepage Pond	WM-F1-82-016	Dec-82	WM-F1-83-011	Jul-83											PG-WM-84-001	Feb-84	EGG-2291	Nov-84
SPERT II Leach Pond	WM-F1-82-017	Dec-82	WM-F1-83-010	Jun-83														
CPP-603 BIF Filter Room	WM-F1-83-006	May-83	NOTE B														WINCO-1028	Dec-84
TAN/TSF-3 Concrete Pad	NOTE A		WM-F1-83-004	Feb-83											WM-F1-83-002	May-83	EGG-2292	Apr-84
BORAX V Leach Pond	WM-F1-82-019	Dec-82	WM-F1-83-013	Aug-83					???	Jun-83					PG-WM-84-004	May-84	EGG-2300	Jan-85
CPP-601 Process Cells A,B,C,D,L	NOTE A		NONE												PR-W-80-007	Apr-80	EGG-2304	Sep-84
SPERT III Large Leach Pond	WM-F1-82-018	Dec-82	WM-F1-83-009	Jun-83											WM-F1-83-023	Sep-83	EGG-2306	Apr-84
MTR-605 Process Water Bldg.	PR-W-79-015	Jun-79													PG-WM-84-006	Apr-84	EGG-2341	Jan-85
SPERT I Reactor Facility	WM-F1-81-012	Jul-81	PG-WM-83-036	Dec-83											PG-WM-84-016	???-84	EGG-2396	Feb-86
MTR-603 HB-2 Cubicle	WM-F1-81-016	Jul-81	PG-WM-84-012	Apr-84											PG-WM-84-023	Mar-84	EGG-2431	Dec-85
CPP-631 RALA Off-Gas Cell & Storage Tank	WINCO-1030	Apr-85													WINCO-1032	Jul-85	WINCO-1036	Feb-86
IETF (Facilities & Hot Waste Line)	WM-F1-82-013	Aug-82	PG-WM-84-024	Feb-85											PG-WM-85-008	May-85	EGG-2468	Apr-87
ARA IV	WM-F1-83-025	Aug-83	NOTE B														EGG-2518	Mar-88
HTRE-2 & HTRE-3	NOTE A										NOTE 1	Nov-88			PR-W-79-001	Jan-88	EGG-2575	Sep-89
Subtotal thru 1992 ==> 24 Projects																		
BORAX V Facility Turbine Building			PG-WM-84-003	Dec-88			MTF	Jul-90							PR-WM-79-017	Sep-90	EGG-2683	Dec-92
CRS Annex	WINCO-1089	Jun-91	Note B				CX	May-92	Note D						WINCO-332	Aug-91	WINCO-1124	Feb-93
SL-1 Demo Equip													WM-ERP-91-002	Jul-91				
SPERT IV Ancillaries	WM-PD-86-002	Feb-86	EGG-WM-9649	Jun-92	EGG-WM-9649	Jun-92			EGG-WM-9508	May-91			WM-ERP-91-001	Oct-92	EGG-WM-8587	Aug-89	EGG-2709	Oct-93
TAN-616 Interim Action																	EGG-2714	Sep-93

NOTES:

A - Characterization Report information part of the D&D Plan
B - Decision Analysis part of the Characterization Report
C - Characterization, Decision Analysis, and D&D Plan are part of the Final Report
D - Health & Safety Plan part of the D&D Plan
1 - Transportation Plan is Revision A but has no document number assigned
S1G Original Final Report ==> PE-WM-83-031, Sep-83
Hallam Reactor Components External Final Report ==> TREE-1368, dated Aug-79
CPP-631 RALA Off-Gas Original Characterization Report ==> WM-F1-81-010, May-81

ACRONYMS:

ARA - Auxiliary Reactor Area
BORAX - Boiling Water Reactor Experiment
CPP - Chemical Processing Plant
EBR - Experimental Breeder Reactor
ETR - Engineering Test Reactor
HTRE - Heat Transfer Reactor Experiment (Test Assemblies)
IETF - Initial Engine Test Facility
MTR - Materials Testing Reactor
OMRE - Organic Moderated Reactor Experiment
RALA - Radioactive Lanthanum
SPERT - Special Power Excursion Reactor Test
TAN - Test Area North
TSF - Test Support Facilities

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Table A-1. (continued).

D&D PROJECT DESCRIPTION	CHARCTZN REPORT	DATE	DECISION ANALYSIS	DATE	SAMP/ANALY PLAN	DATE	NEPA DOCs	DATE	H&S PLAN	DATE	TRANSPTN PLAN	DATE	SAR	DATE	D&D PLAN	DATE	D&D FINAL REPORT	DATE
ACTIVE PROJECTS																		
EG&G Idaho, Inc. Projects																		
ARVFS (NaK)	PG-WM-84-009	Jul-84	NOTE B								NOTE 1	Apr-90	EGG-WM-7592	Sep-87	EGG-WM-7375	Sep-86		
ARVFS (Area)	PG-WM-84-013	Aug-84	NOTE B															
CFA-669 Hot Laundry	EGG-WM-10034	May-92	EGG-WM-9394	Mar-91					EGG-WM-10170	Nov-92			WM-ERP-92-017	Sep-92	EGG-WM-10125	Nov-92		
ARA-II	PT-WM-84-010	Aug-84	EGG-WM-9457	Jan-91									WM-ERP-91-006	Oct-91	WM-ERP-92-016	May-92		
ARA-III	PG-WM-84-011	Feb-85	NOTE B						EGG-WM-10136	Oct-92			WM-ERP-91-003	Mar-92	WM-ERP-92-023	May-93		
WRRTF Hot Waste Tank																		
ARA-I	EGG-WM-10757	Apr-92	NOTE B										ERD-92-019	Jun-92				
MTR Facility	WM-F1-63-016	Apr-84																
ETR Facility	EGG-PR-5784	Sep-82																
TAN-607 Decon Shop	PW-WM-83-029	Sep-84			EGG-DD-8711	Sep-89			EGG-DD-8740	Aug-87								
TAN/TSF	WM-F1-83-012	Sep-83	NOTE B															
Borax V	PR-W-74-017	Sep-90	PG-WM-84-003	Dec-86					***	Jul-88			ER-93-024	Apr-93	EGG-ER-10888	Aug-93		
LOFT Ancillaries	EGG-ERD-10282	Sep-92	NOTE B										RE-A-74-037	Jun-79	EGG-ERD-10594	Feb-93		
TTAF																		
WINCO Projects																		
WCF																		
CPP-431																		
CPP-740	WM-F1-81-023	May-82	Note B															
CPP-640																		
Tank Farm																		
CPP-601																		
CPP-603																		
CPP-709																		
CPP-734																		
SFE-39	WINCO-1021	Sep-84	Note B															

NOTES:
B - Decision Analysis part of the Characterization Report
1 - Transportation Plan is Revision A but has no document number assigned
ARA III Original Characterization Report PR-W-79-030, Sep-79

ACRONYMS:
ARA - Auxiliary Reactor Area
ARVFS - Army ReEntry Vehicle Facility Site
BORAX - Boiling Water Reactor Experiment
CFA - Central Facilities Area
CPP - Chemical Processing Plant
CRS - Chloride Removal System
EBR - Experimental Breeder Reactor
ETR - Engineering Test Reactor
FECF - Fuel Element Cutting Facility
MTR - Materials Testing Reactor
SPERT - Special Power Excursion Reactor Test
TAN - Test Area North
TSF - Test Support Facilities
TTAF - Test Train Assembly Facility
WCF - Waste Calcining Facility

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Table A-1. (continued).

D&D PROJECT DESCRIPTION	CHARCTZN REPORT	DATE	DECISION ANALYSIS	DATE	SAMPLAN ALY PLAN	DATE	NEPA DOCs	DATE	H&S PLAN	DATE	TRANSPTN PLAN	DATE	SAR	DATE	D&D PLAN	DATE	D&D FINAL REPORT	DATE
INACTIVE / SPECIAL PROJECTS																		
EG&G Idaho, Inc. Projects																		
BORAX I Burial Site	PR-W-80-014	Jul-80																
MTR-611 Plug Storage	WM-F1-81-020	Sep-81																
TAN IET Valve Pit	WM-F1-82-004	Feb-82																
TAN-616 Liquid Waste Treatment Facility	WM-F1-83-012	Sep-83	Note B															
TAN IET Hot Waste Line	PG-WM-84-012	Aug-84	Note B															
WINCO Projects																		
CPP-633 NaK Furnace	WM-F1-81-004	Mar-81	Note D															
CPP-603/740 Settling Basin & Well	WM-F1-81-023	May-81	Note F															
CPP-603 FECF																		

NOTES:

B - Decision Analysis part of the Characterization Report

D - Following Characterization Report Facility Designated for ICPP Specific Use

F - This project is included as part of the SFE-20 D&D Project

Table A-2. INEL facilities for which D&D is currently in progress or has been completed.

INEL DECONTAMINATION & DECOMMISSIONING
PROJECTS LISTING / SUMMARIES

DDPROJR4, Revision 4, Dated 18-Oct-93
Prepared by RJ Buckland, DJ Kenoyer & RH Meservey

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

D&D PROJECT DESCRIPTION	START DATE	ESTIMATED FINISH DATE	BUDGET COST ($k)	START DATE	FINISH DATE	ACTUAL COSTS THRU 1992 ($k)	PROJECT COST ($k)	WASTE VOLUMES (cm)	D&D MODE	REMARKS / EXPLAINATIONS / STATUS
COMPLETED PROJECTS										
TSR-1 Complex	Sep-73	Sep-75	[illegible]	Oct-73	Jun-75		***	***	Note D	
MTR Overhead Reservoir	***	***	105.0	May-75	Jun-75		***	***	Note D	
[illegible] Reactor Components	Oct-77	Sep-78	451.0	Oct-76	Oct-79		425.0	***	Note D	Est. Waste Vol ==> [illegible] cm
SPERT IV Reactor Facility	***	***	***	Dec-78	Feb-79		123.0	66.0	Note D	
OMRE Leach Pond	***	***	***	***	***		***	***	Note C	
OMRE Reactor Facility	Oct-77	Oct-79	766.0	Oct-77	Sep-79		160.0	146.1	Note D	
SPERT II & III Reactor Buildings	***	***	235.0	Jun-80	Sep-80		221.1	23.9	Note B	
TAN Rad Liquids Evaporator (PM-2A)	***	***	***	Oct-81	Sep-82		254.0	467.7	Note D	
STG Reactor Vessel	Oct-82	Sep-83	1700.0	Dec-82	Sep-83		[illegible]	52.3	Note D	
MTR-657 Plug Storage Facility	Apr-83	Sep-83	***	Jun-83	Sep-83		54.4	4.8	Note C	Est. Waste Vol ==> 51 cf or 1.4 cm
SPERT I Seepage Pond	Mar-84	Sep-84	75.0	Aug-84	Sep-84		67.0	59.6	Note B	Est. Waste Vol ==> 2000 cf or 56.6 cm
SPERT II Leach Pond	***	***	***	***	***		***	***	Note B	
CPP-603 BIF Filter Room	Jan-84	Sep-84	126.0	Jul-84	Sep-84		147.6	119.5	Note C	Est. Waste Vol ==> 608 cf or 17.2 cm
TAN TSF-3 Concrete Pad	***	***	50.0	Jun-83	Sep-83		75.0	78.7	Note D	Est. Waste Vol ==> 1665 cf or 47.1 cm
BORAX V Leach Pond	***	***	30.0	Jul-84	Aug-85		30.0	***	Note B	
CPP-601 Process Cells A,B,C,D,L	***	***	***	Jul-80	Jun-84		1070.0	458.2	Note C	
SPERT III Large Leach Pond	Sep-83	Feb-84	16.0	Sep-83	Nov-84		30.6	***	Note B	
MTR-605 Process Water Bldg.	Nov-83	Sep-84	256.0	May-84	Aug-84		297.0	67.3	Note C	
SPERT I Reactor Facility	***	***	***	Aug-85	Dec-85		1365	***	Note C	
MTR-603 HB-2 Cubicle	***	Sep-85	270.0	Mar-85	Aug-85		228.0	59.6	Note D	Est. Waste Vol ==> 398 cf or 11.3 cm
CPP-631 RALA Off-Gas Cell & Storage Tank	Jul-85	Feb-86	300.0	Aug-85	Nov-85		124.2	38.2	Note D	
IET (Facilities & Hot Waste Line)	Mar-85	Dec-87	914.0	Apr-85	Apr-87		[illegible]	***	Note D	Est. Waste Vol ==> 3552 cf or 100.6 cm
ARA IV	***	***	77.5	***	***		***	***	Note D	Est. Waste Vol ==> 5100 cf or 144.4 cm
HTRE-2 & HTRE-3	***	***	2580.0	Oct-86	Sep-89		1364.0	13.4	Note B	
Subtotal thru 1992 ==> 24 Projects			8563.5				7680.6	3027.5		
BORAX V Facility Turbine Building	Apr-88	Sep-90	693.0	Apr-90	Mar-92		1528.0	465.0	Note D	
CRS Annex	Jan-91	Feb-91	570.0	Apr-92	Nov-92		640.0		Note C	
SL-1 Demo Equip										
SPERT IV Auxiliaries										
TAN-616 Interim Action										

NOTES:
A - Safe Storage
B - In-Place Stabilization
C - Decontamination for Reuse
D - Dismantlement

Table A-2. (continued).

D&D PROJECT DESCRIPTION	START DATE	ESTIMATED FINISH DATE	BUDGET COST	START DATE	FINISH DATE	ACTUAL COSTS THRU 1992 ($k)	PROJECT COST ($k)	WASTE VOLUMES (m³)	D&D MODE	REMARKS EXPLAINATIONS STATUS
ACTIVE PROJECTS										
EG&G Idaho, Inc. Projects										
ARVFS (NaK)						4100			Note D	
ARVFS (Area)									Note D	
CFA-669 Hot Laundry	Oct-92	Sep-94	2500			[illegible]			Note D	
ARA-II	Oct-92	Sep-97	6177			567			Note C & D	
ARA-III	Oct-92	Sep-94	1077			801			Note C & D	
WRRTF Hot Waste Tank	N/A	N/A	0	N/A		0			Note D	Transferred into WAG 1 in 1993
ARA-I	Oct-93	Sep-97	6342			100			Note C & D	
MTR Facility	Oct-96	Sep-01	31026	N/A		0			Note C & D	
ETR Facility	Oct-95	Sep-03	22074	N/A		0			Note C & D	
TAN-607 Decon Shop	Oct-93	Aug-95	500	Apr-93		0			Note C	
TAN TSF	May-93	Sep-02	4393	Apr-93		0			Note C & D	
Stack	Oct-92	Sep-95	[illegible]			4007			Note D	
LOFT Annexes	Oct-92	Sep-96	1646			295			Note D	
TTAF	Oct-93	Sep-00	178	N/A		0			Note C & D	
WINCO Projects										
WCF	Oct-93	Sep-02							Note D	
CPP-631	Oct-93	Sep-96							Note D	
CPP-740	Oct-93	Sep-97							Note D	
CPP-640	Oct-94	Note E							Note D	
Tank Farm	Oct-95	Note E							Note D	
CPP-601	Oct-96	Note E							Note D	
CPP-603	Oct-97	Note E							Note D	
CPP-709	Oct-97	Note E							Note D	
CPP-734	Oct-97	Note E							Note D	
SFE-20	Oct-97	Note E							Note D	

NOTES:

A - Safe Storage
B - In-Place Stabilization
C - Decontamination for Reuse
D - Dismantlement
E - WINCO Planning Window 1994-2002

Budget Costs are based upon Actuals thru FY 92 / FY 93 EACs FY 94 CAPs and include escalation & contingency
Estimated Start & Finish Dates are based upon the FY 93 Baseline dated November 1992
(as revised for FY 94 CAPs, i.e. ARA-II & -III delayed due to NEPA EA approval delay)

Table A-2. (continued).

D&D PROJECT DESCRIPTION	START DATE	ESTIMATED FINISH DATE	BUDGET COST		START DATE	FINISH DATE	ACTUAL COSTS THRU 1992 ($k)	PROJECT COST ($k)	WASTE VOLUMES (cm)	D&D MODE		REMARKS / EXPLAINATIONS / STATUS
INACTIVE / SPECIAL PROJECTS												
EG&G Idaho, Inc. Projects												
BORAX I Burial Site												
MTR-611 Plug Storage												Transferred into WAG-1 in [illegible]
TAN IET Valve Pit												Included as one of the TAN TSF D&D Projects
TAN-616 Liquid Waste Treatment Facility												Transferred into WAG-1 in [illegible]
TAN IET Hot Waste Line												
WINCO Projects												
CPP-633 NaK Furnace												
CPP-603/740 Settling Basin & Well												
CPP-602 FECF												

Appendix B

Facility Description Forms

Appendix B

Facility Description Forms

The following facility description forms provide condensed information, in the format recommended by the DOE-HQ Program, regarding project identification, estimated cost and waste volume, and facility information. Only forms for facilities for which D&D has not been completed are included.

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DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**	CONTRACTOR: **EG&G Idaho, Inc.**

PROJECT: **ARMY ReENTRY VEHICLE FACILITY SITE (ARVFS)**

PROJECT PRIORITY: 1	PRIORITY BASIS: RCRA Driven	
SCHEDULE DURATION: 2 yrs	SCHEDULE ID: N/A	ACTIVITIES THROUGH FY 1992: $4199K
TOTAL ESTIMATED COST: $7553K	ESTIMATE BASE YEAR: FY 93	
FUNDING SOURCE: EW2010402	ADs No.: 46-EG	WBS No.: 1.4.9.2.13.2.1.1

SAR REQUIREMENT:(REVISE EXISTING or PREPARE NEW) Prepare New SAR	RCRA/CERCLA:(APPLICABLE REQUIREMENTS) RCRA Interim Status Permitted Facility Requirements

FY-93: $ 657k	FY-94: $ 799k	FY-95: $ 1106k	FY-96: $ 0k	FY-: $ k	FY-: $ k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k

TOTAL WASTE VOLUME ESTIMATE: 25.4 m^3	ESTIMATE BASE YEAR: 1993

HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 1 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE: 1 m^3	STAINLESS STEEL WASTE:
MIXED WASTE: 180 gal.	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPAL/SANITARY WASTE:24.4 m^3	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 1993 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 1994 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

Approximately 180 gallons of sodium-potassium eutectic liquid alloy (NaK) reactor coolant were contaminated with radionuclides during a partial meltdown of EBR-I in November of 1955. The material was placed into four containers and stored at EBR-I. During decontamination and decommissioning of EBR-I in 1974, the containers were transported to the Army Reentry Vehicle Facility Site (ARVFS) waste storage unit.

A treatment facility was designed and built at WRRTF however, this facility was determined not suitable for handling the contaminated NaK in its current design configuration. Currently alternative treatment options are being considered.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

The NaK is contained in two 55 gallon stainless steel MSA drums and 2 containers fabricated from carbon steel pipe sections. The containers are currently located in a metal dumpster. The dumpster is stored inside the ARVFS waste storage unit. The ARVFS waste storage unit is an underground bunker fabricated from an ARMCO multi-plate arch measuring 9.25 feet high at the center, 16 ft wide and 18 ft long. The entrance to the bunker is closed by a semi-circular steel plate, which is welded in place.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-1 ARVFS NaK Prototype Treatment Unit at WRRTF and Figure B-2 NaK storage containers (Ref. 1)

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

Alan J. Luptak, Cost Account Manager, EG&G Idaho, Inc., phone 526-2715, MS 3953

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The NaK is contaminated with mixed fission products from the partial meltdown of EBR-I. Facilities for treatment of radioactive contaminated NaK are not as common as noncontaminated NaK treatment facilities. NaK is highly reactive with water.

PERMITTING REQUIREMENTS:

NaK is classified as a D001 waste under RCRA. The ARVFS is operated as an interim status waste management unit subject to the requirements of IDAPA 16.01.05009 (40CFR265).

SURVEILLANCE and MAINTENANCE STATUS:

Inspection of the ARVFS waste storage unit is conducted on a weekly basis in accordance with RCRA Interim Status Inspection Plan for the ARVFS Storage Unit, Revision 2.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

NaK is highly reactive with water and reacts with air. Operations with NaK must be conducted within an inert atmosphere.

D&D RECOMMENDED METHODOLOGY:

Current efforts are to establish a subcontract with a private sector treatment facility for the transport and treatment of the NaK. One facility does exist overseas. Procurement actions are in place to establish a subcontract for treatment of NaK.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None

WASTE VOLUME ESTIMATE BASIS:

The waste volume estimate basis assumed treatment at a private sector facility and disposal of the low level radioactive residue in a solid concrete form. It is estimated the volume of residue is equal to the volume of NaK. Nonradioactive waste will be generated because of the disposal of non-used treatment system at WRRTF.

FACILITY REUSE CONSIDERATIONS:

The ARVFS facility is not anticipated to be radioactively contaminated. Following removal of the NaK and RCRA Closure of the facility, the facility can be reused. The WRRTF treatment unit has not been used for contaminated material. The treatment system will be dismantled following issuance of a subcontract and removal of the material from the INEL.

REFERENCES:

1. INEL D&D Long Range Plan, PR-W-005, Revision 8, dated September 1991, prepared by M. Sekot and R. Buckland.

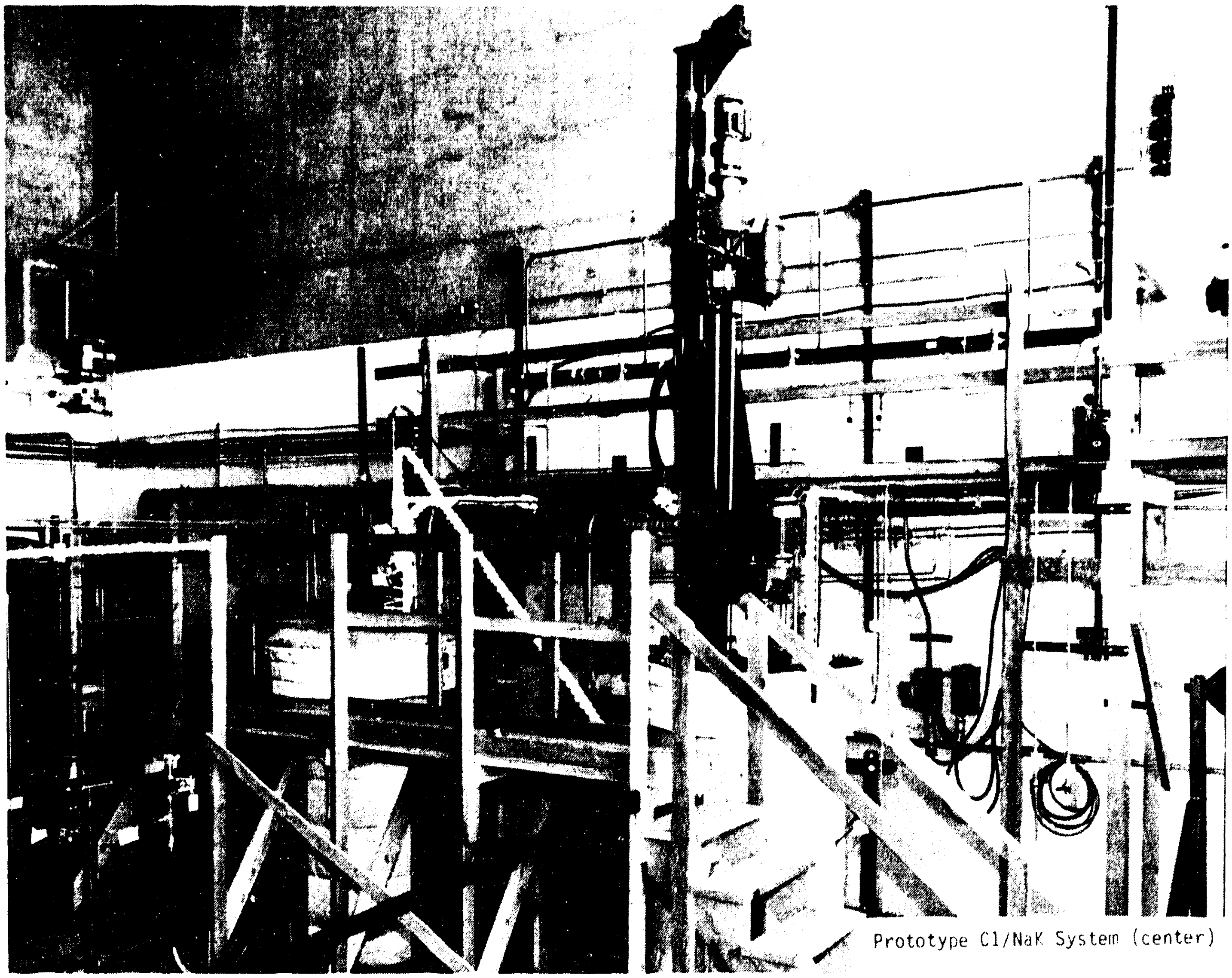

Figure B-1. ARVFS NaK Prototype.

Figure B-2. NaK storage containers.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **AUXILIARY REACTOR AREA (ARA) I**					
PROJECT PRIORITY: 3		PRIORITY BASIS: FFA/CO Driven			
SCHEDULE DURATION: 4 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $6342K		ESTIMATE BASE YEAR: FY 1993		ACTIVITIES THROUGH FY 1992: $99K	
FUNDING SOURCE: EW2010401		ADs No.: 52-EG		WBS No.: 1.4.9.1.2.01.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirement CERCLA Partial		
FY-93: $ 445k	FY-94: $ 340k	FY-95: $ 852k	FY-96: $ 2295k	FY-97: $ 2311k	FY-98: $ 0k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k

TOTAL WASTE VOLUME ESTIMATE: 1,137.3 M^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 217.3 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 1.3 m^3
HAZARDOUS WASTE:	CONCRETE WASTE: 202 m^3	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE: 14 m^3	COMBUSTIBLE WASTE:
MUNICIPAL/SANITARY WASTE: 920 m^3	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 93 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [including start and finish operational years]

ARA-I is one of four facilities built in support of military nuclear reactor programs in the late 1950s. It is located 7.5 mi (12 km) east of the CFA of the INEL and approximately 0.3 mi (0.5 km) north of U.S. Highway 20. ARA-I was constructed as a support facility for the other three nearby ARA facilities (ARA-II, -III, & -IV). The Army Reactor Program was phased out by 1965.

The main structures at ARA-I are buildings ARA-626 and ARA-627. ARA-627 houses some offices and laboratory space. The Hot Cell Facilities are located in Building ARA-626. Figure B-3 shows a plot plan of ARA-I. Detailed descriptions of the facilities and the work that was performed in them are described below.

PHYSICAL DESCRIPTION OF FACILITY: [including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

ARA-626

The floor plan of Building ARA-626 is shown in Figure B-4. The principal facilities are the two shielded cells designed to handle high-level radioactivity. Associated with the cells in the operating gallery are viewing windows. Penetrations for six pairs of master-slave manipulators at the windows have been plugged, and the plugs spot-welded in place. Behind each cell is an isolation room and behind those rooms a large common service area with a truck door. These rooms had been used as setup and temporary storage areas for containers used for transporting radioactive materials. The service area also contains a decontamination room and a hot source storage facility. Others rooms in the building were used to house various support facilities (i.e., utility boiler, ventilation, health physics, personnel change rooms, and laboratories). Laboratories were used for sample preparation, metallurgical analyses, and photographic development.

Hot Cells. The two hot cells are constructed of high-density concrete with walls 37 in. (0.94 m) thick and viewing windows of high-density glass and oil, which provide equivalent shielding. Roof shielding for the cells is approximately 24 in. (0.61 m). Interior walls and floors are covered with painted carbon steel sheet. Penetrations of the front wall are provided for manipulators, periscopes, and service piping. Penetrations not in use are plugged or capped to maintain containment and to reduce personnel exposure.

Cell No. 1 is approximately 8 ft x 16 ft (2.4 m x 4.9 m) and has two viewing windows. Cell No. 2 is approximately 8 ft x 8 ft (2.4 m x 2.4 m) and has a single viewing window. The wall separating the two cells is high-density concrete, 18 in. (0.5 m) thick, and is covered by a 4 in. (0.1 m) thick, 87 in. (2.2 m) high lead brick liner on the Cell No. 1 side. A remotely-operated sliding shield door is provided in this wall for passage of materials between the cells.

Personnel access to the cells was provided through motor-operated sliding doors in the isolation rooms adjacent to the cells. These doors are made from a cast-iron concrete composite of sufficient thickness to provide approximately the same shielding as the concrete walls. A charging port, designed for use with horizontal charging casks, is located in the access door of Cell No. 1 and is closed with a plug door. The charging port minimized personnel exposure and the potential for the spread of contamination. Heavy pieces of equipment or casks were moved into and out of Cell No. 2 by a dolly mounted on tracks attached to the floor.

The two adjacent hot cells could be used individually or in combination depending on the nature of the work. Materials can be transferred between Cell No. 1 and Cell No. 2 through the transfer port in the wall between the cells. Cell No. 1 is equipped with a two-ton bridge crane, and Cell No. 2 with a two-ton monorail crane.

Liquid effluent from the cells was piped from each floor drain to an underground 1,000-gal (3.8 m^3) contaminated Waste Storage Tank, ARA-729, also called the Hot Waste Catch Tank. The openings to the drains are plugged to prevent the inadvertent transfer of liquid to the underground tank.

No equipment is stored in the hot cells. The cells are empty except for the crane and the high-efficiency particulate air (HEPA) prefilter assembly.

Airborne effluents from each cell were exhausted through independent ventilation systems. Prefilters are located within each cell and could be remotely replaced if they become an undesirable radiation source in the cell. Effluents passed from the prefilters to HEPA filters located in a loft over the cells before being discharged through a roof stack. Because of a damper in the duct in Cell No. 1, the exhaust air stream could be routed through a charcoal filter, which was switched into the stream whenever the potential for a radioactive iodine release into the cell existed.

Isolation Rooms. The isolation rooms, Rooms 117 and 118, are located immediately behind each cell. These rooms were used for initial decontamination of equipment removed from the cells. They were also used for the repair and modification of equipment. The doors to the isolation rooms have been covered with plywood sheets to prevent access and minimize the spread of contamination.

The isolation rooms were decontaminated to ALARA levels, and the seal doorway was closed off by bolting a plywood barricade in place. Caulking was applied to the sealing surface. The plywood barrier was painted with flame retardant paint.

Service Area. The service area, Room 123, located behind the isolation rooms, was used for equipment repair, modification, cell setup, cask loading and unloading, and cask and equipment storage.

Located in the floor of the service area are 20 below-grade storage holes with locking covers. They were used for the temporary storage of radioactive substances. Each measures 10 in. (25 cm) in diameter and is 9 ft 7.25 in. (2.9 m) deep. At present, no radioactive material is stored in these storage holes.

Equipment Decontamination Room. The equipment decontamination room, Room 124, is located in the northwest corner of the service area (see Figure B-2). After initial decontamination in the cells and isolation rooms, tool and equipment decontamination was completed in the equipment decontamination room. A hood and sink with HEPA-filtered ventilation were provided for his final decontamination step.

Metallography Laboratories. Two metallography laboratories were used for preparing samples and metallographic examination. Room 125, in the northwest corner of Building ARA-626, was designated as a "hot" lab, capable of performing metallography work on low-level radioactive or radioactively contaminated materials. This capability was provided mainly by two hoods, two glove boxes, and a sink routed to the waste catch tank. The exhaust from the hoods is routed through a HEPA filter bank. During operations the flow through this exhaust system established a slight negative pressure in the lab to help prevent contamination spread.

ARA-627

ARA-627 is the shop and maintenance building used to support work at ARA-626. It contains shops and equipment supplied with 480V three-phase power, office space, wash and locker rooms.

Contaminated Waste Storage Tank (ARA-729) The contaminated waste storage tank is a 1,000-gal (3.8 m^3) stainless steel (No. 304) underground tank. It rests on a bed of gravel inside a concrete bunker. Five ft (1.5 m) of earth overburden provide shielding from any radioactive material. The location of the tank is shown in Figure B-3.

The tank included drains from the following areas:

Hot Cell No. 1	ARA-626
Hot Cell No. 2	ARA-626
Isolation Area	ARA-626
Service Areas	ARA-626
Decontamination Room Sink and Floor	ARA-626
Hot Metallography Area	ARA-626

Fuel Storage Tank (ARA-720) The fuel storage tank located between Buildings 626 and 627 has a 7,000-gal (26 m^3) capacity. Fuel oil was stored there for use in the boiler in Building ARA-626. This above-ground storage tank was drained to less than 1% of capacity.

Water Reservoir and System (ARA-727, 629) The water reservoir is a 100,000-gal (380 m^3) capacity elevated storage tank located about 110 yd (100 m) west of ARA-626. This location is shown in Figure B-3. The tank is filled from a well in the area via two 7 ft^3/min (3.31/s) electric pumps. Water is supplied to ARA-626 and -627 by gravity.

Sanitation (ARA-726) Sanitary sewage and liquid wastes from cold drains in ARA-626 and ARA-627 are piped to a septic tank and drain-field treatment system. Liquid effluent from the drain field percolates into surrounding soil. This sanitary waste system does not have any radiation monitoring instrumentation or provisions for flow diversion. The location of the seepage pit is shown in Figure B-3.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Radioactive material exists primarily in ARA-626, and the sludge in the bottom 3 in. of the 1,000 gallon underground hot waste catch tank. Minor amounts exist in ARA-627. Other contamination exists inside drain lines running from the Hot Cell to the hot waste catch tank and in sealed ducts that ventilated the building during operation. The soil surrounding the tank is also contaminated. Buildings ARA-628, 629, and 631 have no known contamination.

Tanks ARA-727, 728, and 733 are also uncontaminated. The sanitary septic tanks located outside the fenced area (which are not part of this D&D effort) contain several hazardous and radioactive wastes and it is assumed that the buried lines originating from the buildings within the fenced area will contain some of these same contaminates.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

The Figures B-3, ARA-I Plot Plan, and B-4, ARA-626 Hot Cells Floor Plan, copied directly from the ARA-I Characterization & Decision Analysis Report, EGG-WM-10757, dated June 1993 (reference 1).

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

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D&D/S&M PREVIOUS ACCOMPLISHMENTS:

All reactors have been removed or dismantled previously as the reactors were decommissioned. Presently, the only activities occurring at the ARA-I site are (a) routine periodic surveillance and maintenance for security, environmental, and health and safety measures, (b) radiological surveys, and (c) nonintrusive, noninvasive characterization for site remediation investigations and future D&D.

The hot cells of ARA-626 were cleared of equipment and contents and partially decontaminated. In-cell ventilation filters were removed, bagged, and shipped out of the facility for disposal. The ventilation openings in the hot cells were sealed by cover plates to isolate the cells from the ventilation system. The doors to the hot cells were locked and sealed with caulking material effectively separating the cells from the isolation rooms that serviced them. The periscopes and master-slave manipulator assemblies were removed from the hot cell wall and shipped off the ARA-I site. The openings in the wall created by this removal were subsequently filled with metal plugs that were tacked welded in place. Oil was drained from the three hot cell windows and shipped to another facility.

After limited decontamination of the Equipment Decontamination Room of ARA-626, the equipment decontamination room was sealed. The in-room ventilation

After limited decontamination of the Equipment Decontamination Room of ARA-626, the equipment decontamination room was sealed. The in-room ventilation (HEPA) filters were removed first, bagged, and shipped off the ARA-I site for disposal. The ventilation openings were closed by cover plates. After decontamination, the room was sealed by padlocking the access door and caulking the door's sealing surfaces.

The Metallography Laboratory of ARA-626 was stripped of equipment and instrumentation and sealed. Contaminated lead was placed in a concrete box. Biological test tube samples were shipped out for disposal. Internally contaminated off-gas hoods were removed, packaged, and shipped out for disposal. Other equipment in the laboratory was removed for reuse or disposal. The HEPA filters were removed from their housings, packaged, and shipped for disposal. The housing was then sealed by tack welding the filter doors shut. The decontamination sink trap was removed and the drain was then capped. Finally, the room was sealed by padlocking the door and installing sheet metal plates across the windows.

The hot waste tank, ARA-729, was emptied, the asbestos removed, and the access lines capped and cut. After draining, the tank was partially exposed by excavation. Inlet lines, instrument lines, and the outlet pump housing were closed off by cutting, capping, and installing a blind flange. Finally, the excavated area was refilled with the original soil.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

None.

PERMITTING REQUIREMENTS:

The determination of the required NEPA documentation necessary for the D&D of the ARA-I facilities was accomplished in 1993. If a "Memorandum of Agreement" is in place for a mitigation of hazards for a facility then a Categorical Exclusion (CX) should be sufficient NEPA documentation. This is the approach being taken by EG&G Idaho for the NEPA documentation for the ARA-I D&D Project. Recent NEPA reviews of the ARA-I by DOE-ID have indicated that this approach may not be acceptable and the ARA-I D&D Project may require an Environmental Assessment (EA).

SURVEILLANCE and MAINTENANCE STATUS:

Presently, the only activities occurring at the ARA-I site are (a) routine periodic surveillance and maintenance for security, environmental, and health and safety measures, (b) radiological surveys, and (c) nonintrusive, noninvasive characterization for site remediation investigations and future

D&D. All facilities are in good condition and pose no threat for loss of containment integrity.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exists.

D&D RECOMMENDED METHODOLOGY:

Total dismantlement and unrestricted release of site.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

Characterization and Decision Analysis Report, Reference 1

FACILITY REUSE CONSIDERATIONS:

The cost of existing facility renovation for reuse equals or exceeds the cost of new facility and the risk of residual contamination remains.

REFERENCES:

1. Characterization and Decision Analysis for Auxiliary Reactor Area I, EGG-WM-10757, dated June 1993, Revision 0, Prepared by D. J. Larsen and T. N. Thiel.

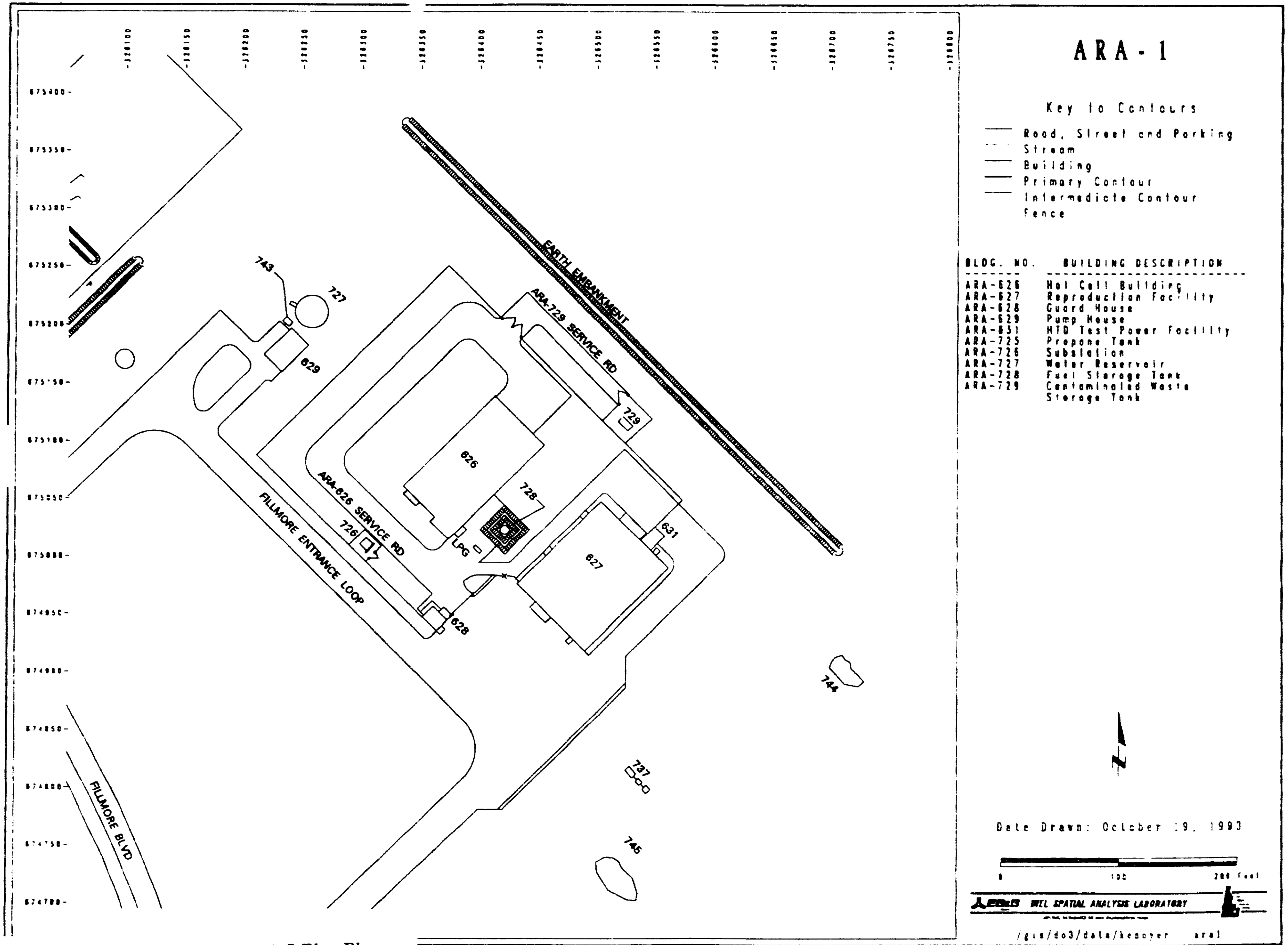

Figure B-3. ARA-I Plot Plan.

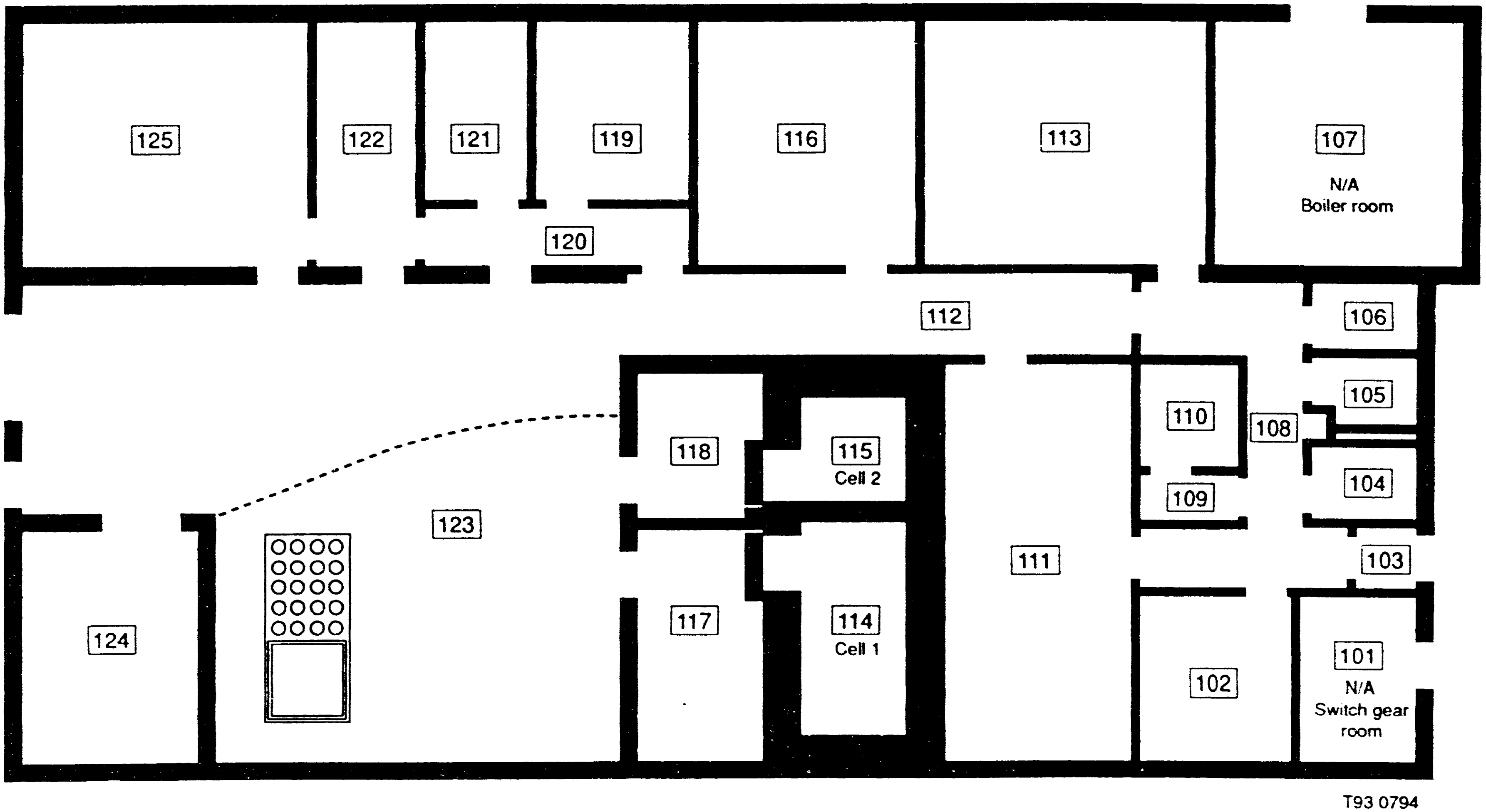

Figure B-4. ARA-I hot cells/plan first floor.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**		CONTRACTOR: **EG&G Idaho, Inc.**			
PROJECT: **AUXILIARY REACTOR AREA (ARA) II**					
PROJECT PRIORITY: 4		PRIORITY BASIS: FFA/CO Driver			
SCHEDULE DURATION: 4 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 6177K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 1367K	
FUNDING SOURCE: EW2010402		ADs No.: 48-EG		WBS No.: 1.4.9.1.2.2.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements CERCLA Partial		
FY-93: $ 743k	FY-94: $ 700k	FY-95: $ 607k	FY-96: $ 2139k	FY-97: $ 621k	FY-98: $ 0k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
TOTAL WASTE VOLUME ESTIMATE: 976.1 m^3 and 530 gal.				ESTIMATE BASE YEAR: 1993	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): 875.1 m^3/500 gal			
TRU WASTE:		SOIL WASTE:		CARBON STEEL WASTE: 5 m^3	
HAZARDOUS WASTE:		CONCRETE WASTE: 593 m^3		STAINLESS STEEL WASTE: 0.1 m^3	
MIXED WASTE: 30 gal.		RUBBLE WASTE: 209 m^3		COMBUSTIBLE WASTE: 10 m^3	
MUNICIPAL/SANITARY WASTE: 101 m^3		LIQUID WASTE: 500 gal.		COMPACTIBLE WASTE: 37 m^3	
		OTHER WASTE: Transformers 21 ea.			

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The Auxiliary Reactor Area (ARA) II facilities have been funded for D&D from FY 1992 through 1997. The ARA II reactor test area is located at the south central end of the INEL, approximately 10 miles east of the Central Facilities Area (CFA).

A military reactor testing program was conducted at ARA II from August 1958 until December 23, 1960. A nuclear excursion and steam explosion occurred on January 3, 1961, in which the three-man operating crew was fatally injured. Cleanup operations were completed 18 months later. The SL-1 reactor building was buried in the burial ground located 1600 ft northeast of ARA II. Blacktop was placed over the entire 350-ft x 375-ft ARA II area within the perimeter fence to stabilize the area. Following cleanup, the three main buildings were converted to offices and welding shops and were utilized for these purposes until 1986. ARA II has remained abandoned since that time.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

All buildings on the ARA II site were built between 1956 and 1961. The following is a current description of each existing building and structure, including its name, number, and contents. The arrangement of the buildings is shown in the plot plan in Figure B-5.

<u>Guardhouse</u> Building ARA-604 is located the right (south) just inside the entrance to the ARA II site (shown in the plot plan in Figure B-5. This 172-ft^2, one-story building has corrugated metal siding and roofing and a reinforced concrete floor. The guardhouse is vacant.

Administration Building ARA-613 is a 1280-ft^2, two-story administration building that is currently vacant. The building has masonry exterior walls, a concrete frame, and a flat, tar-and-gravel roof. It has a reinforced concrete floor and is connected on the northeast to Building 602. Some office furniture (desks and tables) remains inside.

Support Building Building ARA-602 is a 3900-ft^2, one-story, steel frame building originally built as a laboratory and then converted for offices. It has metal panel walls, corrugated sheet metal siding and roofing, and is connected to Building 613. The building, seen in the plot plan in Figure B-5 just left (northeast) of Building 613, was partially decontaminated after the SL-1 accident. Subsequently, the building was used until the mid-1970s for administrative and engineering offices in support of the Power Burst Facility (PBF).

Old Weld Shop and Technical Support Building ARA-606 is shown in the plot plan in Figure B-5. Like Building ARA-602, Building ARA-606 is 3900-ft^2, one-story, steel frame building that has metal panel walls with corrugated sheet-metal siding and roofing and a large double door. The building is vacant.

Power Extrapolation Building ARA-615 (Figure B-5 in the plot plan) is an 836-ft^2, one-story, steel frame, power extrapolation building. It has corrugated sheet metal siding and roofing with a reinforced concrete floor. This building was used to extrapolate the power, by way of steam, from the reactor but has had most of the hardware used for this function removed from the building.

Storage Building ARA-614, the old decontamination and laydown building, is shown in Figure B-5 in the plot plan as being just north of Building 602. The building has 532 ft^2 of floor space; it is a single story with steel frame and metal panel walls, and it has corrugated sheet-metal siding and roofing. The building is un-insulated, unheated, and unoccupied. Parts of the building are radioactively contaminated. The building is located just northwest of where the SL-1 reactor building, now dismantled and removed, was located.

Utility Structures The ARA II utility structures and systems include those for (a) electrical power; (b) water pumping, storage, and treatment facilities; (c) fuel oil tanks and lines; (d) waste storage and drain tanks and lines; (e) communications (telephone lines); and (f) the trailer next to the guardhouse (removed).

Electrical Power Substation and Power Distribution The ARA II power Substation ARA-701 has a single 13.8 kVA feeder [from Special Power Excursion Reactor Test (SPERT) Substation No. 10]. Power is transformed at Substation ARA-701 by three 300-kVA transformers to 2400V, 3-phase delta ungrounded for the deep-well pump, to 480 V ungrounded delta 3-phase for equipment (now unused) in Building ARA-615 and equipment in Building ARA-606, and to 208/120 V 3-phase 4-wire underground for distribution at ARA II. Much of the cables and wiring to the buildings is underground. A pit covered by a carbon steel plate houses the connections for the wiring leading to the three transformers. All power to ARA II has been disconnected.

Water Supply Facilities The ARA II waste supply facilities include pumping, storage, and treatment equipment and piping that supplied potable water to both ARA II and ARA I to the southeast. The Wellhouse (pumphouse) ARA-601 and Storage Tank ARA-702 are shown in Figure B-3. The well-house interior has fixed contamination. The well-house is a one-story, 294-ft^2 building with a gabled roof and reinforced concrete floor. It has sheet metal siding and roofing. It contains a deep-well pump, a fire pump, a domestic water pump, and a chlorinator. Water was pumped from the well-house to the storage tank where it was stored until needed. Storage Tank ARA-702 is a large steel tank with a 50,000-gal capacity.

The water was chlorinated in a one-story 53-ft^2 Building ARA-605 with corrugated siding and roofing; the roof interior is insulated. The chlorination Building ARA-605 has a reinforced concrete floor and contains a chlorinator and chlorine tank.

Fuel Oil Tanks and Lines. Aboveground 1400-gal fuel oil Tank ARA-705 is located southeast of Building ARA-602. The tank is surrounded by a rectangular earth berm about 2 ft high. The tank, with a label on it reading "No. 2 Fuel Oil," formerly served to supply fuel to a diesel generator in the northeast section of Building ARA-602. (The diesel generator has since been removed.) Another underground fuel supply line provided fuel from Tank ARA-705 to Building ARA-613.

Waste Storage and Drainage Systems. ARA II has two sanitary waste systems and one waste detention storage tank.

ARA II East Side Sanitary Waste System consist of two septic tanks, a chlorinator tank, and a seepage pit. ARA-09 (738) is a 1026-gal septic tank containing both liquid and sludge waste. It is connected to a 200-gal chlorinator tank (ARA-718) down-gradient to the east. Both drain into the ARA-07 seepage pit outside the facility fence to the east. ARA-10 is a second 500-gal septic tank located in the southeast corner of the ARA II facility yard and also drains into ARA-07 seepage pit to the east. This tank is dry and empty except for a minor amount of sediment. The chlorinator tank has not been examined but probably contains similar material as the up-gradient septic tank. The seepage pit is dry and the gravel base is visible, indicating that only minor amounts of solids were discharged to the seepage pit.

ARA II West Side Sanitary Waste System consists of one 500-gal septic tank (ARA II), one 200-gal chlorinator tank, and a seepage pit (dry well) (ARA-08), and received wastes from Building ARA-606. The septic tank (ARA II) is full with approximately 40 in. of liquid waste and 6 to 8 in. of sludge. The chlorinator tank was not opened but is assumed to contain similar material as the septic tank. The seepage pit (ARA-08) is dry and has about 1 to 2 ft of sediment present.

A 1000-gal radioactive waste detention tank is located underground adjacent to fuel oil Tank ARA-705. The detention tank is a horizontal cylinder about 10 1/2 ft long and 4 ft in diameter. The top of the tank is about 4 ft underground. The condition of the detention tank inlet line is not known. The outlet line drains to the southeast seepage pit. Near the southeast end of the tank, a 2-1/2-in. inside diameter (ID) access pipe to the tank protrudes about 2 in. above ground level. The access pipe has a removable cover. This tank contains two liquid phases and a sludge phase.

Grounds At the conclusion of he SL-1 recovery operation, low-level radioactive contamination remained throughout the soil areas at ARA II. The widespread low-level contamination was due primarily to cross contamination during recovery operations.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Essentially all structures contain varying amounts of low-level radiological contamination.

A layer of noncontaminated soil (depth unknown) was placed over ground areas with high radiation fields to stabilize the contamination and attenuate the fields. To further fix and stabilize the contamination, a layer of asphalt was placed over the entire area inside the fence. The asphalt has deteriorated and eroded over the last 20 years and left the contamination exposed in some areas.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

The Figure B-5 is a copy directly from the D&D Plan for ARA-II, (reference 2)

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop, etc.]

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Rod V. Nelson, ARA-II Project Manager, EG&G Idaho, Inc., 526-9863, TSB, MS 2414, Profs ID RVN

Doug J. Larsen, ARA-I, -II, -III Project Engineer, EG&G Idaho, Inc., 526-9862, TSB, MS 2414, Profs ID DL6

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The ARA II facilities were radiologically and physically characterized in 1984. Additional characterization was conducted in 1991 for hazardous substances.

Several underground fuel lines to Building ARA-602 have been disconnected, capped, and abandoned. Fuel oil Tank ARA-705 was emptied in 1986.

The 1000-gal underground fuel oil Tank ARA-606, adjacent to the northwest wall of Building ARA-606, was removed in 1990 by the Underground Storage Tanks (UST) program. This tank was used to heat Building ARA-606. The residual fuel was pumped out and shipped to an offsite recycler.

A mobile home trailer (removed) was formerly located at ARA II just southeast of Building 604 (the unused guardhouse).

Equipment associated with the cleanup and disposal of the SL-1 Reactor accident were D&D'd and disposed in 1992.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The widespread ground soil contamination will require development of innovative soil washing or particle picking techniques.

PERMITTING REQUIREMENTS:

The ARA-II D&D Project has been reviewed for applicable NEPA documentation in 1991 and it was determined that an Environmental Assessment (EA) would be required. This EA was prepared in 1991 and was formally submitted into the DOE-HQ review and approval system in September 1992. To date DOE-HQ has not approved this EA, which was scheduled for approval September 1993.

SURVEILLANCE and MAINTENANCE STATUS:

Presently, the only activities occurring at the ARA-II site are (a) routine periodic surveillance and maintenance for security, environmental, and health and safety measures, (b) radiological surveys, and (c) nonintrusive, noninvasive characterization for site remediation investigations and future D&D. All facilities are in good condition and pose no threat for lose of containment integrity.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety environmental and radiological controls will be required. No special or high hazard conditions exists.

D&D RECOMMENDED METHODOLOGY:

The 1984 Characterization Report contains a decision analysis, which considered six alternatives. These alternatives varied from restoring the area to a natural condition to leaving the area in its present condition. The alternatives were compared on the basis of estimated cost, material reuse, facility reuse, surveillance and maintenance costs, volume of waste generated, radiation exposure to involved workers, short-term impact on INEL personnel and operations, and long-term impact to the public. Since that time, other institutional requirements as well as environmental concerns have influenced the decision analysis.

The recommended alternative would remove all buildings, structures, and underground utilities, leaving only the contaminated soil, which would be monitored with the contaminated soil that exists outside the fence as part of this Federal Facility Agreement/Consent Order (FFA/CO) operable Unit. This action will remove all eight buildings (including foundations), nine structures, all underground utility systems, and any underground utility systems and environmental hazards from the area and eliminate the need for future remedial action. The ARA II facility, following decommissioning, will be removed from the surplus facilities inventory.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for ARA II, Reference 2.

FACILITY REUSE CONSIDERATIONS:

The cost of existing facility renovation for reuse equals or exceeds the cost of new facility and the risk of residual contamination remains.

REFERENCES:

1. Characterization and Decision Analysis for the ARA-II, PT-WM-84-010, dated August 1984, prepared by J. D. Bradford and J. H. Clark.

2. Decontamination and Decommissioning Plan for ARA-II, WM-ERP-92-016, dated May 1993, prepared by T. N. Thiel.

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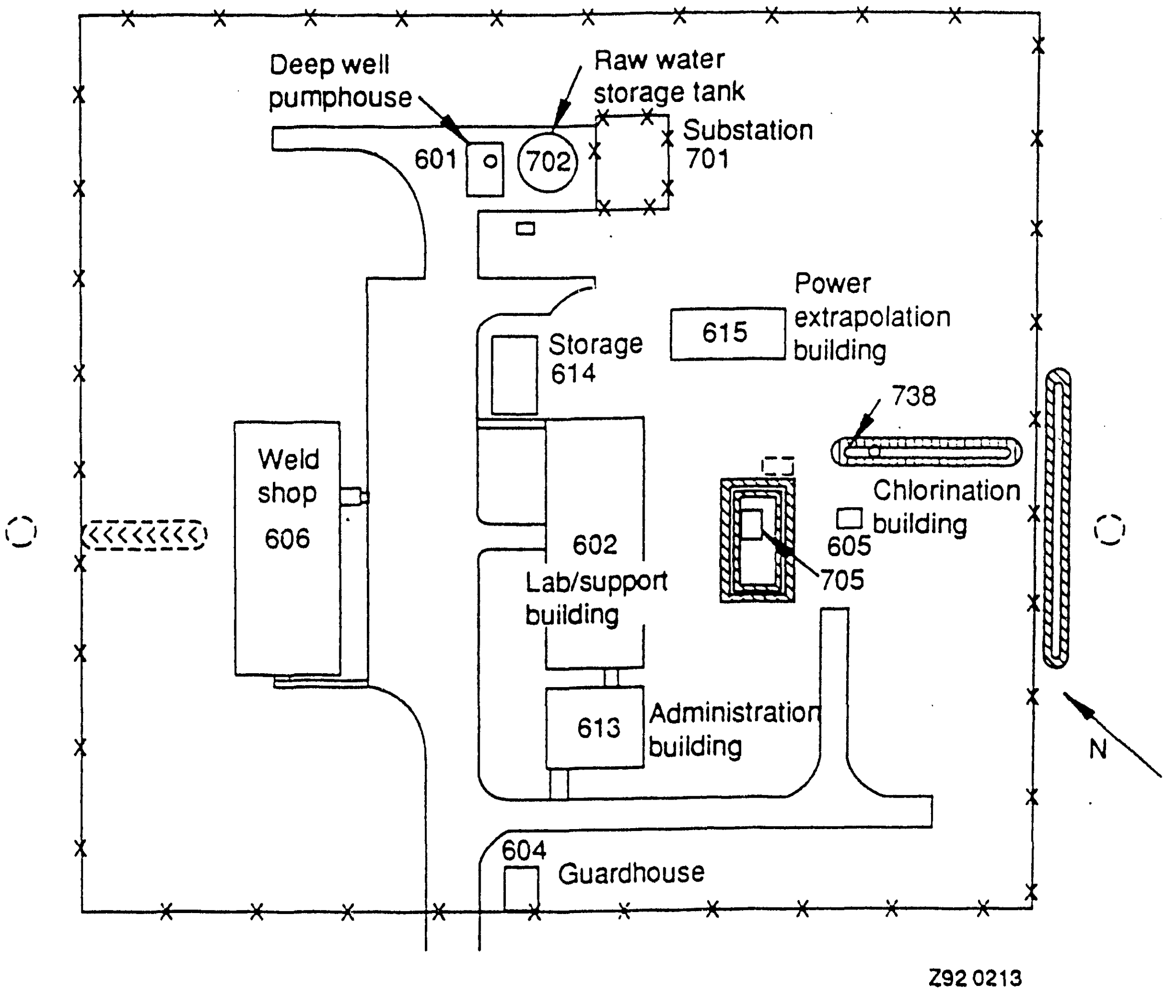

Figure B-5. ARA-II Plot Plan.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **AUXILIARY REACTOR AREA (ARA) III**					
PROJECT PRIORITY: 8		PRIORITY BASIS: FFA/CO Driven			
SCHEDULE DURATION: 1 yr		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 1077K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 401K	
FUNDING SOURCE: EW2010402		ADs No.: 49-EG		WBS No.: 1.4.9.1.2.03.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements CERCLA Driven		
FY-93: $ 676k	FY-94: $ 0k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k

TOTAL WASTE VOLUME ESTIMATE: 888 m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 832 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 484 m^3
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE: 344 m^3	COMBUSTIBLE WASTE: 4 m^3
MUNICIPAL/SANITARY WASTE: 56 m^3	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The Auxiliary Reactor Area (ARA) III facilities have been funded for D&D from FY 1992 through FY 1993. The ARA III reactor test area is located at the south central end of the INEL, approximately 8 miles east of the Central Facilities Area (CFA).

The ARA III facility was initially constructed for development and experimental testing of an Army Gas-Cooled Reactor (AGCR). The site was originally called the Gas-Cooled Reactor Experiment Facility (GCREF). The goal of the first Gas-Cooled Reactor Experiment (GCRE-I) program was the test operation for a developmental model of an AGCR. Construction began in the spring of 1958 and was completed in 1959. Reactor test programs were conducted at ARA III until 1965, when the entire Army Reactor Program was phased out. From 1966 through 1988, the facility was been used as a component and instrumentation laboratory for testing and evaluating items used in nuclear reactor experiments. Since this time, the area has been in a safe storage condition.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

Buildings at the ARA-III site were built in 1959, unless otherwise specified, and can be seen in Figure B-6, the facility plot plan. Below is a description of the two existing buildings scheduled for decontamination and decommissioning, including their names, numbers, and contents.

Reactor Building ARA-608 is a 7,270 ft^2, one-story reactor building with a high bay. It is a steel frame building with metal panel walls, a reinforced concrete floor, and corrugated sheet metal siding and roofing. The reactor area in the high bay is made of high-density concrete and has a 20-ton bridge crane. The reactor pit has been covered with large concrete shielding blocks. The building is attached to ARA-607. Part of ARA-608 is the reactor heater pit, which contains the nitrogen-fired heater tank and associated piping.

Contaminated Water Pumphouse ARA-612 is a 240 ft^2, one-story, contaminated water pumphouse. It has masonry exterior walls, a tar and gravel roof, and a reinforced concrete floor. Radioactive sources previously stored in ARA-612 were removed in July 1992.

Power Power is supplied to ARA-III at 13.8 kV from SPERT Substation No. 10. The power is transformed lower to 480 V from the substation for area distribution. ARA-713 is the substation and contains a 1,000 kVA transformer. The transformer has been removed and the power system was deactivated in 1988.

Water All water is supplied to ARA-III from a deep well in ARA-611 and a 56,900-gal water storage tank (ARA-709).

Fuel Oil and Gas Systems ARA-710 is a 42,000-gal fuel oil tank that use to contain No. 2 fuel oil. ARA-711 is a fuel oil storage pump canopy that contains pump valves.

Drains and Waste Systems The drainage and waste systems include sewage, service waste, and abandoned warm and hot contaminated waste lines or tanks. ARA-708 is a 75,000-gal wastewater storage tank currently unused. Attached to this tank is a process stack (ARA-714), a high-level waste storage tank with a 10,000-gal capacity (ARA-735), and a 10,000-gal low-level radioactive liquid waste storage tank (ARA-736). All are currently unused.

ARA-739 and ARA-740 are septic tanks with 500-gal and 1,500-gal capacities. ARA-715 is a ventilation stack for water gases and is currently unused.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

The majority of the facilities and grounds are uncontaminated. Most areas of contamination are limited to portions of ARA-608 and ARA-612, and the drain and waste systems.

No chemical hazards have been observed during site visits and sampling events. Volatile organic compounds were not detected during the 1990 ARA-III sampling effort.

The reactor pit in Building 608 has approximately 10 ft of contaminated water in the bottom. The pit is covered with concrete blocks. Discussions with personnel indicate that the pit was decontaminated after the reactor was removed; however, some low-level contamination still exists (specific concentrations are not known). The general radiation levels in Building

607/608 are <0.1 mR/h; and, in addition to the reactor pit, there is a Zone I contamination area.

The results from previous sampling indicate the following gamma-emitting radionucludies are present in the tanks and stacks: Cobalt-60 (^{60}Co), Silver-108m (^{108m}Ag), and Cesium-137 (^{137}Cs.). The activity in Ventilation Stack 714 was 1.41E-05 μCi/g of ^{60}Co, 1.22-05 μCi/g of ^{108m}Ag, and 1.47E-05 μCi.g of ^{137}Cs. The activity in Ventilation Stack ARA-715 was 1.5E-03 μCi/g, 3.1E-03 μCi/g, and 6.6E-06 μCi/g, respectively. The activity Tank ARA-736 was 1.19E-03 μCi/g of ^{60}Co, 3.7E-03 μCi/g of ^{108m}Ag, and 6.4E-06 μCi/g of ^{137}Cs. All samples were taken from the bottom surfaces. Positive results were found in Tank ARA-735 (up to 3.45E-06 μCi/sample) and Tank ARA-736 (up to 1.95E-05 μCi/sample).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

The Figure B-6 is a copy directly from reference 3.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

Tom N. Thiel, ARA-I, -II, -III Project Coordinator, EG&G Idaho, Inc., 526-9876, TSB, MS 2414, Profs ID TNT

Stan T. Fenn, ARA-III Project Maanger, EG&G Idaho, Inc., 526-9823, TSB, MS 2414, Profs ID STF

Doug J. Larsen, ARA-I, -II, -III Project Engineer, EG&G Idaho, Inc., 526-9862, TSB, MS 2414, Profs ID DL6

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

Transported 14 radioactive sources and carrying pigs to commercial vendor for recycling purposes in 1992.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

None.

PERMITTING REQUIREMENTS:

The ARA-III D&D Project has been reviewed for applicable NEPA documentation in 1991 and it was determined that an Environmental Assessment (EA) would be required. This EA was prepared in 1991 and was formally submitted into the DOE-HQ review and approval system in September 1992. To date DOE-HQ has not approved this EA, which was scheduled for approval September 1993.

SURVEILLANCE and MAINTENANCE STATUS:

Presently, the only activities occurring at the ARA-III site are (a) routine periodic surveillance and maintenance for security, environmental, and health and safety measures, (b) radiological surveys, and (c) nonintrusive, noninvasive characterization for site remediation investigations and future D&D. All facilities are in good condition and pose no threat for loss of containment integrity.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exists.

D&D RECOMMENDED METHODOLOGY:

The Auxiliary Reactor Area (ARA) III, previously called the Army Reactor Area (ARA III), was characterized in 1984 and again in 1990. The 1985 document contains a decision analysis that considered five alternatives. These alternatives varied from restoring the area to a natural condition to leaving the area in its present condition. Alternatives were compared on the basis of estimated cost, material reuse, facility reuse, surveillance and maintenance costs, volume of waste generated, radiation exposure to involved workers, short-term impact on INEL personnel and operations, and long-term impact to the public. The recommended alternative would remove all radioactively contaminated material from the area. The ARA III facility, following decommissioning, will be removed from the Surplus Facilities management Program (SFMP) inventory.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for ARA-III, Reference 2.

FACILITY REUSE CONSIDERATIONS:

The cost of existing facility renovation for reuse equals or exceeds the cost of new facility and the risk of residual contamination remains.

REFERENCES:

1. Characterization and Decision Analysis of the ARA-III, PG-WM-84-011, dated February 1985, prepared by M.R. Dolenc and J. H. Clark.

2. D&D Plan for ARA-III, WM-ERP-92-023, dated May 1993, prepared by T. N. Thiel and D. J. Larsen.

3. INEL D&D Long Range Plan, PR-W-005, Revision 8, dated September 1991, prepared by M. Sekot and R. Buckland.

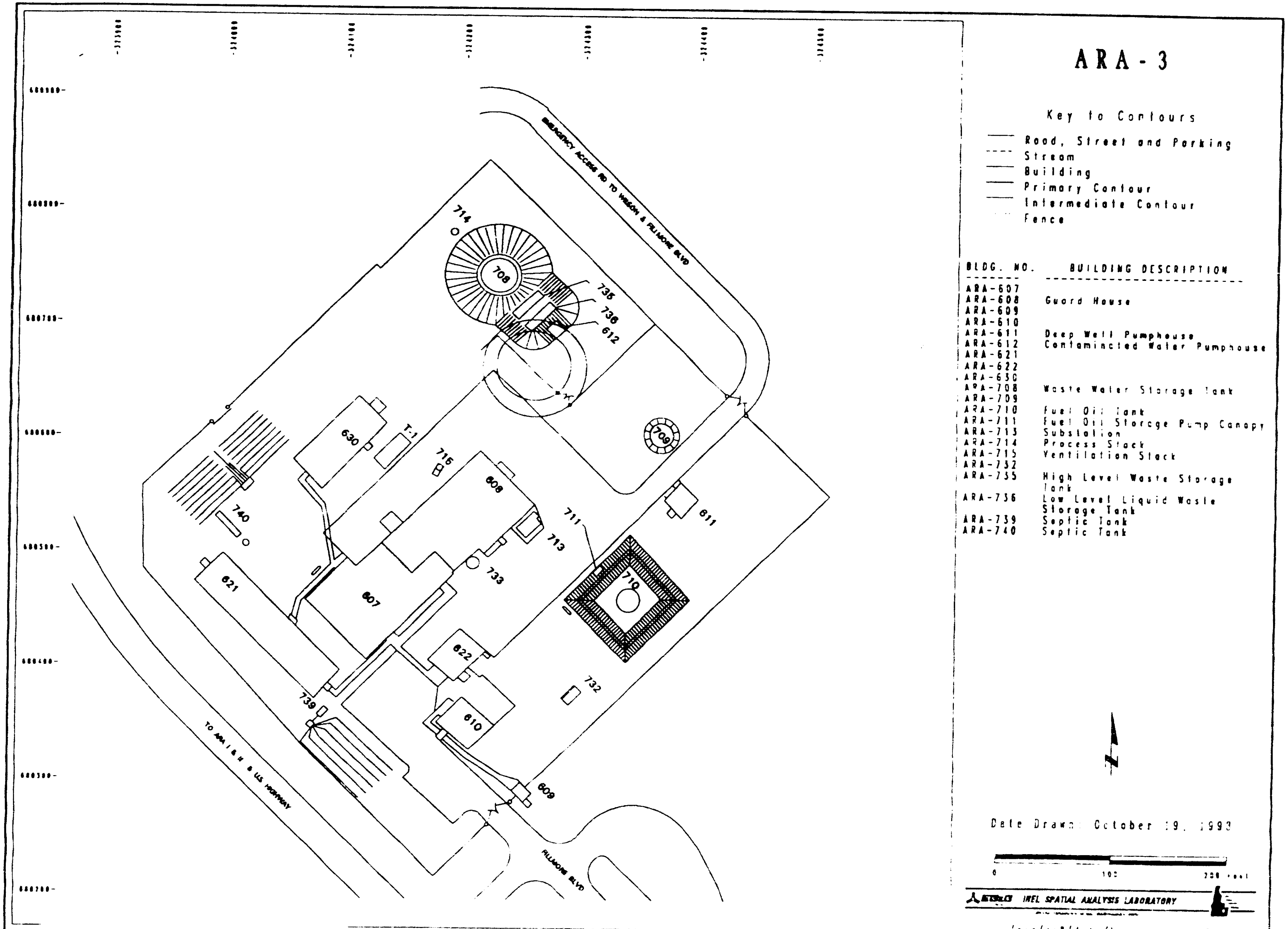

Figure B-6. ARA-III Plot Plan.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**		CONTRACTOR: **EG&G Idaho, Inc.**			
PROJECT: **TAN-607 Decon Shop**					
PROJECT PRIORITY: 13		PRIORITY BASIS: FFA/CO Driven			
SCHEDULE DURATION: 1 yr		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 840K		ESTIMATE BASE YEAR: FY 1993		Actuals thru FY 1992: $ 0k	
FUNDING SOURCE: EW2010401		ADs No.: 53-EG		WBS No.: 1.4.9.1.2.05.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare USQ Against Existing SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY 1993: $ 145K	FY 1994: $ 695K	FY 1995: $ 0K	FY 1996: $ K	FY 1997: $ K	FY 1998: $ K
FY 1999: $ K	FY 2000: $ K	FY 2001: $ K	FY 2002: $ K	FY 2003: $ K	FY 2004: $ K

TOTAL WASTE VOLUME ESTIMATE: 8.8 m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 8.8 m^3	
LOW-LEVEL WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 7.2
TRU WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
HAZARDOUS WASTE:	RUBBLE WASTE: 0.9	COMBUSTIBLE WASTE:
MIXED WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE: 0.7
MUNICIPLE/SANITARY WASTE:	OTHER WASTE:	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 1992 and all planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate are based upon FY 1994 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

This Decon Shop began operation in 1957 and was utilized for radiological decontamination of tools and small pieces of equipment from INEL and Non-INEL facilities until 1987. The Decon Shop is actually three areas; the Decon Room, the Change Room, and the HEPA Filter Room, located in the southwest corner of the TAN-607 building.

The decontamination process involved dipping contaminated tools and equipment into a series of solvent and rinse water solutions contained in six (6) seperate dip tanks (open-topped tanks). Tanks #1, 2, and 3 measure approximately 4 x 4 x 5 ft and tanks # 4, 5, and 6 measure approximately 5 x 5 x 5 ft. The plant steam was used to keep the dip tank solutions (except rinse water) between 160°F and 200°F. The dip tanks are arranged in two rows of three each with their drains going to the below-slab, 200 gallon, sump located in the west corner of the Decon Room. In the past, material that accumulated in this sump was occasionally pumped to the buried storage tanks east of TAN-616.

A variety of decontamination solutions and solvents have been used in the Decon Room. Some of these include: Hydrochloric Acid, Sodium Hydroxide, Nitric Acid, Citric Acid, Hydrofluoric Acid, Trichloroethylene (TCE), Stoddard Solution, Acetone, Toluene, Perchloroethylene, nad Turco Solutions 4501-A, 4502, and 4521.

In April 1990, leftover aqueous decontamination solutions and sludge from the six dip tanks and the sump were pumped into approximately twenty-one (21) 55-gallon drums. All drums were shipped to an approved storage facility known as the Radioactive Mixed Waste Storage Facility (RMWSF), formerly the site of the

SPERT IV Reactor. Solutions and sludge pumped into these drums were as follows:

Dip Tank No. 1	Rinse Water	Dip Tank No. 2	Empty
Dip Tank No. 3	Empty	Dip Tank No. 4	Turco 4521
Dip Tank No. 5	Turco 4501-A	Dip Tank No. 6	Turco 4502

The Change Room is located in the south corner of the Decon Room and provides personnel access to the Decon Room. The change room provided the necessary change and wash areas for personnel working in the Decon Room.

Adjacent to the Change room is the HEPA Filter Room that houses the 12 High Efficiency Particulate Filters (HEPA Filters) and the major electrical junction boxes for the motor control centers and Heating Ventilating and Air-Conditioning (HVAC) Systems for the Decon Room.(Reference No. 4).

All of the TAN-607 D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimenstions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

Decon Shop: The main room measurements are approximately 41 ft wide by 34 ft long and more than 16 ft high and designated as a Zone II Contamination Area. Removable steel plate covers the 200 gallon sump. The room construction is cast in place contrete, structural steel, and insulated metal siding. A further listing of the major systems and equipment in this room can be found on pages 6 and 13 of Reference No. 4.

Change Room: The room measurements are approximately 18 ft wide by 15 ft long and more than 10 ft high. Above the 10 ft ceiling are the exhaust air/gas ducts. The room construction is cast in place contrete, structural steel, and insulated metal siding. A further listing of the major systems and equipment in this room can be found on page 13 of Reference No. 4.

HEPA Filter Room: The room measurements are approximately 34 ft wide by 13 ft long and more than 16 ft high. The room construction is cast in place contrete, structural steel, and insulated metal siding. A further listing of the major systems and equipment in this room can be found on page 20 of Reference No. 4.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Decon Room: Before April 1990, radiological surveys indicated that the liquid and sludges contained in the dip tanks and sumps were radioactive (reading 7 to 220 mR/hr) with associated radiation fields over the tanks openings ranging from 10 to 90 mR/hr. Trace amounts of Uranium Isotopes (U^{234}, U^{235}, U^{236}, and

U^{238}), Plutonium Isotopes (P^{238} and P^{239}), Americium (Am^{241}), Curium (Cm^{244}), and Strontium (Sr^{90}) exist in the dip tanks.

Change Room: The exhaust air/gas ducts above the 10 ft ceiling contain radioactive contamination. Radioactive contamination can also be found under the wash fountain next to the step-off pad that enters into the Decon Room.

HEPA Filter Room: Is free of radioactive contamination and hazardous materials except the used HEPA filters, the inside of the exhaust duct work, and the sodium hydroxide.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-7, TAN/TSF Plot Plan, from INEL database plot by Spacial Graphics.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

C. Bruce Hansen, Project Manager, EG&G Idaho, Inc., 526-8108, , MS-4133, Profs

ID CBH

Ted A. Evans, Project Coordinator, EG&G Idaho, Inc., 526-9819, TSB, MS-2414, Profs ID TAE

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

In April 1990 all waste from the process dip tanks in TAN-607 Decon Shop had been removed and managed as mixed-hazardous waste.

In December 1990, a potable water line froze and broke causing flooding of the Decon Facility. The water accumulated in the sump. The waste was pumped into thirteen (13) 55-gallon drums and sampled for analysis. The samples exhibited the hazardous characteristic of TCLP toxicity for Trichloroehtylene (Trichloroethene).

Heavy rains in April and May 1991, creating ponding outside the truck and equipment access door of the Decon Shop, flooded the Decon Shop flooring witht the water being accumulated in the sump. The waste was pumped into twelve (12) 55-gallon drums and sampled for analysis. The samples did not exhibit the hazardous characteristic of TCLP toxicity for metals, ignitability, corrosivity, reactivity, PCBs, or volitiles (Reference No. 5).

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

None Known or Listed.

PERMITTING REQUIREMENTS:

The exisiting TAN-607 Safety Analysis Report (SAR) includes the following activities:

Current planning by the ER&WM, D&D Projects Unit calls for the utilization of the existing TAN-607 SAR to perform this work task as a "Maintenance Corrective Action" to decontaminate the TAN-607 Decon Shop for future use by the TAN-607 Landlord. This would call for the utilization of a Categorical Exclusion (CX) to perform this work task.

SURVEILLANCE and MAINTENANCE STATUS:

Currently the TAN-607 Decon Shop is being maintained by the TAN-607 Facilities and Maintenance Department (F&MD). Surveillance is being performed by the EG&G Idaho, Inc, ER&WM, D&D Projects Unit, Surveillance & Maintenance Program, which will be absorbed into the projects in FY 1994 and outyear funding.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exists.

Finalize the complete removal of the hazardous materials from the TAN-607 Decon Shop (not specifically addressed here). For additional information see Reference No. 4, which outlines the specific work task items necessary for an "Inactivation Plan."

D&D RECOMMENDED METHODOLOGY:

Complete removal of contaminated equipment, tools, and materials from the TAN-607 Decon Shop (including the Decon Room, Change Room, and HEPA Filter Room) and the decontamination of the existing walls and floors as required. For additional information see Reference No. 4, which outlines the specific work task items necessary for an "Inactivation Plan."

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None required.

WASTE VOLUME ESTIMATE BASIS:

ER&WM Waste Stream Projections, 1992 calculations.

FACILITY REUSE CONSIDERATIONS:

None listed at this time by the existing TAN-607 Landlord.

REFERENCES:

1. Long Range Plan for Decontamination and Decommissioning Excess Contaminated Facilities at the INEL, Report No. PR-W-79-005, Revision 4, dated May 1983, Section 2.2, Engineering Test Reactor, pages A-4 to A-22.

2. TAN-607 Decon Shop Assessment Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNDSA000 / WBS No. 1.2.5.1.1.1]

3. TAN-607 Decon Shop Cleanup Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNDSC000 / WBS No. 1.2.5.2.1.1]

4. Inactivation Plan for the TAN 607 Decontamination Shop, FM-PS-90-001, Revision 0, dated July 1990, prepared by R. R. Rodriguez and M. M. Patterson.

5. FAX to R. V. Nelson, Senior Engineer, EG&G Idaho, Inc., ER&WM, D&D Projects Unit, dated July 06, 1993, from Babcock & Wilcox Idaho, Inc. B. E. Olaveson, Project Work Manager, B&W Environmental Projects, Subject: TAN-607 Decon Shop.

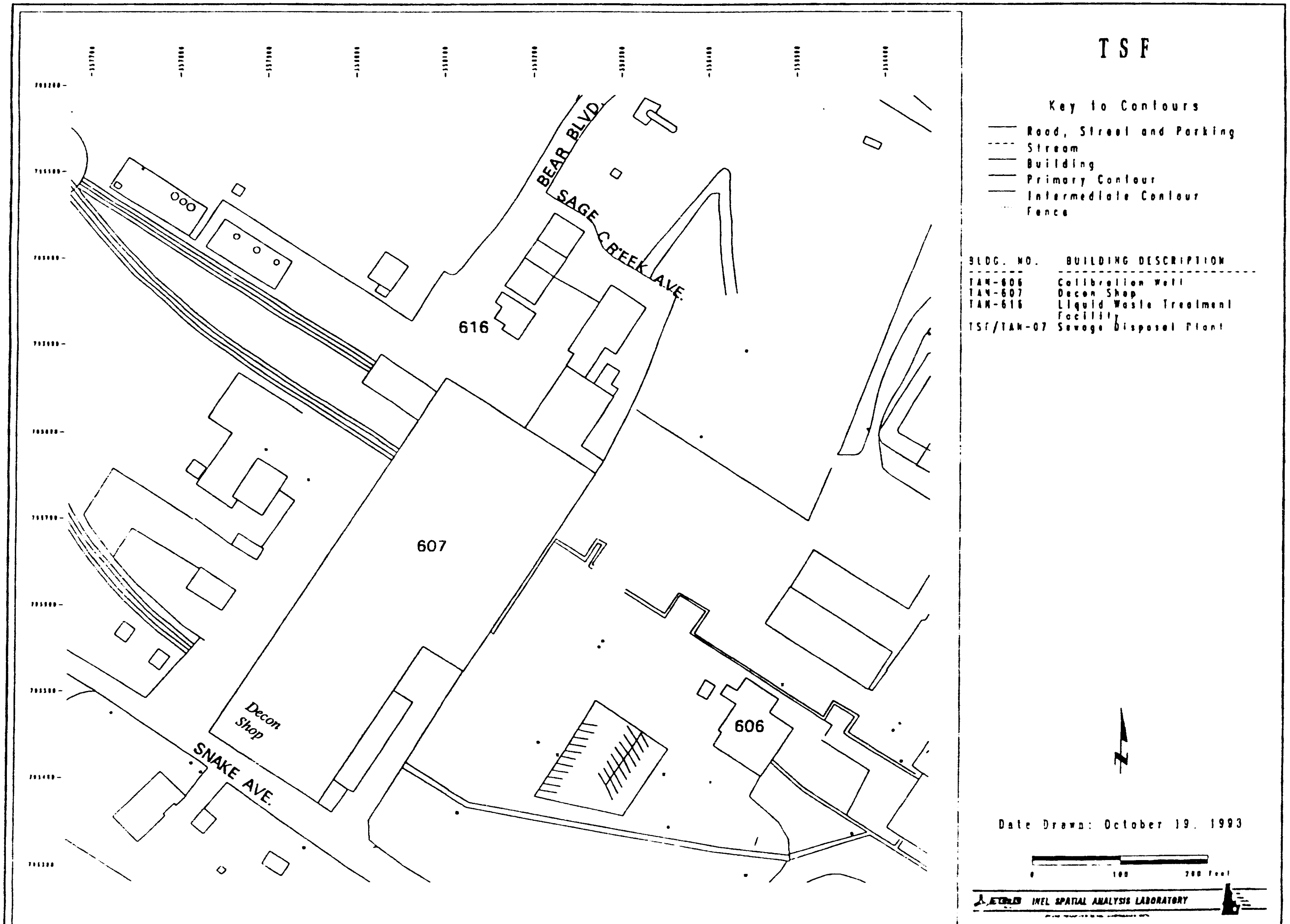

Figure B-7. TAN-TSF Plot Plan.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**		CONTRACTOR: **EG&G Idaho, Inc.**			
PROJECT: **Materials Test Reactor (MTR)**					
PROJECT PRIORITY: 6		PRIORITY BASIS: Personnel Hazards			
SCHEDULE DURATION: 8 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 33,026K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 0k	
FUNDING SOURCE: N/A		ADs No.: 54-EG		WBS No.: 1.4.9.1.2.06.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-94: $ 123k	FY-95: $ 128k	FY-96: $ 1738k	FY-97: $ 1909k	FY-98: $ 4570k	FY-99: $ 5925k
FY-2000:$6500k	FY-01: $ 5000k	FY-02: $ 4000k	FY-03: $ 3133k	FY-04: $ 0	FY-05: $ 0k

TOTAL WASTE VOLUME ESTIMATE: 23,272 m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 7,662 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 310 m^3
HAZARDOUS WASTE:	CONCRETE WASTE: 3,344 m^3	STAINLESS STEEL WASTE: 257 m^3
MIXED WASTE: 10 m^3	RUBBLE WASTE: 3,522 m^3	COMBUSTIBLE WASTE: 60 m^3
MUNICIPAL/SANITARY WASTE: 15,600 m^3	LIQUID WASTE:	COMPACTIBLE WASTE: 120 m^3
	OTHER WASTE: (Graphite) 49 m^3	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J. Weighed priority analysis has been performed to determine the overall priority ranking.

PROJECT COST ESTIMATE BASIS:

The MTR Surveillance & Maintenance Cost Account Plan No. 3KNMTA000 and Work Package No. 3KNMTAA00 for WBS No. 1.2.6.1.1.1 were developed in November 1992 by the EG&G Idaho, Inc., Environmental Restoration Program, D&D Unit (Ref. 2). This CAP has an estimated value of $200,000 and requires approximately 1,910 man hours.

The MTR Cleanup Cost Account Plan No. 3KNMTC000 and Work Package No. 3KNMTCC00 for WBS No. 1.2.6.2.1.1 were developed in November 1992 by the EG&G Idaho, Inc., Environmental Restoration Program, D&D Unit (Ref. 3). This CAP has an estimated value of $26,800,000 and requires approximately 326,000 man hours. This CAP only covers work from FY 1998 to FY 2001 and does not include information on D&D tasks through FY 2004.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

MTR-603 Reactor Building
The oldest of the INEL Test Reactors, the Materials Test Reactor (MTR) was first operated in 1952 and was the second reactor to be operated at the INEL (Ref. 7). Successful operation resulted in the development of several plate-type reactors including the Engineering Test Reactor (ETR) and the Advanced Test Reactor (ATR). The MTR also contributed to the development of pressurized water reactors, organic reactors, liquid metal reactors, and homogeneous reactors.

The 40 MW_t (thermal) MTR could provide neutron fluences averaging 2.5×10^{14} n/cm^2-s, and maximum fluences of 5×10^{14} n/cm^2-s. Following the first nuclear startup on March 31, 1952, the reactor was operated at 30 MW_t until September 19, 1955 when the thermal output was increased to 40 MW_t.

During August 1958, the MTR became the first reactor to be operated using plutonium-239 as fuel at power levels up to 30 megawatts. The demonstration proved the feasibility of fabricating a plutonium-fuel core capable of withstanding high-power, high-flux conditions. The test also demonstrated that a reactor fueled with plutonium can be satisfactorily controlled (Ref. 7).

The fuel was contained in the active core within a lattice region that was 41 cm x 71 cm x 61 cm, which was surrounded by a 102 cm (high) beryllium reflector. Both lattice and reflector were encased in an aluminum tank, which was extended by stainless steel sections at the top and bottom, to form a 9.1 m (deep) tank with top and bottom enclosures. Demineralized water flowed through the reactor tank at 1.5 m^3/s to dissipate the 40 MW_t of heat. Reactor heat was transferred to secondary water through a flash evaporator, which then was released to the atmosphere through a forced draft cooling tower.

The MTR logged just under 180,000 MW-days and more than 19,000 neutron irradiations before retirement on August 21, 1970 and partial dismantling and decommissioning in 1974 (Ref. 7).

The MTR is located in building MTR-603, which contains the reactor structure and a storage canal. The main building is 39.6 m square, 24.4 m high, and has a 5.2 m (deep) basement. The reactor shielding is in the center of the building. The removable top head of the reactor provides access to the reactor core for refueling and test train handling. Most irradiated material left the reactor tank through an underwater discharge mechanism, passing downward through the subpile room to the storage canal.

During FY 1980, water used for additional shielding was drained from the reactor vessel after external radiation levels indicated it was no longer required, thus reducing the volume of water being pumped to the leaching pond by 1.987×10^3 m^3 per year.

All experimental cubicles and loop equipment were removed from the MTR-603 basement with the exception of HB-2 and VH-3. The HB-2 cubicle contains an assortment of pumps and piping contaminated to approximately 100 mR/h. Piping leading in and out of the cubicle was disconnected but not decontaminated. The VH-3 cubicle is being used as a training simulator for ETR and ATR. An experimental loop control panel, decontamination room, reactor canal, PBF test train assembly area (TTAF) and fuel vault are also in the basement.

The MTR-603 HB-2 Cubicle was decontaminated and decommissioned from April 1985 to September 1985 as documented in D&D Final Report EGG-2431, published in December 1985. All equipment was removed, walls and ceiling were decontaminated and removed, and the floor scrabbled and replaced. The finished, post-D&D area, is an open floor space, which has since been modified for additional office space (Ref. 5).

The south side of the MTR-603 main floor was used by Exxon Nuclear Idaho Company (ENICO) as a valve operation and remote maintenance checkout facility from 1976 to 1985.

The main reactor overhead crane 45,359 Kg (50 ton) capacity is extensively used for loading and unloading casks from trucks. The portion of the main floor not used for valve testing provides access for the trucks as well as for cask and other experimental equipment storage.

The primary sump tank, seal tank, and some auxiliary cooling loop piping will be used in an upgrade of the Test Reactor Area (TRA) radioactive liquid waste handling capability (Ref. 1).

MTR-603 Canal
The canal is 2.4 m wide x 5.5 m deep and extends 42.7 m eastward from the west wall of the MTR. The canal is lined with stainless steel and purged with demineralized water. The east end of the canal is connected to the (ARMF) canal by a 5.1 cm shuttle tube, which was inactivated in 1983. Spent fuel, irradiated samples, and associated equipment stored in the canal during operation were removed in 1985.

The canal is being used for the Power Burst Facility (PBF) irradiated fuel storage in support of the Design & Assembly Group activities. Specifically, the Test Train Assembly Facility (TTAF) (Ref. 1)

MTR-604 Reactor Building Wing
The west wall of the MTR reactor building is common with the east side wall of the wing. The wing is basically rectangular (about 43.3 m east-west by 39.6 m north-south), has a full basement and a partial second floor (formerly called the Fan Loft).

In the wing basement are heating and ventilation equipment (enclosed in the central area), electrical switchgear, storage areas, and some offices currently being used on the west side. The wing first floor is generally in use and has offices, chemical and instrumentation laboratories, a machine shop, model shops, a RIOT computer area, storage areas, and the Radiation Measurements Laboratory. The latter provides a range of services including specialized radiation dosimetry and spectroscopy, neutron activation analyses, and radioactive effluent monitoring and analyses utilizing computer techniques. The partial second story (fan loft) has offices in the north-south leg and a storage area in the east leg.

The wing has three single story extensions of similar construction. One extension (MTR-668) is flush with the wing west wall on the wing north side. There are two extensions on the south side and the smaller of these is flush with the wing east wall, and the larger, known as the Alpha Wing (MTR-661) is flush with the wing west wall.

The wing north extension (MTR-668) was constructed in 1956 and has a utility tunnel below grade. This extension is currently in use as instrumentation and physics laboratories, and office space. The alpha wing (south) extension (TRA-661) was constructed in 1962 and has laboratories on both sides of a central north-south corridor; the laboratories are used to perform radiochemical separation techniques, to measure particle and photon energies, and to perform nuclear spectrometry. This wing also has a utility tunnel at the basement level.

To the west of the reactor building wing (MTR-604) and joined only by a common central corridor are two additional wing extensions (TRA-652 and 649) that were built in 1966 and are currently in use entirely as offices and administrative areas. The middle (east) wing "B" (TRA-652) extension is a two-story structure and wing "C" (TRA-649) is a single story structure.

MTR-605 Process Water Building
This building housed the equipment required for the heat exchange of the primary loop cooling water from the MTR. The three flash evaporators are located in the upper story above the tank room. In addition to the flash evaporators the building contains a 379 m^3 capacity sump tank, a ventilation system, and various pumps and piping. The primary pumps and flash evaporators are contaminated to an extent that would present problems in decontamination and disposal. A modification to use the building, sump tank, and seal tank as an integral part of the TRA radioactive water cleanup system was completed in 1980 (Ref. 1). Much new piping and equipment has been and is being installed in the building for this project.

MTR-610 Fan House
This building contains five large fans and fan motors, which draw air from the various MTR buildings and exhaust through the MTR-710 stack, all are contaminated. Three fan motors have been removed leaving two fans and motors in operation for the ventilation system. The above-ground air ducts between the various MTR buildings and the fan house are part of this system and are internally contaminated. The switchgear in the building was removed to facilities electrical equipment storage (Ref. 1). All of the blower rooms are radioactively contaminated and are separated from the main part of the fan house by closed doors. The main part of the fan house is used for storage of electrical cabling and wire.

MTR-611 & 657 Plug Storage Facilities
These structures are horizontal pipes or receptacles provided to contain the reactor neutron beam holes plugs when not in use. These receptacles (32 in MTR-657 and 14 in MTR-611) are shielded by earth. MTR-611 is contained only by a faceplate that opens to the reactor services building. MTR-657 is

contained by concrete walls facing the side of the reactor building. The contamination is a result of activation products and is moderate (Ref. 1). A portion of MTR-657 is being used as a radiation (radioactive components storage) area and is cordoned off by a 1.8 m high chain-link fence and two sets of locked gates.

MTR-626 Compressor Building

The compressor building is located just east of the reactor building's northeast corner. All compressor equipment and piping have been removed from the building interior, although two large air receivers remain (abandoned) outside the east side of the building.

Outside the compressor building nest to the east wall is an operating electrical transformer on a 3.0 m square concrete pad. The transformer is enclosed on three sides by a 4.6 m high cyclone fence that has a padlocked personnel access gate. A yellow CAUTION placard indicates the unit contains PCBs.

MTR-630 Catch Tank Pump Pit

The pump pit is located west of the reactor services building and south of the reactor building wing beneath a concrete slab. The slab is a 0.3 m above ground level and on the north center side has a 0.9 by 1.5 m access hatch (and ladder) with a steel cover. The pump pit beneath the concrete slab is 2.0 m deep and has 0.3 m thick concrete retaining walls and floor. A drain sump is in the south center side of the floor, two catch tank transfer pumps are emplaced along the north side of the pit floor. Thirty-odd valve stems with handles or handwheels extend about 0.9 m above the concrete slab. The stems penetrate the slab and connect to valves in the piping in the pump pit.

MTR-635 Service Building

The MTR Service Building (MTR-635) is adjacent to (and its north wall is common with) the reactor building south wall. The services building is 48.8 m north-south by 29.6 m east-west with a 14.0 m wide walled off extension (with 2 doors) at the southwest side that extends west 4.0 m where it abuts a plug storage area (MTR-611). This building is mainly a high bay area and is 7.9 m high. The western third of the building has a second floor, which is entirely used as office space. At the northeast corner is a two story walled off room (Room 101) that was used as a part of the 20-meter neutron chopper house (TRA-665) and is now used as a temporary laboratory, interim fissile material storage area, and on the east side, a control data acquisition facility associated with the accelerator in the adjacent neutron chopper house. The remainder of the main floor of the building is primarily used for warehousing and a materials staging area for the various site projects.

MTR-706 Working Reservoir Pipe Pit
About 22.9 m east of the MTR process water building (MTR-605) is the process piping pit and the steam injector pit. The latter is a concrete building at the east end of a 3.0 by 3.5 m concrete pad, which is the top of the processing piping sump pit. Surrounding this location is a radiation control area fence, a two strand wire fence that runs 12.2 m on each side and that also encloses four concrete piers. The concrete building that encloses the injector pit is 1.7 by 3.5 m and 2.0 m high. Access is through a metal door and down a stairs-like ladder on the south side. The pit floor is about 3.0 m below grade.

MTR-710 Stack & Monitor Building
The MTR stack is 4.1 m diameter at the base and is 76.2 m high. The inside diameter is 3 m at the base tapering to 1.5 m at the top. The MTR stack was decommissioned, the main blowers were shut down, and the draft bypass was activated. Laboratory exhausts not containing acid vapors are filtered through a High Efficiency Particulate (HEPA) filter and then discharged to the atmosphere (Ref. 1).

MTR-712 Retention Basin
The retention basin is located about 45.7 m directly south of the MTR fan house and consists of two underground rectangular concrete tanks. Each tank is 39.6 m long by 6.1 m wide by 6.1 m deep, separated by a 0.3 m thick common concrete wall. A serpentine flow path is created through the tanks by use of 0.3 m thick concrete baffles across the width of each tank at 3.0 m intervals. Six baffles hang from the roof and 5 alternate baffles stand on the basin floor. Each tank has a capacity of 1,363 m^3.

MTR-730 Catch Tanks
Four black-iron glass lined tanks, 5.7 m^3 capacity, are underground, south of the reactor building. Two catch tanks receive water from the laboratories and selected building drains. The other two catch tanks receive water from the TRA hot cells. While one of the tanks is receiving water from its source, the other is either in a standby condition or is being sampled for radioactivity in preparation for pumping.

The vent scrubber system provides the capability for treating radioactive and corrosive fumes from various hoods in the laboratories, alpha laboratory, and hot cells. The fumes are washed with caustic liquid in a scrubbing tower to neutralize the acids and to wash out most of the radioactive contaminants. The caustic effluent is neutralized and then drained to the catch tanks. The scrubbing tower is not used, although the off-gas system is still in service.

The hot drain system removes liquid with activity less than the activity of reactor primary water. The system was primarily used for experimental loop effluent and reactor primary water.

The catch tanks are normally filled once per week. A full tank is recirculated and sampled to determine if the contents are of sufficiently low radioactivity levels to be discharged to the retention basin or if the tank must be discharged into the hot waste storage tank (Ref. 1).

MTR-607 Auxiliary Facility

This one-story building is constructed of hollow concrete blocks with insulated metal siding. It has a composition roof, concrete floors, and large window areas on all sides. The building interior measures 14.6 m north-south and 13.4 m east-west. A double-wide double door access enclosure is on the west side and a single door access enclosure is on the east side. The north 14.6 m by 13.4 m area served as the pump room and is about 3.0 m below grade.

A battery bank located in the southwest floor area is in service and is used for backup electrical power for the TRA fire alarm system.

MTR-612 Sump Pump House

This is a small 3.0 m square wood frame building built on a concrete pad that surrounds it.

MTR-636 Monitoring Station

At the north end of the retention basin is the basin monitoring station (MTR-636). This is a one-story building about 3.0 m square with a corrugated metal roof and sides and a concrete floor. A metal roll-up door is on the east side. A concrete pad on the east, north, and west sides of the building has three metal hatch covers, several valve reach rod stems and handles, motor controls, and a 0.3 m diameter metal vent stack about 6.1 m high. A similar concrete pad more than 30.0 m to the south has a similar arrangement of hatch covers, valve and motor controls and a 6.1 m high stack.

MTR-641 Gamma Facilities Building

This structure is 18.9 m east-west by 10.0 m north-south and is a single story building about 6.7 m high. Constructed of 20.3 cm hollow concrete blocks, it has a reinforced concrete floor and composition roof of poured concrete on steel beams and steel joists.

Adjacent to the building south wall is a corrugated metal cold storage building measuring 9.1 m north-south by 3.0 m east-west and is being used for cold storage of unrefrigerated chemical stock.

A 12.2 m long by 4.9 m deep (dry) canal runs east-west just south of the building's east-west centerline. The canal is 2.1 m wide and has a 0.9 m high 0.3 m thick concrete parapet around it. Along the south wall is a 12.2 m long, 4.9 m deep, and 1.2 m wide piping pit under concrete covers except at the east end, which has a 0.6 by 1.2 m metal grating. With the grating removed, a ladder integral with the east wall of the pit provides access. The pit contains a pump, motor, valves, and piping. There is a 0.6 m deep sump near the east end. Exiting the south wall underground is a 10.2 cm warm drain pipe (cast iron) that is routed to the catch tank outlet piping, which in turn goes to the retention basin.

<u>MTR-651 Auxiliary Facility</u>
This structure is used as a storage building and is 8.5 m deep east-west and 7.3 m wide north-south. It is 4.3 m high at the sides with a 0.9 m higher center-arched roof that slopes north and south and has two 0.3 m roof vents. The building walls and roof are corrugated metal on steel frame and fiberglass insulation on the inside. The floor is reinforced concrete 20.3 cm above grade. Outside the east side of the building is a 3.0 m wide by 2.4 m deep concrete pad in front of two 1.2 m wide sliding doors that provide a 4.0 m high by 2.4 m wide access. A 1.1 m personnel door is in the north wall and 3.0 m above the floor are two 1.2 m square louvered openings. A covered pipe trench below grade on the west side extends from the storage building into the reactor building basement.

<u>MTR-758 Leaching Pond</u>
The leaching pond is a barbed-wire fenced area located south and east of the TRA perimeter fence. It is used for the disposal of radioactively contaminated water. The pond fenced area encompasses more than 68,580 m^2 and has within it three excavated pits.

<u>MTR-885 Auxiliary Facility</u>
All of the MTR D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

<u>MTR-603 Reactor Building</u>
The main building is 39.6 m square, 24.4 m high, and has a 5.2 m (deep) basement. The reactor shielding is in the center of the building. The building utilizes precast insulated concrete slabs, which are bolted to the concrete-encased structural columns to form the walls. The flat roof is constructed of precast concrete panels laid on steel purlins covered with foam-glass insulating blocks and built-up roofing. The main floor is

reinforced concrete and is 0.9 m thick around the reactor vessel (23.8 m^2) and surrounding this the remainder of the floor is 0.3 m thick. The balcony floors are generally 10.2 cm thick and fabricated from reinforced concrete. The basement floor is constructed of reinforced concrete and is 0.3 m thick. It rests on soil, which has been tamped to carry a load of 40,045 Kg/m^2.

MTR-603 Canal

The canal in the reactor building basement is considered an integral part of the overall facility design. The main section of the canal is 2.4 m wide and extends eastward from the east face of the reactor. The canal section termed "rabbit canal," that lies partially beneath the reactor west wall is 1.8 m wide. A 2.1 m wide canal parapet connects these sections and extends through the reactor subpile room. This section of canal has been drained and sealed off. The parapet around the main canal is 25.4 cm thick at the bottom and projects outward to a width of 33.0 cm at the top. This projection provides toe space and also gave personnel better stability when working from the parapet. The top of the parapet is 0.9 m above floor level.

The bottom of the hydraulic rabbit canal is 0.8 m below the basement floor level. The water level in the canal was maintained 0.6 m above the basement floor level providing depths of water in the rabbit canal and main canal of 2.4 m and 5.5 m respectively.

Outside the reactor building, the canal has a 0.8 m wide working space on each side and at the east end. This working space is enclosed by a tunnel or canal envelope 4.2 m high and 6.4 m wide. The tunnel extends 26.7 m beyond the reactor building east wall.

The canal walls were originally covered with 20.3 by 40.6 cm white glazed structural tile 10.2 cm thick, and the bottom was lined with 10.2 cm of white concrete. A stainless steel liner was later installed to inhibit leakage. All of the canal except the section underneath the reactor vessel was lined with stainless steel. This section has been drained, and a permanent bulkhead installed to isolate it from the remainder of the canal. A cover and shielding has been placed over this section to protect personnel.

MTR-604 Reactor Building Wing

The west wall of the MTR reactor building is common with the east side wall of the wing. The wing is constructed of 20.3 cm hollow concrete blocks, is basically rectangular (about 43.3 m east-west by 39.6 m north-south), and has a full basement and a partial second floor. The basement floor is concrete and the first floor is concrete largely covered by tile. The roof is composition on steel beams with a ceiling of noncombustible tile.

MTR-605 Process Water Building

This structure is 36.6 m east-west by 23.2 m north-south. The building has a basement and the 15.2 m east end has a second floor that is accessible by an inside stairway to the first floor north roof and an outside stairway above the roof to the northwest corner of the evaporator room.

The building has concrete walls and floors and a composition roof with steel beams and a gravel top.

Along the north side beneath the first floor at the basement level is a pipe tunnel that contains the old MTR primary coolant piping as well as some newly installed piping that is being used as part of the TRA radioactive waste cleanup system.

MTR-610 Fan House

This structure is 20.1 m east-west by 14.6 m north-south and the ceiling height inside is 5.5 m above the floor. This one-story building is constructed of hollow concrete block with a reinforced concrete floor and a composition roof (on poured concrete on fiberboard on steel beams).

There are three large blower rooms associated with this building. All of the blower rooms are radioactively contaminated and are separated from the main part of the fan house by closed doors. Each blower room has a set of double swinging doors on the outside of the building.

MTR-611 & 657 Plug Storage Facilities

MTR-657 comprises two structures adjacent to the north side of the first floor of the reactor building (MTR-603). One structure is the 853.4 m^2 roofed enclosure, which is used primarily as a storage area and vehicle passageway through the 4.3 m high roll-up truck doors, one each on the north and south walls. This structure has 20.3 cm hollow concrete block walls on the north and east sides, a reinforced concrete floor, thick, and a composition roof on a reinforced concrete deck.

The other structure on the west end is a 12.2 m east-west by 15.2 m north-south area that has 32 horizontal steel tubes embedded in 3.7 m deep gravel backfill. The gravel backfill is contained within walls on the north and west sides (without a roof), which are constructed of reinforced concrete 20.3 cm thick.

Approximately 381.0 m^2 on the west side of the roofed enclosure is cordoned off as a radiation and radioactive components storage area by a 0.8 m high north-south chain link fence with two locked gates.

MTR-611 abuts the west side of the MTR reactor services building (MTR-635) at the southwest corner. It consists of a mound of earth fill, which covers 14 horizontal storage tubes that penetrate the reactor services building concrete west wall, from which two mound-supporting concrete abutments at least 0.3 m thick extend 4.1 m (at about a 30-degree angle) to the north-northwest and south-southwest. The steel tubes are at least 2.4 m deep in the mound, which extends 6.7 m west of the services building and measures about 10.7 m north-south. The mound tapers off to ground level on the north, west, and south sides and consists of approximately 665.2 cubic meters of compacted earth fill.

MTR-626 Compressor Building

This structure is 14.6 m north-south and 9.4 m east-west and is approximately 6.1 m high. The building is constructed of 20.3 cm hollow concrete block with windows on all sides except the west wall. There is a roll-up truck door and a personnel door on the north side and a sealed personnel door on the south side.

A new roof was installed on the building and consists of concrete supports, steel joists, metal decking, rigid insulation, and polyester fabric. The roof is topped with a layer of crushed gravel.

The building floor is concrete; the south half is about 0.6 m below grade, the north floor is level and slightly above grade.

MTR-630 Catch Tank Pump Pit

The pump pit is located west of the reactor services building and south of the reactor building wing beneath a concrete slab that measures 6.7 m east-west by 4.9 m north-south. The slab is 0.3 m above ground level and on the north center side has a 0.9 by 1.5 m access hatch (and ladder) with a steel cover. The pump pit beneath the concrete slab is 2.0 m deep and has a 0.3 m thick concrete retaining walls and floor. A drain sump is in the south center side of the floor, two catch tank transfer pumps are emplaced along the north side of the pit floor. Thirty-odd valve stems with handles or handwheels extend about 0.9 m above the concrete slab. The stems penetrate the slab and connect to valves in the piping in the pump pit.

MTR-635 Service Building

This building is adjacent to (and its north wall is common with) the reactor building south wall. The services building is 48.8 m north-south by 29.6 m east-west with a 14.0 m wide walled off extension (with 2 doors) at the southwest side that extends west 4.0 m where it abuts a plug storage area (MTR-611). This building is mainly a high bay area and is 7.9 m high. The western third of the building has a second floor, which is entirely used as

office space. At the northeast corner is a two story walled off room (Room 101) that was used as a part of the 20-meter neutron chopper house (TRA-665) and is now used as a temporary laboratory, interim fissile material storage area, and on the east side, a control data acquisition facility associated with the accelerator in the adjacent neutron chopper house.
This building is constructed of 20.3 cm hollow concrete blocks set in a steel frame with a composition roof on poured concrete that is on steel joist beams on steel columns. The floor is reinforced concrete.

MTR-684 North Storage Area

MTR-706 Working Reservoir Pipe Pit
About 22.9 m east of the MTR process water building (MTR-605) is the process piping pit and the steam injector pit. The latter is a concrete building at the east end of a 3.0 by 3.5 m concrete pad, which is the top of the processing piping sump pit. Surrounding this location is a radiation control area fence, a two strand wire fence that runs 12.2 m on each side and that also encloses four concrete piers. The concrete building that encloses the injector pit is 1.7 by 3.5 m and 2.0 m high. Access is through a metal door and down a stairs-like ladder on the south side. The pit floor is about 3.0 m below grade On the southwest section of the concrete pad is a badly deteriorated concrete plug that covers a hatch opening to the pipes underground.

MTR-710 Stack & Monitor Building
The MTR exhaust stack is 76.2 m high and tapered from 3.0 m inside diameter at the base to 1.5 m inside diameter at the top. Metal ladder rungs are integral with the concrete structure on the south exterior and afford exposed personnel access to the stack top.

The monitoring building adjacent to the north measures approximately 3.4 by 3.4 m and is 2.4 m high inside. It is constructed of concrete blocks and has a concrete slab floor. A 1.7 m long by 0.8 m diameter delay tank is buried about 1.5 m east of the monitoring building.

MTR-712 Retention Basin
The retention basin is located about 45.7 m directly south of the MTR fan house and consists of two underground rectangular concrete tanks. Each tank is 39.6 m long by 6.1 m wide by 6.1 m deep, separated by a 0.3 m thick common concrete wall. A serpentine flow path is created through the tanks by use of 0.3 m thick concrete baffles across the width of each tank at 3.0 m intervals. Six baffles hang from the roof and 5 alternate baffles stand on the basin floor. Each tank has a capacity of 1,362.7 m^2.

<u>MTR-730 Catch Tanks</u>

These tanks are located to the south of the MTR-630 Catch Tank Pump Pit. They are 2.3 m underground and are labeled 309-A, B, C, and D. They are mounted on steel frames on a 5.2 by 8.2 m concrete slab that is 4.6 m below grade. Centrally located on the slab are natural drainage sumps and a 1.0 m diameter dry well that extends 0.3 m above grade. The four catch tanks are each 5.7 m^2 capacity, are constructed of black iron, and are glass-lined.

<u>MTR-758 Leaching Pond</u>

The leaching pond is a barbed wire fenced area located south and east of the Test Reactor Area (TRA) perimeter fence. It is used for disposal of radioactively contaminated water. The pond fenced area encompasses more than 68,580 square meters and has within it three excavated pits. The eastern most pit is 76.2 m wide by 121.9 m long, the other two are 39.6 m wide by 73.2 m long each. Fluid capacity of the three pits is 28,390.5 m^3.

<u>MTR-607 Auxiliary Facility</u>

This one-story building is constructed of hollow concrete blocks with insulated metal siding. It has a composition roof, concrete floors, and large window areas on all sides. The building interior measures 14.6 m north-south and 13.4 m east-west. A double-wide double door access enclosure is on the west side and a single door access enclosure is on the east side. The north 14.6 m by 13.4 m area served as the pump room and is about 3.0 m below grade.

A battery bank located in the southwest floor area is in service and is used for backup electrical power for the TRA fire alarm system.

<u>MTR-612 Sump Pump House</u>

This is a small 3.0 m square wood frame building built on a concrete pad that surrounds it.

<u>MTR-636 Monitoring Station</u>

At the north end of the retention basin is the basin monitoring station (MTR-636). This is a one-story building about 3.0 m square with a corrugated metal roof and sides and a concrete floor. A metal roll-up door is on the east side. A concrete pad on the east, north, and west sides of the building has three metal hatch covers, several valve reach rod stems and handles, motor controls, and a 0.3 m diameter metal vent stack about 6.1 m high. A similar concrete pad more than 30.5 m to the south has a similar arrangement of hatch covers, valve and motor controls and a 6.1 m high stack.

MTR-641 Gamma Facilities Building

This structure is 18.9 m east-west by 10.1 m north-south and is a single story building about 6.7 m high. Constructed of 20.3 cm hollow concrete blocks, it has a reinforced concrete floor and composition roof of poured concrete on steel beams and steel joists.

Adjacent to the building south wall is a corrugated metal cold storage building measuring 9.1 m north-south by 3.0 m east-west and is being used for cold storage of unrefrigerated chemical stock.

A 12.2 m long by 4.9 m deep (dry) canal runs east-west just south of the building's east-west centerline. The canal is 0.8 m wide and has a 0.9 m high 0.3 m thick concrete parapet around it. Along the south wall is a 12.2 m long, 4.9 m deep, and 1.2 m wide piping pit under concrete covers except at the east end which has a 0.6 by 1.2 m metal grating. With the grating removed, a ladder integral with the east wall of the pit provides access. The pit contains a pump, motor, valves, and piping. There is a 0.6 m deep sump near the east end. Exiting the south wall underground is a 10.2 cm warm drain pipe (cast iron) that is routed to the catch tank outlet piping which in turn goes to the retention basin.

MTR-651 Auxiliary Facility

This structure is used as a storage building and is 8.5 m east-west and 7.3 m north-south. It is 4.3 m high at the sides with a 0.9 m higher center-arched roof that slopes north and south and has two 0.3 m roof vents. The building walls and roof are corrugated metal on steel frame and fiberglass insulation on the inside. The floor is reinforced concrete 20.3 cm above grade. Outside the east side of the building is a 3.0 m wide by 2.4 m deep concrete pad in front of two 1.2 m wide sliding doors that provide a 4.0 m high by 2.4 m wide access. A 1.0 m personnel door is in the north wall and 3.0 m above the floor are two 1.2 m square louvered openings. A covered pipe trench below grade on the west side extends from the storage building into the reactor building basement.

MTR-685 Auxiliary Facility

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Widespread low-level contamination exists in most facility structures (Reference 8).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-8, Aerial Photograph of the Test Reactor Area (TRA); Figure B-9, MTR Complex Plot Plan, copied directly Reference 9; Figure B-10, MTR High Bay Photograph, and Figure B-11, MTR Cutaway Isometric, copied directly from Reference 8.

The MTR Characterization Report, Reference 8, provides a complete set of schematics and drawings detailing each of the facility structures.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mail stop,etc.]

D. E. Baxter, MTR and Engineering Test Reactor (ETR) Project Manager, EG&G Idaho, Inc., 526-5519, TSB, MS 2414, Profs ID DDB.

D. J. Kenoyer, MTR and Engineering Test Reactor (ETR) Project Manager (Alternate), EG&G Idaho, Inc., 526-9837, TSB, MS 2414, Profs ID DNK.

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The MTR-605 Process Water Building was decontaminated and decommissioned from February 1984 to September 1984 as documented in the D&D Final Report EGG-2361, published in January 1985. The four evaporators and associated pumps, valves, piping, strainers, etc. were all removed from the building. The finished, post-D&D area, is an open floor space (approximately 5600 sf) available for reuse. Total decontamination of the building was not completed because of cost/benefit trade-offs. Those areas still contaminated are shielded vaults with no planned present or future need (Ref. 6).

The MTR-657 Plug Storage Facility was decontaminated and decommissioned from April 1983 to October 1983 as documented in the D&D Final Report EGG-2286, published in January 1984. All the storage holes are empty and have been decontaminated to levels below 500 dpm/40 cm^2 β-α. At the INEL, less than 200 dpm/40 cm^2 β-α is considered clean (Ref. 4).

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The primary concern with this project will be the determination of the mode and method for D&D of the MTR reactor vessel and components. The reactor core components are highly radioactive.

PERMITTING REQUIREMENTS:

It is anticipated that D&D of the MTR will be permitted under the INEL site wide Environmental Information System (EIS) scheduled to be approved by 1996. Independent NEPA documentation would probably also require an EIS.

SURVEILLANCE and MAINTENANCE STATUS:

Currently the S&M Program of the D&D Unit does not perform any S&M work tasks for the MTR. The MTR Facility and Maintenance (F&M) Program has the overall facility responsibility for performing routine surveillance of and maintaining the facility.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

A decision analysis has not been performed for this facility; the recommended D&D mode has yet to be determined.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

TBD

WASTE VOLUME ESTIMATE BASIS:

Characterization of the MTR, Reference 8.

FACILITY REUSE CONSIDERATIONS:

Reuse considerations will be determined following the results of the Decision Analysis Report to be prepared in 1996.

REFERENCES:

1. Long Range Plan for Decontamination and Decommissioning Excess Contaminated Facilities at the INEL, Report No. PR-W-79-005, Revision 4, dated May 1983, Section 2.2, Materials Test Reactor, pages A-59 to A-71.

2. MTR Surveillance & Maintenance Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNMTA000 / WBS No. 1.2.6.1.1.1]

3. TTAF Cleanup Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNMTC000 / WBS No. 1.2.6.2.1.1]

4. Decontamination and Decommissioning MTR-657 Plug Storage Facility, Final Report, EGG-2286, prepared by Linda L. Kaiser, published January 1984.

5. Decontamination and Decommissioning MTR-603 HB-2 Cubicle, Final Report, EGG-2431, prepared by Donald L. Smith, published December 1985.

6. Decontamination and Decommissioning MTR-605 Process Water Building, Final Report, EGG-2361, prepared by Joe H. Browder and Everet L. Wills, published January 1985.

7. Idaho National Engineering Laboratory Publication, BP 380-R-0886-5M-A, assumed date August 1986, Detailing INEL history for public relations, Materials Testing Reactor (MTR), page 33.

8. Characterization of the MTR, WM-F1-83-016, dated April 1984, prepared by R. L. Rolfe and E. L. Wills.

9. INEL D&D Long Range Plan, PR-W-005, Revision 8, dated September 1991, prepared by M. Sekot and R. Buckland.

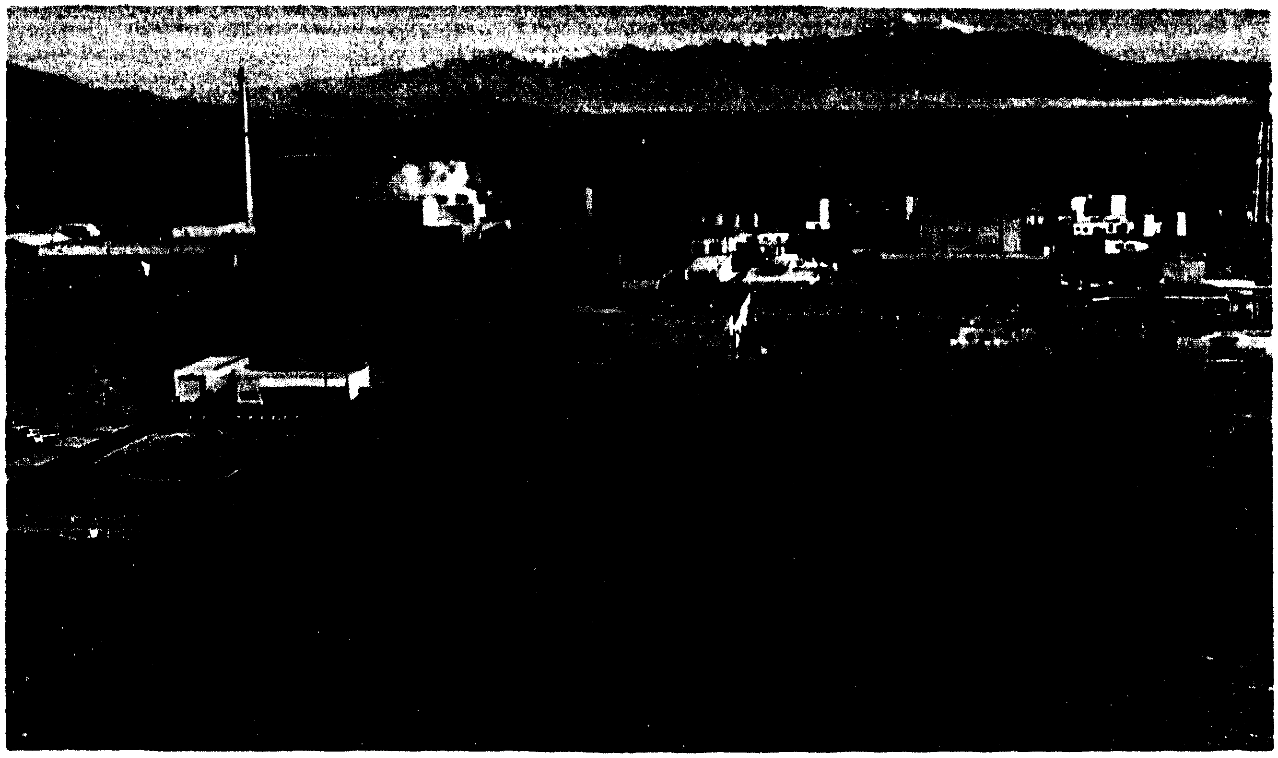

Figure B-8. Aerial photograph of TRA.

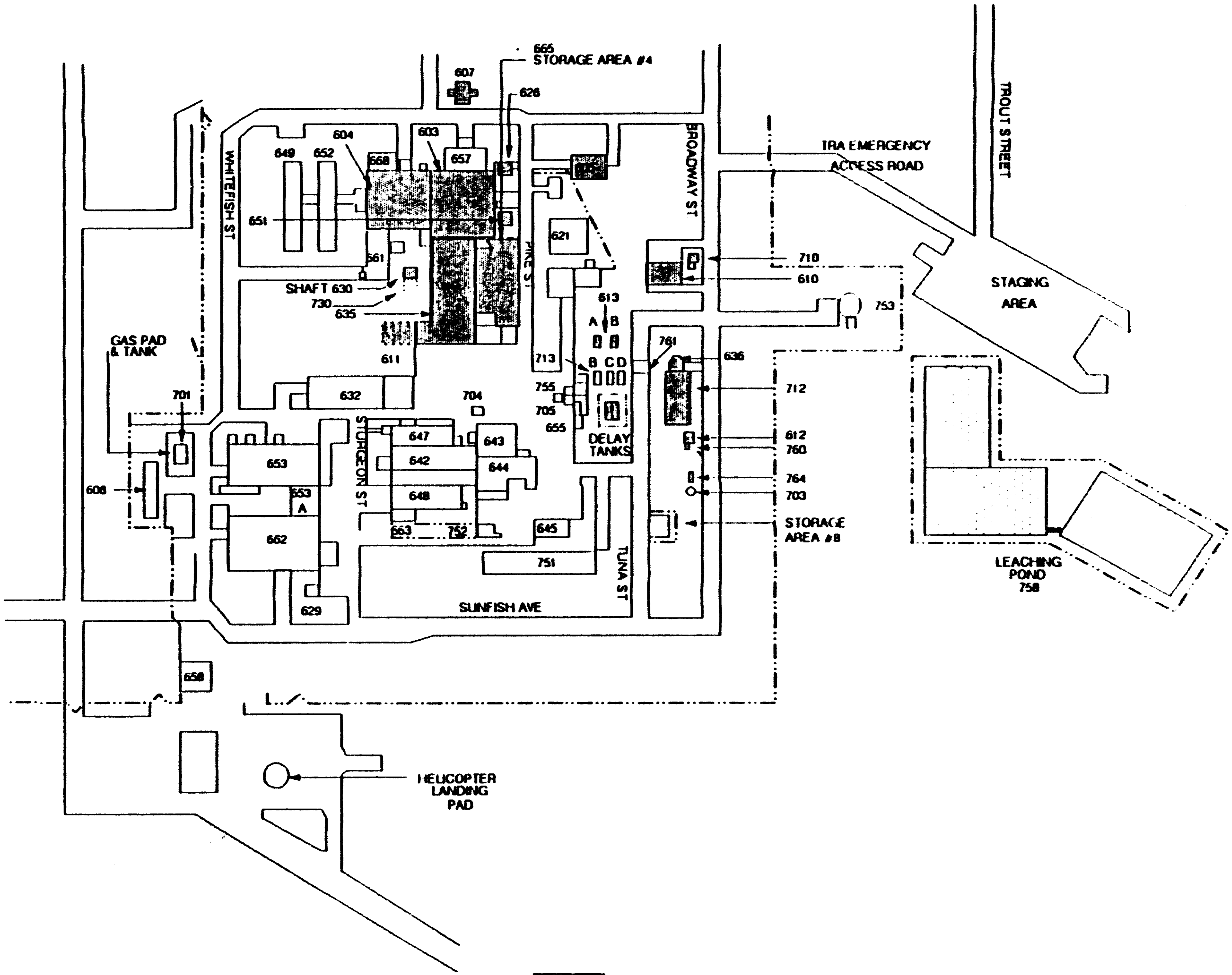

Figure B-9. MTR Complex Plot Plan.

Areas targeted for D&D

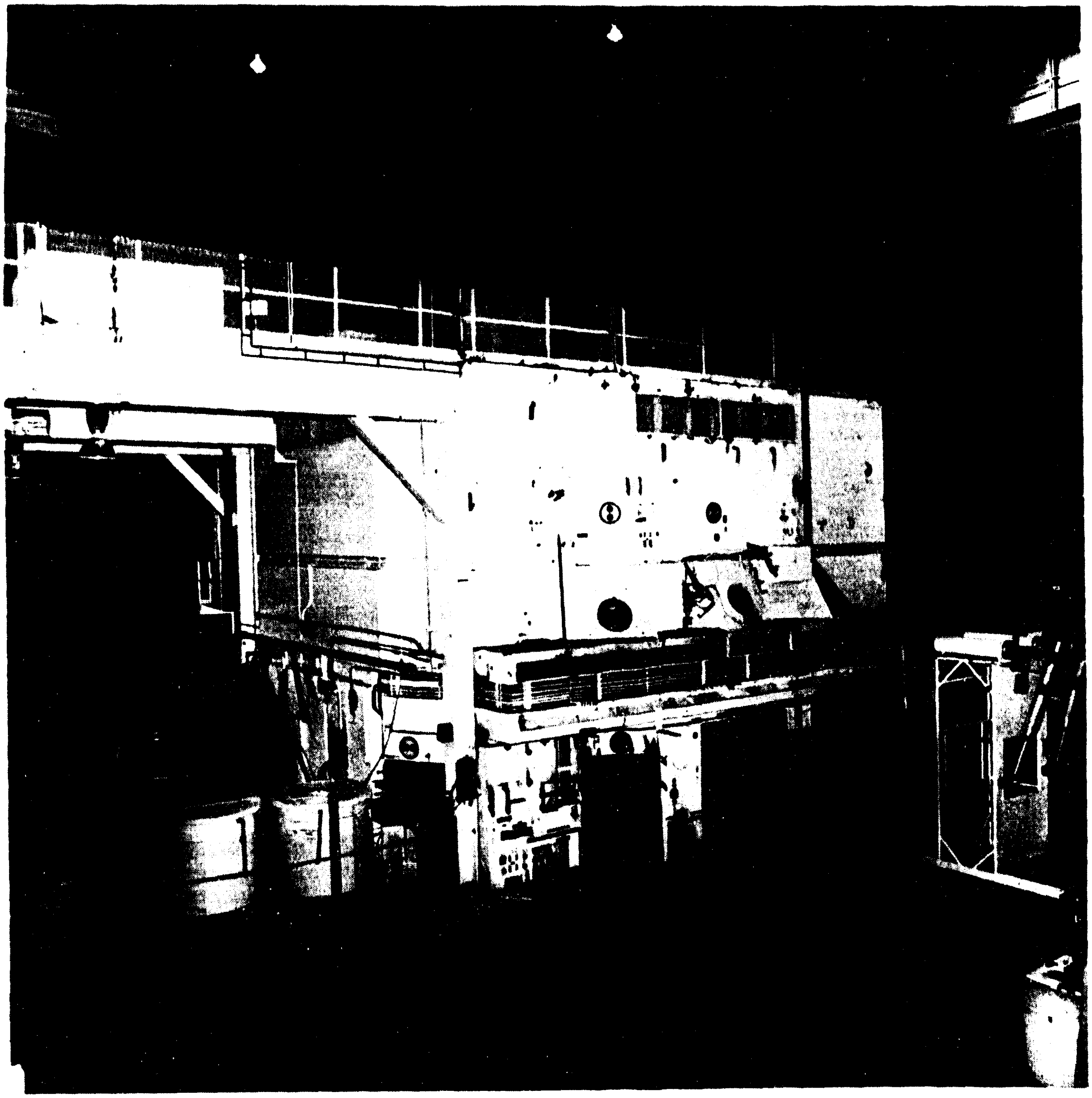

Figure B-10. Part of the first floor of the reactor building showing south side of reactor structure.

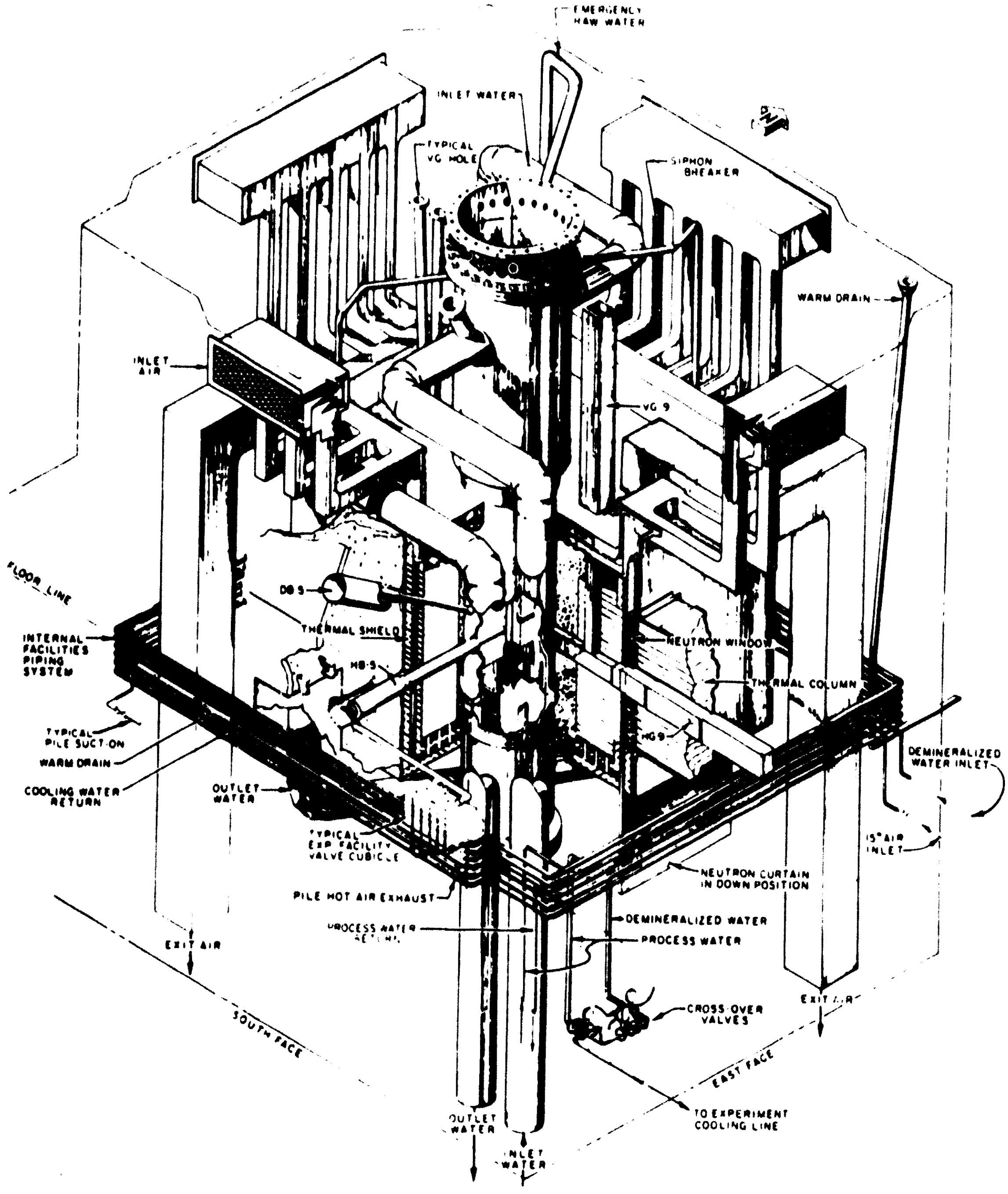

Figure B-11. Cutaway isometric of reactor structure showing typical arrangement of penetrations, piping, experiment facilities, and air ducts.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **CFA-669 Hot Laundry**					
PROJECT PRIORITY: 5		PRIORITY BASIS: Cost Benefit Analysis/Public Hazard			
SCHEDULE DURATION: 3 yrs		SCHEDULE ID:			
TOTAL ESTIMATED COST: $2958K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 369K	
FUNDING SOURCE: EW2010402		ADs No.: 58-EG		WBS No.: 1.4.9.1.2.07.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) None		
FY-93: $ 1573k	FY-94: $ 853k	FY-95: $ 164k	FY-96: $ 0k	FY-: $ k	FY-: $ k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
TOTAL WASTE VOLUME ESTIMATE: 202.8 m^3				ESTIMATE BASE YEAR: 1993	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): 143.1 m^3			
TRU WASTE:		SOIL WASTE:		CARBON STEEL WASTE: 34 m^3	
HAZARDOUS WASTE:		CONCRETE WASTE: 20 m^3		STAINLESS STEEL WASTE:	
MIXED WASTE: 9.7 m^3		RUBBLE WASTE: 74 m^3		COMBUSTIBLE WASTE: 15.1 m^3	
MUNICIPAL/SANITARY WASTE: 50 m^3		LIQUID WASTE:		COMPACTIBLE WASTE:	
		OTHER WASTE:			

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

CFA-669 was constructed in 1950 to serve as the "hot" and "cold" laundry for INEL site contractors. In the mid-1970s, a new laundry facility was proposed and subsequently built because CFA-669 did not comply with required standards. The use of CFA-669 was discontinued in 1981 after the boiler exploded.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

Facility Interior

CFA-669 has nearly 4500 ft^2 of floor space.

Rooms 101, 102, and 103. Room 101 was used as a lunch area. Room 102 was the main entry to the laundry room from the outside. Room 103 contains a hot waste heater. These rooms have no traps, floor drains, or pipe clean-outs.

Rooms 104 and 105. These rooms were used as the men's and women's restrooms, respectively. Each room housed showers and contains floor and shower drains and sink traps.

Room 106. This room was a storage area and contains no traps, clean-outs, or drains. There are some wood shelves in the room.

Room 107. This room served as the shipping and receiving area and has no traps, clean-outs, or drains. The room opens into a hallway where a recessed scale in the floor was used to weigh laundry bundles.

Room 108. This was the main laundry area. The room houses five dryers, two washers, and an extractor. The extractor was used to remove excess water from laundry using centrifugal force. The main HV system is suspended from the ceiling. A drain trench is located near the washers. The drain pipes that lead from the building are beneath the floor.

Room 109. This room was used as a sorting and folding area. There are no drains, traps, or clean-outs in this area.

Room 110. This was the boiler room. The boiler and assorted piping remain in the room. The boiler is damaged from an earlier explosion. A pipe drench and drain are located in the room. A chimney clean-out is located on the outside of the north wall.

Room 111. This is a small room that contains a drinking fountain and a clean-out drain next to the fountain.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

The chemical characterization of CFA-669 is described and reported in Reference 1. A summary of the characterization results is given in this section to generally indicate the extent of hazardous waste and conditions in CFA-669 for planning purposes.

Lead (Pb), cadmium (Cd), and chromium (Cr) concentrations as high as 8380 μg/L, 2390 μg/L, and 1010 μg/L, respectively, were measured in samples taken from dryer clean-outs in Room 108. Concentrations of Pb up to 20,000 μg/L were detected in samples from Room 108 and floor drains in other rooms. The maximum allowable toxic characteristic leaching procedure (TCLP) concentration for Pb is 5000 μg/L (5.0 mg/L); Cd is 1000 μg/L (1.0 mg/L); and Cr is 5000 μg/L (5.0 mg/L). The maximum TCLP concentrations are given to show that some samples contain Pb or Cd of sufficient quantity to be considered a hazardous or mixed waste. Possible sources of these heavy metals are paint chips from nearby walls and ceiling.

Mercury (Hg) concentrations of 163 and 532 μg/KL were measured in the pipe clean-out and pipe trench in Room 110, respectively. The Hg measurements were flagged to indicate the spiked sample recovery, and the duplicate analyses were not within control limits. The maximum allowable TCLP concentration for Hg is 200 μg/L (0.2 mg/L). More than half the air samples taken in Room 110 indicated Hg levels greater than the Occupational Safety and Health Administration (OSHA) exposure limit of 0.05 mg/m^3.

Asbestos was identified in the building and roof. All equipment and material in the boiler room (Room 110) is covered by a fine asbestos-laden dust generated by a boiler explosion. The dust and equipment in the Room 110 are free of any radioactive contamination. A roof material sample indicated that two of the three layers of roofing material contained asbestos.

Benzoic acid (from 70 to 720 μg/L), methylene chloride (from 73 to 1200 μg/L), and acetone (from 72 to 900 μg/L) were detected in soil and debris samples. To define if a sample is hazardous waste, the concentration limit of these organic compounds is determined from a risk-based analysis. Such analysis has not been performed at the time. Barium (Ba) concentrations ranging from approximately 1000 to 3000 μg/L were measured but are significantly below the maximum allowable TCLP concentration of 100,000 μg/L (100 mg/L).

RADIOLOGICAL

The radiological characterization of CFA-669 is described and reported in Reference 1; however, the results are summarized in the following sections to generally indicate the extent and levels of radiological contamination in CFA-669 and for planning purposes.

Gross Alpha and Gross Beta Contamination

Gross alpha concentrations in the 29 grab samples ranged from 6 to 310 pCi/g. Gross beta measurements ranged from 6 to 15,000 pCi/g. The highest concentrations of alpha and beta contamination were measured in samples taken from Room 108. In Room 108, gross alpha measurements ranged from 13 to 310 pCi/g, and gross beta measurements ranged from 310 to 15,000 pCi/g.

Gamma Contamination

The grab samples were analyzed by gamma spectrometry for specific gamma-emitting radionuclides. Radionuclides identified in the samples were Cobalt (Co)-60, Cesium (Cs)-137, Antimony (Sb)-125, Europium (Eu)-152, and Eu-154, and Niobium (Nb)-94. The highest radionuclide activity was measured in samples from Room 108. The sample from the extractor drain pipe measured Co-60 activity of 10,200 pCi/g, Cs-137 activity of 452 pCi/g, and Nb-94 activity of 301 pCi/g. Radionuclides Co-60 (up to 800 pCi/g) and Cs-137 (up to 398 pCi/g) were measured in the dryer clean-outs.

Other Radiological Measurements

Smears, wipes, and direct scans were performed to further characterize the level of removable and fixed radioactive contamination in CFA-669.

Building Roof. The only contamination on the roof is the HEPA filter system at the west end of the building where the contact beta-gamma radiation field measured 300-2000 counts per minute (cpm) above background (removable and fixed).

Building Interior. All smears made in CFA-669 measured less than 200 disintegrations per minute (dpm)/100 cm^2 beta-gamma and less than 20 dpm/100 cm^2 alpha above background. Wipes of HV vents indicated radiological contamination of vents in Rooms 101, 103, 104, 107, and 108. Floor wipes indicated contamination in Room 107, 108, and 109. Floor wipes in the other rooms indicated no radioactive contamination.

Contact radiation measurements of the floor surface in Room 107 and Room 108 revealed localized areas of beta-gamma contamination ranging from 1,000 to 46,000 cpm above background beta-gamma.

Soil. Eight soil samples were collected at four locations outside CFA-669 near the roof runoff drain pipes and analyzed for gross alpha and beta and gamma spectrum. A surface sample and subsurface sample at a depth of 2 ft were collected at each of the four locations.

The gamma-emitting radionuclides identified were Cs-137 and Co-60. The highest specific activity for Cs-137 and Co-60 in all the soil samples was 2.9 pCi/g and 2.7 pCi/g, respectively. These were both detected in surface samples.

The highest concentration of gross alpha detected in the soil samples was 55 pCi/g in a subsurface sample. The highest gross alpha concentration detected in a surface soil sample was 53 pCi/g.

The highest concentration of gross beta in the soil samples was 34 pCi/g.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-12, CFA Plot Plan CFA-669 Location, and Figure B-13, CFA-669 Floor Plan, copied directly from Reference 3.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D. L. Smith, Hot Laundry Project Manager, EG&G Idaho, Inc., 526-9875, TSB, MS 2414, Profs ID DLZ.

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

D&D activities were initiated in November 1992. Current activities have resulted in the removal of contaminated equipment from the building.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

None.

PERMITTING REQUIREMENTS:

NEPA documentation requirements have been satisfied by an approved categorical exclusion (CX).

SURVEILLANCE and MAINTENANCE STATUS:

Not required, D&D activities are currently active.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

The approved D&D mode is to remove and dispose of all hazardous and radiological contamination, demolish the remaining structure, and release the site for unrestricted use.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for CFA-669 Hot Laundry, Reference 2.

FACILITY REUSE CONSIDERATIONS:

Objective is to release site for reuse; the reuse of the building is not economically viable.

REFERENCES:

1. Characterization and Decision Analysis for the Old Hot Laundry Facility (CFA-669), EGG-WM-10034, dated May 1992, prepared by K. J. Lickhus.

2. D&D Plan for CFA-669 Hot Laundry, EGG-WM-10125, dated November 1992, prepared by D. L. Smith.

3. Safety Analysis Report for the D&D of Hot Laundry Facility (CFA-669), WM-ERP-92-017, Revision 0, dated September 1992, prepared by C.E. Klassy.

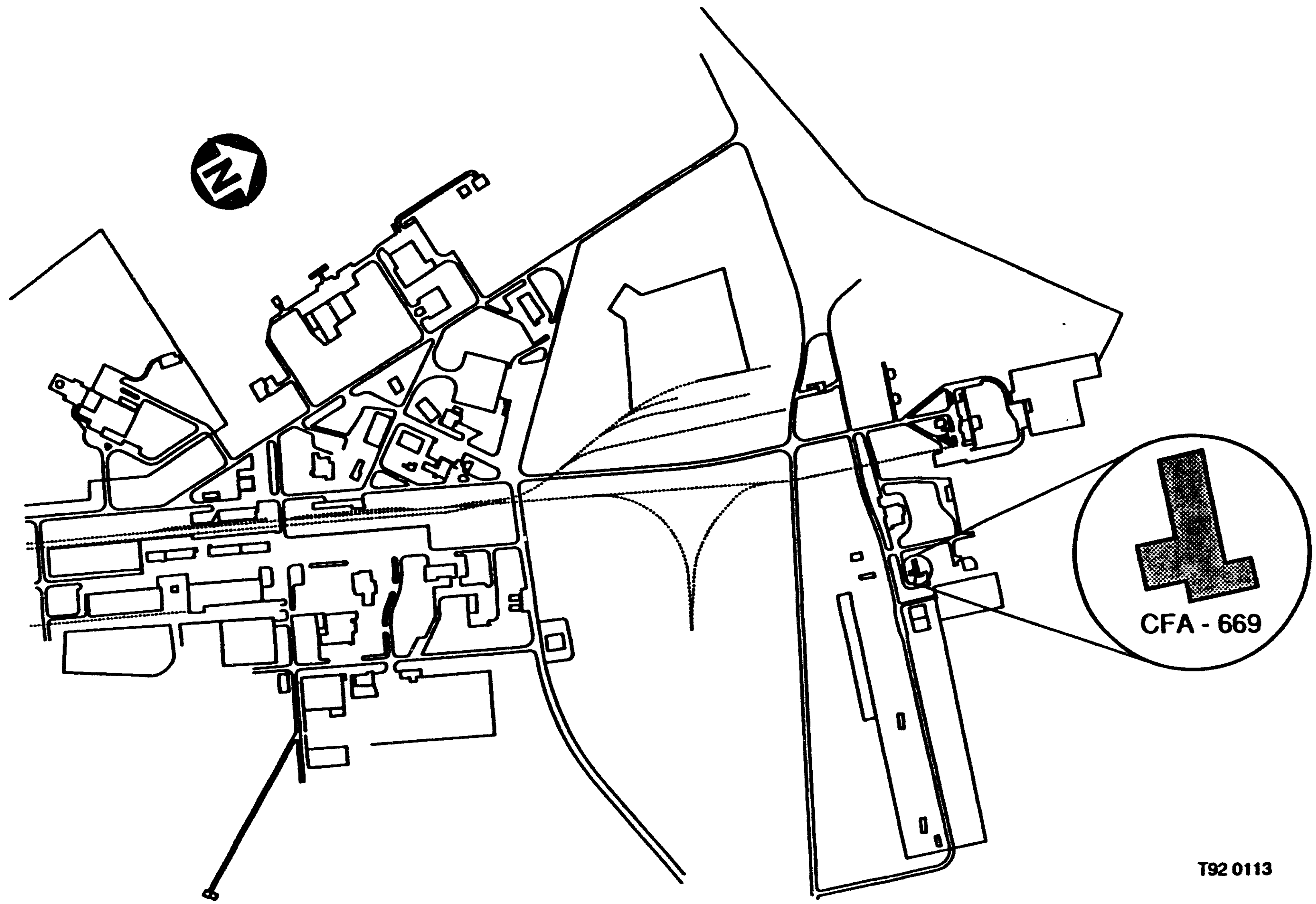

Figure B-12. CFA and the relative location of CFA-669.

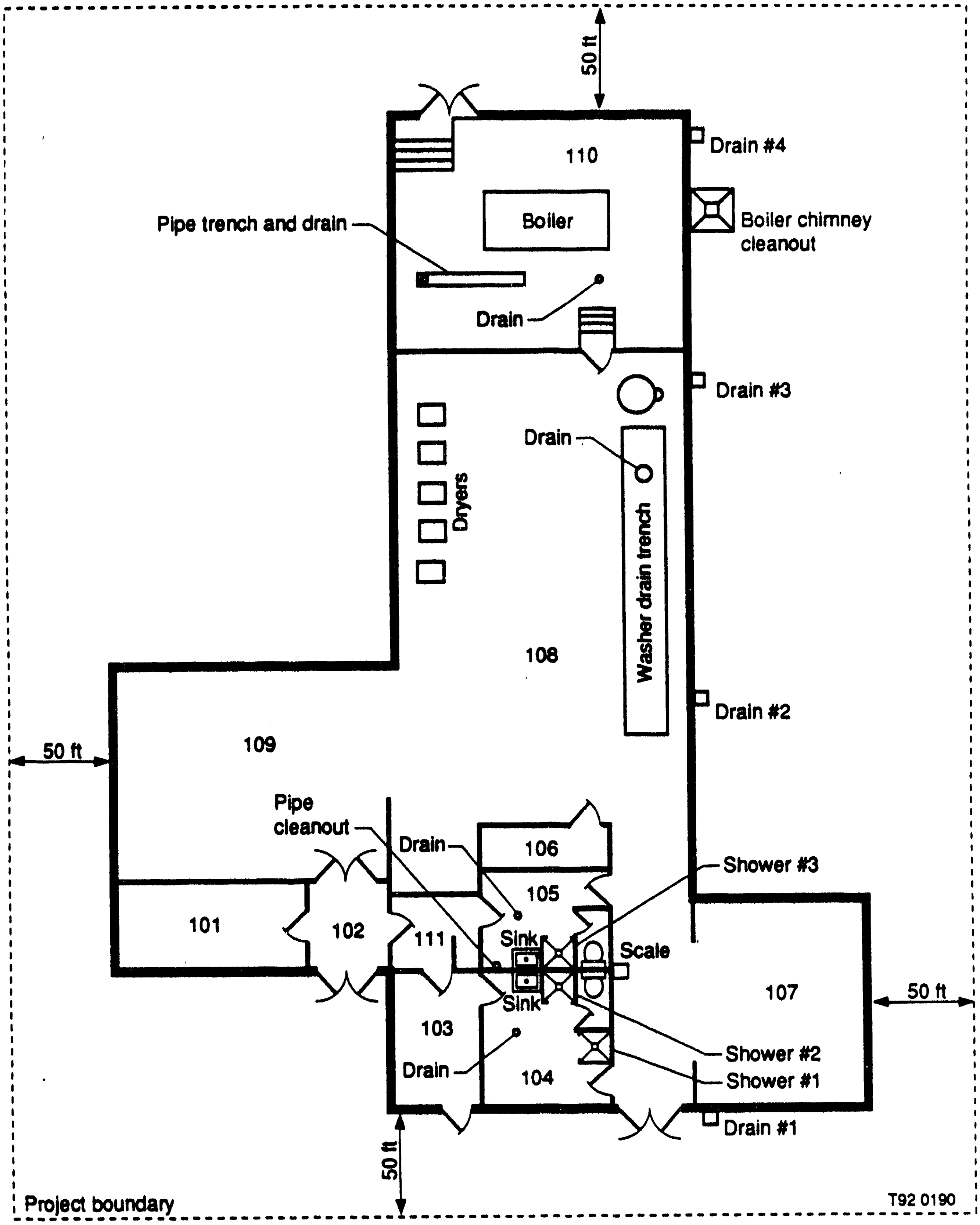

Figure B-13. Floor plan of CFA-669.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **Engineering Test Reactor (ETR)**					
PROJECT PRIORITY: 7		PRIORITY BASIS: Personnel Hazards			
SCHEDULE DURATION: 11 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $44,974K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 0K	
FUNDING SOURCE: EW2010401		ADs No.: 60-EG		WBS No.: 1.4.9.1.2.08.2.1.1.	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Revise Existing SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-94: $ 123k	FY-95: $ 128k	FY-96: $ 1738k	FY-97: $ 1909k	FY-98: $ 4570k	FY-99: $ 5929k
FY-00: $ 6500k	FY-01: $ 6500	FY-02: $ 6000k	FY-03: $ 5000k	FY-04: $ 4000k	FY-05: $ 2714k

TOTAL WASTE VOLUME ESTIMATE: 18,853 m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 6,178 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 1761 m^3
HAZARDOUS WASTE:	CONCRETE WASTE: 3370 m^3	STAINLESS STEEL WASTE: 109 m^3
MIXED WASTE: 17 m^3	RUBBLE WASTE: 743 m^3	COMBUSTIBLE WASTE: 65 m^3
MUNICIPAL/SANITARY WASTE: 12,658 m^3	LIQUID WASTE:	COMPACTIBLE WASTE: 130 m^3
	OTHER WASTE:	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

Engineering Test Reactor (ETR)

The ETR was first operated in 1957. The ETR evolved from the demand for high flux testing space, more stable flux, a greater variety of flux levels than the Materials Test Reactor (MTR) could provide, and the need for through-the-core facilities. Fuel, coolant, and moderator characteristics as well as compatibilities were studied in environments similar to those that would exist in many types of reactors.

The 175 MW_t (thermal) ETR could provide neutron fluences averaging 3-5 x 10^{15} n/cm^2-s, and maximum fluences of 5 x 10^{15} n/cm^2-s. Following the first nuclear startup in October, 1957, the reactor was operated at 175 MW_t until it was shutdown in 1981.

The ETR provided several irradiation spaces, up to 0.23 m x 0.23 m x 0.91 m, within the high flux area of the core. The active section of the core was 91 cm high by 76 cm square and was capable of accommodating experimental facilities oriented vertically and parallel to the fuel assemblies.

The reactor was cooled by 0.32 m^3 of demineralized water circulating through the core each second. The primary coolant system (PCS) absorbed the reactor heat and transferred it through heat exchangers to a secondary water system which, in turn, dissipated the heat to the atmosphere through a conventional forced draft cooling tower.

Most of the ETR experiment-oriented facilities consisted of high pressure water loops. These were designed to pump as much as 6.3 l/s of high pressure, high temperature water through the experimental fuel assemblies in special housings. These loops permitted fuel and component testing under a wide range of operating conditions, up to or exceeding the experiment fuel failure point.

In 1972, the ETR was modified for a new role to support DOE's breeder reactor safety program. Test programs relating to reactor core design and operation were performed by means of the Sodium Loop Safety Facility (SLSF) inserted into the ETR core (Ref. 4). The water loop programs were terminated in 1975 (Ref. 1).

As a test vehicle supporting DOE breeder reactor safety programs, the reactor was modified with a new top closure accommodating the irradiation loop in 1975. Other modifications included adding a helium coolant system and sodium-handling system (Ref. 4).

From 1975 to 1981, self-contained sodium (liquid-metal) loops were irradiated to support a national safety program. The sodium in the sodium loops was removed and the system flushed as part of the ETR deactivation. The ETR was deactivated and a radiological characterization was completed as documented in EGG-PR-5784, September 1982 (Ref. 5).

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

MTR-642 ETR Reactor Building

The reactor building is 41.5 m (136 ft) in the east-west direction by 34.1 m (112 ft) in the north-south direction. It extends 17.7 m (58 ft) above grade level and 11.6 m (38 ft) below grade level to the basement floor. The walls, floors, and columns below grade are of reinforced concrete construction. The walls above grade are insulated metal-sandwich panel siding with the interior surface sealed and taped to make the structure gastight. The roof construction consists of steel decking on purlins with applied foam glass insulation and built-up roofing. The roof was reworked in 1982 and consists of steel roof decking covered with light weight concrete that is covered with asphalt, felt vapor retardant, another layer of asphalt, a layer of 1.9 cm (3/4 in.) fiberboard covered with 7.62 cm (3 in.) of urethane foam, 1.9 cm (3/4 in.) of fiberboard covered with fiberglass felt and two layers of asphalt and gravel. The panel walls, roof, and crane structure are supported on a steel superstructure of columns and trusses. The steel columns rest on reinforced concrete columns, which extend to bedrock from the first floor level.

The first floor between column centerlines E24 to E25 from the north truck door to and including the pipe tunnel, the eastward extension of the pipe tunnel, and remaining floor area north to the edge of the stairwell enclosure is rated at 1000 psf. The central floor area in the vicinity of the reactor is limited to 750 psf. This area extends 6.7 m (22 ft) south, 8.9 m (29 ft 2 in.) west, 8.2 m (27 ft) north, and 8.4 m (27 ft 6 in.) east of the reactor centerline (except where this area overlaps the 1000 psf area). The balance of the first floor area is limited to 350 psf.

The reactor pressure vessel is approximately 10.7 m (35 ft) long and 3.7 m (12 ft) in diameter at the top, with a lower section diameter of 2.44 m (8 ft). It has a cluster of perforations in the bottom head to accommodate the control rod drives and experimental loop through-piping. The reactor top is approximately 2.4 m (7 ft 10 1/2 in.) above the main floor level.

The first basement level, or console floor, housed all experimental control panels. The second basement level contained all radioactive experimental equipment in heavily shielded concrete cubicles.

The high pressure experimental water loops had nonregenerable-resin bypass demineralizers to control water quality. In general, the water loop radioactivity level was approximately that of the primary coolant (10^5 dpm/ml). Each loop could be drained to either the warm or hot drain system.

MTR-643 Compressor Building

The compressor building houses the equipment that was used to supply large quantities of heated, hydrocarbon-free air to various experiments. In the building is the process control room (at the east end) that was used to control all plant services to the reactor and a sample laboratory (on the south side) that was used to conduct chemistry samples on the reactor primary and secondary coolant systems.

The building is 38 m (124 ft 8 in.), in the east-west directions at its north boundary, 32.9 m (108 ft) in the north-south direction and is 9.3 m (30 ft 5 in.) high. At the south wall, the primary coolant system (PCS) pump pits extend 3.1 m (10 ft 3 in.) above the floor, and 6.6 m (21 ft 6 in.) from the wall. The area above the pump pit is being used for storage. A 1.2 m (4 ft) high 1.27 cm (1/2 in.) plywood barrier separates the contaminated storage items from the noncontaminated items. The storage area contains primarily experiment spare parts, handling tools, and lifting fixtures.

The building walls above grade are 30.48 cm (12-in.) pumice block to a height of 2.4 m (8-ft) with insulated metal panels above. The north wall contains 1.2 m (4 ft) high manually operated metal louvers for a 15.8 m (52-ft) long section just above the pumice block, which have been covered with aluminum sheets from the outside; the east wall contains a chain-operated 2.9 m (9-1/2-ft) by 3.7 m (12-ft) rolling steel service door and a 0.8 m (32-in.) personnel door. A 0.9 m (3-ft) personnel door penetrates the east wall from the process control room. Access to the reactor building is through a 1.1m (42-in.) door near the center of the compressor building west wall. The building foundation is a spread-footing type supported by pipe piling. Building floors are concrete, with asphalt tile covering in the control room only. Much of the north flooring contains a grating-covered trench extending as far as 2.4 m (8-ft) below the floor. At the north-east corner of the building floor a locker room has been constructed of 20.32 cm (8-in.) pumice block. The compressor building roof is steel deck on steel frame, vapor-sealed, with 5.08 cm (2 in.) of glass insulation. The roofing is built-up with a gravel top and is surrounded by a 0.3 m (1-ft) parapet. The process control room walls are constructed of 10.16 cm (4-in.) pumice blocks with 7.62 cm (3-in.) of glass fiber insulation between. A balcony above the control room has an 27.94 cm (11-in.) concrete floor. The balcony contains motor control center MCC-3A (which was diesel powered) and commercial powered control centers MCC-3B and -3C; the switchboards powered most of the pumps and blowers in the process water systems. Electrical controllers are located on the north and east walls. The sample laboratory north wall is (20.32 cm (8-in.) concrete block with voids filled with concrete, and the south, east, and west walls are the concrete heat exchanger building (MTR-644) walls. A 0.9 m (3-ft) door and 1.8 m (6 ft) by 1.2 m (4-ft) safety glass window are in the north wall of the sample laboratory.

Along the south side of the main floor are five large access hatches made of high-density concrete, which provide access to the primary coolant system pipe tunnel. On the southeast side is an access plug to the cold pit. Access plugs are also provided into the primary coolant system pump pits from above.

Four evaporator coolers with steam heating units penetrate the roof, as well as five exhaust blowers. The building has been converted to electrical heat with five units for the main floor, and one each for the control room, locker room, and laboratory. The process control room also has an air conditioning unit that penetrates the north wall of the control room. All heating and cooling units have been electrically disconnected, and all liquid systems have been drained.

The building contains one Travlift Bridge type 6803.85 Kg (7-1/2 ton) overhead crane with top running trolley. It has a lift of 8.2 m (27-ft), span of 12.2 m (40-ft 2-in.), and spread of 2.1 m (7-ft). The bridge is hand racked with a chain sprocket that is located 1.8 m (6-ft) from the north end. The rail is 6.1 m (20-ft) above the floor and has a 30.5 m (100-ft) east-west runway.

The main floor of the compressor building is served with 20 drains that drain to a sump on the northwest side of the process control room. This sump pumps to the cold waste leaching pond. A warm drain is located in the pipe shaft in the west side of the building near the reactor building.

The primary coolant system pipe tunnel is located beneath the compressor building and reactor building main floors. Its purpose was to contain the piping necessary to transport the reactor fission heat to the secondary coolant systems. The tunnel floor elevation is 5.4 m (17-ft 9-in.) below the compressor building floor. The tunnel extends approximately 52.4 m (172-ft) east from the reactor in a dog-leg configuration. The pipe tunnel overhead is solid concrete varying from 1.4 m (4-ft 9-in.) thick to 0.8 m (2-ft 6-in.) thick. The north and east walls are 0.3 m (1-ft) thick and the south wall is (0.5 m (18-in.) thick.

Access to the PCS tunnel is from the heat exchanger building (MTR-644) through a 0.9 m ((3-ft) by 2 m (6-1/2-ft) door cut through the 0.5 m (18-in.) concrete separating wall. Five concrete plugs (four are 1.5 m (5-ft) by 2 m (6-ft 9-in.), one is 1.5 m (5-ft) by 1.5 m (5-ft) penetrate the 1.4 m (4-ft 9-in.) concrete overhead above the supply header isolation valves and above the surge tank. A metal ladder is bolted by the "B" plug. The tunnel is ventilated by the heat exchanger building exhaust blower, which draws through the heat exchanger building. Warm drains are in the tunnel in a line about 0.9 m (3-ft) from the north tunnel wall at about 7.6 m (25-ft) intervals. Warm drains are also located in the northeast, southeast, and southwest corners of the area below the pressurizing and emergency pump pits, and in the southwest corner of the area below the sample laboratory.

The compressor building contains the following electric motors: (a) four PCS motors (800 hp, 900 rpm, 4160V synchronous); (b) two emergency pump motors (Fairbank Morse, 20 hp, 1200 rpm, 480V direct drive); (c) two pressurizing pump motors (50 hp, 3500 rpm, 480V direct drive); (d) two gland seal pump motors (GE 25 hp, 3600 rpm, 440V, 60-hz, 3-phase squirrel cage induction type); and (e) experimental cooling loop pump motors (Marathon Electric, 100 hp, 1760 rpm, 440V 60-hz, 3-phase induction type). The following pumps are located in the building: (a) two gland seal pumps (Byron Jackson, two-stage centrifugal with horizontal split case rated at 5.68 l/s (90 gpm), 140.2 m (460-ft) discharge head); and (b) two experimental cooling loop pumps (Peerless, direct-drain, double-suction, enclosed, horizontal centrifugal, rated at 63.1 l/s (1000 gpm), 68.6 m (225-ft) discharge head).

Major components of an experimental air system operated as a part of an aircraft nuclear propulsion (ANP) testing program remain in the compressor building. Among these are two very large air compressors (Clark Brothers Co. Model CBA-8, three-stage reciprocating, eight cylinders, balanced horizontally opposed type, each designed for 113.4 grams/sec (15 lb/s) flow at 300 psig); the compressor electric motors (GE 4000 hp, 300 rpm, 13,200V, 60-hz, 3-phase, synchronous); an emergency air compressor (Sutorbilt, positive displacement, belt-driven, rated at 7.6 grams/sec (1 lb/s) flow at 6 psig); the emergency compressor motor (Allis Chalmers, 60 hp, 440V, 60-hz, 3-phase); an experimental air heater combustion air blower (Spencer Turbine Co. Model 25125-H turbo compressor rated at 7200 scfm at 29 oz. differential pressure); and the turbo compressor motor (GE 125 hp, 3600 rpm, 220/440V, 60/50 hz, 3-phase induction type). Outside the north wall of the building are two air receivers. The Clark compressor system was retired in 1964 and mothballed in 1965. Its cooling water system is blank-flanged downstream of the first isolation valve. Dessicant has been added to the compressors.

The compressor building also contains three experimental air heaters rated at 8 million Btu per hour at 60.5 grams/sec (8 lb/s) flow, which were fired by diesel fuel. In the northwest corner of the building are two oil vapor absorption filters filled with activated alumina and rated at 113.4 grams/sec (15 lb/s) and 300 psig. There are also nine limitorque valve operators that are rated at 60-ft-lb starting torque, 12-ft-lb running torque, 240/440V, 60-hz, 3-phase with a 15 minute duty rating. An experimental loop heat exchanger in the building is a fixed tube sheet type with a shell rating of 150 psig, 500°F, and a tube rating of 250 psig, 205°F; it weighs 5,533.8 kg (12,200 pounds).

The area between the Clark compressors is utilized for the storage of reactor spare parts. It is enclosed on north and south sides with an 2.5 m (8-ft high 2-in.) mesh wire barrier with a locking gate on the south side. Another storage area is located north of the east Clark compressor. The area between the compressor and north wall is enclosed with 4.45 cm (1-3/4 in.) mesh 3.0 m (10-ft) high wire fence with a sliding gate. Inside are stored primarily process system spare parts.

MTR-644 Heat Exchanger Building
The heat exchanger building (MTR-644) is adjacent to and east of the reactor building (MTR-642) and south of the compressor building (MTR-643). The building includes: (a) main room and lower level, (b) demineralizer wing (valve room and tank room), (c) degassing tank room, (d) cubicle exhaust booster blower room, and (e) secondary pipe pit.

The primary function of the heat exchanger building main room was to house the 12 primary coolant/secondary coolant system heat exchangers and associated piping. The 12 7.9 m (26-ft) long by 1.2 m (4-ft) diameter primary-to-secondary heat exchangers each contain 1700 1.59 cm (5/8-in.) OD tubes.

The building is constructed of reinforced concrete; the west wall is 1.5 m (5-ft) thick, the east wall 1.2 m (4-ft) thick, and the north and south walls are 1.4 m (4-ft 6-in.) thick. The building dimensions are 20.3 m (66-ft 6-in.) by 23.8 m (78-ft) by 6.7 m (22-ft) high above ground. The lower level on the north side extends down an additional 5.4 m (17-ft 9-in.) below ground level. The roof is 0.9 m (3-ft) thick reinforced concrete. The west wall rests on the east wall of the reactor building and connects on the north to the compressor building. The heat exchanger building has one 0.9 m (3-ft) by 2.0 m (6-ft 8-in.) metal door in a metal frame on the south wall; there are no other readily accessible openings. Four knockout wall sections are provided on the south wall for access to and removal of the heat exchanger banks. The removable knockout sections are constructed of high density shielding block. Two ladders lead from the main room down to the north lower level and one ladder on the south side leads down to the secondary pipe pit.

The building was ventilated by an exhaust fan installed on the building roof that discharged to the exhaust stack through the cubicle exhaust piping.

Permanent scaffolding is installed on the north end of each bank of heat exchangers. One set of movable scaffolding is installed at the south end; facilities have been installed at each bank of heat exchangers to move this scaffolding as necessary. There are five sets of three-level temporary scaffolding stored at the heat exchanger banks that were manufactured to allow access to the heat exchangers for maintenance.

There is a warm drain line running east-west in the building north lower level. The automatic heat exchanger vents and the primary piping drained to the warm drains. A second warm drain line runs east to west under the primary pump cubicles for draining the primary pumps.

The heat exchangers and associated piping are drained. The permanent scaffolding has been left in place and various pieces of temporary scaffolding have been left in the building because of contamination of the pieces.

The degassing tank room houses the primary coolant system de-gassifier tank and its associated piping. The room is located on the northeast corner of the roof of the heat exchanger building. The outside dimensions of the room are 6.9 m (22-ft 9-in.) by 5.7 m (18-ft 9-in.) by 2.4 m (8-ft) high. The walls are 0.4 m (1-ft 4-in.) thick and constructed of high density shielding blocks. The roof and floor are high density concrete.

The room has one 0.9 m (3-ft) by 2.0 m (6-ft 8-in.) door on the north wall and two 0.9 m (3-ft) by 0.9 m (3-ft) shield plug hatches on the roof. There is one ladder access to the roof on the west side of the room.

The degassing tank is horizontal, round, 2.4 m (8-ft) outside diameter by 3.6 m (12-ft) long, and has a 15 psig design pressure and a capacity of 18,927 liters (5000 gallons); it is constructed of type 304 stainless steel. The tank and all associated piping have been drained and left in place. One warm drain line from the degassing tank overflow and one floor drain run to the warm drains in the heat exchanger building lower level.

The cubicle exhaust blower room is located on the southwest corner of the heat exchanger building roof. This building houses the 141,580 liters/min (5000 cfm) heat exchanger building exhaust blower and the reactor building cubicle exhaust booster blower (rated at 707,909 liters/min (25,000 cfm) and driven by a 75 hp motor). Electrical power to the cubicle exhaust blower has been shut off; the heat exchanger building exhaust blower remains in service.

The external dimensions of the blower room are 6.9 m (22-ft 9-in.) by 6.3 m (20-ft 9-in.) by 4.0 m (13-ft) high. The walls are constructed of cinder block and the roof is reinforced concrete. The room has one access double door entrance 1.5 m (5-ft) wide by 2.0 m (6-ft 8-in.) with metal encased metal doors.

The demineralizer wing of the heat exchanger building is divided into two rooms; the tank room contains four resin bed demineralizer tanks and the valve room contains the valves and piping associated with the demineralizers. The four demineralizers tanks are rated at 250 psig, 849.5 liters (30-ft^3) capacity, and measure 1.1 m (42-in.) diameter by 2.1 m (84-in.) high. The tanks are constructed of single sheet welded 1.59 cm (5/8-in.) thick rubber-lined carbon steel; tank nozzles and outlet connections are type 304 stainless steel. The valve room has one small capacity caustic addition pump.

The walls, ceiling, and floor of the wing are constructed of reinforced concrete. The valve room walls are 0.3 m (1-ft) thick, and the tank room walls 0.76 m (2-ft 6-in.) thick. Overall outside dimension of the wing is 13.7 m (45-ft) by 3.8 m (12-ft 6-in.) by 5.2 m (17-ft) high. The valve room measures 3.8 m (12-ft 6-in.) by 6.6 m (21-ft 6-in.) The tank room is 3.8 m (12-ft 6-in.) by 6.4 m (21-ft) with a 0.76 m (2-1/2-ft) thick wall separating the two rooms.

Access to the demineralizer tank room is through on 1.8 m (6-ft) by 2.7 m (9-ft) and one 0.9 m (3-ft) by 0.9 m (3-ft) hatch opening in the roof. There is one high density shielding block knockout door on the east wall to facilitate removal of the demineralizer tanks. Entrance to the valve room is through on 0.9 m (3-ft) by 1.8 m (6-ft) metal door in a metal frame on the east wall. A ladder on the west wall of the tank room allows access to the roof of the building.

There are two warm drains, one under the cation units and one under the anion units. The resin discharge header is installed on the tank room east wall with a hose connection that enabled discharge of used resin to a tank truck.

The resin tanks have been emptied of all resin and tne tanks are in dry lay-up. The caustic tank has been removed and the system drained.

The secondary coolant system pipe trench is an underground structure on the south side of the heat exchanger building. It houses the secondary coolant system heat exchanger isolation valves and the secondary coolant system drain sump and sump pump. The drain sump pump and motor are in the southeast corner of the trench floor. The sump extends about 2.1 m (7-ft) below the floor level. The sump pump discharged to the cold well. Electrical power to the sump pump has been shut off. Piping in the trench (as well as the entire secondary coolant system) has been drained.

The walls, ceiling, and floors are constructed of 0.3 m (1-ft) thick reinforced concrete. The outside dimensions are 4.4 m (14-1/2-ft) by 23.8 m

(78-ft) by 4.3 m (14-ft 2-in.) high. The south wall of the heat exchanger building rests on the north wall of the secondary pipe trench.

Entrance to the pipe trench is gained through an opening in its north wall. A ladder down from the south heat exchanger building main floor leads to the opening. There are also three 0.9 m (3-ft) by 1.1 m (3-1/2-ft) hatch openings on the roof of the pipe trench with vertical ladders leading to the main floor. The trench was ventilated by the heat exchanger building exhaust fan through the opening in the north wall of the trench. Some temporary scaffold framework and lumber were stored in the trench.

Secondary Coolant Pump House MTR-645

The secondary coolant pump house is a pumice block structure 12.2 m (40-ft) by 28.0 m (92-ft) by 4.8 m (16-ft) high. It has reinforced concrete floor slab, a reinforced concrete cold well and a pipe trench below floor level. The building has a metal roof deck and built-up insulated roof with gravel top. The roof has eight hatch covers for pump removal. There is an interior hollow metal door to a treatment room that is 6.1 m (20-ft) by 4.0 m (13-ft) by 4.9 m (16-ft) high with pumice block interior walls. There are two exterior hollow metal personnel doors, one roll-up steel door for truck entrance, one pair of hollow metal swinging doors in the building, three projected type windows, and four banks of louvers. A monorail is located in the treatment room that houses the chlorinator, chemical proportioning pumps, chemical day tanks, and chemical storage tanks. A 15.24 cm (6-in.) concrete curb in the southeast corner of the pump house sets off an acid tank and pump. The building houses four secondary coolant system (SCS) pumps, four utility cooling water (UCW) pumps, and a cooling tower fire water control and distribution system. The building also houses switchgear (MCC-5A and MCC-5B, commercial and diesel power) for the cooling tower fans, three of the four UCW pumps, a sump pump, and electrical heaters.

Secondary water flow was from the cooling tower canal to the cold well beneath the pump house. The four secondary and the four UCW pumps took suction from the cold well, which is 4.3 m (14-ft) deep. The floor of the cold well beneath No. 22 UCW pump is constructed 0.5 m (21-in.) lower to form a sump. This sump and the No. 22 pump are used to completely drain the cold well. All water systems and chemical processing equipment (pumps, lines, chlorinator, acid tank, and day and storage tanks) have been drained.

ETR Office Building (MTR-647)

The outside dimensions of the office building are 13.0 m (42-1/2-ft) by 28.3 m (93-ft) by 7.8 m (25-1/2-ft) above grade and 3.4 m (11-ft) below grade. The south wall of the basement rests on the north wall of the reactor building. The walls below grade are constructed of reinforced concrete. The walls above grade are constructed of pumice blocks. The roof is a steel deck supported by a steel frame, insulated and vapor sealed with gravel on built-up roofing. The roof was reworked in 1982 and consists of steel roof decking covered with light weight concrete that is covered with asphalt, felt vapor retardant, another layer of asphalt, a layer of 1.90 cm (3/4-in.) fiberboard covered with fiberglass felt and two layers of asphalt and gravel.

The first and second floor office spaces are still being utilized including the console room. The floors are smooth surface concrete covered with asbestos tile except the change room floor, which is covered with a waterproof terrazzo asphalt. The ceilings are concrete supported by steel frame except those in the corridor, reactor console room, and room 100, which have dropped acoustic tile. The interior walls are gypsum board over wood framing. The walls in room 100 are paneled.

The four entrance doors to the office building from the outside and five from the reactor building are all hollow metal in metal frames. All interior doors are wood in wood frames, except those at the entrance to the reactor console room and the door by the Health Physics room opening to a hall leading to the reactor building main floor. The exterior windows are projected 1.2 m (4-ft) by 1.2 m (4-ft) steel sash with sliding aluminum frame storm windows installed on the inside of the building. The three offices on the north have 1.2 m (4-ft) by 1.2 m (4-ft) picture windows facing the reactor building main floor. The reactor console room has a 1.2 m (4-ft) by 2.4 m (8-ft) picture window facing the reactor main floor with a fusible link fire barrier screen mounted on the reactor building side. All windows and doors facing the reactor building are provided with a neoprene seal for gas tightness. There is a stairway from the corridor leading to the second floor and a second stairway from the reactor console room to the office building basement. All rooms are ventilated via a blower located in the office building basement and outside wall windows. The reactor console room is air-conditioned by a chilled water air conditioning unit installed in the office building basement.

The Health Physics room sink and the men's change room sink drain to the warm waste system. All other drains go to the cold waste system.

There are no storage areas or major equipment stored on the office building first floor. A hood vent remains installed in the Health Physics room.

The office building basement east section was utilized as a reactor control instrument repair shop and amplifier room. The amplifier room dimensions are 7.3 m (24-ft) by 10.7 m (35-ft); the repair shop dimensions are 5.5 m (18-ft) by 6.4 m (21-ft). The balance of the building basement housed heating and ventilation equipment for supplying conditioned air to the reactor building and office building. The heating and ventilation equipment includes three chilled water air conditioning units, three air blowers (one in each in the office building, the reactor console room, and the amplifier room), two large capacity blowers (one each in the reactor building main floor and the console floor); the building ventilation control system has been left in place.

All floors are smooth finish concrete; however, the instrument shop and amplifier room floors are covered with asbestos tile. The floor drains in the basement drain to the cold waste system; there are no warm or hot waste drains.

All doors in the office building basement are metal frame hollow metal doors. There are no exterior or interior windows. The instrument repair shop and amplifier room were air conditioned by a chilled water air conditioning unit installed in the heating and ventilating room. There is one stairway down from the office building main floor, and another leading down to the reactor building north console floor.

The office building second floor contains 13 personnel office spaces and two restrooms. There is one exterior door at the east end of the second floor. This exit opens to an enclosed stairway leading to the area just outside of the main truck door at ground level. Normal entrance is gained from the first floor approximately 6.1 m (20-ft) from the west end of the building up a double landing stairway. Interior doors are wood in wood frames. All exterior windows measure 1.2 m (4-ft) by 1.2 m (4-ft) and have steel sashes with sliding aluminum frame storm windows installed on the inside of the rooms. The offices are ventilated from a blower in the office building basement and outside wall windows. The interior walls are gypsum board on wood frame. The floors are smooth concrete covered with asbestos tile. There are no warm or hot drains on the second floor. All drains go to the cold waste system.

Electrical Building (MTR-648)

The electrical building consists of the 13.8-Kv, 4160-v, and 480-v switchgear, No. 1 emergency diesel generator, five motor-generator units, and one lead-storage battery bank. The building is a two-level structure consisting of the upper story and a basement level referred to as the cable vault. The building upper level is a structural steel frame building 16.5 m (54-ft) by 35.1 m (115-ft) by 5.0 m (16-1/2-ft) high. The north wall is common with the ETR reactor building (MTR-642) south wall and is constructed of metal panel installed on a structural steel frame. The remaining exterior walls are constructed of 0.3 m (12-in.) pumice block. The floor, basement walls, and basement slab are reinforced concrete. Footings are spread-type supported by pipe piling where necessary. The roof is steel decking on steel framing, insulated, vapor sealed, built-up, and topped off with gravel. The basement level (cable vault) measures 34.5 m (113-ft 4-in.) east-west by 8.4 m (27-ft 7-in.) north-south. The vertical height is 3.9 m (12-ft 8-in.). All doors in the building are of steel construction mounted in steel frame. There are five rooms within the electrical building upper level; the No. 1 battery room, No. 2 battery room, No. 1 emergency diesel generator room, the motor-generator room and the switchgear room. A steel framed stairway with concrete steps leads from the switchgear room down to the cable vault landing and continues down to the reactor building console floor.

The electrical building heating system is electric heaters with fan-forced air. The heating units are wall-mounted 480-v units powered from motor-control centers (MCCs) located in the building. All water systems in the building have been drained. The CO_2 fire protection system was left in service to provide fire protection to the building. The dry pipe firewater valve that supplies fire protection systems in the cable vault, the reactor building low-bay, and the diesel engine rooms is also located in the electrical building.

The No. 1 battery room is located in the southeast corner of the building and measures 5.4 m (17-ft 10-in.) east-west by 6.5 m (21-ft 4-in.) north-south. The No. 2 battery room is located north of No. 1 battery room and measures 4.3 m (14-ft) north-south by 5.4 m (17-ft 10-in.) east-west. The north side of No. 1 battery room and the south side of No. 2 battery room share a common wall. The battery room walls are 20.32 cm (8-in.) pumice block except for the east wall, which utilizes the electrical building 0.3 m (12-in.) pumice block exterior wall. The No. 1 battery room has one door located on the west wall entering the motor-generator room. The No. 2 battery room has one door located on the north wall entering the switchgear room. Each of these doors measures 0.8 m (34-1/2-in.) by 2.1 m (83-1/2-in.) and has a wire reinforced glass window measuring 22.5 cm (8-7/8-in.) square. Both doors have air intake ventilation slots, and each room has a roof-mounted exhaust fan.

The No. 1 battery room has four separate monorails running north-south; there is one 453.6 Kg (1/2 ton) trolley. The room contains four rows of lead acid storage battery cells stacked two cells high in each row. There is a total of 120 cells. Each cell measures 0.4 m (14-in.) by 0.33 m (13-in.) by 0.5 m (19-1/2-in.) high and the cells are interconnected with copper bus bars. This battery has been left in service and is connected to the motor-generator switchgear units. The No. 2 battery room has had the battery bank removed and is being used for archiving of all the ETR records.

A 2.54 cm (1-in.) demineralized water line is located in the southwest corner of No. 2 battery room, penetrates the west wall, and supplies demineralized water to both No. 2 and No. 1 battery rooms. Two CO_2 fire protection lines penetrate the No. 1 battery room east wall and supply fire protection nozzles in the Nos. 1 and 2 battery rooms, the motor-generator room, the switchgear room, and the cable vault.

The No. 1 emergency diesel room is located in the south-west corner of the electrical building and measures 7.9 m (26-ft) north-south by 12.2 m (40-ft) east-west. The north and east walls are 0.2 m (8-in.) pumice block. The east and south walls utilize the electrical building 0.3 m (12-in.) pumice block exterior walls. The room has two truck doors and two personnel sliding access doors. A roll-up truck door is located in the west wall exiting to the outside area; door dimensions are 2.9 m (9-ft 6-1/2 in.) wide by 3.0 m (10-ft) high. The other truck door is located on the east wall entering the switchgear room. It is a sliding door measuring 2.1 m (6-ft 11-in.) wide by 3.0 m (9-ft 11-1/2-in.) high. One sliding personnel door on the north wall entering the switchgear room measures 0.9 m (38-1/2-in.) by 2.0 m (80-in.). The other sliding door is on the south wall entering the No. 2 emergency diesel building and measures 0.9 m (38-in.) by 2.0 m (79-1/4-in.). The No. 1 diesel room has a large louvered roof opening for summer ventilation and also has a roof-mounted evaporator cooler. During diesel operation, the diesel exhaust exits the west wall. A trolley and monorail system is located directly over the diesel engine.

The diesel generator unit extends east-west in the room with auxiliary equipment located south and west of the engine. The diesel engine and generator are mounted in a pit 8.1 m (26-ft 6-in.) long, 3.7 m (12-ft) wide, and 2.3 m (7-ft 6-in.) deep. The diesel engine extends vertically 2.0 m (6-ft 6-in.) above the main floor of the room. The diesel engine is a 1423 hp, six cylinder engine with a 0.4 m (14-1/2-in.) bore. The engine weighs 35,833.6 Kg (79,000) lbs. The generator is a 1000-Kw capacity. Two air compressors and their receivers are located south of the engine. The compressors are 480-v, 1-hp units. The air receivers have a 0.6 m (2-ft) diameter and are 1.8 m (6-ft) high. Located directly west of the engine, mounted on the main floor, are two lube oil pumps and a jacket water pump. Mounted on the west wall are the engine jacket water cooler and diesel lubricating oil cooler. Directly west, in front of the engine, 1.8 m (6-ft) above floor level is an oil bath diesel air intake. The oil bath unit has a 0.6 m (2-ft) diameter and is 1.1 m (3-ft 7-in.) deep. Located near the northwest corner of the diesel engine is the diesel control panel, which is a steel enclosed unit 1.1 m (3-ft 6-in.) wide by 2.1 m (7-ft) high, and 0.6 m (2-ft) deep. Near the southwest corner of the diesel engine is a lubricating oil filter 1.5 m (5-ft) high with a 0.8 m (2-1/2-ft) diameter. The No. 1 diesel generator unit has been mothballed. The diesel engine internal components were coated with a wax based oil and its air intake was covered. The main generator and excitation generator brushes were lifted and the generators are covered with plastic sheeting. The lubricating oil system, fuel oil systems, and cooling water systems were drained. Spare parts for the diesel generator were left stored in the No. 1 emergency diesel room.

The motor-generator room is located between the No. 1 battery room and the No. 1 emergency diesel room and measures 17.0 m (55-ft 9-in.) east-west by 4.3 m (14-ft) north-south. The north wall is constructed of prefabricated vinyl-covered, fire retardant sheet rock on a steel frame. The east and west walls utilize the electrical building 0.3 m (12-in.) pumice block wall. The room has two doors on the north wall each measuring 0.8 m (34-1/2) by 2.1 m (83-1/4-in.). The south wall has a double door exiting to the outside area and measures 1.8 m (71-in.) wide by 2.3 m (90-1/2-in.) high. The other door at the west end of the south wall allows access to the No. 2 emergency diesel building and measures 0.9 m (37-in.) by 2.1 m (82-1/2-in.). In addition, there is one wire-reinforced glass panel window measuring 1.1 m (44-3/4-in.)

wide by 1.2 m (48-1/4-in.) high in the south wall. The room has a roof-mounted evaporator cooler that was used for summer ventilation.

Five motor-generator units are in the M-G room. Each is mounted on a cement pedestal. M-G Unit 1 (MG-1) consists of a dc unit coupled to an ac motor-generator. The dc component is rated at 200 Kw as a generator and 360 hp as a motor. The ac component is rated at 312 Kva as generator and 300 hp as a motor. M-G unit 2 has an ac induction motor rated at 75 hp driving a dc generator rated at 500Kw. M_G units 3 and 4 are identical, and each consists of a dc motor rated at 30 hp driving an ac generator rated at 25 Kva. M-G unit 7 consists of a 50 hp motor driving a 30 Kva generator. M-G units -1, -2, -3, -4, and -7 were all inactivated. The motor-generator switchgear units associated with the M-Gs were inactivated by removing power leads and bussing within the switchgear. The brushes were removed from the M-Gs and each one was covered with plastic sheeting.

The M-G switchgear was left partially energized for use with a new TRA un-interruptable power supply (UPS) installed to provide battery backed power to the TRA evacuation system. The new UPS was installed in the M-G room in 1982. The UPS is an 80 Kw static device that provides 480v, 3-phase, 60-hz failure free -power to the TRA evacuation sirens system "B" and the TRA evacuation directional lights. During loss of power on the 480v switchgear the UPS converts dc power from the No. 1 battery bank to 480v, 60-hz power.

Rising vertically from the floor in the southeast corner of the M-G room are the following piping systems:

(1) Utility cooling water (UCW) supply and return lines. These are 15.24 cm (6-in.) steel lines that supply the No. 1 diesel engine lubricating oil coolers and engine cooling water located in the No. 1 diesel generator room. These UCW lines also supply the No. 2 emergency diesel generator building.

(2) Service water 2.54 cm (1-in.) piping that supplies No. 1 diesel water systems and the electrical building evaporator cooler units.

(3) Plant air and instrument air 3.175 cm (1-1/4-in.) lines that supply the diesel engine auxiliaries.

(4) Diesel fuel oil 5.715 cm (2-1/4-in.) line to the diesel day tank located below ground outside the west wall of the electrical building. In 1981 the diesel fuel oil line developed a fuel oil leak somewhere below ground. An excavation was made outside the southeast corner of the electrical building in which the fuel oil line and a previously abandoned steam line were both cut to allow connection of the fuel oil line to the 150 psig abandoned steam line. The 150 psig steam line travelled parallel with the fuel oil line and both entered the southeast

corner of the electrical building. The fuel oil line was cut again above the floor level in the southeast corner and the 150 psig steam line was connected to the fuel oil transfer line leading to the diesel fuel oil day tank. Diesel fuel oil now utilizes that portion of steam piping from the outside underground area to the fuel oil piping located in the southeast corner of the electrical building M-G room.

(5) 150 psig 5.715 cm (2-1/4-in.) steam line and a steam condensate 2.54 cm (1-in.) return line. These systems were inactivated in 1981. However, the lines still connect to the electrical building overhead steam heating units.

The switchgear room is the north section of the electrical building. The room has two doors measuring 0.9 m (34-1/2-in.) by 1.8 m (72-in.) Each door has a wire reinforced glass window measuring 0.8 m (31-in.) by 0.6 m (22-3/4-in.). One door is located on the west wall and exits to the outside area. The other door is located on the east end of the north wall entering the reactor building. The electrical building switchgear room has one monorail running east-west over the 480v switchgear; the monorail has a 136.1 Kg (300 lb) capacity and does not have a trolley.

The switchgear room has roof-mounted evaporator coolers for summer ventilation. A floor-mounted fan removes air from the electrical building at a maximum rate of 169,896 liters/min (6000 cfm). The air is passed through a connecting duct and force ventilates the cable vault area. Venting is effected through a vent duct to the roof at the west end of the building.

A 10.16 cm (4-in.) firewater line (abandoned in place) rises vertically from the northeast corner of the switchgear room and crosses overhead to cross-tie to the UCW piping located in the southeast corner of the M-G room. A 10.16 cm (4-in.) firewater line in the west wall of the switchgear room supplies fire protection sprinklers for the No. 1 diesel generator room and the No. 2 diesel generator building.

There are separate switchgear assemblies for the 4160-V, the 13.8-kV, the 480-V, and the motor-generator with the motor control center switchgear units. Individual units contain the circuit breakers, controllers, regulators, transformers, instrumentation, and bussing for the 4160-V generators, motors, and distribution located within ETR and TRA. The majority of the incoming or outgoing externally located cabling is through the bottom of the individual units from the electrical building basement (cable vault) located directly below the switchgear. Some of the units have cabling entering the top of their enclosures through conduit leading from overhead wireways. The circuit breakers are removable units that can be jacked out and removed from their enclosures.

Extending east-west along the north wall of the switchgear room is the 4160-V switchgear. The east-west length of the switchgear is 26.1 m (85-ft 9-in.) The height of the switchgear is nominally 2.3 m (7-ft 5-in.). The 4160-V switchgear consists of 35 steel-enclosed units bolted together. Ten units are 0.8 m (2-ft 6-in.) deep, three units are 1.0 m (3-ft 4-in.) deep, and 22 units are 1.9 m (6-ft 1-in.) deep. South of the west end of the 4160-V switchgear is the 13.8-kV switchgear. The east-west length of the switchgear is 30-ft 2-in. The height of the switchgear is nominally 2.3 m (7-ft 5-in.). The 13.8-kV switchgear consists of 10 steel enclosed units bolted together to form the switchgear. Nine units are 0.9 m (3-ft) deep, and the remaining unit is 0.6 m (2-ft) deep. The 13.8-kV and 4160-V switchgear remains energized to supply power to the electrical equipment necessary to support the ETR complex in an inactivated status and to TRA for support equipment. Power supplies to equipment that has been inactivated (i.e., motors and motor control centers, have had their breakers racked out or power leads disconnected to remove power from inactivated components).

East of the 13.8-kV switchgear is the 480-V switchgear. The east-west length of the switchgear is 10.8 m (35-ft 6-in.). The height of the switchgear is nominally 2.3 m (7-ft 5-in.). The 480-V switchgear consists of 18 steel enclosed units bolted together. Seventeen are 1.5 m (4-ft 11-in.) deep and one unit is 0.6 m (2-ft 1-in.) deep. Some sections of the 480-V switchgear have been deenergized in total while others have been left energized.

South of the 480-V switchgear is the motor-generator (M-G) and motor control center (MCC) No. 4 switchgear. The switchgear extends east-west with the MCC-4 at the west end. The total east-west length of the switchgear is 13.0 m (42-ft 8-in.), 9.4 m (31-ft) of this is the M-G switchgear and 3.6 m (11-ft 8-in.) of it is MCC-4. The M-G switchgear consists of 12 steel enclosed units bolted together. These units are 1.0 m (3-ft 4-in.deep) and 2.3 m (7-ft 5-in.) high. The MCC-4 portion consists of seven steel enclosed units 0.5 m (1-ft 8-in.) deep and 2.3 m (7-ft 5-in.) high. The individual units contain the circuit breakers, controllers, instrumentation regulators, and bussing for the M-G units, storage batteries, and auxiliary equipment located in ETR and TRA. The circuit breakers and controllers can be jacked out and removed from their individual enclosures. The majority of the incoming or outgoing external cabling is through the bottom of the individual units through conduits to the external equipment. This switchgear is not located above the cable vault. Some of the units have cabling entering the top of the enclosures through conduit leading from overhead wireways.

The cable vault exhaust blower is located in the northeast corner of the switchgear room. It is floor-mounted unit consisting of a 2-hp motor and fan. Its exhaust ducting exits through the floor to the cable vault. Other wall-mounted electrical distribution panels and transformers, conduit, and wireways are located in the switchgear room.

The electrical building basement (cable vault) contains wireways and conduits, which distribute incoming power from underground conduits outside the building to the bottom of the switchgear room.

The cable vault has a walled-off room at the east end that houses two cubicle exhaust blowers. The blowers exhaust the basement cubicles and various systems gaseous effluent to the ETR stack. The cable vault runs east-west beneath the 13.8-kV, 4160-V, and 480-V switchgear and measures 34.5 m (113-ft 4-in.) east-west by 8.4 m (27-ft 7-in.) north-south and 3.9 m (12-ft 8-in.) inside height. The cable vault walls are constructed of reinforced concrete. The north wall is common with the reactor building console floor level and except for the support columns is 0.5 m (1-ft 8-in.) thick. There are six support columns in the north wall, which measures 1.8 m (5-ft 10-in.) wide. The cable vault east-west and south walls and floor are 0.3 m (1-ft) thick. The cubicle exhaust blower room at the east end of the cable vault measures 5.4 m (17-ft 10-in.) east-west by 8.4 m (27-ft 7-in.) north-south. The east wall of the cubicle exhaust blower room is constructed of 0.2 m (8-in.) pumice block.

There are two doors for cable vault access. One is located at the cable vault stairway landing from the switchgear room. The other is located at the bottom stairway landing and opens into the south console floor of the reactor building. Both doors are metal encased in a steel frame and measure 2.0 m (6-ft 7-in.) high by 0.8 m (2-ft 10-1/2-in.) high. The cubicle exhaust blower room access door measures 2.1 m (6-ft 11-in.) high by 0.9 m (2-ft 10-1/2-in.) wide and has a wire reinforced glass window measuring 22.54 cm (8-7/8-in.) square. The cable vault is ventilated by fan forced air from the switchgear room entering the east end of the cable vault and exiting through exhaust ducting at the west end of the cable vault.

The cable vault and cubicle exhaust blower room are protected by CO_2 and dry-pipe firewater sprinkler systems, which have been left in service. There are two cold drains (no warm or hot drains), one located in the cable vault floor and one located in the cubicle exhaust blower room that drain to the secondary pipe tunnel located outside and to the east of the electrical building.

Floor-mounted against the north cable vault wall is an experimenter's instrument automatic bus transfer (ABT) switch No. 645-21. The switch is mounted in a metal enclosure 1.2 m (4-ft) high, 1.3 m (4-ft 2-in.) wide by 0.5 m (1-ft 8-in.) deep.

The cable vault has been left with the south cubicle exhaust blower operating to provide reactor building exhaust. Various 13.8-kV, 4160-V, and 480-V cabling are energized. The cable vault exhaust system is inactivated.

ETR Critical Facility (TRA-654)
This facility consisted of a low-power reactor that was a nuclear mock-up of the ETR. The critical facility was housed in a 12.2 m (40-ft) by 15.2 m (50-ft) by 9.1 m (30-ft) high building addition on the southeast corner of MTR-635. The critical facility was used to duplicate fuel and experiment arrangements before their use in the ETR to facilitate calculation of neutron flux, flux patterns, excess reactivity, and associated operating parameters.

The building addition has concrete block walls and has one 4.3 m (14-ft) by 3.0 m (10-ft) truck door, two personnel doors, concrete floors, and a canal. The canal is 3.0 m (10-ft) by 4.0 m (13-ft) by 6.1 m (20-ft) deep. North of the canal is a 0.7 m (2.3-ft) by 1.2 m (4-ft) by 1.2 m (4-ft) by 5.8 m (19-ft) sump with sump pump. In the canal is 0.7 m (2.3-ft) by 1.2 m (4-ft) by 2.4 m (8-ft) storage box that contains various reactor equipment (e.g., poison sections, filler pieces, aluminum blocks). In the north end of the canal is a 0.6 m (2-ft) wide storage canal separated from the main canal by a 3.0 m (10-ft) by 1.5 m (5-ft) by 0.3 m (1-ft) wall. The canal was drained and left covered with a plywood sheeting cover that is rated at 97.65 Kg/m^2 (20 pounds per ft^2) load. All radioactive components have been removed from the facility. General radiation field inside the canal is 0.5 mR/h and less than 3.0 mR/h at the center of the reactor core location.

On the east end of the building addition is a balcony floor that was used as an administrative center and office. The building still contains miscellaneous instrumentation, an electronic control console, and associated cabinets. All of the ETRC associated equipment has been electrically inactivated. The building has an operable 9,071.8Kg (10-ton) capacity overhead crane.

Building system that remain operable include the electrical system, the raw water system, the heating and ventilating system, and the firewater system.

The ETRC is being utilized for office space and for laboratory operations.

ETR No. 2 Diesel Building (TRA-663)
The ETR was only allowed to be operated while a diesel generator was in operation. Because of this operating practice, a second diesel generator was added to the ETR facility to allow one diesel to be off-line for maintenance and still allow the reactor to be operated.

This second diesel is installed in a cinder block building that was built next to the southwest corner of the ETR electrical building (TRA-648). This new building was referred to as the No. 2 diesel building or the standby power building or the experimenter's standby power building or the Superior diesel building. Herein, No. 2 diesel building will identify the structure.

The No. 2 diesel building houses the No. 2 diesel engine and generator set, a starting air compressor, air receiver tank, a work bench and tools for servicing the diesels, lubricating oil and jacket water coolers, a lubricating oil filter, motor control center (MCC-4A), and space heating units.

The building is rectangular 16.3 m (53-1/2-ft) east-west by 5.8 m (19-ft) north-south. The ceiling is 6.1 m (20-ft) high. The north wall is common with the south wall of the ETR electrical building. All walls are constructed of 0.3 m (12-in.) cinder block. The floor is concrete 15.24 cm (6-in.) thick. The roof was reworked in 1982 and consists of steel decking covered with light weight concrete that is covered with asphalt, felt vapor retardant, another layer of asphalt, a layer of 1.90 cm (3/4-in.) fiberboard covered with 7.62 cm (3-in.) of urethane foam, 1.90 cm (3/4-in.) of fiberboard covered with fiberglass felt and two layers of asphalt and gravel.

Three personnel doors are in the No. 2 diesel building. One is in the west wall and opens to the outside, it is a swinging steel clad door 0.9 m (36-in.) wide by 2.1 m (83-in.) high with a wide glass window 0.6 m (22-in.) by 0.8 m (30-in.). The other two doors are both in the north wall, one at the west end and the other at the east end. The west door is an Underwriters Laboratory (UL) class "A" sliding fire door covering a doorway 0.9 m (37-in.) by 2.0 m (79-in.). It is actuated by weights suspended from a fusible link. The link is rated at 160°F. The doorway opens into the No. 1 diesel room of the ETR electrical building. The east door is a swinging steel clad door deeply recessed into the door frame with a fire door that slides across it. The doorway is 1.0 m (38-in.) by 2.1 m (84-in.) and opens into the motor-generator room of the electrical building. The fire door is identical to the one describe above. There is one equipment door into the No. 2 diesel building located in the west wall; it is 2.9 m (114-in.) wide by 3.9 m (154-in.) high and is a steel roll-up overhead door actuated by an endless pull chain.

There is one window in the building, located in the east wall 1.8 m (70-in.) above the floor; it is 3.4 m (134-in.) wide by 2.4 m (96-in.) high. The window is constructed of wire mesh and eight sets of crank-actuated louvers. There is no glass in the window (it is part of the ventilation system). During winter months the window was covered with plywood backed with foam panels to reduce the heating load.

Two large fans are on the building roof. In conjunction with the east window the fans served as the ventilation system. Each vertical fan duct is 1.3 m (52-in.) in diameter with a 5-hp 440-V motor powered from MCC-4A driving the fan blades. The ducts are covered by a louver that opens by the pressure of the fan airflow. One ladder fixed to the outside of the west wall allows access to the roof.

An abandoned steam heating unit is suspended from the ceiling in the southeast corner. An outside air roof duct penetrates the ceiling and into this heating unit. A steel ladder is installed that allows access from the floor of the building.

An overhead monorail carries a manually operated 1814 Kg (4000-lb) chain fall. The monorail passes east-west over the center of the diesel then turns south and passes east-west over the floor to the south of the diesel then curves north and ends its travel over the center of the equipment door.

There are no hot or warm drains in the building. Diesel fuel oil was supplied by buried pipes that go to a day tank buried outside, northwest of the No. 2 diesel building. The tank was kept filled with fuel oil pumped from the TRA bulk storage area. A small tank overhead in the northwest corner was designed to be used as a gravity feed fuel oil priming tank.

The diesel engine lubricating oil and jacket water were cooled by UCW, which enters from the upper west end of the north wall. The coolers are located on the east end of the south wall. UCW enters the oil-water heat exchanger, then enters the water-water heat exchanger, and then returns to the UCW system by way of the upper east end of the north wall. Demineralized water (DW) supplied the jacket water expansion tank located overhead on the north wall. Demineralized water was added to the expansion tank to make up for normal jacket water loss.

Fire water enters the building from the upper middle of the north wall to supply the dry pipe system sprinkler for the area. Steam lines supplying the space heater enter from the north; these lines were abandoned in 1980.

High pressure starting air is stored in a receiver tank and supplied by a compressor, both of which are located in the northeast corner of the building.

A lubricating oil filter is located next to the south wall at the west end.

The diesel engine rests on a concrete pad about 4.0 m (13-ft) east-west by 1.8 m (6-ft) north-south by 0.5 m (18-in.) above floor level and extending 1.8 m (6-ft) below floor level. The generator is in a 1.4 m (55-in.) deep pit to the east of the diesel engine and attached to the drive shaft. The generator measures 0.9 m (3-ft) wide by 2.1 m (7-ft) across.

At the southeast corner of the generator and mounted on the 3.4 m (11-ft) by 3.4 m (11-ft) by 0.5 m (18-in.) parapet, which surrounds the generator pit is the exciter for the generator.

The work bench at the southeast corner of the building is 0.9 m (34-in.) high by 1.7 m (65-in.) east-west by 1.0 m (40-in.) north-south. A storage cabinet 0.4 m (16-in.) deep by 0.9 m (36-in.) high by 1.7 m (65-in.) long rests on the back 0.4 m (16-in.) of the bench. There are a few tools and spare diesel fuel injectors in the cabinet. The bench is located just north of the lubricating oil and jacket water coolers.

The muffler for the diesel is mounted on the roof of the building at the west end. An air cleaner for the diesel engine is suspended from the ceiling to the northwest of the engine as is an aftercooler, which removes the heat of compression from the air coming out of the turbocharger. The aftercooler utilized UCW. The turbocharger is installed on the exhaust stack at the southwest corner of the diesel.

During 1982 the No. 2 diesel engine was mothballed in place. The lubricating oil system was treated with a preservative and the oil pumped out. The jacket water was drained, as have been the oil filter, oil cooler, and jacket water cooler. The starting air receivers have been drained and power to the compressor has been interrupted. The generator and exciter have been covered with plastic sheeting.

Transformer Station (TRA-752)
Located immediately south of the No. 2 diesel building is the ETR transformer station. Within this area are the large electric power transformers that provide electric power to the ETR complex. The yard is an exclusion area and is fenced and the entry gate is locked.

There are ten transformers in the station, identified as T-1, T-2, T-3, T-4, T-5, T-7, T-8, T-9, T-11, and HT-1. Transformer T-6 was removed in 1980, a new concrete pad was placed near the old pillar and transformer HT-1 was installed on the new pad. HT-1 provides power for the electric resistance heaters throughout the ETR facility.

The transformer station is rectangular in shape, bounded on all sides by a fence or wall, and is 33.5 m (110-ft) east-west by 10.2 m (33-1/2-ft) north-south. The east fence is constructed of corrugated asbestos on an iron frame. The north boundary is in part common to the No. 2 diesel building south wall and the remaining boundary is cyclone type fence. All fence is 2.4 m (8-ft) high. The only entry into the transformer station is through a double gate 4.6 m (15-ft) wide in the southwest corner of the fence.

The floor of the transformer station is 15.24 cm (6-in.) gravel base over the existing grade except where the transformers are located. In these locations concrete pillars or pads of various dimensions bear the weight of the transformers and provide cable ways for the cable runs from the transformer to the cable vault. The individual transformers are isolated from each other by corrugated asbestos fence or fire walls. The fire walls between transformers T-1 and T-2 are 4.3 m (14-ft) high and 5.0 m (16-1/2-ft) wide. The remaining fire walls are in sections 3.0 m (10-ft) high. The sections between T-5 and T-3 and between T-11 and the switchgear box is 4.3 m (14-ft) long. The other two sections are 3.8 m (12-1/2-ft) long.

The concrete pillars on which the transformers stand have cable ways running down from the top of the pillar and out the north side toward the bottom of the pad about 1.3 m (50-in.) beneath grade. Buried conduits connect the pillars to the cable vault.

Transformers T-1 and T-2 are 7500-kVA 13.8/4160-V oil-filled, forced air cooled devices. Located on the large pillars at the west end of the station, each transformer is 3.9 m (12-ft 9-in.) high. The pillars are 2.9 m (9-ft 6-in.) by 1.4 m (4-ft 6-in.) by 1.7 m (5-ft 6-in.) deep with all but a few centimeters (in.) below grade.

Transformers T-3, T-4, T-5, and T-11 are 1000-kVA 4160/480-V oil-filled, air convection cooled devices. Transformers T-3 and T-5 each rest on a concrete pillar 0.9 m (3-ft) by 1.5 m (5-ft) by 1.5 m (5-ft) deep. Transformers T-4 and T-11 rest on pillars 2.3 m (7-ft 7-in.) by 0.9 m (3-ft) by 1.7 m (5-ft 6-in.) deep, with all but about 15.24 cm (6-in.) below grade.

Transformers T-7 and T-9 are 750-kVA 4160/480-V oil-filled, air convection cooled devices. Both transformers rest on pillars identical to the pillars described for T-3 and T-5.

Transformer T-8 is a 112.5-kVA 4160/480-V oil-filled unit. It has no external cooling fins, and rests on a concrete pillar 1.2 m (4-ft) by 1.4 m (4-ft 5-in.) by 2.1 m (5-ft 6-in.) deep with all but a few centimeters (in.) below grade.

Transformer HT-1 rests on a concrete pad 5.5 m (18-ft) by 1.5 m (5-ft) by 0.2 m (8-in.) thick. The transformer is seated on the west end of the pad and a switchgear cabinet is installed on the east end of the pad. Transformer HT-1 is a 2000-kVA 13.8-kV/4160/277-V oil-filled, convection air cooled device.

All transformers except HT-1 were dielectric tested for the presence of Polychlorinated biphenyl (PCB) and are placarded in accordance with the Code of Federal Regulations (CFR), 44 CFR 106, as reflected on May 31, 1979. Transformer HT-1 was manufactured November 1979, after the ban on PCB usage went into effect. All of the transformers except T-9 were found to have less than 50 parts per million (ppm) of PCB and are classified as free from PCB. Transformer T-9 was found to have a PCB content of between 50 ppm and 499 ppm; as such, it is classified as PCB contaminated.

There are two sets of large resistors located in cages in the transformer station. Used for ground current detection circuits on the 13.8-kV transformers T-1 and T-2. One set of resistors is located 1.4 m (55-in.) north of T-1 and T-2. The pillars on which the resistors rest are 1.4 m (4-ft 6-in.) by 1.4 m (4-ft 6-in.) by 1.5 m (5-ft) deep with all but a few centimeters (in.) below grade.

Air Intake Building (TRA-655)

The ETR air intake building was originally designed and built as a filter building and air intake for an experimental air system that included the two large Clark air compressors. The filters have since been removed and the building has been used as a storage area.

The building is 3.7 m (12-ft) by 7.5 m (24-ft 8-in.) with walls 0.3 m (12-in.) thick. The exterior walls are 5.3 m (16-ft 8-in.) high with a roof cap of an additional 15.24 cm (6 in.) consisting of a double plywood deck with built-up roofing on top and an air space between. The whole roof edge is faced with a metal flashing, approximately 0.635 cm (1/4-in.) by 0.3 m (1-ft.) The interior roofing is supported by three I-beams. Two of the beams are 3.0 m (10-ft) long, approximately 17.8 cm (7-in.) high, and 15.24 cm (6-in.) wide. These I-beams are located 1.5 m (5-ft) from the north and south walls and are placed east-west. The third I-beam is placed in the center and is 3.0 m (10-ft) long, 0.7 m (26-in.) high, and 20.3 cm (8-in.) wide. The north and south sections of the building are separated by a curb 10.2 cm (4-in.) high by 0.8 m (32-in.) wide. This curbing and the large I-beam were originally the mountings for the filters.

The northern half of the building, which was originally the intake side of the filters, is floored by a 10.2 cm (4-in.) concrete slab. The southern half of the building, originally the discharge side of the filters, contains four removable grates at floor level and a 2.1 m (7-ft) pit below the grates, which served as the experimental air suction plenum. The grates are each 3.2 cm (1-1/4-in.) thick by 0.8 m (2-1/2-ft) by 3.0 m (10-ft). The floor of the pit is poured concrete 0.3 m (1-ft) thick and forms part of the foundation on the building south end. Three 0.9 m (36-in.) exhaust pipes are located on the west wall of the pit. The pipes were the air intake for the experiment air compressors and empty into a chamber under the change room in the compressor building. There is one condensate drain in the center of the discharge pit floor.

The building contains three steel doors and three sets of air intake louvers. One door is situated on the west end of the south wall and is 0.9 m (3-ft) by 2.1 m (7-ft) in size. The other two doors form a double-door on the north end of the west wall; these doors are 0.8 m (2-1/2-ft) by 2.1 m (7-ft) each. Three sets of air intake louvers are located on the north half of the building on the north, east, and west walls. The east and west louvers are identical, each consisting of two 1.2 m (4- ft) by 1.2 m (4-ft) sections separated by a 0.3 m (1-ft) section of wall. The northern louver consists of one large louver panel 1.2 m (4-ft) by 2.4 m (8-ft). All louvers are located 3.7 m (12-ft) above ground level and are centered on each wall with respect to the intake plenum.

Liquid Effluent Systems

The liquid effluent systems consist of four primary systems. These are the hot and warm liquid waste, the cold liquid waste, and the sanitary sewer system. There are also various sump pits that either have french drains or are pumped into some of the other systems.

The hot and warm liquid effluent systems provide for the removal of radioactive contaminated liquids to either the hot waste catch tank or the warm sump tank.

The warm waste system consists of numerous drains on the reactor building main floor, the console floor, the basement floor, the compressor building, and the heat exchanger building. Warm effluents entered 4-in. collector piping and were routed directly to a 18,927 liter (5000 gallon) stainless steel warm sump tank located beneath the floor in the north reactor building basement. Two sump pumps took suction from the warm sump tank and discharged into a common header. This header penetrates the sump tank pit north wall; rises within 1.5 m (5-ft) of finish grade, and is then routed to the north end of the retention basin. Warm effluent could be pumped to any of the three MTR hot waste storage tanks. A spare connection is provided on both hot and warm discharge lines. The connection is accessible 1.5 m (5-ft) below grade and 0.9 m (3-ft) from the north wall of the office building. At this point, the warm sump pump discharge line transitions (via a mechanical joint) to a cast iron line that extends to the retention basin. The sump pump discharge piping is 10.2 cm (4-in.) stainless steel and includes a horizontal swing check valve and reach-rodded plug valve.

The hot effluent system routed experiment leakage and control rod seal leakage to a 1,893 liter (500 gallon) hot catch tank located under hatch covers near the warm sump tank. There are numerous hot drains located on the reactor main floor, the console floor, and the basement floor. The pipe header is primarily 103 cm (4-in.) with many of the drains either 5.1 cm (2-in.) or 10.3 cm (4-in.). The effluent from the hot catch tank could be pumped to the hot waste storage tanks and then to the retention basin, or directly to the retention basin. All piping in the warm and hot waste systems is sloped at an incline of 0.32 cm (1/8-in.) per 0.3 m (ft) of travel to eliminate any liquid traps.

The cold waste or GEEL system consists of a 3,785 liter (1000 gallon) tank that routes cold liquids (i.e., drinking fountain waste, safety shower drains, air conditioning, and core deluge leakage) from various 1.8 cm (1/2-in.), 5.1 cm (2-in.), and 10.3 cm (4-in.) carbon steel pipes to the tank and then to the cooling tower blowdown drain.

The sanitary sewer system routed waste from the restrooms in the ETR office building and compressor building to the main sewer system in the TRA.

The hot catch tank [1,893 liter(500 gal.)], the warm sump tank [18,927 liter (5000 gal.)], and the GEEL or cold tank [3,785 liter (1000 gal.)] were left in their respective vaults beneath the north basement floor. All sump pumps and tank pumps were left in place, but only one, manually operated, sump tank pump was left with power. The warm sump tank was left with a local level sensor to prevent overflowing the tank. Both the cold waste and sanitary sewer systems were left intact.

ETR Exhaust Stack (TRA-753)

The stack is a vertical, tapered reinforced concrete tube with an outside diameter of 4.3 m (14-ft) at the base and 1.8 m (6-ft) at the top and an inside diameter of 3.0 m (10-ft) at the bottom and 1.5 m (5-ft) at the top. It rises 76.2 m (250-ft) above ground level to the top and is located approximately 167.6 m (550-ft) north-east of the compressor building. There is an exhaust stack gas monitoring room located at the base of the stack and measures 2.4 m (8 ft) x 3.0 m (10 ft) x 2.4 m (8 ft) high. It is constructed of 20.3 cm (8 in.) pumice block and has a concrete floor 10.2 cm (4 in.) thick. All of the monitoring equipment has been removed from the building.

Filter Pit Building (TRA-755)

This building is located about 18.3 m (60-ft) northeast of the compressor building and houses fans associated with the experimenters service exhaust. The building is 3.9 m (12-ft 8-in.) by 3.9 m (12-ft 8-in.) by 4.0 m (13-ft) high and is constructed of concrete blocks. On the north side of the building the 0.5 m (20-in.) exhaust line exits to the exhaust stack. Access to the loop filters (designated loops 66 and 99 filters) is on the northwest side of the building. The filters are a canister charcoal-activated type contained in a lead and concrete shield.

Located in the filter pit building is the 3-hp exhaust fan, a 7.5-hp exhaust booster fan, and another 2-hp auxiliary fan. Power for the exhaust fan was from MCC-3B and power for the booster and auxiliary fans was experimenters commercial power panel No. 2 (642-35).

ETR Experiment Gaseous Effluent System

The experiment gaseous effluent system suctioned gaseous effluent from several sources and discharged to the exhaust stack.

Located on the reactor pressure vessel top is a service exhaust ring that received effluent waste from experiments including what was the On-line Cover Gas Sampling System (OLCS) used during the sodium loop safety facilities experiments. The service exhaust ring discharged to a hot filter located under the filter pit building (TRA-755). From the hot filter the effluent was discharged to the exhaust stack through a 7.5-hp exhaust booster fan.

Cubicle Exhaust System
The cubicle exhaust system is a continuation of the reactor console floor and basement heating and ventilating system. The air flow passes through rectangular openings along the perimeter of the basement ceiling into the experiment cubicles. Flow then enters individual cubicle exhaust ducts, which connect to the main cubicle exhaust header located below the basement ceiling. The main header makes a partial loop around the basement before exiting in the southeast corner to the cubicle exhaust fans located in the cubicle adjacent to and at the same floor level as the electrical building cable vault. Two 7.5-hp cubicle exhaust fans, each rated at 215,202 liters/min. (7,600 cfm), discharged to the suction side of a booster fan. The booster fan is rated at 75-hp, 736,216 liters/min. (26,000 cfm) and is located in a room on top of the heat exchanger building and discharges to the exhaust stack by way of a continuation duct. Located in the same room as the booster fan is an exhaust fan rated at 141,580 liters/min. (5,000 cfm) and driven by a 15-hp motor. The controls for this fan have been relocated to MCC-4C and it has been left in service.

Part of the cubicle exhaust system draws from the cold, warm, and hot waste tanks, the rod access room, and the subpile room. Another portion of the cubicle exhaust system was used to provide cubicle exhaust suction at three locations on the reactor building main floor; these locations are the working canal, storage canal, and the reactor top. The piping to the reactor top includes the reactor pressure vessel via the working platform and the nozzle trench. These ducts penetrate the reactor building main floor and combine into a common duct on the south console floor balcony, which contains an Axivane fan left electrically disconnected. The Axivane fan is rated at 110,432 liters/min. (3,900 cfm) and was driven by a 2-hp, 2-speed motor. The fan speed was selectable at start-stop buttons located on the southside main floor, MCC-1, unit 3B. The Axivane fan header connects to the main cubicle exhaust header at the suction side of the cubicle exhaust fans. An electrical lockout for the Axivane fan is located on the south console balcony near the fan.

All of the ETR D&D Project is considered contaminated.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Widespread low-level contamination exists in most facility structures (Reference 5).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-14, Aerial Photograph of TRA; Figure B-15, ETR Complex Plot Plan, from INEL Spacial Graphics database; Figure B-16, ETR High Bay Photograph, and B-17, ETR Cross-section Diagram, copied directly from Refernce 5. The ETR

Characterization Report (Reference 5) provides a complete set of schematics and photos detailing each of the facility structures.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mail stop,etc.]

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D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The ETR was deactivated and a radiological characterization was completed as documented in EGG-PR-5784, September 1982 (Ref. 1). This was the first complete reactor facility to be deactivated and documented immediately after shutdown (Ref. 4).

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The reactor core components are highly radioactive.

PERMITTING REQUIREMENTS:

It is anticipated that D&D of the ETR will be permitted under the INEL sitewide EIS scheduled for approval by 1996. Independent NEPA documentation would probably also require an EIS.

SURVEILLANCE and MAINTENANCE STATUS:

Currently the S&M Program of the D&D Unit does not perform any S&M work tasks for the ETR. The TRA Facility and Maintenance (F&M) Program has the overall facility responsibility for performing routine surveillance of and maintaining the facility.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

A decision analysis has not been preformed for this facility; the recommended D&D mode has yet to be determined.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

TBD

WASTE VOLUME ESTIMATE BASIS:

Characterization of the ETR, Reference 5.

FACILITY REUSE CONSIDERATIONS:

Reuse considerations will be determined following the results of the Decision Analysis Report to be prepared in 1996.

REFERENCES:

1. Long Range Plan for Decontamination and Decommissioning Excess Contaminated Facilities at the INEL, Report No. PR-W-79-005, Revision 4, dated May 1983, Section 2.2, Engineering Test Reactor, pages A-4 to A-22.

2. ETR Surveillance & Maintenance Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNETA000 / WBS No. 1.2.8.1.1.1]

3. ETR Cleanup Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNETC000 / WBS No. 1.2.8.2.1.1]

4. Idaho National Engineering Laboratory Publication, BP 380-R-0886-5M-A, assumed date August 1986, Detailing INEL history for public relations, Engineering Test Reactor (ETR), page 34.

5. Characterization of the ETR Facility, EGG-PR-5784, dated September 1982, prepared by L. L. Kaiser, R. L. Rolfe, B. J. Sneed, and E. L. Wills.

6. Characterization of the MTR Facility, WM-F1-83-016, dated April 1984, prepared by R. L. Rolfe and E. L. Wills.

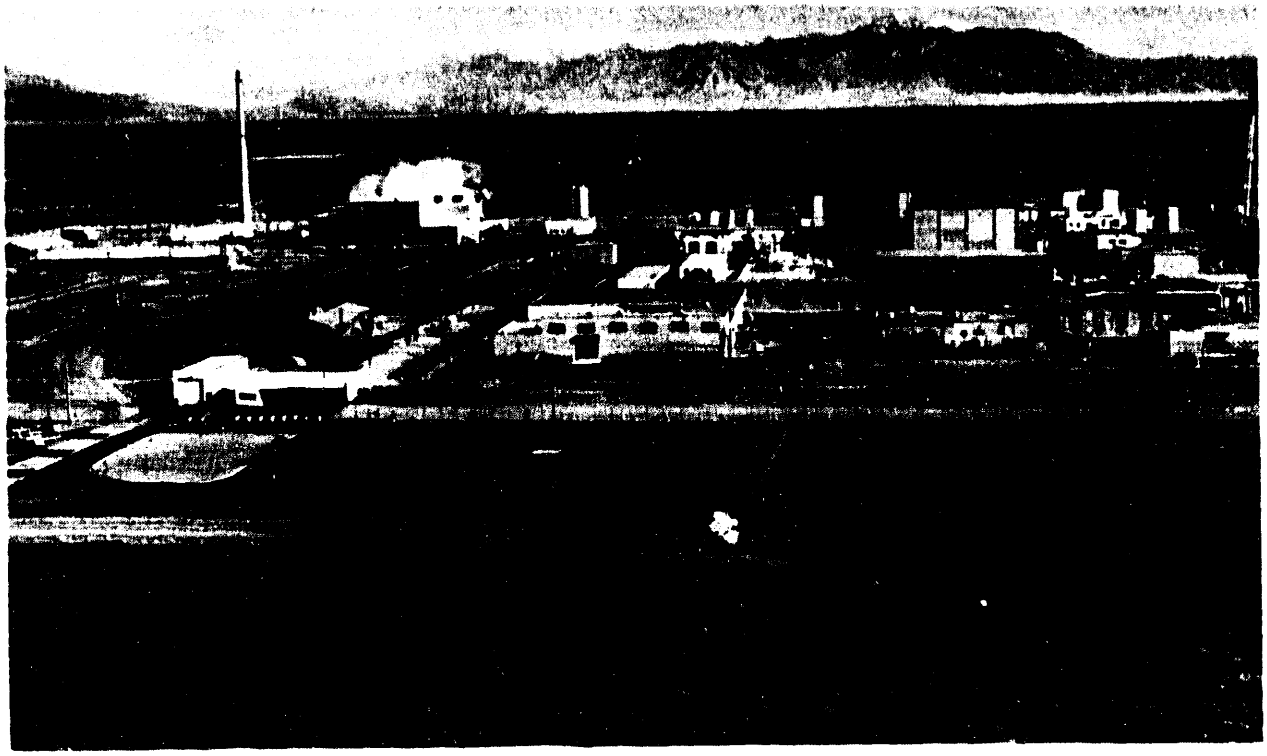


Figure B-14. Aerial photograph of TRA.

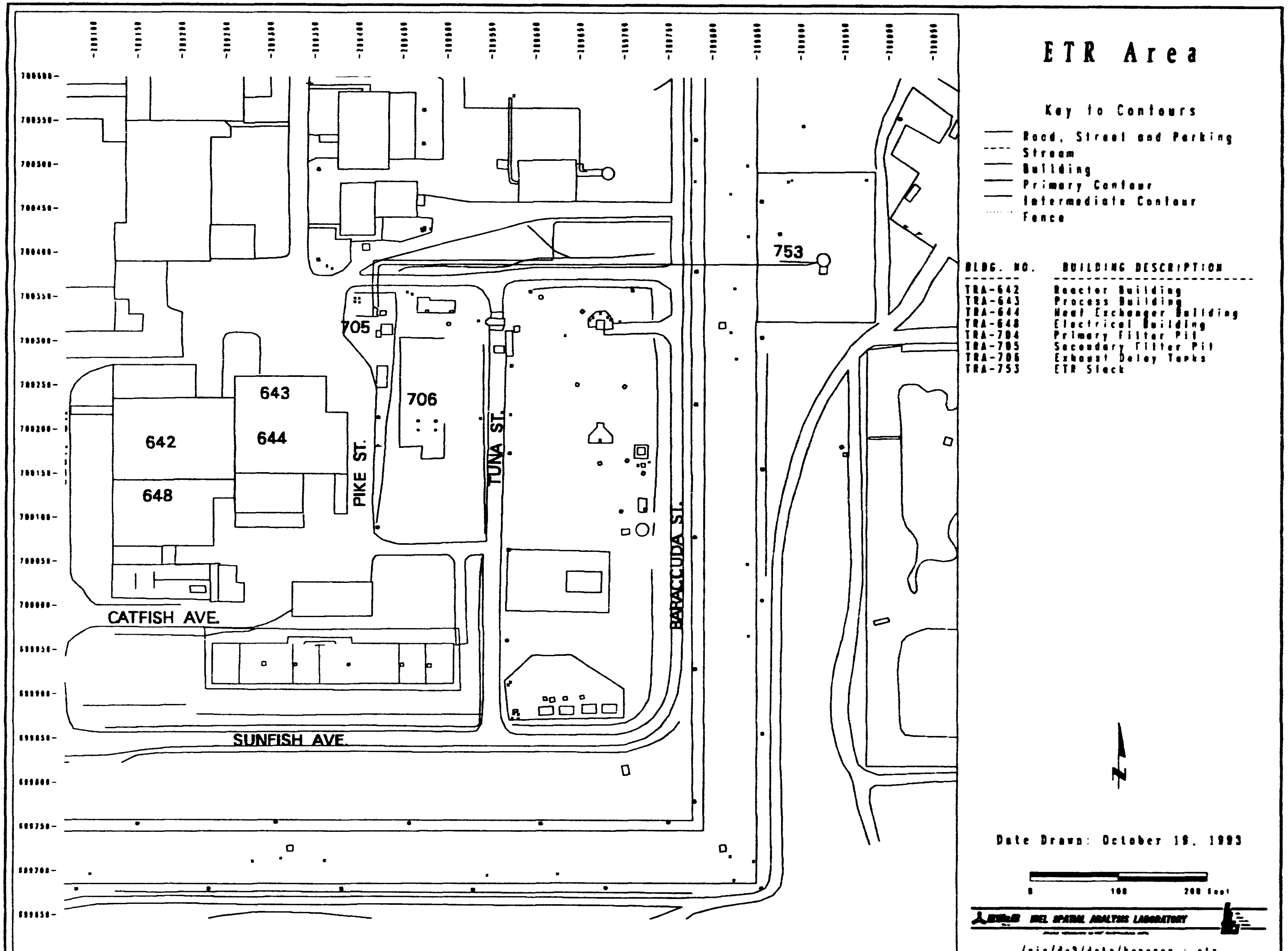


Figure B-15. ETR Complex Plot Plan.

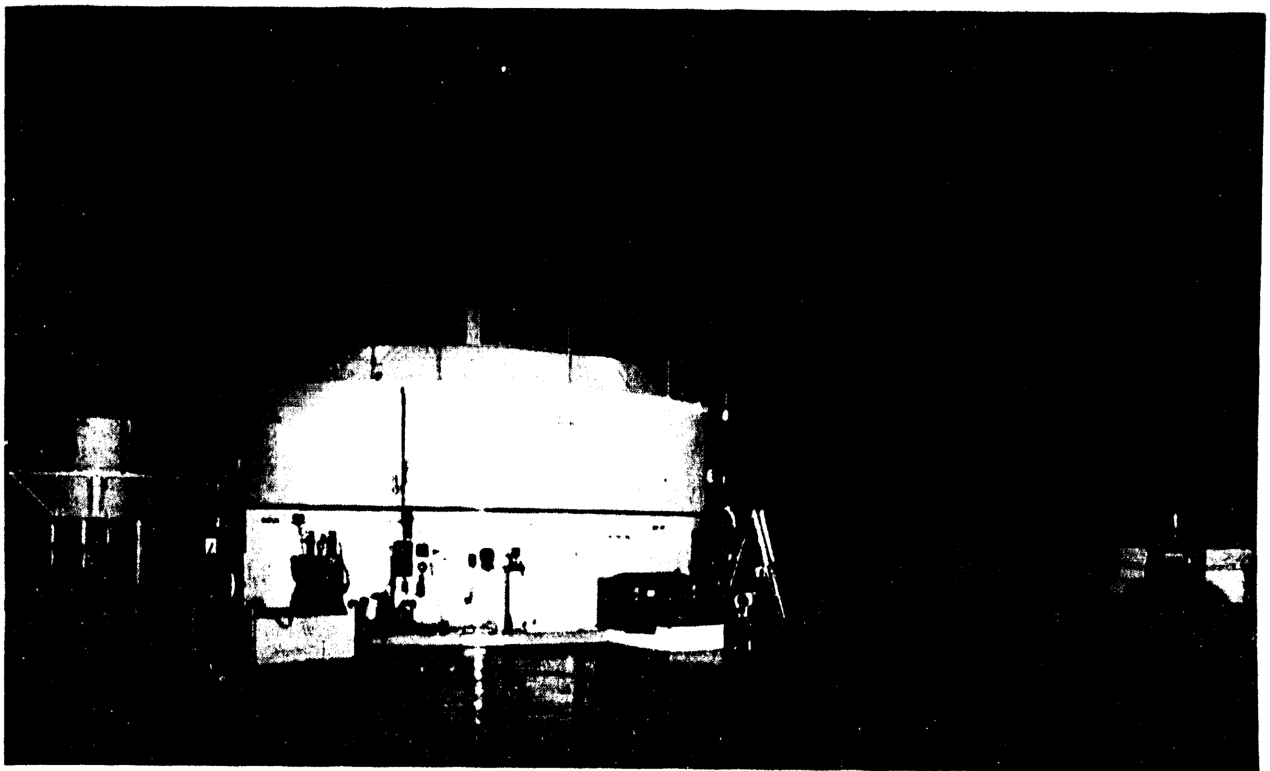


Figure B-16. The ETR and high bay area.

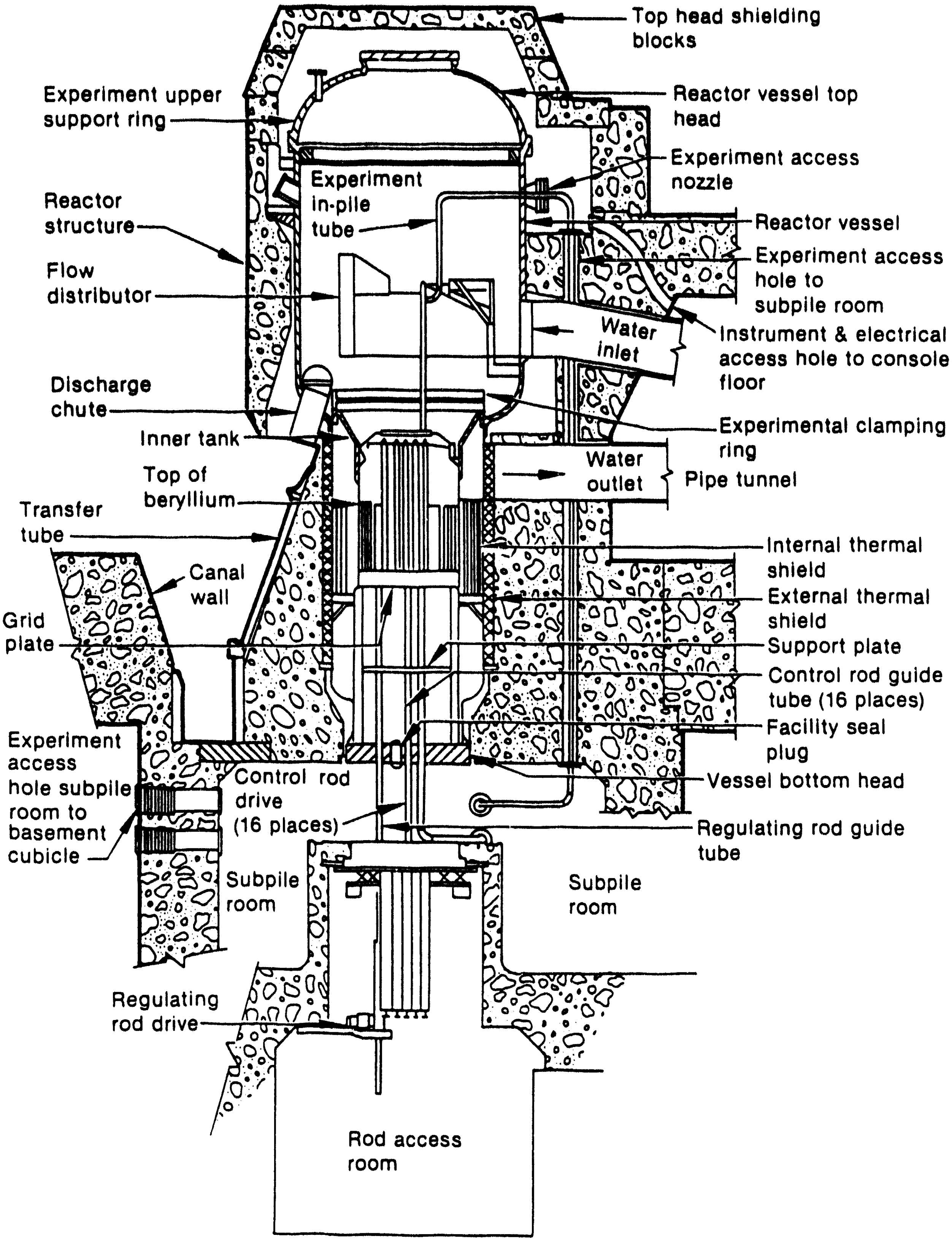


Figure B-17. Cross-section diagram of the reactor pressure vessel and associated components.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **Loss of Fluid Test Facility (LOFT) Ancillaries**					
PROJECT PRIORITY: 11		PRIORITY BASIS: Surveillance and Maintenance Cost Benefit			
SCHEDULE DURATION: 4 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $1947k		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1993: $ 295K	
FUNDING SOURCE: EW2010402		ADs No.: 65-EG		WBS No.: 1.4.9.1.2.09.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Covered by existing SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-94: $ 9k	FY-95: $ 51k	FY-96: $ 12k	FY-96: $ 55k	FY-97: $ 1300k	FY-98: $ 0k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k

TOTAL WASTE VOLUME ESTIMATE: 83.5 m^3		ESTIMATE BASE YEAR:
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 73.8 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE: 9.7 m^3	RUBBLE WASTE:	COMBUSTIBLE WASTE: 13.8 m^3
MUNICIPAL/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE: Hardware 60 m^3	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The LOFT Facility was operated from 1978 through 1985 to provide experimental data during accident conditions that result from simulated loss of reactor coolant testing. Following inactivation of the facility, several contaminated items were identified for D&D and termed the "LOFT Ancillaries." The major item remaining for D&D is the Mobile Test Assembly (MTA).

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

The MTA was a removable shielding tank that surrounded the LOFT reactor core. It was removed from the LOFT containment building in 1986 and currently resides on a double-wide railroad flatbed car outside at TAN.

The MTA now consists of only the dolly platform and shield tank. The dolly is approximately 20 ft wide x 46 ft long. The shield tank is approximately 13 ft high and approximately 17 ft in diameter. The circular opening (core barrel) in the center of the shield tank previously contained the reactor vessel but is now empty. The core barrel diameter is approximately 6.5 ft. The annulus surrounding the core barrel in now empty but originally contained water for shielding. The circular region around the outside of the shield tank is still filled with lead shot. The lead shot is assumed to be contaminated.

Lead sheets and lead wool were installed in the I beams in the substructure of the dolly. The lead sheets and wool are present, and their radiological condition will be determined when the MTA is disassembled and sized. This will be performed inside the TAN Hot Shop. The lead sheets and lead wool are assumed to be contaminated.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Radiological contamination is widespread both inside and out. Removable contamination on the outside is low and containment is currently maintained by a strippable paint covering.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-18, LOFT Schematic copied directly from Reference 3, and Figure B-19, Mobile Test Assembly (MTA) Photograph, copied directly from Reference 2, and Figure B-20, MTA Lead Shot Shielding Sketch, from Reference 1.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D. L. Smith, LOFT Ancillaries Project Manager, EG&G Idaho, Inc., 526-9875, TSB, MS 2414, Profs ID DLZ.

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

All of the smaller LOFT Ancillary items have been disposed or recycled; only the MTA remains. The MTA was painted in June 1992 with a durable, strippable paint, which can be incinerated at WERF upon removal.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The large amount of potentially contaminated lead will result in the generation of mixed waste. Treatment and disposal will be a primary consideration.

PERMITTING REQUIREMENTS:

In compliance with NEPA requirements, an EC will be prepared. It is anticipated that this activity can be preformed under a categorical exclusion (CX).

SURVEILLANCE and MAINTENANCE STATUS:

The MTA is on a periodic surveillance and maintenance schedule. The protective containment coating will be maintained as required.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

The recommended D&D is to dismantle, size, package, and dispose of the entire MTA.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for the LOFT MTA, Reference 2.

FACILITY REUSE CONSIDERATIONS:

Decontamination and reuse of the lead will be determined. The MTA is of little reuse value and will be dismantled and disposed of.

REFERENCES:

1. Characterization and Decision Analysis Report for the LOFT MTA, EGG-ERD-10282, dated September 1992, prepared by D. L. Smith.

2. D&D Plan for the LOFT MTA, EGG-ER-10594, dated February 1993, prepared by D. L. Smith.

3. INEL D&D Long Range Plan, PR-W-005, Revision 8, dated September 1991, prepared by M. Sekot and R. Buckland.

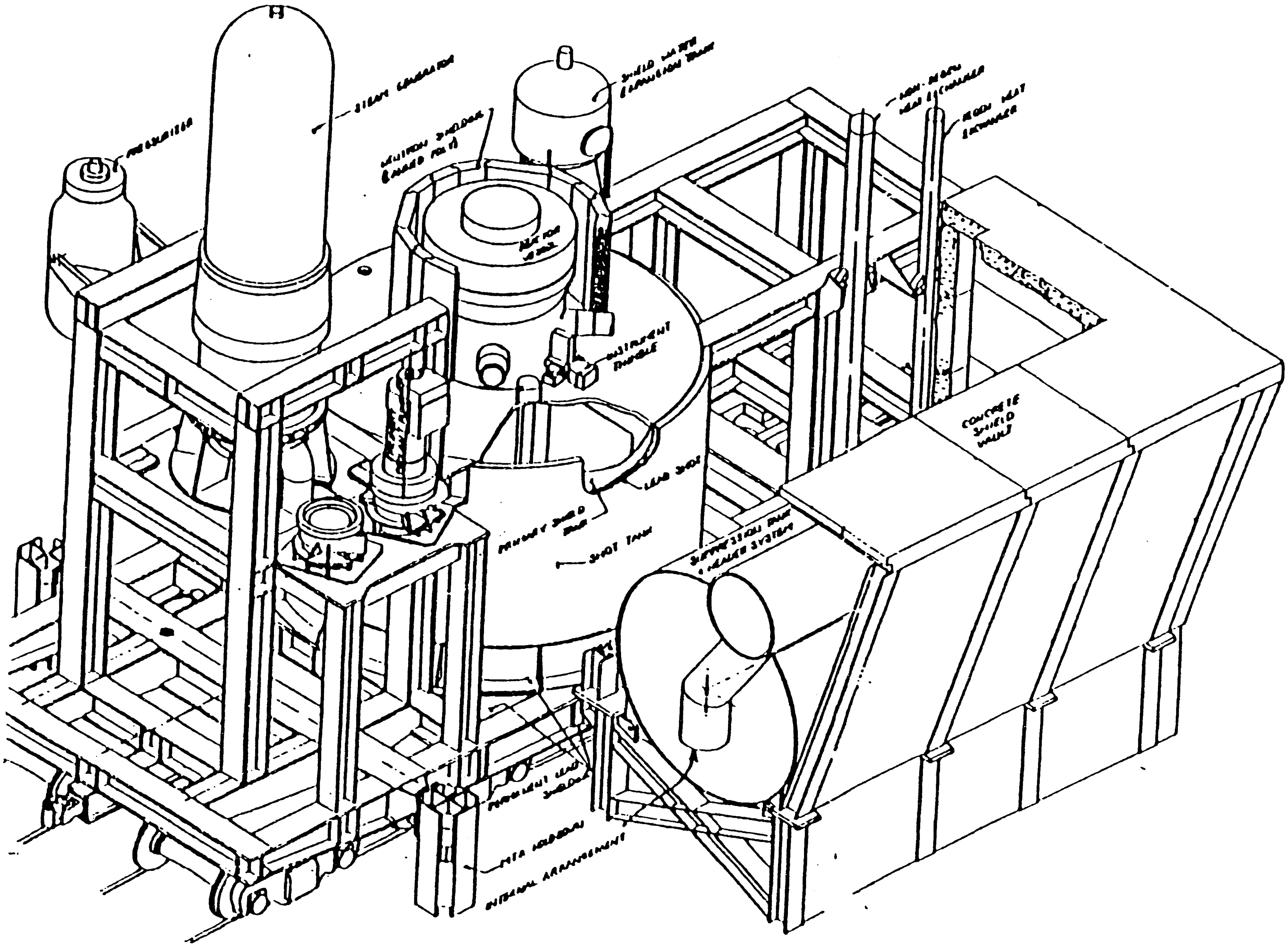


Figure B-18. LOFT Mobile Test Assembly schematic.

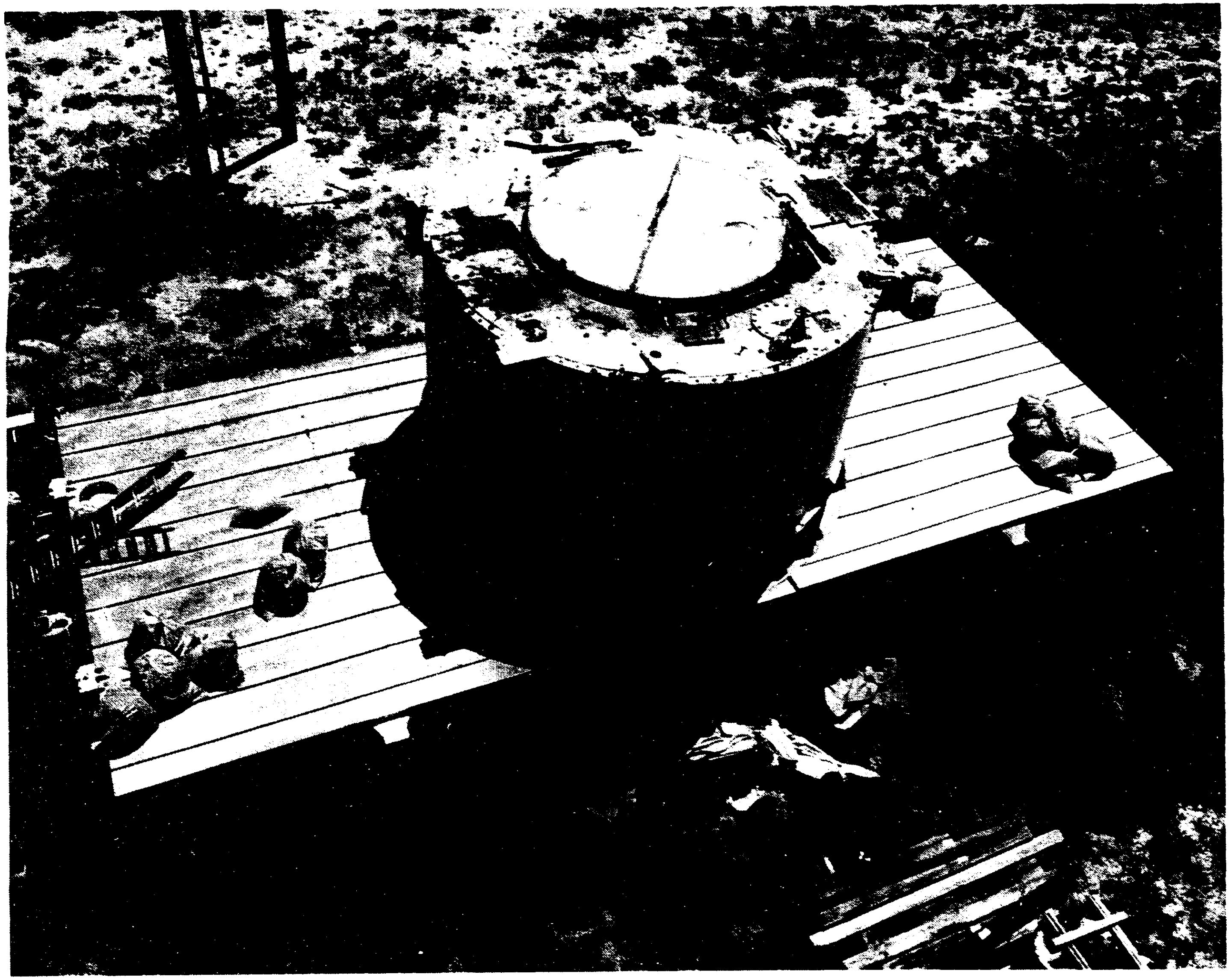


Figure B-19. The MTA looking toward the east.

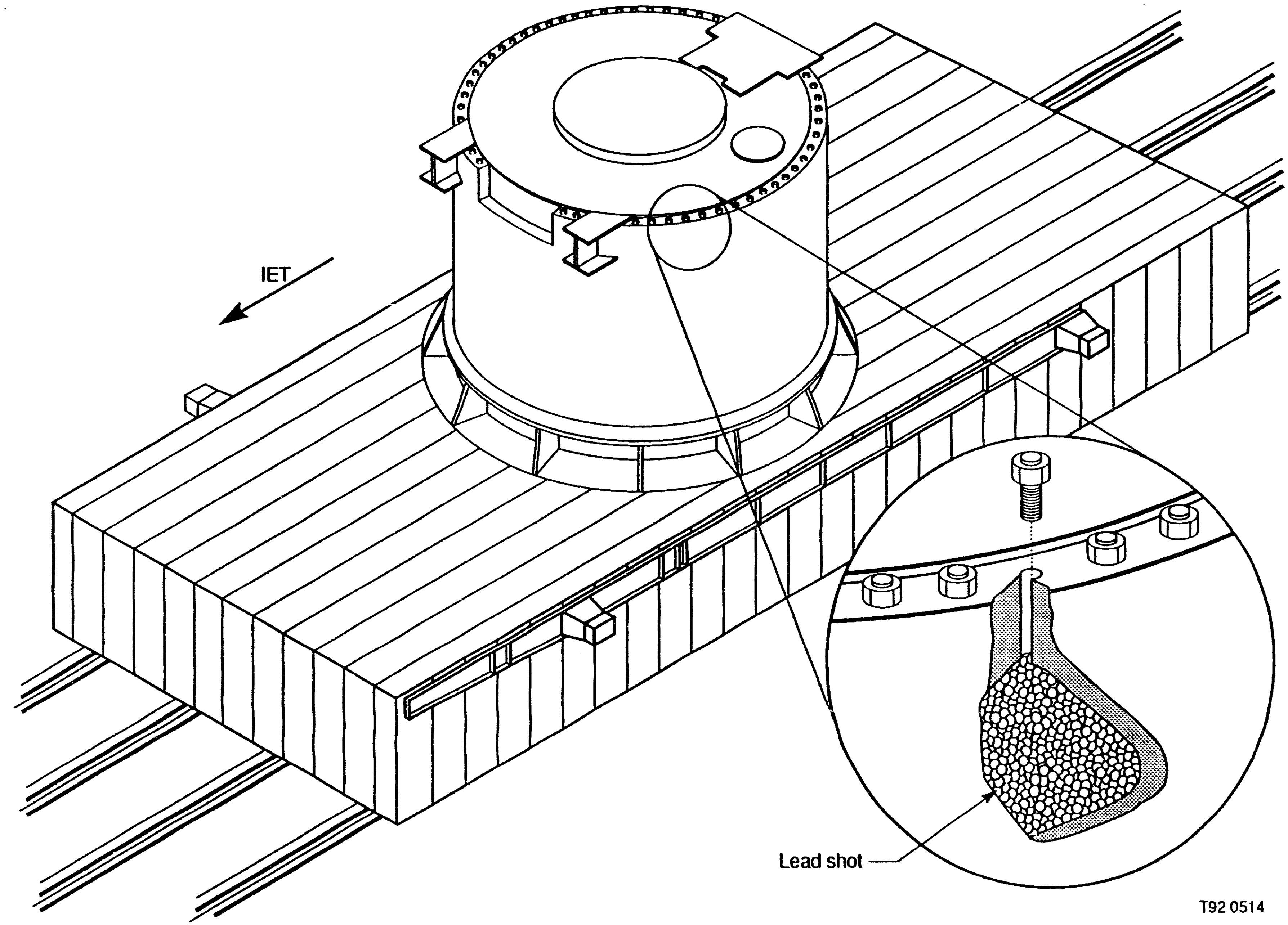


Figure B-20. Sketch of shield tank showing circular region containing lead shot.

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: EG&G Idaho, Inc.			
PROJECT: **Test Train Assembly Facility (TTAF)**					
PROJECT PRIORITY: 2		PRIORITY BASIS: Spent Nuclear Fuel Storage in temporary facility and MTR-603 canal leak of contaminated water into surrounding soil in previous years.			
SCHEDULE DURATION: 6 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $6,364K		ESTIMATE BASE YEAR: FY 1994		ACTUALS thru FY 1992: $ OK	
FUNDING SOURCE: EX2010401		ADs No.: 67-EG		WBS No.: 1.4.9.1.2.10.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Use existing SAR for fuel removal. TBD for D&D.			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-94: $ 700K	FY-95: $ 946K	FY-96: $ 965K	FY-97: $ 331K	FY-98: $ 254K	FY-99: $1619K
FY-00: $1550K	FY-: $ OK	FY-: $ OK	FY-: $ OK	FY-: $ OK	FY-: $ OK

TOTAL WASTE VOLUME ESTIMATE: 83.5 m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 73.8 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE: 9.7	RUBBLE WASTE:	COMBUSTIBLE WASTE: 13.8
MUNICIPAL/SANITARY WASTE:	LIQUID WASTE: gallons	COMPACTIBLE WASTE:
	OTHER WASTE: Hardware 60 m^3	

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The Test Train Assembly Facility (TTAF) is located in the basement of the Materials Test Reactor (MTR) building, which is located in the Test Reactor Area (TRA) at the INEL. The TTAF was used in support of the NRC's Thermal Fuels Behavior Program, in the 1980's, to build and disassemble nuclear fuel tested at the Power Burst Facility (PBF).[5]

The major portion of the TTAF D&D Project is the MTR-603 Water Canal. This is in addition to the normal test train assembly hardware and laboratory equipment. All items in the TTAF D&D Project are considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

MTR-603 Canal

The canal, which is located in the MTR basement, is 8 ft wide, 15.5 ft below floor level, and extends 121.5 ft eastward from the reactor structure. The reactor building east wall is 40 ft from the reactor structure; therefore, the canal extends 81.5 ft beyond the reactor building east wall. Outside the reactor building, the canal has a 6 ft wide working space on each side and at the east end. This working space is enclosed by a tunnel 13 ft 8 in. high and 21 ft wide.

A "rabbit canal" lies directly west of the reactor structure and is 6 ft wide x 6 ft deep x 18.5 ft long. A 7 ft wide portion of the canal below the subpile room and reactor structure connects the rabbit canal and main canal. This section, as well as the rabbit canal, has been drained of all water and sealed off. A permanent bulkhead was installed to isolate it from the remainder of the main canal. A cover and shielding has been placed over this section to protect personnel.

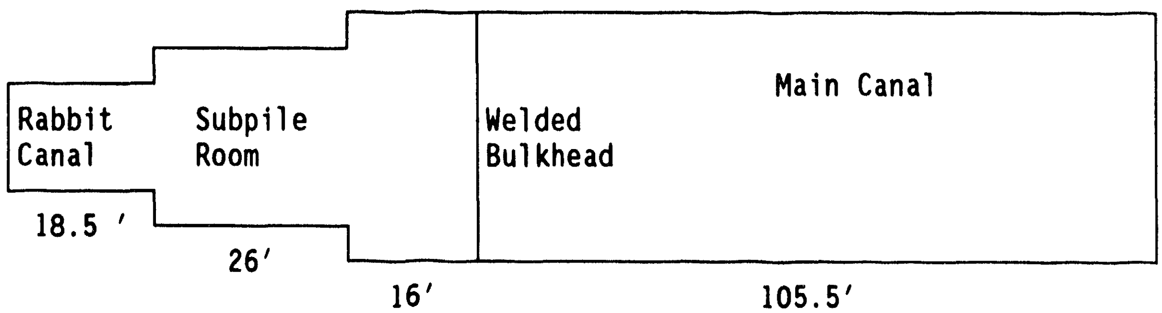
A parapet around the main canal is 10 in. thick at the bottom and projects outward to a width of 13 in. at the top. This projection provides toe space and gives personnel better stability for fuel handling operations. The top of the parapet is 3 ft above floor level. The water level in the canal was maintained 2 ft above the basement floor level providing a depth of water in the main canal of 17.5 ft.

The canal walls were originally covered with 8 x 16 in. white glazed structural tile 4 in. thick, and the bottom was lined with 4 in. of white concrete. A stainless steel liner was later installed to inhibit leakage. All of the canal except the section underneath the reactor vessel was lined with stainless steel.

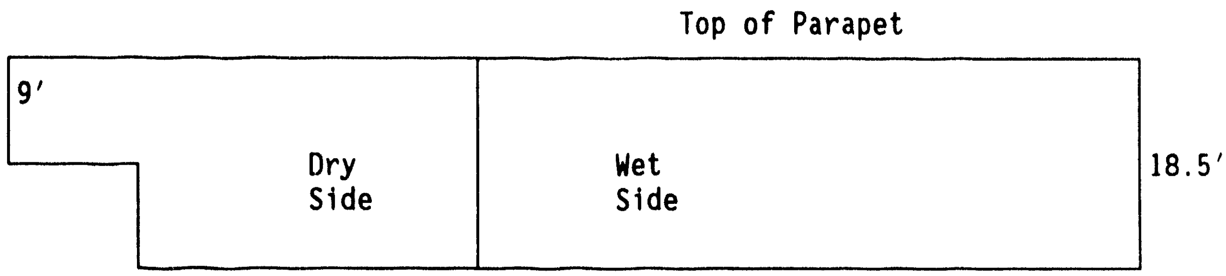
The east end of the water canal is connected to the Advanced Reactivity Measurement Faciltiy (ARMF) canal by a 5.1 cm shuttle tube that was inactivated in 1983. Spent fuel, irradiated samples, and associated equipment stored in the ARMF canal were removed in 1985.

PLAN and ELEVATION VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-21, MTR Basement Floor Plan; Figure B-22, MTR Cross-section of Reactor Structure; and Figure B-23, TTAF Canal Photograph copied directly from Reference 5.



Plan View
Not To Scale



Elevation View
Not to Scale

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

To be determined during the D&D Characterization phase. Significant contamination levels are expected because of the extent of fuel handling performed in the past and the Fuel Removal Phase of this project.

CONTACT INFORMATION:

S. A. LaBuy, D&D Project Manager for TTAF, EG&G Idaho, Inc., 526-9856, TSB MS 2414, Profs ID YUB
E. F. Perry, Unit Manager, D&D Projects Unit (3910), 526-9711, TSB MS 2414, PROFs EFP
C. W. Woolstenhulme, TTAF Facility Custodian, 526-4226
W. F. Lewis, Unit Manager, Utility Facilites, 526-4423
W. L. Powell, Manager, PRP Nonreactor Operations, 526-7055
J. Leatham, PBF Project, 526-9253

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

No D&D activities have been performed on the water canal; however, a portion of the water canal, under the reactor vessel, has been drained and sealed off to prevent further leakage into the surrounding soil. A stainless steel liner was installed in the remaining portion of the main canal.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The MTR-603 Canal contains irradiated fuel elements that must be removed before D&D Assessment activities can proceed. The fuel removal activities include, in part, preparation of a project plan, characterization of the fuel, revision of a cask transport plan to address this fuel, and actual fuel removal. The canal will also be partially drained, following fuel removal, until a radiation level of 10 mR/hr is present at the canal floor level. Any remaining water will then become the responsibility of the D&D Project. D&D Assessment activities will begin in FY 1997.

PERMITTING REQUIREMENTS:

The MTR water canal has an approved Safety Analysis, EGG-PRP-8239, which addresses fuel handling activities for the current contents of the canal. The SAR will be reviewed for applicability to D&D activities during the D&D assessment phase.

It is anticipated that the fuel removal activities will be permitted with a categorical exclusion. The D&D assessment phase will be covered by a categorical exclusion; whereas, the D&D cleanup phase may require an environmental assessment.

SURVEILLANCE and MAINTENANCE STATUS:

The EG&G Idaho, D&D Unit does not currently perform any surveillance and maintenance (S&M) efforts for the TTAF. The EG&G Idaho Power Reactors Program has the responsibility for performing routine S&M for the facility.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

There is a potential for further degradation to the environment from the increasing probability, with time, of a minor failure in the MTR-603 canal steel liner. This would result in contaminated water leakage into the surrounding soil.

D&D RECOMMENDED METHODOLOGY:

Following all fuel removal, D&D assessment and cleanup will be performed to remove the contamination in this facility and the surrounding soil area. The extent of soil cleanup will be determined during the decision analysis phase. The facility will be restored to a stable condition following the completion of dismantling efforts.

SPECIALIZED CAPITAL EQUIPMENT and TOOLS REQUIRED:

TBD

WASTE VOLUME ESTIMATE BASIS:

Characterization of the MTR Facilities, Reference 5.

FACILITY REUSE CONSIDERATIONS:

TBD

REFERENCES:

1. Idaho National Engineering Laboratory Decontamination and Decommissioning Long Range Plan, Report No. PR-W-79-005, Revision 8, September 1991.

2. TTAF Fuel Removal Cost Account Plan, 3KKTTF000, WBS 1.2.10.1.1.2, Revision 0, Draft, July 1993.

3. TTAF Assessment Cost Account Plan, 3KKTTA000, WBS 1.2.10.1.1.1, Revision 0, Draft, July 1993.

4. TTAF Cleanup Cost Account Plan, 3KKTTC000, WBS 1.2.10.1.1.1, Revision 0, Draft, July 1993.

5. R. L. Rolfe and E. L. Wills, "Characterization of the Materials Testing Reactor," WM-F1-83-016, April 1984.

6. E. V. Mobley, Safety Analysis for the Power Reactor Programs MTR Canal Facility, EGG-PRP-8239, April 1990.

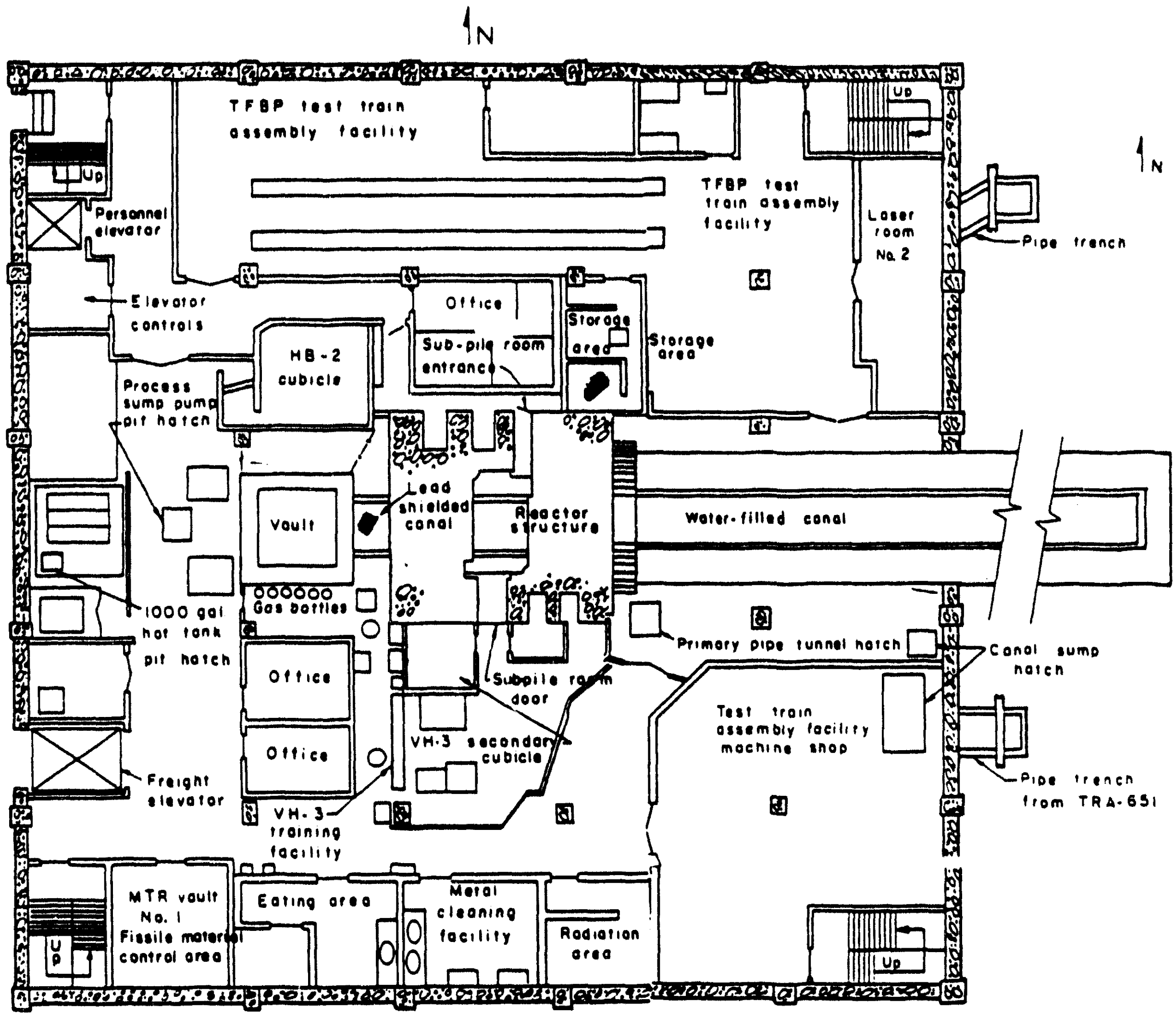


Figure B-21. MTR Basement Floor Plan.

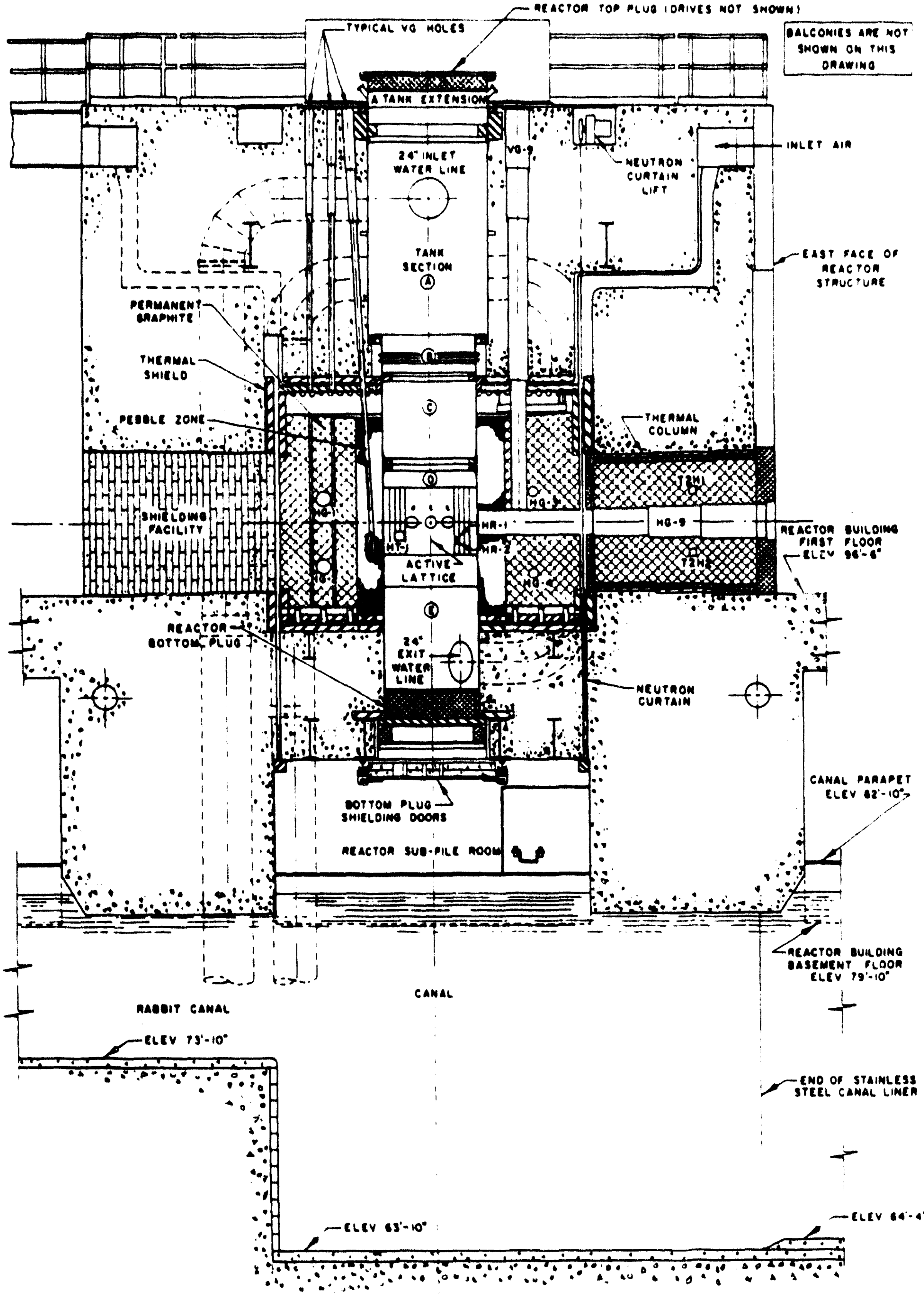


Figure B-22. Cross-section of reactor structure as viewed from south at east-west center plane.

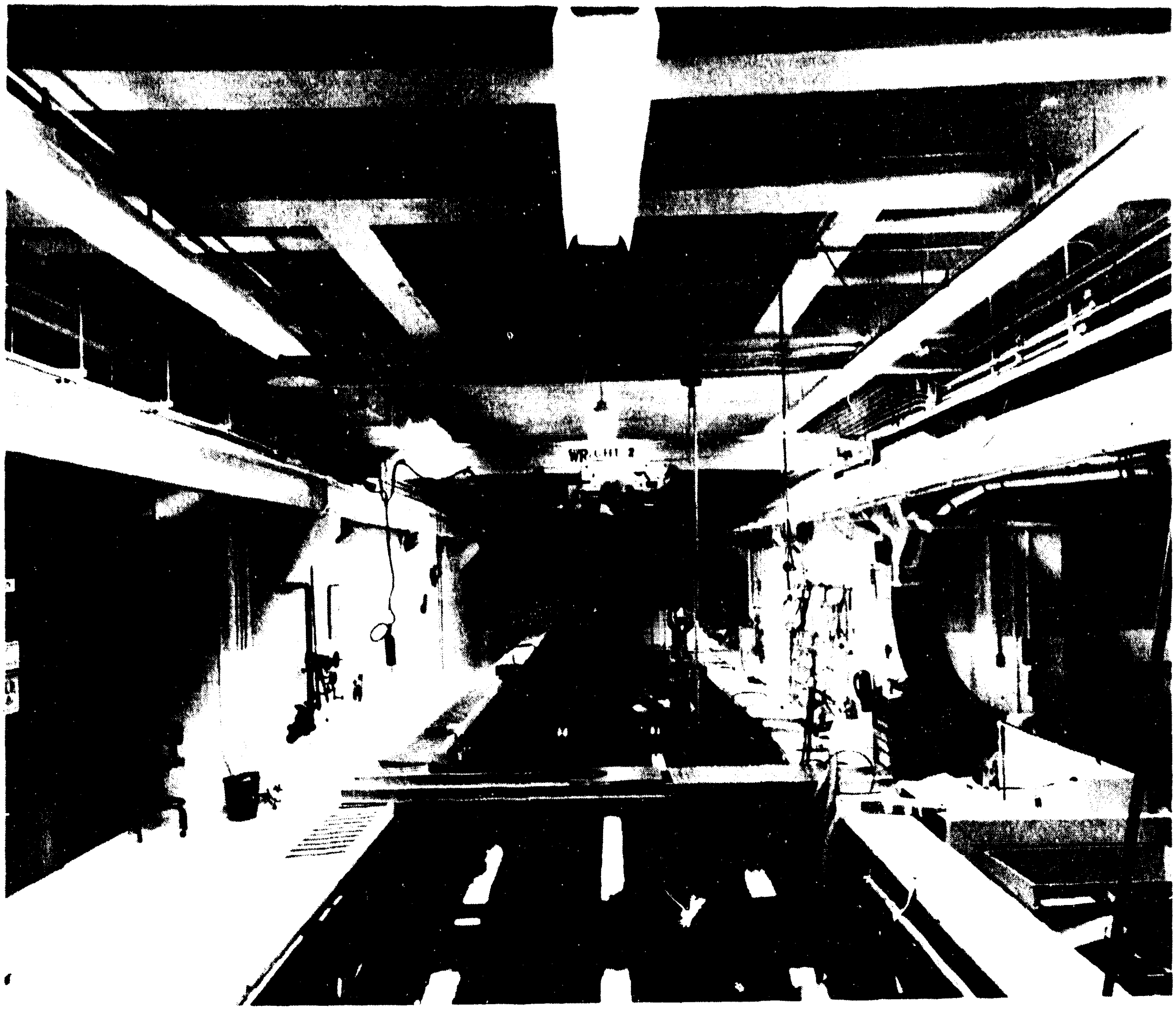


Figure B-23. The water-filled canal extends underground 88 ft east of the reactor building basement.

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3 of 3

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: **EG&G Idaho, Inc.**			
PROJECT: **SPECIAL POWER EXCURSION REACTOR TEST (SPERT-IV) ANCILLARIES**					
PROJECT PRIORITY: 12		PRIORITY BASIS: Surveillance and Maintenance Cost Benefit			
SCHEDULE DURATION: 2 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 1334K		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 865k	
FUNDING SOURCE: EW2010402		ADs No.: 64-EG		WBS No.: 1.4.9.1.2.14.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-93: $ 469k	FY-94: $ 0k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
TOTAL WASTE VOLUME ESTIMATE: 53 m^3				ESTIMATE BASE YEAR: 1993	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): 45 m^3			
TRU WASTE:		SOIL WASTE:		CARBON STEEL WASTE: 3 m^3	
HAZARDOUS WASTE:		CONCRETE WASTE:		STAINLESS STEEL WASTE:	
MIXED WASTE:		RUBBLE WASTE: 42 m^3		COMBUSTIBLE WASTE:	
MUNICIPAL/SANITARY WASTE: 8 m^3		LIQUID WASTE:		COMPACTIBLE WASTE:	
		OTHER WASTE:			

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The SPERT-IV Reactor Facility was operated from 1961 through 1970. The SPERT-IV reactor building was D&D'd in 1979, but decommissioning of the adjacent waste holdup tank and associated underground piping was postponed because of funding limitations. D&D of the SPERT-IV waste holdup tank (PBF-714) was initiated in 1992.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

The waste holdup tank is located 170 ft south of the SPERT-IV reactor building. Figure is a view of the tank. The tank is a 26 ft diameter by 21 ft high welded steel tank with a 61,000 gal capacity.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Before current removal activities there was a thin layer of sludge on the tank bottom contaminated with radioactive mixed waste. Several radioisotopes, including some transuranic, were determined to be present in the sludge.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-24, SPERT-IV Site Plan, and Figure B-25, SPERT-IV, Waste Holdup Tank and underground piping.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

C. B. Hansen, SPERT-IV Ancillaries Project Manager, EG&G Idaho, Inc., 526-8108, MS-4133, Profs ID CBH.

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

SPERT-IV reactor building was D&D'd in 1979.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The existence of mixed waste required the preparation of a Generator Treatment Plan in compliance with RCRA LDR regulations.

PERMITTING REQUIREMENTS:

NEPA requirements were satisfied by a Memorandum to File, number PBF-89-308.

SURVEILLANCE and MAINTENANCE STATUS:

Not required, D&D activities are currently active.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

To remove and dispose of all hazardous and radioactive contamination, demolish the tank and underground piping, and release the area for unrestricted use.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None.

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for SPERT-IV waste holdup tank, Reference 1.

FACILITY REUSE CONSIDERATIONS:

Objective is to release site for reuse.

REFERENCES:

1. D&D Plan for the SPERT-IV waste holdup tank and underground piping, EGG-WM-8587, dated July 1989, prepared by D. L. Smith.

2. SPERT-IV Ancillaries Characterization, WM-PD-86-002, dated February 1986, prepared by R. A. Suckel.

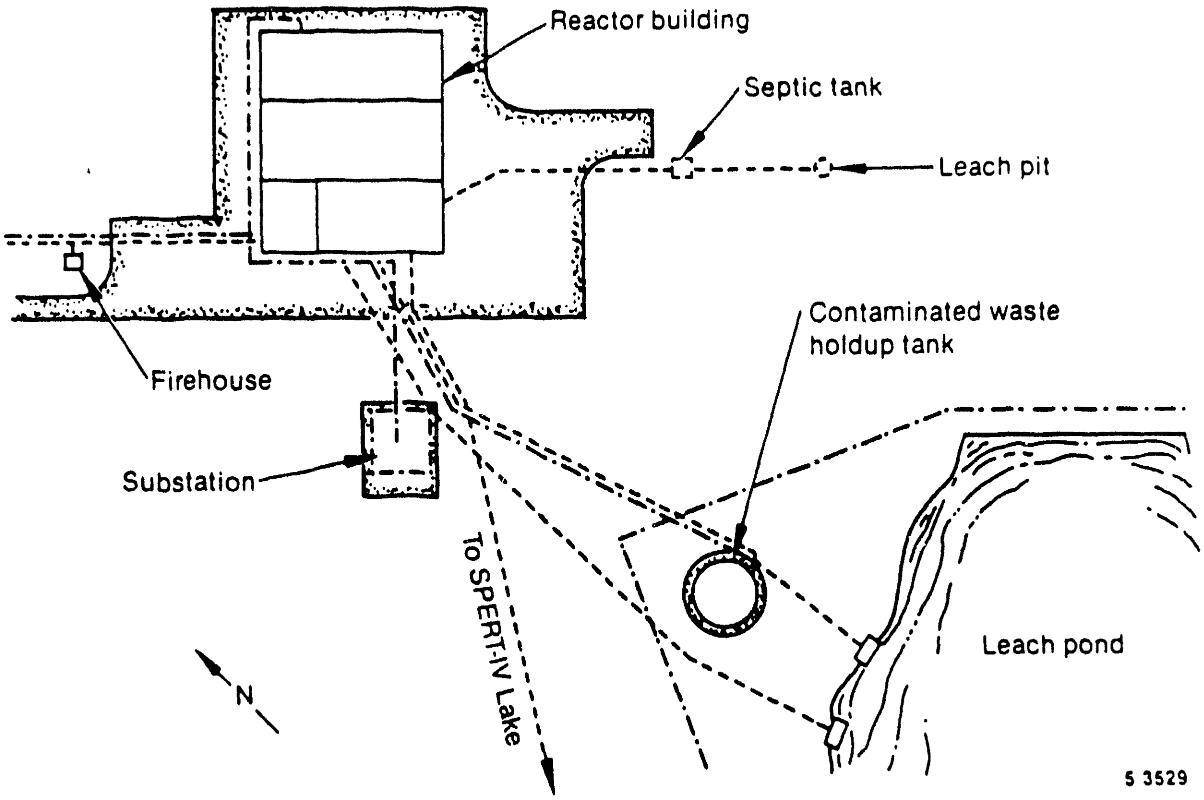

Figure B-24. SPERT-IV site plan.

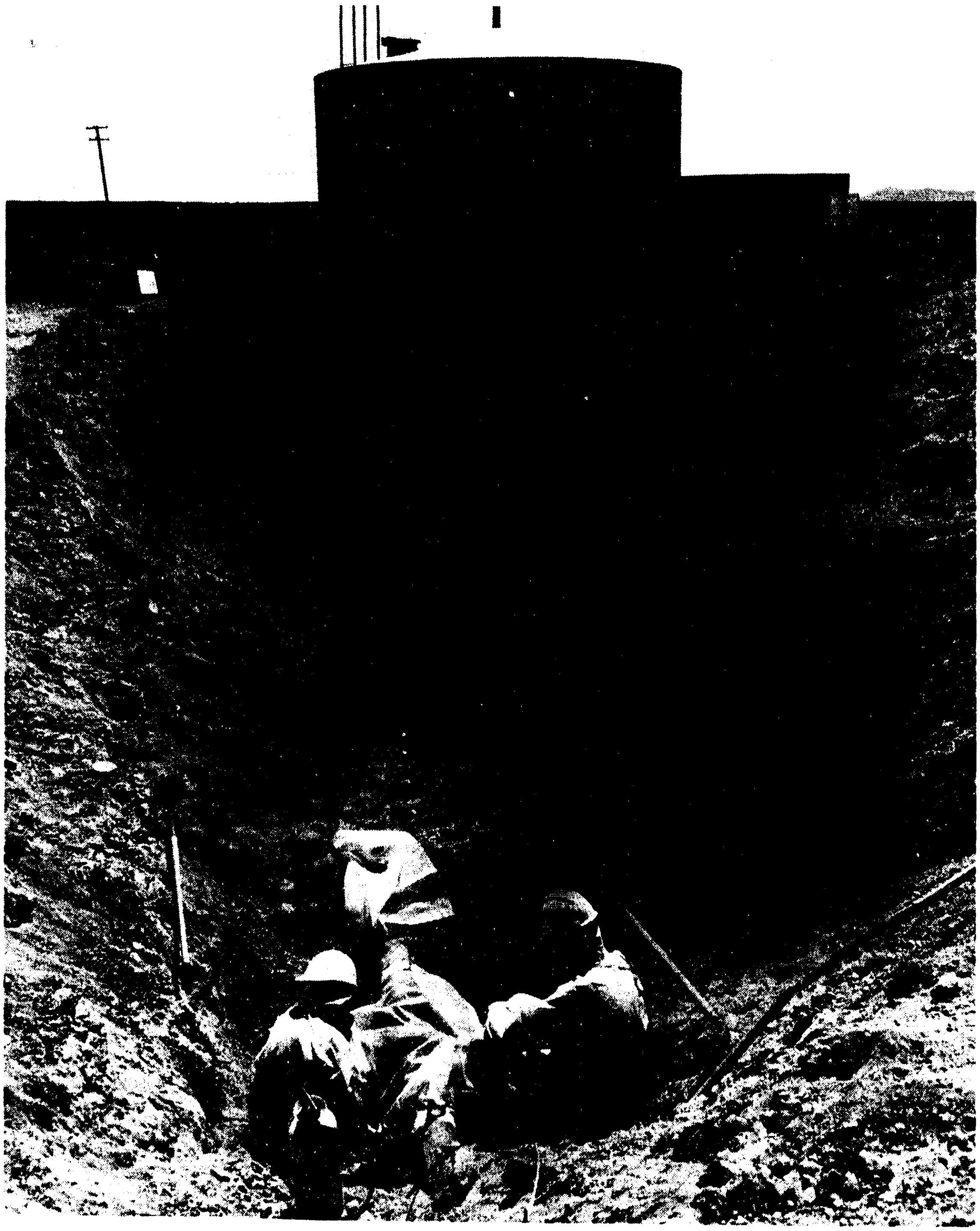

Figure B-25. Photograph of the SPERT-IV Waste Holdup Tank and underground pipeline.

Form-DD-100, Rev. 2 (29-Jul-93)

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Rev. 0, 15-Oct-93

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**		CONTRACTOR: **EG&G Idaho, Inc.**			
PROJECT: **BOILING WATER REACTOR EXPERIMENT (BORAX-V)**					
PROJECT PRIORITY: 9		PRIORITY BASIS: Surveillance and Maintenance Cost Benefit			
SCHEDULE DURATION: 6 yrs		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 5455K		ESTIMATE BASE YEAR: FY 93		ACTUALS thru FY 1992: $ 3067K	
FUNDING SOURCE: EX2010401		ADs No.: 63-EG		WBS No.: 1.4.9.1.2.15.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-93: $ 500k	FY-94: $ 124k	FY-95: $ 896k	FY-96: $ 868k	FY-97: $ 0k	FY-: $ k
FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k	FY-: $ k
TOTAL WASTE VOLUME ESTIMATE: 626.3 m^3				ESTIMATE BASE YEAR: 1993	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): 458.2 m^3			
TRU WASTE:		SOIL WASTE: 80 m^3		CARBON STEEL WASTE: 17.4 m^3	
HAZARDOUS WASTE: 94.7 m^3		CONCRETE WASTE:		STAINLESS STEEL WASTE:	
MIXED WASTE: 3.0 m^3		RUBBLE WASTE: 275 m^3		COMBUSTIBLE WASTE: 62 m^3	
MUNICIPAL/SANITARY WASTE: 70.4 m^3		LIQUID WASTE: 5.5 m^3		COMPACTIBLE WASTE: 18.3 m^3	
		OTHER WASTE:			

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The BORAX facility, located in the southwestern part of INEL, was the site for reactor experiments conducted between 1951 and 1954. The BORAX experiment series began with BORAX-1, an open-top boiling water reactor. This reactor was intentionally destroyed and, after cleanup, buried in place during 1953. A new site, northeast of BORAX-I, was chosen for subsequent experiments. The BORAX-II, -III, -IV, and -V experiments were performed on the same site as the existing BORAX-V facility. The BORAX-V facility is partially contaminated and presently excessed.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

The BORAX-V site boundary, for purposes of this D&D plan, is defined as follows:

To the north, the boundary is the exclusion fence enclosing the reactor building. The east boundary is formed by a line starting at the north boundary along the eastern exclusion fence south to a point due east of the north end of the turbine building. At this point, the site boundary extends 100 ft to the east, then south for 250 ft. The boundary then goes back to the west to within 30 ft of the access road, where it again turns south and parallels the access road to Adams Boulevard. The western boundary is formed by the reactor exclusion fence, a line extending south to the leaching pond area, then east to within 15 ft of the access road, and finally paralleling the road to Adams Boulevard. The southern boundary is Adams Boulevard.

BORAX experiments, except BORAX-I, were housed in two main buildings: the reactor building (AEF-601) and the turbine building (AEF-602), later designated as buildings 717 and 718, respectively. These buildings were constructed of sheet metal over steel frames. A wooden cooling tower and guard post, designated as buildings 719 and 709, respectively, were also present. One reactor vessel was used in conducting three BORAX experiments, designated BORAX-II, BORAX-III, and BORAX-IV. This vessel is designated as the BORAX-II, BORAX-III, and -IV reactor vessel and is housed in building 717. This building also houses the BORAX-V reactor vessel, and miscellaneous process piping and instrumentation that support the reactor. The turbine building contained a 1926 Westinghouse turbine-generator rated at 3750 kVA (3000 kW steam turbine) and associated process piping, instrumentation, and testing loops.

The BORAX-V facility comprised the reactor and turbine buildings, cooling tower, heating and ventilating (H&V) building, and miscellaneous outdoor components. The reactor building is a Butler-type structure, with sheet metal skin and structural steel frame. This building housed the BORAX-V reactor vessel, the BORAX-II, -III, and -IV reactor vessel, and the associated reactor support systems.

The turbine building was also a Butler-type structure and contained the turbine-generator unit and all its associated systems.

Circulating waste from the condenser was cooled by a forced-draft redwood cooling tower.

The heating and ventilating building provided heat for the reactor building in cold weather and air circulation in warm weather. It was constructed of concrete block and is located on the west side of the reactor building.

For purposes of this D&D, the following miscellaneous components were also considered part of this facility:

- Guard house
- Piping to the leaching pond
- Security fence around reactor building
- Facility electrical service
- Septic tank system
- Raw water distribution system
- Buried fuel tanks.

<u>BORAX-V.</u>
The BORAX-V reactor vessel is cylindrically shaped with ellipsoidal heads. It is constructed of carbon steel, and clad internally with Type 304 stainless steel. The top head is joined to the vessel body by means of bolted and gasketed flanges. The vessel flange is a 40-bolt assembly, with each assembly consisting of a 30 in. diameter profiled and bored stud, a stud nut, and a gaging pin. The vessel is equipped with 40 nozzles and ports for access, instrumentation, control rods, etc., to provide flexibility in experiments.

The vessel is supported from the bottom end by an A-7 carbon steel skirt and four sole plates. The plates are welded to 14-in. wide flange beams cast into the concrete support and shield slab. Four equally spaced guide plates are provided on the lower vessel flange. Matching guides are anchored to the reactor pit walls. These plates and guides allowed unrestricted vessel thermal expansion, but prevented lateral movement.

The vessel is insulated with a 2-in. blanket of fine, Type 430 stainless steel wool, supported by a series of steel rings welded to the vessel, and enclosed in a skin of 20-gauge, Type 304 stainless steel sheet. Certain sections are removable for access to the flange bolts, etc. The vessel nozzles and extensions are insulated and jacketed.

The vessel housed and supported the reactor core and control rods, received feedwater, contained pressure, and transmitted steam to the steam system. BORAX-V was designed as an extremely flexible system with three separate core configurations: a boiling core with a centrally located superheater, a boiling core with a peripherally located superheater, and a boiling core without a superheater. In all cases, it was possible to operate with either natural or forced circulation of water through the core. The water served as the moderator in both the boiling and superheater regions of the core, and as coolant in the boiling region. The superheater was cooled by steam.

Water flowed up through the boiling core and the riser above the core by either forced or natural circulation. The steam formed into the core continued into the steam space, while the water flowed down through the annular downcomer

BORAX-II, -III, and -IV.

The BORAX-II, -II, and -IV experiments employed a reactor vessel that was later used for superheater fuel element storage during the BORAX-V experiments. The BORAX-II, -III, and -IV internals and the reactor vessel head have been removed. The vessel is located in the south end of the building in the old reactor pit. The space between the vessel and its concrete shield has been filled with sand and capped with concrete. Piping connects this vessel into circulating water for the fuel storage system.

BORAX-V Control Rods and Drives

Nine control rods were used to control the BORAX-V reactor. The poison sections of the control rods are centered in the reactor core when the drives are disconnected or deenergized. The rod drives mount below the reactor vessel and operate to raise the poison section of the rod up and out of the core. There are five cruciform-shaped rods and four T-shaped rods having a stainless steel clad Boral section 24 in. long and an overall length of 9 ft, 11-3/8 in. The rods have a 24 in. aluminum follower below the Boral section and a 25-in. travel.

Raw Water System

The raw waster system supplied water and provided equipment cooling. Raw water piping is painted brown.

Raw water from the deep well pump at EBR-I is supplied to the area through a 4-in. underground line from the EBR-I well pit. This line has branches to the reactor building, turbine building, and the fire hydrant southeast of the turbine building. A main stop valve is located in the well pit.

Makeup Water System

The makeup water system was the source of demineralized water for the initial filling of the reactor primary coolant and fuel storage systems. It also provided, as makeup water, the difference between reactor water demand and condensate water supply. This system is painted light brown.

Condensate System

The condensate system, painted tan, removed condensed steam from the condenser hotwell and returned it, via the underground trench, to the reactor building and feedwater storage tank T-5. It also met a number of auxiliary requirements: it delivered water to gland-seal storage tank T-7; received water from the condensate drain tank (T-8); was one source of coolant water for the turbine air ejector; and contributed to high quality plant water by virtue of primary condensate filter F-3, condensate demineralizer DM-2, and secondary condensate filter F-2.

Feedwater System

The primary function of the feedwater system was to deliver a regulated supply of demineralized water to the reactor vessel. This system also supplied seal water to the control rod drives, the forced convection pump, and the auxiliary water pump. It was also the water source for the steam system desuperheater. Finally, it supplied cooling and/or seal water for incidental experimental equipment. This system is painted dark green. Basically, the system consisted of a feedwater storage tank (no longer in the facility), two feedwater pumps and a controlled and instrumented distribution system.

Reactor Vessel Standpipe (BORAX-V)

The reactor vessel was equipped with and connected at three points to reactor water-level standpipe T-1. The standpipe is located in the access shaft alongside the BORAX-V vessel. The water level and pressure within this insulated standpipe were virtually the same as in the reactor vessel, permitting them to be monitored at this location. The standpipe is equipped with a number of instruments and devices.

Auxiliary Water System

The auxiliary water system is composed of the 150-gpm auxiliary water pump, a 144-kW bank of immersion-type electric heaters, a 130-kW system of piping strip heaters, a reactor water demineralizer, heat exchangers, piping, valves, and instruments. This system is painted green. Through use of the pump and heaters, reactor water was circulated and increased in temperature without nuclear heat. This was useful in normal startup and superheater shutdown operations and during initial hot critical experiments.

Forced Convection System

The forced convection system, painted green, delivered water to the boiling fuel elements at higher flow rates than could be obtained by natural circulation within the reactor vessel. These higher rates permitted operation of a given core at higher useful powers than would otherwise have been possible.

Process Steam Systems

The process steam systems allowed observation and control of the mechanical operation of the reactor and also conducted steam away from the reactor vessel. The process steam system is painted burnt orange. The component parts of these systems are, for the most part, similar in type and kind to those found in a conventional steam plant. The several control valves and systems were arranged to ensure most cases of control or power failure would cause the valve or valves to close, and thus, isolate or contain the reactor vessel contents. Complete loss of air and electric power resulted in full containment. The most frequently required function of this fail-safe design was to preserve reactor steam pressure after a shutdown that results from power failure. Because BORAX was an experimental facility, provisions were made to take steam from the vessel at a number of points and conduct it away by various routes.

Turbine-Generator System

The turbine-generator unit, with associated plant systems, was used as a reactor heat sink. The principle systems are the turbine steam, air ejector, air ejector exhaust, gland seal water, circulating water, raw water, and lube oil systems.

Steam System

The steam system is painted burnt orange. The major piece of equipment is the 1926 Westinghouse 3600-rpm turbine-generator unit. The 3000-kW steam turbine was designed to operate with 350-psig steam at 150°F of superheat, or 585°F. Steam passed through the governor-controlled nozzle valves in the turbine nozzle block and into the turbine steam chest. Flow continued into the first-stage turbine impulse blading and then on through the remaining reaction blades to the condenser.

Air Ejector System

The air ejector unit is made up as a pair of two-stage air ejectors. The air ejector system is painted tan. The ejector surface condenser was used for condensing steam and cooling the noncondesable exhaust vapors. Only one set of ejectors was used at a time and the other was a spare. The main steam supply to the ejectors was reduced to 175 psig by pressure-reducing valve MS-33. The first-stage air ejector drew off gases from the main turbine condenser through a 10-in. diameter pipeline and deposited them, along with the first-stage ejector steam, into the innerstage condenser. Condensate from this condenser was returned to the main turbine condenser through a loop seal. A leg of water in the loop seal counteracted the pressure difference between the main and intermediate condensers.

Air Ejector Exhaust System

The principal items of equipment in the air ejector exhaust system are a heat exchanger with demister, two filer units, a rotameter, a blower, and a gas activity monitor. This system is painted yellow. The heat exchanger used 5 to 10 gpm of raw water coolant in single-pass flow through the tube side. Approximately 10 cfm of radioactive air ejector exhaust gases passed through the baffled-shell side of the exchanger and out through the demister. Condensate drained from the heat exchanger to the condensate drain tank. Two filter units with replaceable elements are located downstream from the heat exchanger. The first unit contains an absolute-type filter for removal of particualtes from the gases. The second contains a charcoal filter for removal of radioactive iodine fission products should a superheater fuel cladding failure ever have occurred. Both filter elements slip into their respective boxes facilitated by tape seals for ease of removal and replacement. A gas rotameter is located upstream from the filters with a 0 to 10-cfm scale.

Gland Seal Water System

The gland seal water system is painted tan in the facility. The principal item of equipment in the system is the overhead 200-gal gland seal water storage tank located in the turbine building. It supplied a head of approximately 7 psig to the water-sealed turbine glands. Only demineralized water was used in this system in order to prevent scale buildup in the turbine seals or contamination of the condensate water system. Gland seal water pressure control valve C-12 is in the condensate system to create sufficient head to raise condensate to the gland seal water storage tank.

Circulating Water System

The circulating water system (similar to a conventional secondary cooling system) is painted light green in the facility. The main circulating pump is an Allis-Chalmers 6500-gpm centrifugal pump. It was driven by a 100-hp, 440-V, induction-type motor and developed a head of 50 ft. The pump took suction from the condenser 16-in. diameter pipe outlet and delivered water into the top of the Fluor Corp. Model FD 8880 induced-draft cooling tower via a 20-in. line. The water was discharged in a spray from the top distribution chamber;

from here it fell to the basin in the bottom of the tower. The water droplets fell through a stream of air drawn from outside the bottom of the tower. As air was drawn upward by the 4-bladed, 16-ft-diameter fan in the top of the tower, it removed heat from the water by evaporation. The tower was designed to cool 6600 gpm of water from 105° to 90°F. Both the main circulating pump and the two-speed tower fan were controlled from the turbine building motor control center. The fan was operated at 885 or 1770 rpm forward and 885 rpm reverse by a 10/40-hp motor. It is equipped with a vibration cutout switch automatically shuts down the motor in case of excessive vibration in the mechanical assembly.

Raw Water System

The raw water system is painted brown in the facility. The EBR-1 deep well pump supplied raw water to the reactor and turbine buildings via a 4-in. diameter underground main. A 3-in. diameter branch line from this main enters the turbine building and ties into the raw water surge tank.

Lube Oil System

The lube oil system is painted blue. The turbine lube oil sump tank, with a capacity of approximately 110 gl, is suspended from the forward turbine bearing housing. Enough oil was always provided to ensure when the turbine was running at full speed, the oil level in the reservoir was maintained at about the midpoint of the level gauge. Two strainers in the tank served to remove foreign particles from the system.

Pink Tank

A large pink tank currently sits on the turbine building lower level. Its use is unknown and surveys indicate no radioactive or chemical contamination.

Boron Addition and Batch Feedwater Systems

Boron Addition System

The boron addition system is painted purple. It consists essentially of boron storage tank T-2; electric heaters for heating the tank and pipe, a steam supply line, a tank-to-reactor discharge line; and a number of valves, controls, gauges, etc.

Batch Feedwater System

The batch feedwater system is painted dark green. This system consisted of batch feed tank T-3, bath storage tank T-6, plus a system of piping and valves that connect the tanks to one another and to the reactor vessel.

Electrical Power Systems

The electrical power system consisted of the powerline, outdoor substation, motor control centers, lighting transformers, distribution panels, emergency power battery (no longer in the facility), emergency gasoline engine generator (no longer in the facility), and interconnecting wiring. This equipment supplied power to all motors, lights, instruments, etc.. The control building has been disconnected from BORAX-V and is not included in this D&D project.

Powerline

Electric power is supplied to the BORAX area by a 12,470-V powerline from Central Facilities Area. This line also supplied electrical power to three additional main substations: WMO-601 substation, EBR-I substation, and the deep well pump substation. Power to the reactor and turbine building area can be disconnected by a pole-top switch located on the second pole, on the tap running from the main feeder to the BORAX area. The pole-top switch will be opened, tagged, and locked out. The electricians shall remove the lines on the load side of the switch and remove the switch and switch taps. The main feeder to the BORAX-V area shall be opened and disconnected from the main powerline by electricians.

Outdoor Substation

The BORAX substation, located outdoors, is enclosed by a second fence within the reactor building fenced area. Equipment in the substation includes three lightning arresters, six fused cutouts, three 167-kVA transformers, which fed power at 480 V to the indoor motor control center in the reactor building, and a 500-kVA transformers with motor controller, which supplied power at 4160 V to the forced-convection pump motor.

Motor Control Centers

There are two motor control centers, one located in the reactor building and the other in the turbine building. The reactor building motor control center contains motor starters and circuit breakers to supply and control motors for pumps, valves, etc. A circuit breaker in the reactor building motor control center supplied the turbine building motor control center. The turbine building motor control center supplied and controlled turbine auxiliary equipment.

Indoor Transformers and Distribution Panels

A 45-kVA, 3-phase transformer located on the reactor building east wall steps the voltage down from 480 to 208/120V. Distribution panels LB and LC on the east wall, and panel LH on the west wall are fed by this transformer. Panel LB supplied lighting and convenience outlets, panel LC supplied control and miscellaneous requirements, and panel LH supplied water chemistry equipment and other miscellaneous requirements.

Compressed and Instrument Air Systems

The compressed air system consisted of four compressors, two filter-dryer combinations, two air-pressure-reducing stations, and air storage loop, and the necessary piping and tubing for air distribution.

Water Chemistry System
The water chemistry equipment consists of four major components. These are the makeup demineralizer, the reactor water demineralizer, the condensate demineralizer, and the sampling station. These devices were provided to maintain reactor water at the highest possible purity.

Biological Shielding System
Biological shielding was primarily accomplished by locating the BORAX-V reactor and other equipment carrying radioactive materials below ground level. In addition, concrete walls, movable concrete slabs, lead blocks, and water were used to provide personnel and equipment protection from excessive radiation exposure.

The BORAX-V reactor pit is shielded horizontally by 4-1/2 ft of concrete on the access shaft side and by earth and concrete on the other three sides. A 3-ft-thick slab of high-density concrete is located between the floor of the reactor pit and the ceiling of the subreactor room. Penetrations into the reactor pit are offset or stepped as required. The piping trench between the reactor building and the turbine building is covered with 6 in. of concrete and 3 ft of earth.

Reactor pit lead blocks were positioned around the reactor vessel just below the reactor vessel top flange. They were provided to attenuate radiation emanating from the side of the reactor vessel.

Two layers of 31-in.-thick, high-density concrete slabs cover the vessel top head. These slabs weigh as much as 10 tons each and are removed with the 10-ton crane. When removing these slabs, they must be stacked with due regard to floor loading.

NOTE: Slabs must not be stacked to ensure their weight is borne by the pipe trench, water storage pit, or equipment pit covers.

The following biological shielding was also supplied:

- Access Shaft: These slabs have already been removed.
- Water Storage Pit: When in operation, water and a layer of 1-ft-thick concrete slabs were used to shield the reactor water demineralizer and the boiling-type fuel. The concrete shielding still remains.
- Equipment Pit and Pipe Trenches: Concrete slabs, 1 ft thick, were moved only for major equipment maintenance. Manholes are provided in the equipment pit and west trench for entrance.
- Dry Storage Pit: A layer of 1-ft-thick concrete covers this pit.
- BORAX-II, -III, -IV Reactor Storage Pits: A layer of 1-ft-thick concrete covers these two pits.

Fuel Storage Demineralizer System

The fuel storage demineralizer system was designed to maintain water of good quality in both the boiling and superheater fuel element storage facilities. The old BORAX-II, -III, and -IV pressure vessel was used for superheater fuel element storage during BORAX-V operation. Boiling fuel assemblies and rods were stored in the water storage pit. Control rods, chimneys, holddown boxes, superheater outlet connectors, etc., were normally stored in the old reactor storage pit.

Heating and Ventilating Systems

Heating units were provided for the reactor turbine buildings. A pit exhaust system was provided for the reactor building below-grade operating areas. Air conditioning equipment was provided for the reactor building instrument room. These systems provided the necessary environment for satisfactory equipment operation, personnel comfort, and collection of any contaminated particles in the reactor building exhaust system.

Reactor Building

The reactor building is a Butler-type building with sheet metal skin and a structural steel frame. It is insulated and equipped with three personnel access doors and two 20-ft-wide x 16-ft-high equipment doors. The building is 40 ft wide x 86 ft long, with 20-ft high eaves and a 26-ft-high gable.

All construction at floor level and below is either of standard or high-density steel-enforced concrete.

Turbine Building

The turbine building houses the turbogenerator system and other associated systems. A 10-ton maintenance rail crane is in place over the turbine-generator unit and was used for lifting equipment covers for periodic maintenance on the unit.

This building is a Butler building, 40 ft wide x 60 ft long, with 17-ft-high eaves and 24-ft gable. It is equipped with two personnel doors and an equipment door, 14 ft wide x 12 ft high. Floor level and below is constructed of standard steel-reinforced concrete except for a heavy steel structure. This structure supports and isolates the turbine-generator unit.

The building exterior is galvanized sheet steel on a structural steel frame. The building is insulated.

Cooling Tower

The cooling tower is a redwood, induced-draft-type Model FD 8880, manufactured by Fluor, Corp. Information on the tower is available from Ecodyne Products, Corp., Santa rosa, California, the current owners of this tower design.

A concrete base was used as a holding tank or catch basin for the water.

Heating and Ventilating Building
The H&V building is constructed of concrete block walls and a metal roof. It has two personnel access doors, one each on the north and south walls. The building is approximately 15 ft wide x 12 ft long x 8 ft high.

Guard House
A wooden guard house and gate, designated Building 709, is currently east of and across the access road from the cooling tower. This structure is approximately 6 ft wide x 8 ft long x 8 ft high.

The security fence surrounding the reactor building and the septic tank are also considered major components in the BORAX facility D&D project. Included with the septic tank will be any associated piping and drain field.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

General low-level contamination exists throughout the remaining basement areas of the reactor building. Direct radiation readings taken on the two reactor vessels are generally less than 10 R/hr.

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-26, BORAX-V Area Location Map; Figure B-27, BORAX-V Plot Plan; and Figure B-28, BORAX-V Facility Aerial Photograph.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop, etc.]

G. R. Rodman, BORAX-V Project Manager, EG&G Idaho, Inc., 526-8077, MS 4133, Profs ID GRR.

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

Previous D&D tasks completed from 1984 through 1992 include the leaching pond, cooling tower, above grade components of the reactor building and the building, H&V building, USTs, and the turbine building and contents.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The remaining reactor vessels retain significant radiation and will require special rigging and lifting techniques because of their weight.

PERMITTING REQUIREMENTS:

NEPA requirements for the performance of the D&D of the remaining basement portion of he reactor building will be satisfied through the approval of an EA and subsequent FONSI. Approval is currently pending.

SURVEILLANCE and MAINTENANCE STATUS:

Current S&M requirements include the maintenance of a temporary cover constructed over the reactor building main floor concrete slab to prevent water access.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D RECOMMENDED METHODOLOGY:

Total removal of contaminated equipment and basement structure, demolishment of the remaining foundation to 6 ft or more below grade, and backfilled.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None

WASTE VOLUME ESTIMATE BASIS:

D&D Plan for the BORAX-V Facility, Reference 1.

FACILITY REUSE CONSIDERATIONS:

Objective to release site for reuse.

REFERENCES:

1. D&D Plan for the BORAX-V Facility, EGG-ER-10900, dated August 1993, prepared by G. R. Rodman and F. E. Stoll.

2. Safety Analysis Report for the D&D of the BORAX-V Facility, ER-93-024, Revision 0, dated April 1993, prepared by C.E. Klassy.

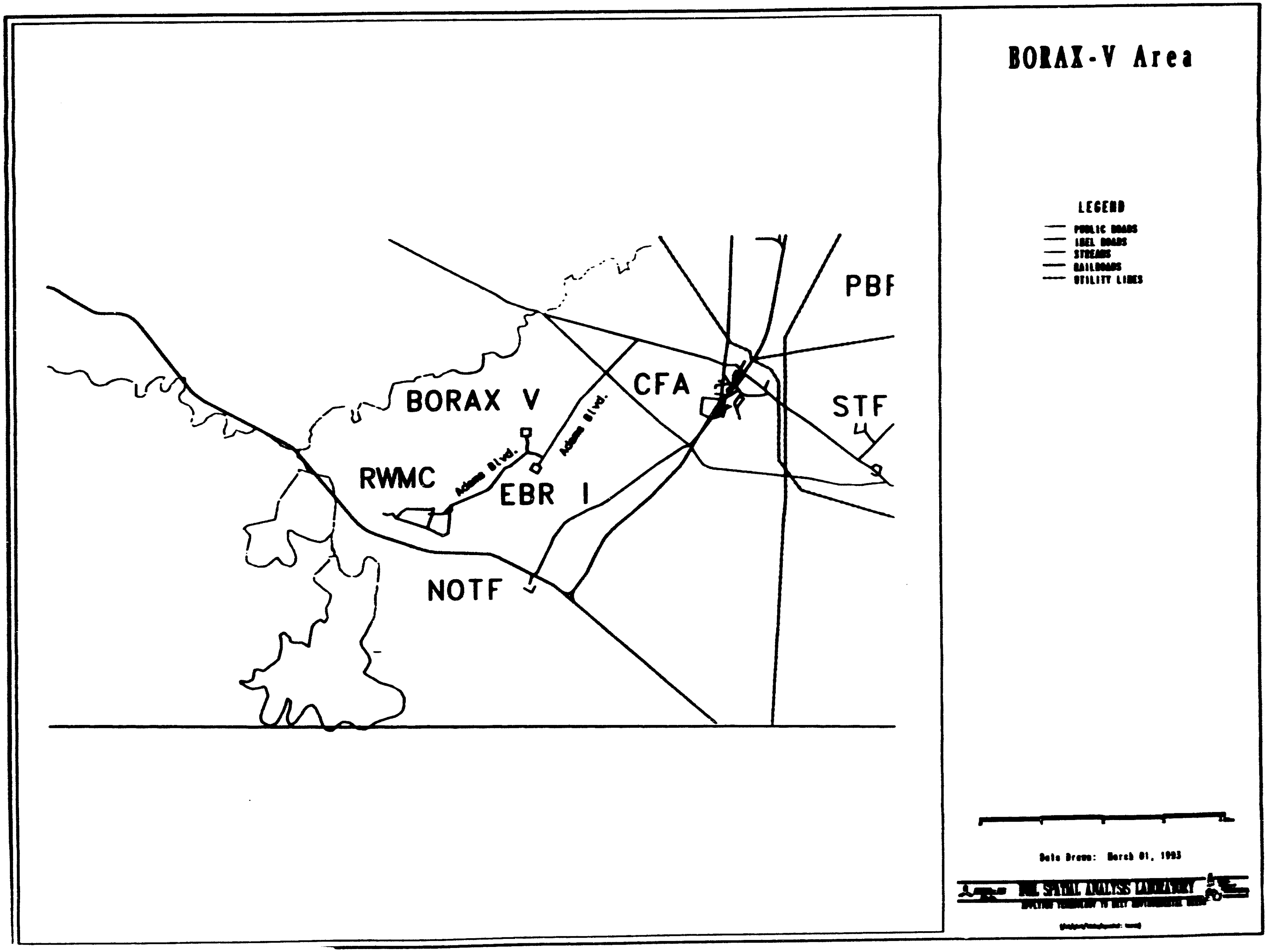

Figure B-26. BORAX-V area.

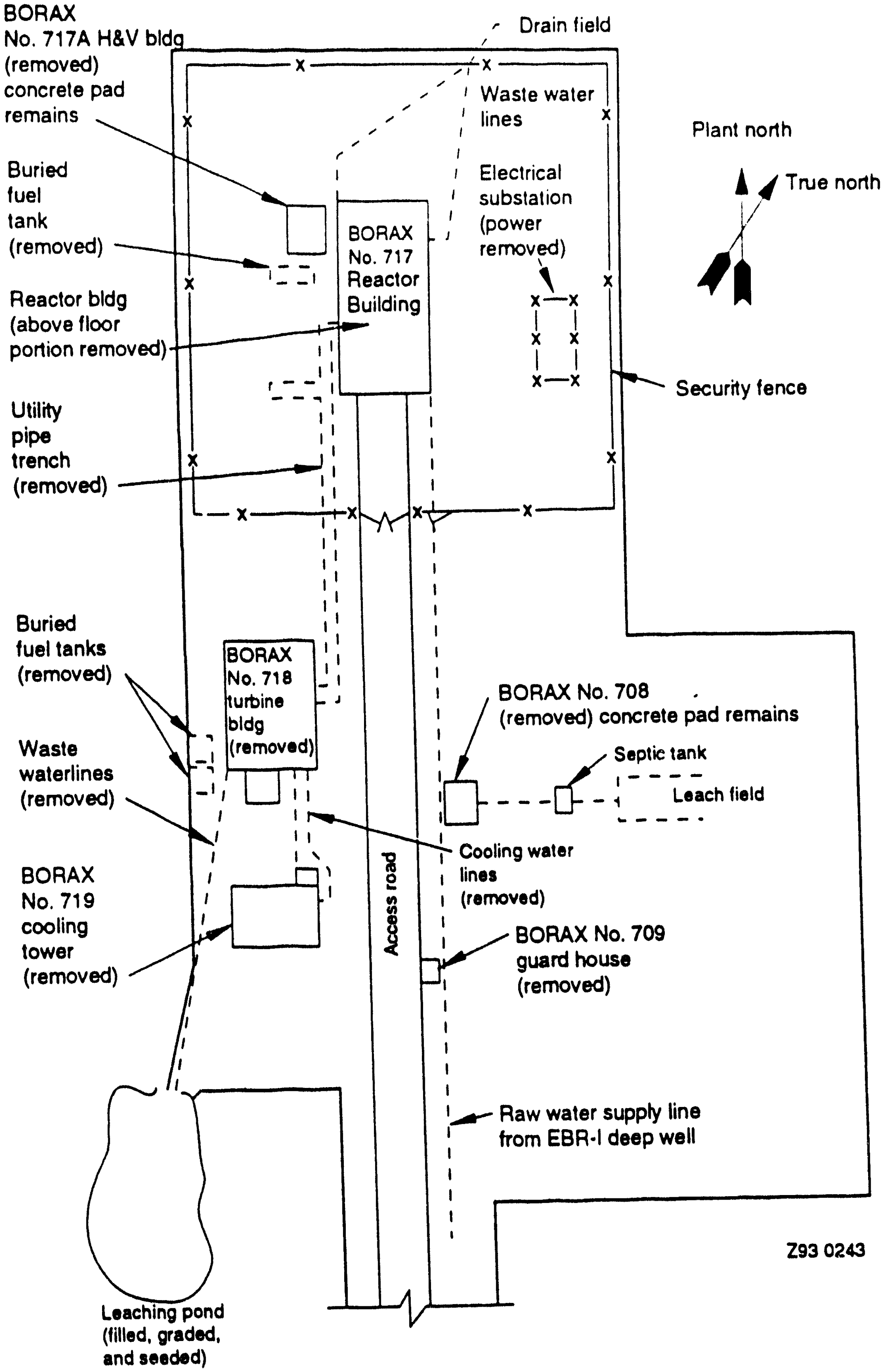

Figure B-27. Facility boundary for the BORAX-V facility.

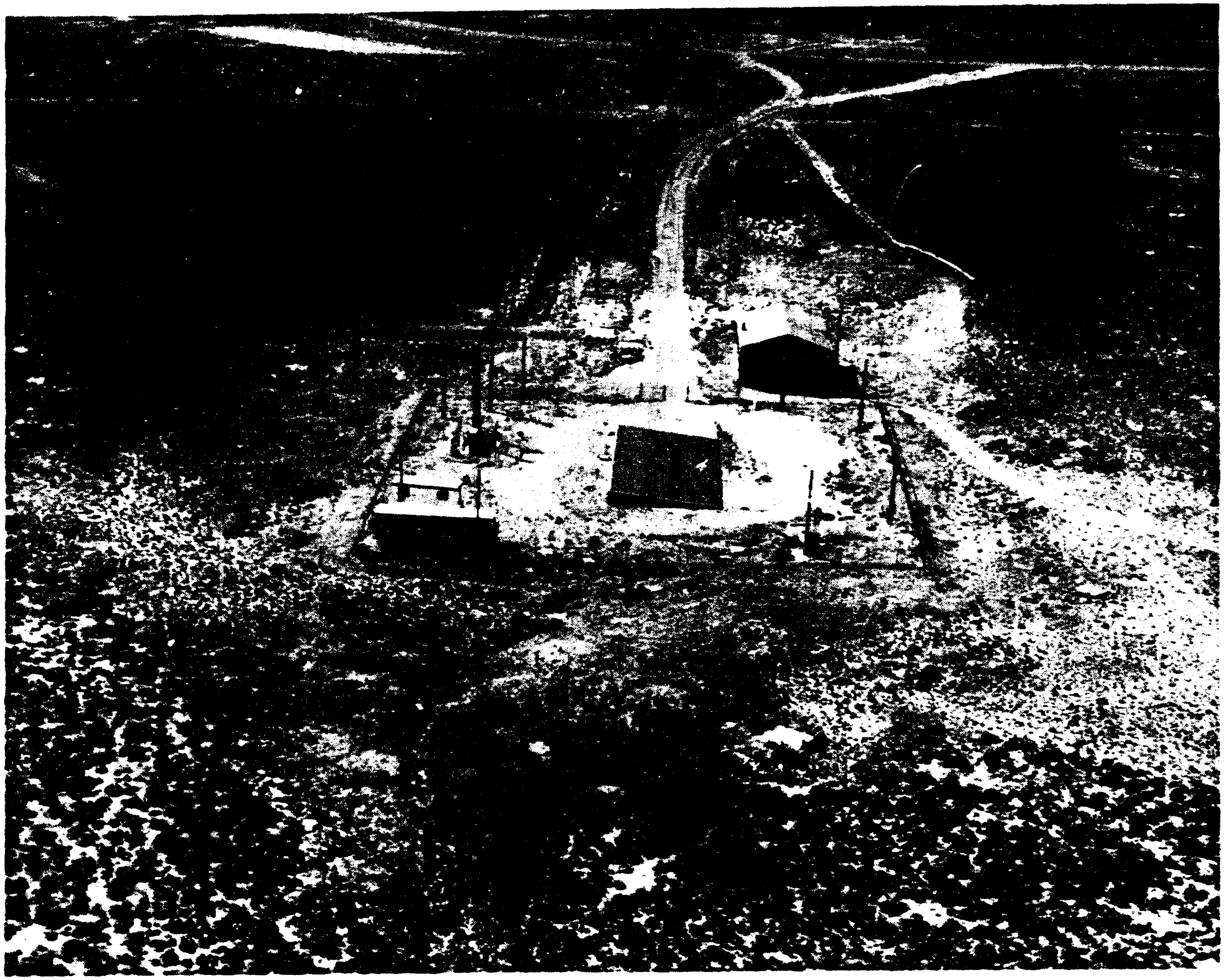

Figure B-28. BORAX-V facility (aerial photograph).

DECONTAMINATION and DECOMMISSIONING UNIT ENVIRONMENTAL RESTORATION PROGRAM

FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**	CONTRACTOR: **EG&G Idaho, Inc.**

PROJECT: **TAN Test Support Facilities (TSF)**

PROJECT PRIORITY: 10		PRIORITY BASIS: FFA/CO Driver & S&M Cost Benefits			
SCHEDULE DURATION: 6 yr		SCHEDULE ID: N/A			
TOTAL ESTIMATED COST: $ 4193k		ESTIMATE BASE YEAR: FY 1993		ACTUALS thru FY 1992: $ 0k	
FUNDING SOURCE: EW2010401		ADs No.: 51-EG		WBS No.: 1.4.9.1.2.23.2.1.1	
SAR REQUIREMENT: (REVISE EXISTING or PREPARE NEW) Prepare New SAR			RCRA/CERCLA: (APPLICABLE REQUIREMENTS) RCRA Storage Requirements		
FY-93: $ 176k	FY-94: $ 466k	FY-95: $ 64k	FY-96: $ 66k	FY-97: $ 68k	FY-98: $ 71k
FY-99: $ 700k	FY-00: $ 894k	FY-01: $ 1341k	FY-02: $ 348k	FY-03: $ 0k	FY-04: $ 0k

TOTAL WASTE VOLUME ESTIMATE: 513 m^3 (a)		ESTIMATE BASE YEAR: 1993
	LOW-LEVEL WASTE (Totals): 513 m^3	
HIGH LEVEL WASTE:	SOIL WASTE:	CARBON STEEL WASTE: 109 m^3
TRU WASTE:	CONCRETE WASTE: 354 m^3	STAINLESS STEEL WASTE: 50 m^3
HAZARDOUS WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MIXED WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
MUNICIPAL/SANITARY WASTE:	OTHER WASTE:	

(a) Only includes the waste calculations for TAN-616

NOTE: Total Estimated Cost includes all Actual Cost to Date thru FY 92 and all planning numbers. FY 93 Cost estimate numbers are based upon FY 93 EAC. All other cost estimate numbers are based upon FY 94 planning, which includes contingency and escalation.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFA/CO), 40 CFR 260.34, and 40 CFR 265, Subpart J. A weighted priority analysis has been performed to determine the overall EG&G Idaho, Inc. / WINCO / INEL priority ranking (see Chapter 3, Table 3, "ER&WM D&D Project Prioritization Analysis").

PROJECT COST ESTIMATE BASIS:

The cost estimate basis is the FY 1994 Cost Account Plan and associated Planning Packages. This cost account is based upon the current knowledge of these facilities and their future utilization.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The TAN/TSF area was built in phases as the need for the facilities developed from the major projects. These facilities were built from 1952 to 1987. Many of these facilities are no longer in use for their original purpose and are scheduled for demolition in the near future.[4]

In the recent past (1993) many of these originally listed D&D Projects have since transferred responsibility to the Environmental Restoration Waste Area Group (WAGs), specifically WAG-1. This was done by DOE-ID in an attempt to have all soil and tank related remedial actions within the WAGs, leaving the D&D Projects to concentrate on buildings and structures. These transferred projects include the following:

TAN Designator	FFA/CO Designator	Description
TAN/TSF-1	TSF-06	Contaminated Equipment Storage Area
TAN/TSF-2	TSF-09	V1, V2, & V3 Tanks Contaminated Soil Area
TAN/TSF-6	TSF-26	Contaminted Soil Area adjacent to PM-2A Liquid Waste Evaporator
TAN/TSF-9	TSF-10	Drain Disposal Well
TAN/TSF-10	TSF-07	Liquid Waste Disposal Pond
TAN/TSF-11	TSF-21	IET Valve Pit & TSF-2 Manhole
TAN/TSF-12	TSF-09	V1, V2, & V3 Tanks
TAN/TSF-13	TSF-26	PM-2A LWE Tanks 709 & 710

These are part of the facilities listed in the TAN/TSF RCRA/CERCLA Remedial Action Units TSF-01 to TSF-33 (listed in Table 5 and located in Figure 17 directly from reference 4).

All of the TAN-607 D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of subfacilities]

TAN/TSF-1, Contaminated Equipment Storage Area
The TAN/TSF-1 is a large open area (approximately 5.6 x 10^4 m^2) with radioactive surface soil contamination. The west side is a common storage area for highly contaminated equipment. The radioactive particulates are not general concentrated but are scattered throughout the area. Radiation levels vary from 0.001 to 3.0 R/h. The total volume of contaminated soil involved is estimated to be 7.6 x 10^9 m^3 (Ref. 1).

The current planning for this area by WAG-1 is to complete the 1993 field sampling activites and conduct a risk assessment for the area. The majority of the areas have shallow surface soil radioactive contamination, <15 pCi/g. This area will probably not require remediation because the radioactivity is anticipated to decay below risk-based levels in 50 years. There are several hot spot areas that will require soil removal of approx. 1.0×10^4 m^3. There is also a buried reactor core vessel and 2 storage containers (without fuel) that will need to be excavated and disposed of.

TAN/TSF-2, -11, & -12, Liquid Waste Evaporator Complex
This complex consists of TAN-616, Liquid Waste Treatment Facility, the liquid waste holding tanks V1, V2, and V3, TSF-12 valve pit (TSF-09) and sand filter (TSF-10), TSF-11 IET valve pit (TSF-21), and TSF-2 manhole. The TSF-2 area (approximately 500 m^2) is a surface and subsurface contaminated soil area located northeast of the TAN-616 building and surrounds the V1, V2, and V3 tanks. These tanks contain approximately 25 m^3 of sludge each. The TSF-12 valve pit and sand filter are also in this general area located east of the TAN-616 building and are also contaminated. The TSF-11 IET valve pit is located approximately 45 m north-northeast of the TAN-616 building and is connected to the TSF-2 manhole by a contaminated 15 cm wrought iron waste line. The inlet line to the IET valve pit comes from the IET Complex. The TAN Liquid Radioactive Waste Management System is shown in Figure E-10 (Ref. 1).

These areas are currently being sampled by WAG-1 and the data will be used to conduct a risk assessment. TSF-21 has been removed. TSF-09 & TSF-10 will be drained and either left in place or removed depending upon the risk assessment and best management practices.

TAN/TSF-3, Radioactive Materials Storage Area
The TAN/TSF-3 consists of a concrete slab on grade (approximately 260 m^2) for the storage of materials used in the TAN-607, , assembly area. The slab is located outside, and west of, TAN-607, and surface contamination up to 2 mR/h (Ref. 1). This slab was constructed during the 1950s as part of the Aircraft Nuclear Propulsion (ANP) Program. During the 1960s, casks that were stored on the pad leaked radioactive contaminants. The casks were removed and disposed of and the pad was roped off and excluded from use until decommissioning in 1983 (Ref. 3).

TAN/TSF-6 and -13, Waste Evaporator Area
TAN/TSF-6 and -13 are adjacent to and around the PM-2A Liquid Waste Evaporator System. Liquid waste was stored here in tanks 709 and 710 that were filled from the liquid waste evaporator system in building TAN-616. These tanks were filled with clean water from a large spill in TAN-607. Radioactive liquid is no longer concentrated at TAN because tanks 709 and 710 were retired from service in 1979 (Ref. 1).

TAN/TSF-7, Sewage Disposal Plant Area
The TAN/TSF-7, Sewage Disposal plant area is approximately 112 m^2 of surface contamination with radiation levels up to 6.5 mR/h. Subsurface contamination is also suspected (Ref. 1).

The current planning by DOE-ID has delayed the D&D of this site for approximately 10 years. The existing sewage treatment plant will be upgraded to supply the TAN/TSF area with the required sanitary capabilities and capacities.

TAN/TSF-9, Drain Disposal Well (Intermediate-Level Waste Disposal System)
There is very limited information about this site available (written documentation).

A Track 2 Investigation has been completed for this site and no further action is planned.

TAN/TSF-10, Liquid Waste Disposal Pond
The TAN/TSF-10 has a small area, which is contaminated with radiation levels up to 0.2 mR/h (measured values). It is recommended that excavation of approximately 3 m^3 of contaminated soil be performed after the TAN/TSF-7 facility has been Decontaminated and Decommissioned (Ref. 1).

A Track 1 Investigation is currently being completed for this site. The site is planned to be included into the WAG-01 Comprehensive Remedial Investigation/Feasibility Study.

TAN-606, Calibration Well
There is very limited information about this site available (written documentation).

TAN-616, Liquid Waste Treatment Facility
The TAN-616 is a one story cast in place, reinforced concrete building with a basement and mechanical penthouse on the roof. The building was constructed in 1955 and began operations in 1958 as an Evaporative Liquid Waste Treatment Facility. The facility only operated successfully for several years and then because of evaporator malfunctions and pump leaks waste began escaping to the surrounding area, which has resulted in the present Zone III rating. The facility was removed from service in 1970.

The above grade dimensions are 36 x 46 x 15 ft. high. The facility is located approximately 60 ft north of the TAN-607 building. The ground floor is internally sectioned into an evaporator pit, valve-operating room, caustic pump room, control room, and a vestibule. There is a pump room in the basement and a cooling tower and heating/ventilating equipment room on the roof.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

TAN-616 had a leaking concrete slab roof, which presented the problem of containment of loose radiological particulates being carried in the in-leaking water. An interim action was taken to install a new sheet metal roof over the existing structure to ensure no further leakage (completed September 1993).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-29, Test Support Facilities Aerial Photograph, and Figure B-30, TSF Plot Plan, copied directly from Reference 7.

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

Ted A. Evans, TAN/TSF Project Manager, ER&WM, EG&G Idaho, phone 526-9819, mailstop 2414, PROFs ID TAE.

Bruce Hansen, TAN/TSF Project Manager, ER&WM, EG&G Idaho, phone 526-8108, mailstop 4133, PROFs ID .

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The TAN/TSF-3 concrete pad located west of TAN-607 was decontaminated and decommissioned in 1983. The pad was radiologically characterized in September 1979 and November 1982, and a decision analysis performed in January 1983 to select the appropriate method of decommissioning. The D&D Plan was published in May 1983 and the project completed in September 1983. This D&D effort is documented in the Final Report, EGG-2292, dated April 1984 (Ref. 3).

The TAN/TSF Radioactive Liquid Waste Evaporator System (PM-2A) was Decontaminated and Decommissioned in FY 1981 and FY 1982. The evaporator system was removed and all contaminated soil removed from the area. The PM-2A tanks 709 and 710 had liquid in them, which was stabilized by the addition of diatomaceous earth and left in place underground. The entire area was graded and fenced (Ref. 5).

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The TAN-616 interim action to remove the cooling tower, H/V equipment and stack, guardrails, and install a new sheetmetal roof was funded in FY 1993. The work started in April 1993 and was completed in August 1993. The final report for this action is being prepared and will be published in September 1993.

PERMITTING REQUIREMENTS:

The TAN-616 interim action was accomplished utilizing the existing SAR, permits, plans, documents, and procedures. An Environmental Checklist (EC) was prepared to ensure the utilization of these existing documents and work proceeded under a Categorical Exclusion (CX).

Future D&D Projects in the TAN/TSF area will probably require and Environmental Assessment (EA) to be processed in conjunction with or support of the INEL Site Wide Environmental Impact Statement (EIS) scheduled for approval 1996.

SURVEILLANCE and MAINTENANCE STATUS:

Presently, the only activities occurring at the TAN/TSF sites are (a) routine periodic surveillance and maintenance for security, environmental, and health and safety measures, (b) radiological surveys, and (c) nonintrusive, noninvasive characterization for site remediation investigations and future D&D. All facilities are in good condition and pose no threat for lose of containment integrity.

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

TAN-616 building is moderately contaminated with most of the heavily contaminated area being restricted to the evaporator in the basement. The only access to this evaporator is through the concrete access roof slab.

D&D RECOMMENDED METHODOLOGY:

TAN-607 Decon Shop will be decontaminated (all equipment, tubs, piping, etc. removed) and be available for reuse by other future programs.

All other facilities have not been fully analized to determine the appropriate D&D methodology.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

None

WASTE VOLUME ESTIMATE BASIS:

The latest TAN-616 and TAN-607 Decon SHop waste volumes were prepared by the D&D Unit for the June 1993 publication of the Waste Stream Projections for Environmental Restoration at the INEL (Ref. 6).

FACILITY REUSE CONSIDERATIONS:

No known reuse programs or projects for any of these facilities considering their level of radiological contamination and poor physical conditions except the TAN/TSF-07.

The TAN/TSF-07 Sewage Treatment Plant will be upgraded to supply TAN/TSF needs. No other reuse known.

REFERENCES:

1. Long Range Plan for Decontamination and Decommissioning Excess Contaminated Facilities at the INEL, Report No. PR-W-79-005, Revision 4, dated May 1983, Section 2.2, Engineering Test Reactor, pages E-14 to E-19.

2. TAN/TSF Assessment Cost Account Plan, Revision 0, Signed Required Approval Date 23-Nov-92 [CAP No. 3KNTSA000 / WBS No. 1.2.23.1.1.1]

3. Decontamination and Decommissioning of the TAN/TSF-3 Concrete Pad, Final Report, EGG-2292, prepared by Donald L. Smith and Carla J. Wisler, dated April 1984.

4. INEL Site Development Plan, Site Characteristics, Volume II, TAN/TSF Area, Control Number 1-377, dated 25-Mar-88.

5. Final Report, D&D of TAN Radioactive Liquid Waste Evaporator System (PM-2A), EGG-2236, dated March 1983, prepared by Donald L. Smith.

6. Waste Stream Projections for Environmental Restoration at the INEL, DOE/ID-10417, dated June 1993.

7. INEL Site Development Plan, Site Characteristics, Volume II, TAN/TSF Area, dated 31-Mar-93.

Figure B-29. Aerial view of TSF.

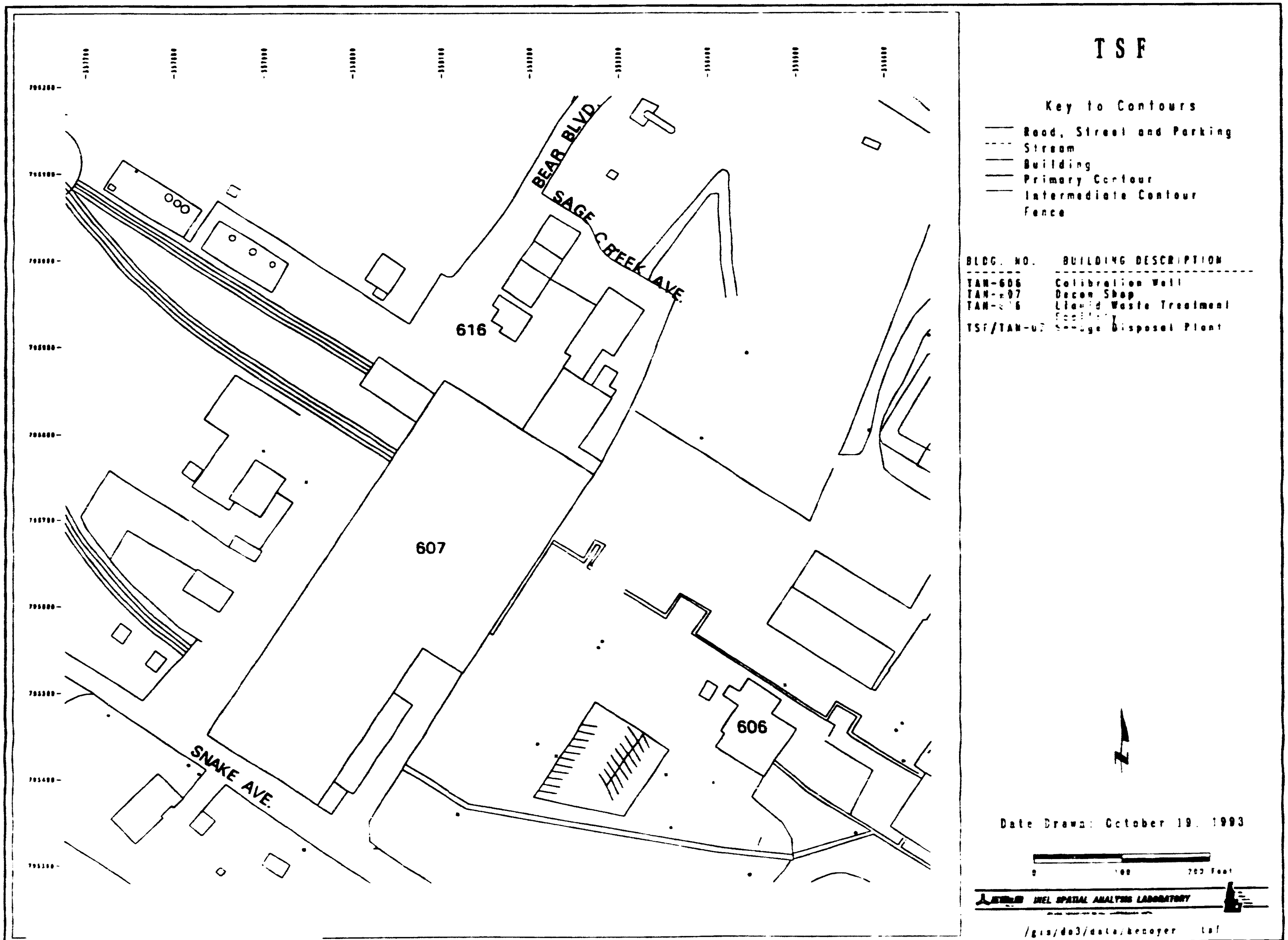

Figure B-30. TSF plot plan.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**			CONTRACTOR: **WINCO**		
PROJECT: **Fuel Element Cutting Facility (FECF) CPP-603**					
PROJECT PRIORITY:		PRIORITY BASIS: DOE Order 5820.2A, 5400.1 and 5480.19.			
SCHEDULE DURATION: 3 yrs		SCHEDULE ID:			
TOTAL ESTIMATED COST: $ 2,006k		ESTIMATE BASE: FY 1994			
FUNDING SOURCE: Defense		ADs No.: 1304		WBS No.: 1.2.22.1.1.1	
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: RCRA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $0k	FY 1994: $0k	FY 1995: $0k	FY 1996: $0k	FY 1997: $ 21k	FY 1998: $ 1,088k
FY 1999: $ 897k	FY 2000:$0k	FY 2001: $0k	FY 2002: $0k	FY-03: $ 0k	FY-04: $ 0k

TOTAL WASTE VOLUME ESTIMATE: m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPLE/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes FY 1993 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The Fuel Element Cutting Facility (FECF) is a hot cell area that was used to prepare spent nuclear fuel for reprocessing. The facility was constructed adjacent to the underwater fuel storage basin at the south end of the CPP-603 building.

All of the FECF D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimenstions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

The cell is concrete structure which is 20 ft wide, 41 ft long, and 17 ft high. The walls are 5 ft thick and contain viewing windows and master-slave manipulators, which allowed operators to safely conduct fuel cutting operations. Some of the equipment inside the cell has been removed but significant radiation and contamination levels are still present. In fact, two spent fuel element segments were present when the system was characterized in 1983.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

PERMITTING REQUIREMENTS:

SURVEILLANCE and MAINTENANCE STATUS:

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

D&D RECOMMENDED METHODOLOGY:

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

WASTE VOLUME ESTIMATE BASIS:

FACILITY REUSE CONSIDERATIONS:

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: WINCO			
PROJECT: **Fuel Receipt and Storage Facility (FRSF) CPP-740/SFE-20**					
PROJECT PRIORITY:		PRIORITY BASIS: FFA/CO Driver			
SCHEDULE DURATION: 4 yrs		SCHEDULE ID:			
TOTAL ESTIMATED COST: $3,924K		ESTIMATE BASE: FY 1994			
FUNDING SOURCE: Defense		ADs No.: 1305		WBS No.: 1.2.18.2.1.1	
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: RCRA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $75k	FY 1994: $102k	FY 1995: $1,022k	FY 1996: $2,152k	FY 1997: $ 648k	FY 1998: $ 0k
FY 1999: $0k	FY 2000:$0k	FY 2001: $0k	FY 2002: $ 0k	FY 2003: $ 0k	FY 2004: $ 0k

TOTAL WASTE VOLUME ESTIMATE: m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPAL/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes FY 1993 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

Prioority determination is based upon a RCRA based Consent Order and Compliance Agreement (COCA) between the Environmental Protection Agency (EPA) Region X, the Department of Engery-Idaho Operations Office (DOE-ID), and the United States Geological Survey (USGS) (Ref. 1).

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The Fuel Element Cutting Facility (FECF) is a hot cell area that was used to prepare spent nuclear fuel for reprocessing. The facility was constructed adjacent to the underwater fuel storage basin at the south end of the CPP-603 building.

All of the FRSF D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

<u>CPP-603 Fuel Storage and Receipt Facility</u> The cell is concrete structure which is 20 ft. wide, 41 ft. long, and 17 ft. high. The walls are 5 ft. thick and contain viewing windows and master-slave manipulators which allowed operators to safely conduct fuel cutting operations. Some of the equipment inside the cell has been removed but significant radiation and contamination levels are still present. In fact, two spent fuel element segments were present when the system was characterized in 1983.

<u>CPP-642 Compressor Building</u>

<u>CPP-740 Settling Basin</u> The CPP-740 area of the FRSF basically consists of four components and their associated piping: two slurry-settling facilities, a dry well, and a valve box manhole. The primary purpose of the system was to receive the backwash slurry of filter aid material

(diatomaceous earth) from the "BIF" filter system. The BIF filter system was decommissioned with DFD funds in 1984.

The enclosed area is bounded by six large cylindrical posts, for which a single-link chain barrier is erected. The enclosure formed by the chain boundary measures 20 x 46 ft. The enclosure has been surveyed by Health Physics and is classified as a radiation area with subsurface solid contamination. The area is not accessible without wearing anti-C's.

<u>SFE-20 Waste Tank</u> The Stored Fuel Exterior Waste Tank (SFE-20) system includes the SFE-20 tank, tank vault, access tunnel, pump pit, and CPP-642 compressor building with related piping and instruments.

The system was constructed in 1957 to collect low level liquid wastes from the south basin area of the CPP-603 south basin and Fuel Element Cutting Facility (FECF) area. The low transfer rate of the SFE-20 pump, lack of easy access, system size, and frequent flooding of the pump pit contributed to a decision to replace the entire SFE-20 waste handling system. This replacement decision was implemented in 1975 and the SFE-20 system was characterized in 1984, however, the decommissioning phase has not been initiated yet.

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Surveys indicate the grade and subsurface soil directly adjoining the CPP-740 and SFE-20 facilities to be radiologically contaminated. Both of these systems were taken out of service in 1977 (Ref. 1).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-31, CPP-740 Facility Isometric and Figure B-32, SFE-20 Layout (copy directly from reference 1).

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

Removal of the drywells and other potential release pathways will include their concrete casings and their affected (potentially contaminated) surrounding soils (Ref.1).

PERMITTING REQUIREMENTS:

SURVEILLANCE and MAINTENANCE STATUS:

Minimal surveillance and maintenance has been conducted (Ref. 1).

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Excavation would require extensive radiological monitoring and contols (Ref. 1).

D&D RECOMMENDED METHODOLOGY:

Complete Decontamination and Decommissioning of the CPP-740 and SFE-20 facilities (Ref. 1).

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

No specialized equipment or tools needs have be identified (Ref. 1).

WASTE VOLUME ESTIMATE BASIS:

CPP-740 and SFE-20; 200 m^3 of Low-Level Waste (Ref. 1).

FACILITY REUSE CONSIDERATIONS:

None. Facilities to be removed (Ref. 1).

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

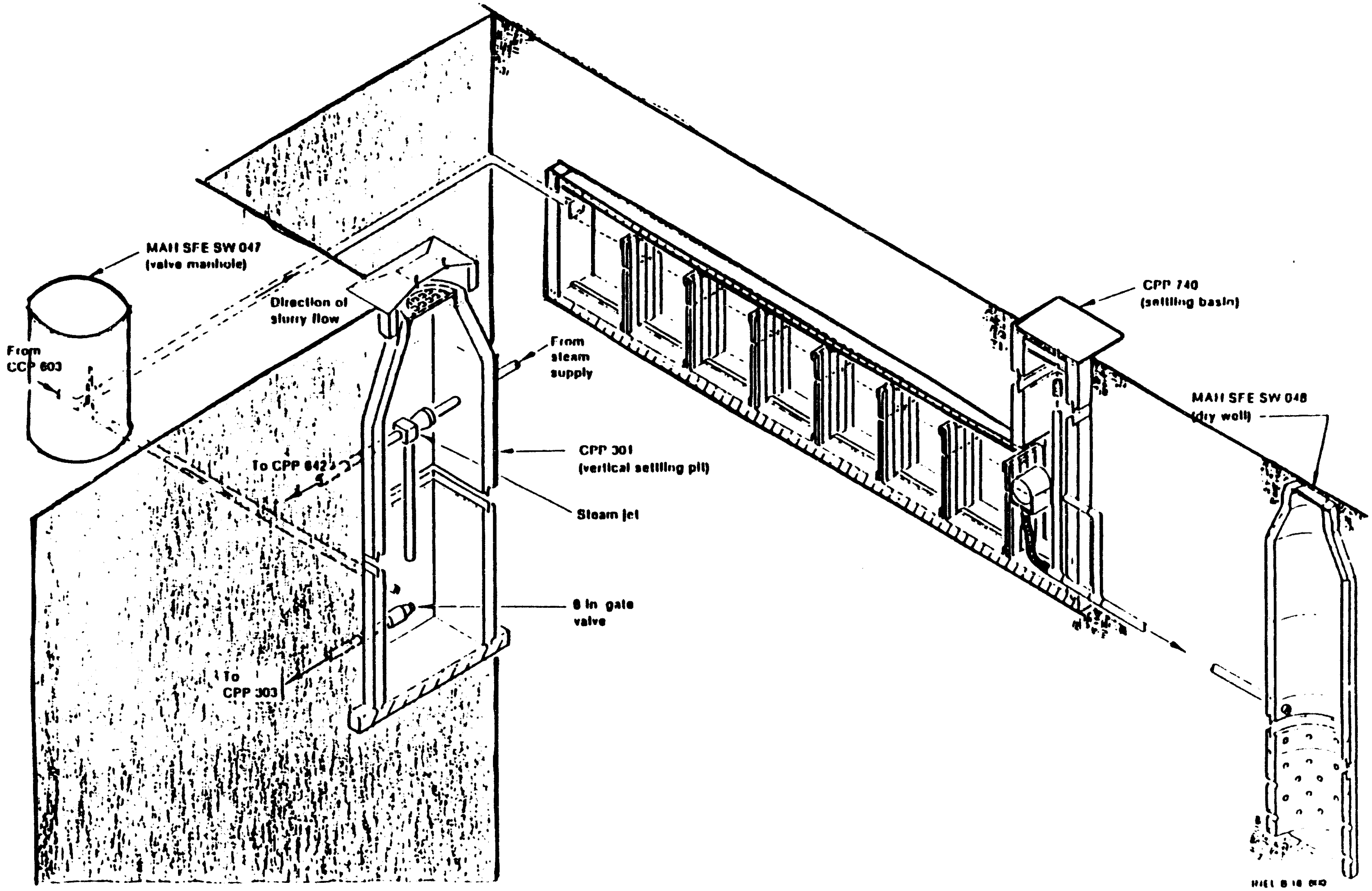

Figure B-31. CPP-740 Facility Isometric.

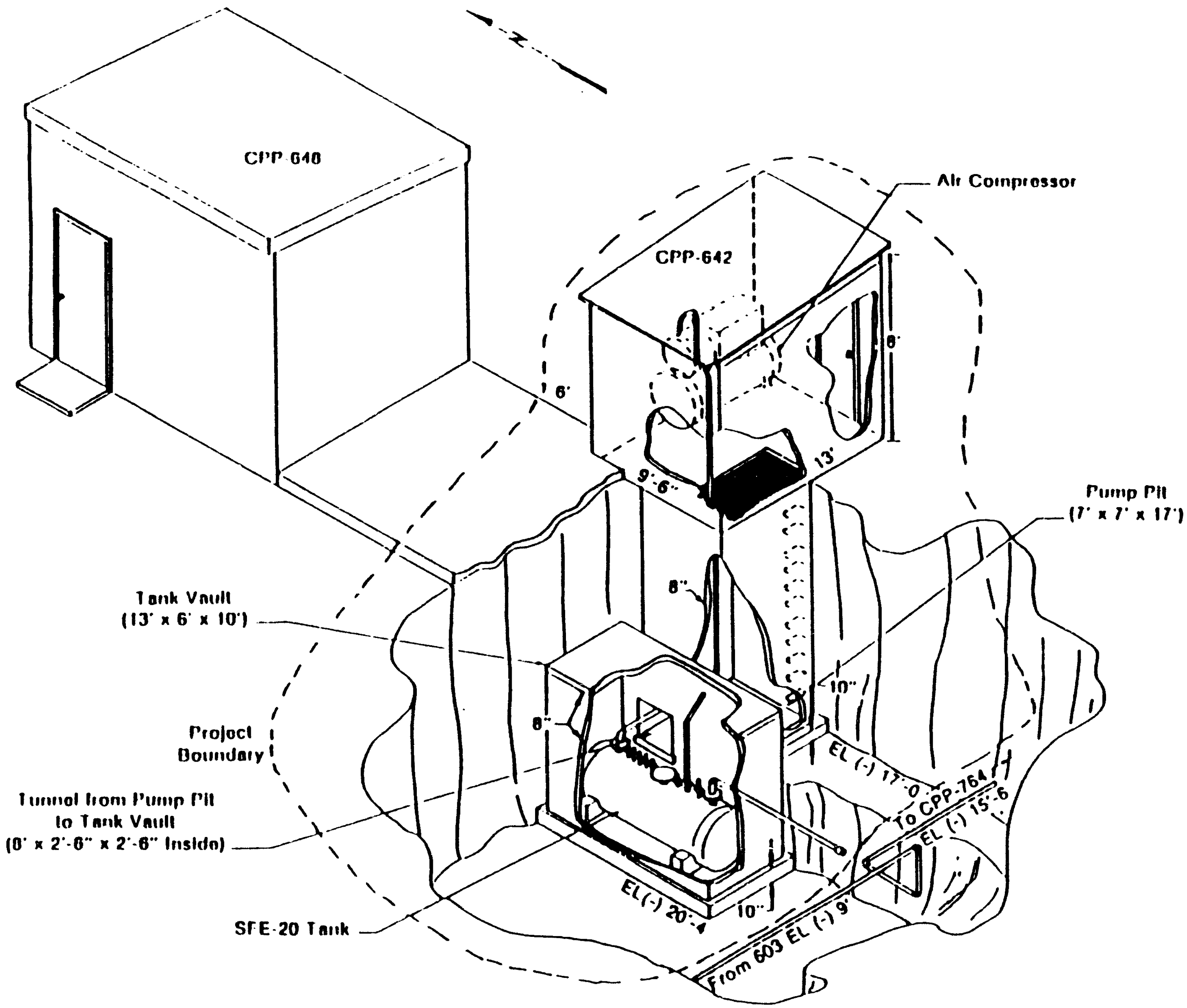

Figure B-32. Drawing of SFE-20.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**	CONTRACTOR: **WINCO**				
PROJECT: **Service Waste Diversion Facility (SWDF) CPP-631/709/734**					
PROJECT PRIORITY:	PRIORITY BASIS: DOE Order 5820.2A - Maintenance of Radioactively Contaminated Facilities.				
SCHEDULE DURATION: 4 yrs	SCHEDULE ID:				
TOTAL ESTIMATED COST: $ 2,233k	ESTIMATE BASE: FY 1994				
FUNDING SOURCE: Defense	ADs No.: 1306	WBS No.: 1.2.17.2.1.1			
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: CERCLA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $500k	FY 1994: $102k	FY 1995: $1,302k	FY 1996: $329k	FY 1997: $0k	FY 1998: $0k
FY 1999: $0k	FYb 2000:$ 0k	FY 2001: $ 0k	FY 2002: $ 0k	FY 2003: $0k	FY 2004: $0k

TOTAL WASTE VOLUME ESTIMATE: m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 85 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPAL/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes FY 1993 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

The RaLa facility (CPP-631) in its deteriorated condition, increases the risks to on-site personnel, due to increasing probability of contaminant migration beyond the facility confinement.[1]

The waste monitoring systems in buildings CPP-709 and -734 are in questionable condition, and present some risk to onsite personnel. These risks and the increasing probability of containment migration beyond these facilities/systems are presently not determined.

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 94 Cost Account Plans (CAPs) and outyear (FY 95 - FY 02) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The original service waste diversion system was designed to prevent the accidental release of high level radioactive solutions to the environment.

The East Side Service Waste (ESSW) monitor in CPP-709 and the West Side Service Waste (WSSW) monitor in CPP-734 were equipped with NaI crystal gamma monitoring instruments. These instruments provided actuation signals to automatic valves, which diverted service waste flow to a 300,000 gallon hold tank (WM-191) if the stream(s) were excessively contaminated.

Recent upgrades to the plant service waste system have rendered this system obsolete. The contamination level in these systems is considered to be relatively low but definitive characterizations have not been conducted.[2]

All of the SWDF D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

CPP-631 RaLa Off-Gas Facility The off-gas from the Radioactive Lanthanum (RaLa) recovery system in CPP-601 was transferred to CPP-631 where it was processed through specialized equipment before being released to the ICPP main exhaust stack. The CPP-601 portion of the RaLa system was decommissioned in FY 1983 with operating funds and the CPP-631 equipment was removed using DFD program funding in FY 1986.

The remaining facility (above grade entry to a subsurface cell, 10 x 14 x 9 ft high) includes approximately 125 feet of contaminated pipechase (2-ft^2) with abandoned capped piping.[1] See Figure B-33 for a cutaway drawing of the RaLa Off-Gas Cell.

CPP-709 East Side Service Waste monitoring system is housed in subsurface rooms (15 x 9 x 9 ft high) with above grade entries. The east side service waste monitoring system and facility are slightly radiologically contaminated.[1]

CPP-734 West Side Service Waste monitoring system is housed in subsurface rooms (15 x 9 x 9 ft high) with above grade entries. The west side service waste monitoring system and facility are slightly radiologically contaminated.[1]

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

Radiological surveys, conducted in FY 1990, indicate the Chloride Removal System equipment and room interior surfaces are highly contaminted and the Service Waste Monitoring System (ESSW and WSSW) are slightly radiologically contamainted.[1]

The CPP-631 RaLa Cell is highly contaminated and has been associated with a "potential" ground contamination incident. The facility surfaces contain radiation hot spots up to 350 mR/hr beta+gamma.[2] For additional information on characterizations see references 3 and 4 (Characterization Reports).

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-33, Cutaway Drawing of the RaLa Off-Gas Cell; Figure B-34, Chloride Removal System Plan; and Figure B-35, CPP-734 Monitoring Station Layout (copy directly from reference 1).

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The CRS equipment is contained in a 400 ft^2 room connected tothe CPP-603 north basin. The area was surveyed in FY 1990 and all of the equipment and the interior building surfaces were found to be radiologically contaminated. Additional characterization/decision analysis work is currently in progress and the remediation work is scheduled to be completed during FY 1991 and FY 1992.

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The pipechases require excavation for D&D which may reveal contaminated soils. The soil under CPP-631 may be contaminated also. Also definitive characterizations of the CPP-709 and 734 systems have not been conducted.[1]

Materials associated with the CRS include chloride containing residuals, asbestos, and elemental lead (Pb). The residuals are assumed to be RCRA nonhazardous, but they are radiologically contamiated. If surface decontamination achieves less than required action levels, removal of the asbestos containing walls may become necessary. The hazardous elemental lead used as radiological shielding is similarly contaminated.[1]

PERMITTING REQUIREMENTS:

SURVEILLANCE and MAINTENANCE STATUS:

Minimal surveillance and maintenance has been conducted because the RaLa equipment removal in 1986.[1]
Minimal surveillance and maintenance has been conducted because the CRS was shut down in 1981.[1]
Minimal surveillance and maintenance has been conducted because the Service Waste Monitoring Systems equipment shutdown in 1989.[1]

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

Excavations will require monitoring and radiological controls upon discovery of radiological contamination.[1]

Characterization data are not avialable and the degree of facility deterioration has not been assessed for the Service Waste Monitoring System. Therefore, the risk of radionuclide or hazardous materials releases from these facilities/systems to the environment, cannot be definitively assessed, although based upon operating history, the potential for release is low.[1]

The risk of hazardous material release from the CRS to the environment is progressively increasing as the CRS facility deterioration continues. Once such a release occurs, the health and safety of on-site personnel becomes at risk.[1]

D&D RECOMMENDED METHODOLOGY:

Complete Decontamination and Decommissioning.[1] For additional information on D&D planning see reference 5.

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

No specialized equipment or tools are anticipated.[1]

WASTE VOLUME ESTIMATE BASIS:

RaLa Off-Gas Facility/System; 15 m^3 Low-Level Waste.[1]
Chloride Removal System; 60 m^3 Low-Level Waste.[1]
Service Waste Monitoring Facilities/Systems; 10 m^3 Low-Level Waste.[1]

FACILITY REUSE CONSIDERATIONS:

RaLa Off-Gas Facility/System to be removed.[1]
Chloride Removal System to be removed.[1]
Service Waste Monitoring Facilities/Systems to be removed.[1]

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

3. Characterization of the RALA Off-Gas Cell, CPP-631, WM-F1-81-010, dated May 1981, prepared by D.L. Smith and D.J. Bradford.

4. Radiological Characterization and Decision Analysis for the RALA Off-Gas Cell and Storage Tank (CPP-631 and VES-702), WINCO-1030, dated April 1985, prepared by C.L. Moser.

5. RALA Off-Gas Cell and Storage Tank (CPP-631 and VES-702) Decontamination and Decommissioning Plan, WINCO-1032, dated July 1985, prepared by C.L. Moser.

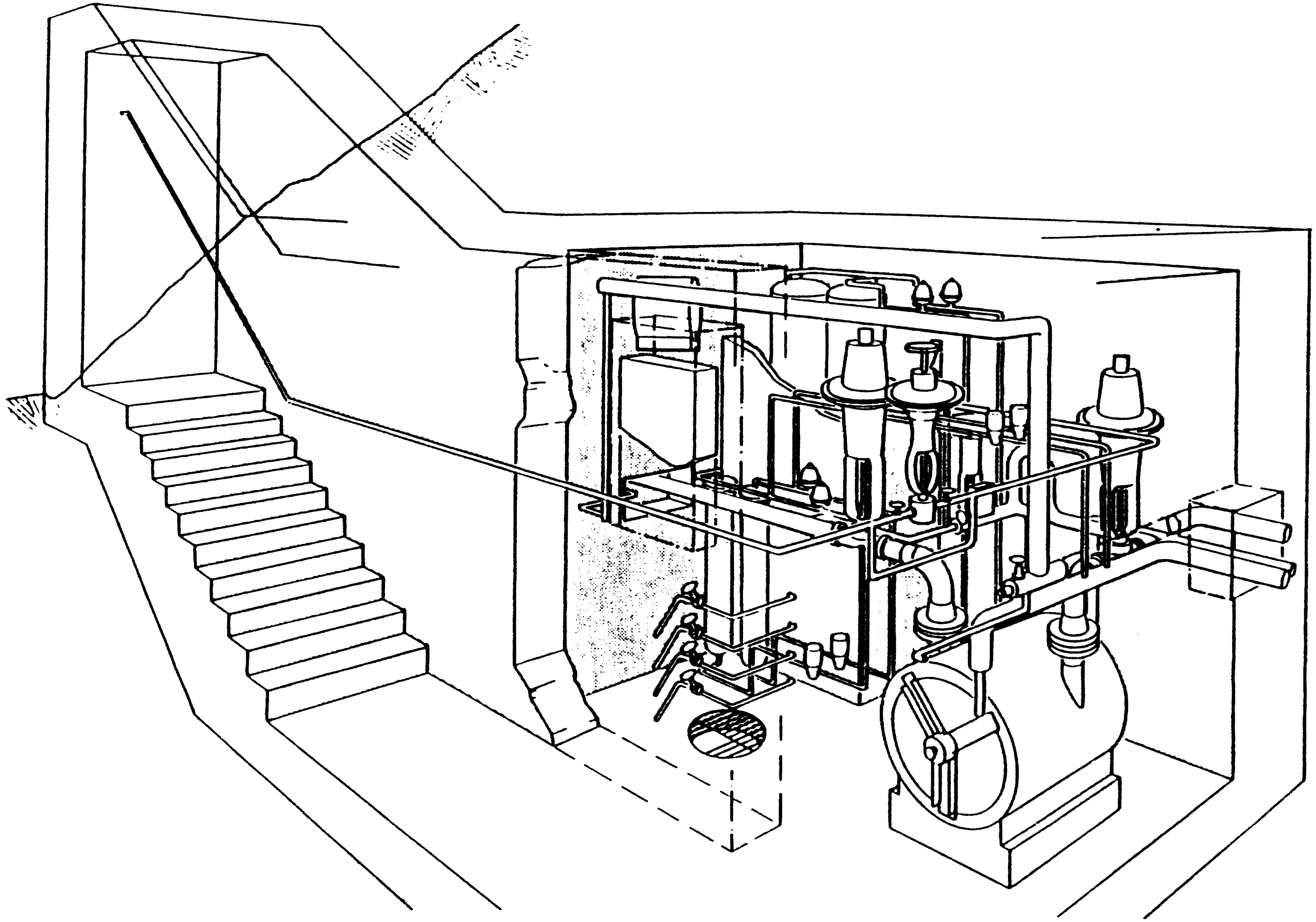

Figure B-33. Cutaway drawing of the RALA Off-gas Cell.

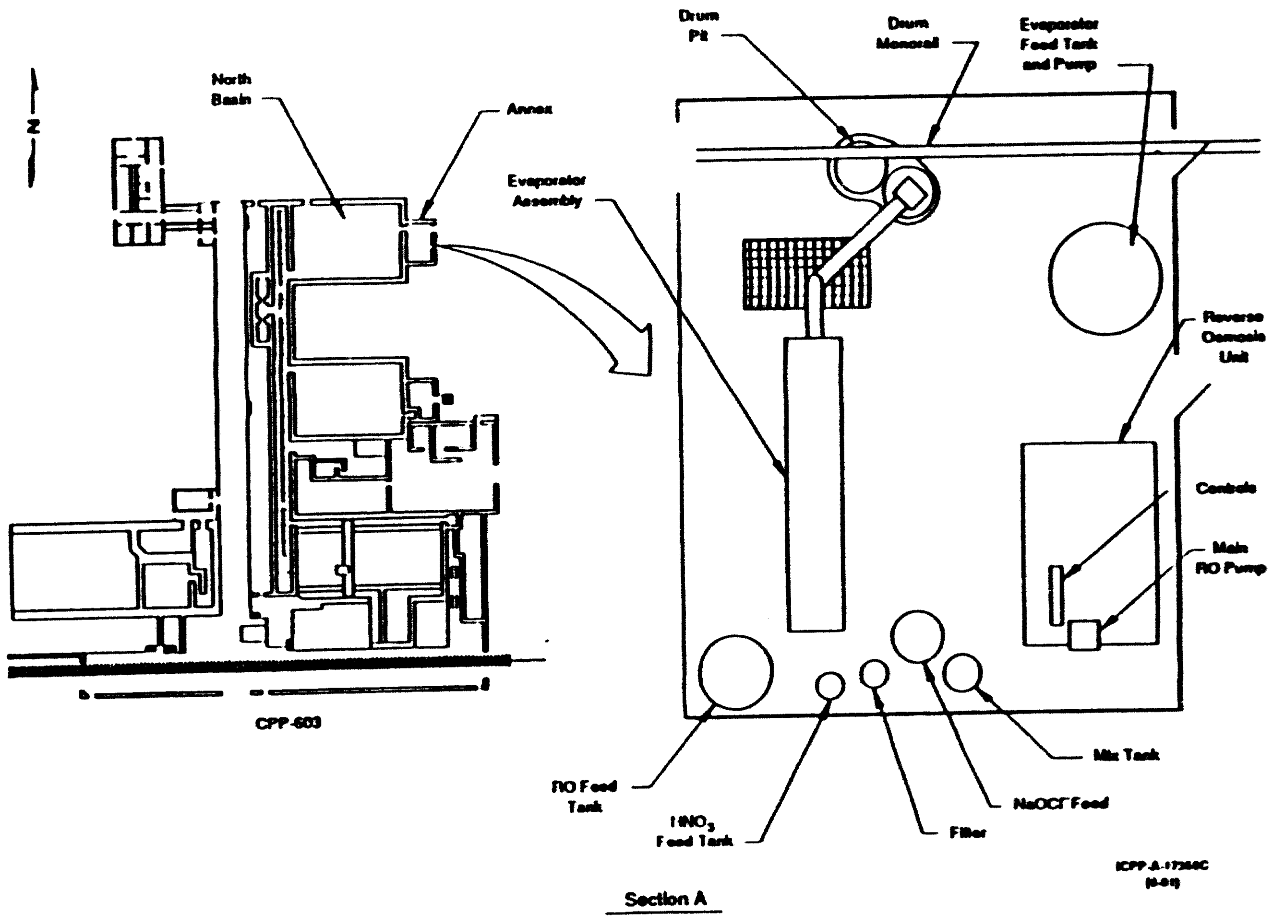

Figure B-34. Plan view of the Chloride Removal Annex.

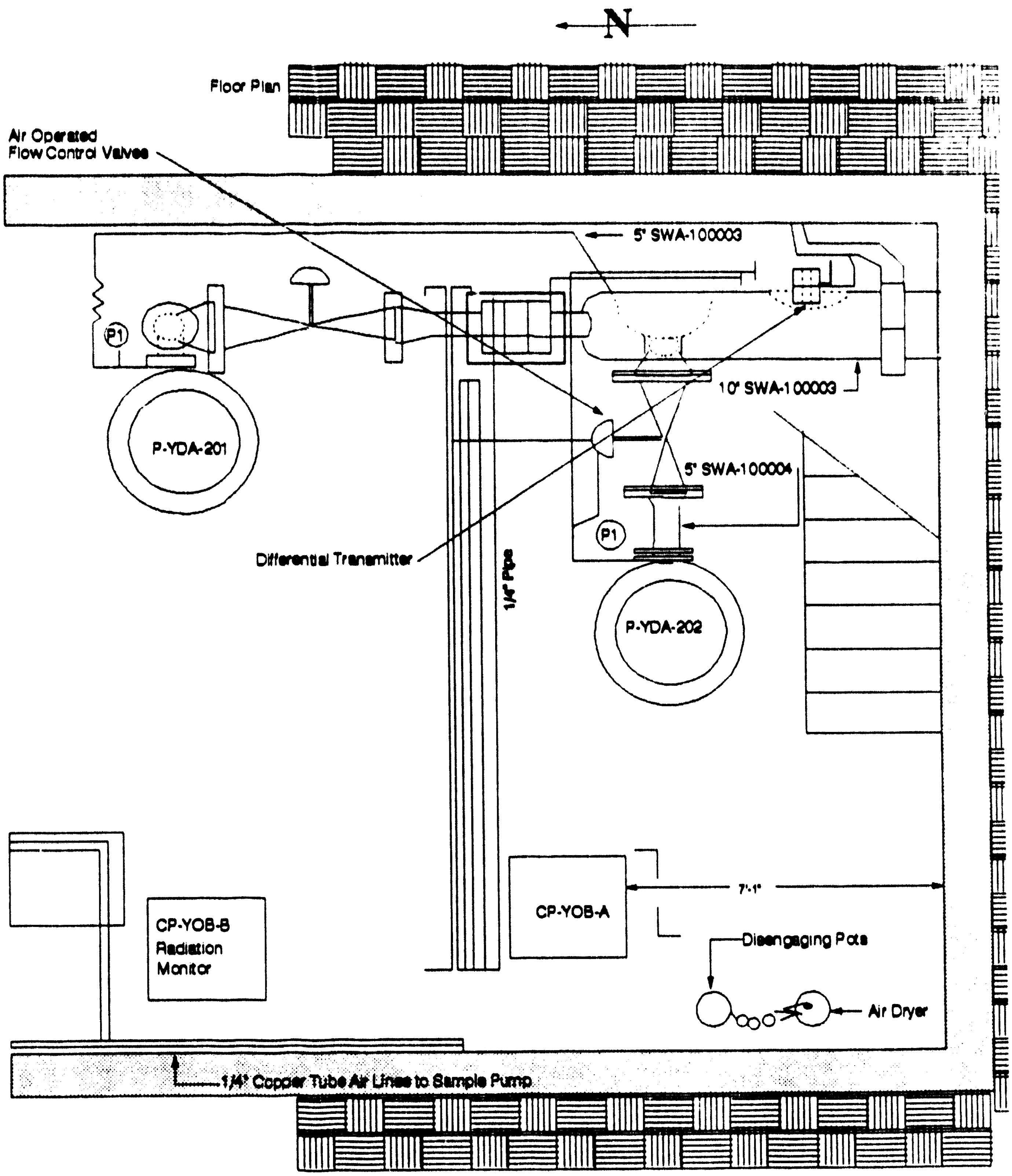

Figure B-35. CPP-734 Monitoring Station.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID	CONTRACTOR: WINCO				
PROJECT: **Headend Processing Plant (HPP) CPP-640**					
PROJECT PRIORITY:	PRIORITY BASIS: RCRA 40 CFR 260 - 277. DOE Orders 5820.2A, 5400.1 and 5480.19.				
SCHEDULE DURATION: 6 yrs	SCHEDULE ID:				
TOTAL ESTIMATED COST:$ 12,766k	ESTIMATE BASE: FY 1994				
FUNDING SOURCE: Civilian	ADs No.: 1307		WBS No.: 1.2.19.1.1.1		
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: RCRA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $0k	FY 1994: $ 102k	FY 1995: $102k	FY 1996: $1,441k	FY 1997: $2,768k	FY 1998: $4,219k
FY 1999: $4,134k	FY 2000: $0k	FY 2001: $0k	FY 2002: $0k	FY 2003: $0k	FY 2004: $0k

TOTAL WASTE VOLUME ESTIMATE: m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 150 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPLE/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes FY 1993 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

Priority determination is based upon RCRA based closure requirements and the potential for release of hazardous materials to worker occupire areas at the ICPP and the general environment. The concrete encased drain lines to the HW Tanks and the underground transfer pipelines leaving the HW Tank system, could discharge to the environment and put onsite personnel at risk because these pipelines are not double-contained and do not have leak detection systems.[1]

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

The HPP is a facility with approximately 15,000 ft^2 of floor space, which housed two unique fuel reprocessing headend systems and a liquid waste handling system. One of the HPP headends, the ROVER rocket fuel headend, has been shut down since 1984. The other, the Electrolytic dissolution headend for stainless-clad fuel, has been shut down since 1981. Although much of the original chemical and radionuclide inventory has been removed form the headend systems neither system has been fully decontaminated. In fact, part of the ROVER system still contains significant quantities of fissile material. Decontamination and decommissioning activities need to be scheduled for all three HPP systems (see Figure B-36).[2]

All of the HPP D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

<u>HPP Liquid Waste System</u> CPP-640 was equipped with its own waste collection system consisting of three 500 gallon tanks located in two cells at the lowest level of the building beneath the basement floor. The tank vaults are constructed of reinforced concrete and are accessible only through hatches in the floor of the waste tank control room above the vaults. The tanks were included in the RCRA Part A permit but the transfer lines form

the tanks do not meet secondary containment requirements. The tanks and vault are to be closed under interim status and decommissioned.[2]

<u>ROVER Headend</u> The ROVER headend process was divided into two parts:

1) combustion of the graphite rocket fuel in the "Dry side."
2) dissolution of the ash in the "Wet side."

The Dry side was housed int he Mechanical Handling Cave (MHC), Cell 3, and Cell 4. The Wet side was housed in Cell 2.

The ROVER process used tow stages of fluidized-bed burning to burn the graphite form the fuel. ROVER fuel elements were periodically charged to the burner system and the resulting Uranium-containing ash was collected, weighed, and transferred to the dissolver in the Wet side (Cell 2) for dissolution. The solution was then transferred to an adjacent facility (CPP-601) where the uranium was further purified and converted back to an oxide.[2]

<u>Electrolytic Headend</u> The Electrolytic dissolution system was located in Cell 5 of the HPP. Stainless steel-clad fuel assemblies or cans were transported in a bottom-opening cask form the fuel storage basin and dropped through a charging port to a table in the Electrolytic Cell. An operator used remotely-operated manipulators to load the fuel into the open top of a trough-shaped titanium dissolver. The dissolver product solution, essentially a metal nitrate-nitric acid solution containing nuclear poison, circulated continuously to a surge tank from which it was pumped through a flowmeter, heat exchanger, conductivity meter, and control valve before being returned to the dissolver. Fresh dissolvent was added as product was transferred to the CPP-601 facility for further processing.

The Electrolytic system was shut down in 1981 following the failure of several pieces of key equipment. The system is highly contaminated.[2]

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

The dissolution systems and their respective cells (5) are highly radioactive and radiologically contaminated. The HW tanks (3) contain hazardous wastes and high levels of radioactive contamination. Portions of the ROVER systems contain fissile uranium.[1]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-36, Headend Processing Plant CPP-640 and Figure B-37, Dissolution System Hot Cell Layout (copy directly from reference 1)

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The fissile uranium must be removed before system decontamination can be completed. This will facilitate cell entries for hazardous waste removal and decommissioning to clean close the HPP. These conditions and circumstances require special tools and techniques to support this closure.[1]

PERMITTING REQUIREMENTS:

One of the systems (the liquid waste system) was included in the RCRA Part A permit and is currently being closed under RCRA interim status control.[2]

SURVEILLANCE and MAINTENANCE STATUS:

Plant maintenance, security surveillance, and equipment monitoring continue as required to maintain the ROVER, ELECTROLYTIC, and HW Tank systems in a safe shutdown condition. Presently access to the ROVER/ELECTROLYTIC dissolution systems and HW Tank vaults is restricted such that in-cell maintenance is not allowed.[1]

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

The fissile uranium entrapped in the dissolution systems cannot be wet decontaminated due to the existing moderator/criticality limits and controls. This dissolution system and its cells (3) include areas of very high radiation and are highly contaminated radiologically. The HW Tank systems and vaults (2) are moderately contaminated. The HW Tank outlets (underground pipelines) require rerouting as the existing pipelines do not meet RCRA double containment/leak detection requirements.[1]

D&D RECOMMENDED METHODOLOGY:

Complete Decontamination and Demolition.[1]

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

This D&D closure will require handling and packaging of the various waste classes for disposal. These efforts will require specially adapted tools and techniques, but no capitol equipment items have been identified. Structural removal will require typical rad-con controls for demolition, waste handling, and packaging.[1]

WASTE VOLUME ESTIMATE BASIS:

FACILITY REUSE CONSIDERATIONS:

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

CPP-640 Headend Processing Plant (HPP)

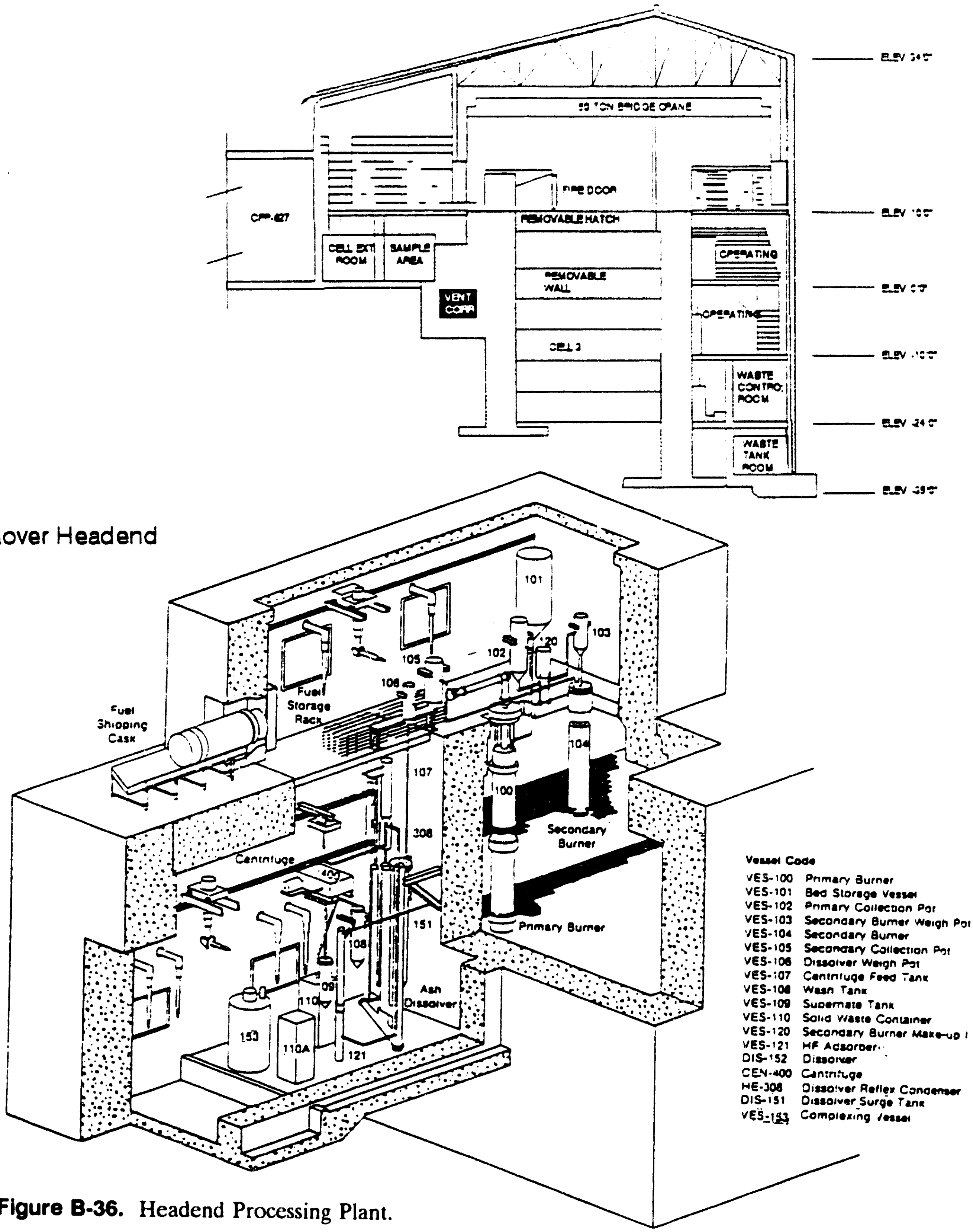

Figure B-36. Headend Processing Plant.

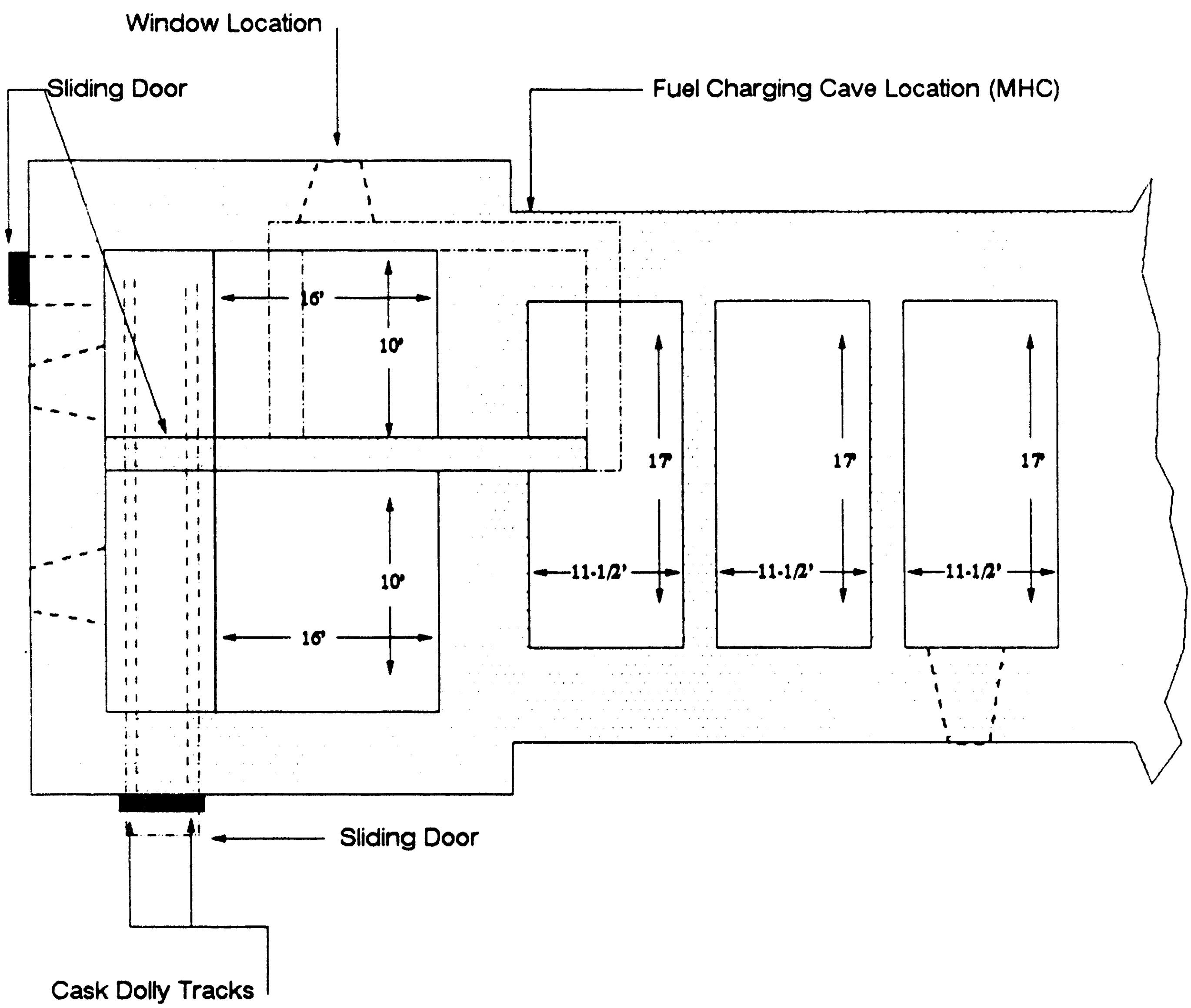

Figure B-37. Cell Layout.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: **DOE-ID**		CONTRACTOR: **WINCO**			
PROJECT: **Fuel Processing Complex (FPC) CPP-601**					
PROJECT PRIORITY:		PRIORITY BASIS: RCRA 40 CFR 260 - 272. DOE Orders 5820.2A, 5400.1, 5480.19.			
SCHEDULE DURATION: 3 yrs		SCHEDULE ID:			
TOTAL ESTIMATED COST:$ 6,065k		ESTIMATE BASE: FY 1994			
FUNDING SOURCE: Defense		ADs No.: 1308		WBS No.: 1.2.21.1.1.1	
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: RCRA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $ 0k	FY 1994: $0k	FY 1995: $0k	FY 1996: $1,025k	FY 1997: $ 1,893k	FY 1998: $ 3,147k
FY 1999: $ 0k	FY-2000:$0k	FY 2001: $0k	FY 2002: $0k	FY 2003: $0k	FY 2004: $0k

TOTAL WASTE VOLUME ESTIMATE: m^3		ESTIMATE BASE YEAR: 1993
HIGH-LEVEL WASTE:	LOW-LEVEL WASTE (Totals): 7 m^3	
TRU WASTE:	SOIL WASTE:	CARBON STEEL WASTE:
HAZARDOUS WASTE:	CONCRETE WASTE:	STAINLESS STEEL WASTE:
MIXED WASTE:	RUBBLE WASTE:	COMBUSTIBLE WASTE:
MUNICIPAL/SANITARY WASTE:	LIQUID WASTE:	COMPACTIBLE WASTE:
	OTHER WASTE:	

NOTE: Total Estimated Cost includes FY 93 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

The high vacuum cell system in its present out-of-service condition, presents risks to on-site personnel health and safety, and radiological materials release from the high vacuum cell system, to the environment.[1]

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

<u>CPP-601 Process Building</u> The facility contains systems for recovering uranium form various types of spent fuels. The entire CPP-601 complex is scheduled for decommissioning beginning in 1997 when the new Fuel Processing Facility construction is completed. Currently the majority of the facility is used to support uranium recovery and purification processes. Some of the CPP-601 systems, however, have been shut down for several years and are surplus to future programmatic needs. One such system, the High Vacuum Cell, is described below.[2]

<u>High Vacuum Cell</u> The High Vacuum Cell, located in CPP-601, originally provided vacuum for solution transfers associated with operating the dissolution equipment in Cells A, C, and D. The decommissioning process for these dissolution cells was completed in 1984.

The High Vacuum Cell is a high radiation area which requires decontamination prior to equipment removal. The cell is very compact (6 x 7 x 8 ft high) and contains vacuum pumps, vacuum reservoir tanks, and demisters. It is located adjacent to the CPP-5601 service corridor and Cell "A" entryway.[2]

All of the FPC D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-38, High Vacuum Cell Plan (copy directly from reference 1)

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

The CPP-601 process cells "A", "B", "C", "D", and "L" cells were decontaminated and decommissioned in 1984.[3] The remaining out-of-service high vacuum cell system is highly contaminated and requires decontamination before beginning equipment removal.[2]

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The out-of-service high vacuum cell system work areas involved are high radiation areas.[1]

PERMITTING REQUIREMENTS:

SURVEILLANCE and MAINTENANCE STATUS:

Periodic surveillance, monitoring, and maintenance is performed on the out-of-service high vacuum cell system.[1]

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

The risks of radiological materials releases from the out-of-service high vacuum cell system to the environment are progressively increasing while the high vacuum cell system remains inaccessible and contaminated.[1]

D&D RECOMMENDED METHODOLOGY:

Complete Decontamination and Decommissioning of the Out-of-Service High Vacuum System.[1]

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

This D&D closure will require handling and packaging of low-level radioactive waste for disposal. Structural removal will require rad-con demolition efforts and waste handling and packaging. No specialized equipment or tools are anticipated.[1]

WASTE VOLUME ESTIMATE BASIS:

Remaining out-of-service High Vacuum Cell System; 7 m^3 Low-Level Waste.[1]

FACILITY REUSE CONSIDERATIONS:

TBD

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

3. Final Report, D&D CPP-601 Process Cells "A", "B", "C", "D", and "L", EGG-2304, dated September 1984, prepared by Donald L. Smith and Jack G. Scott.

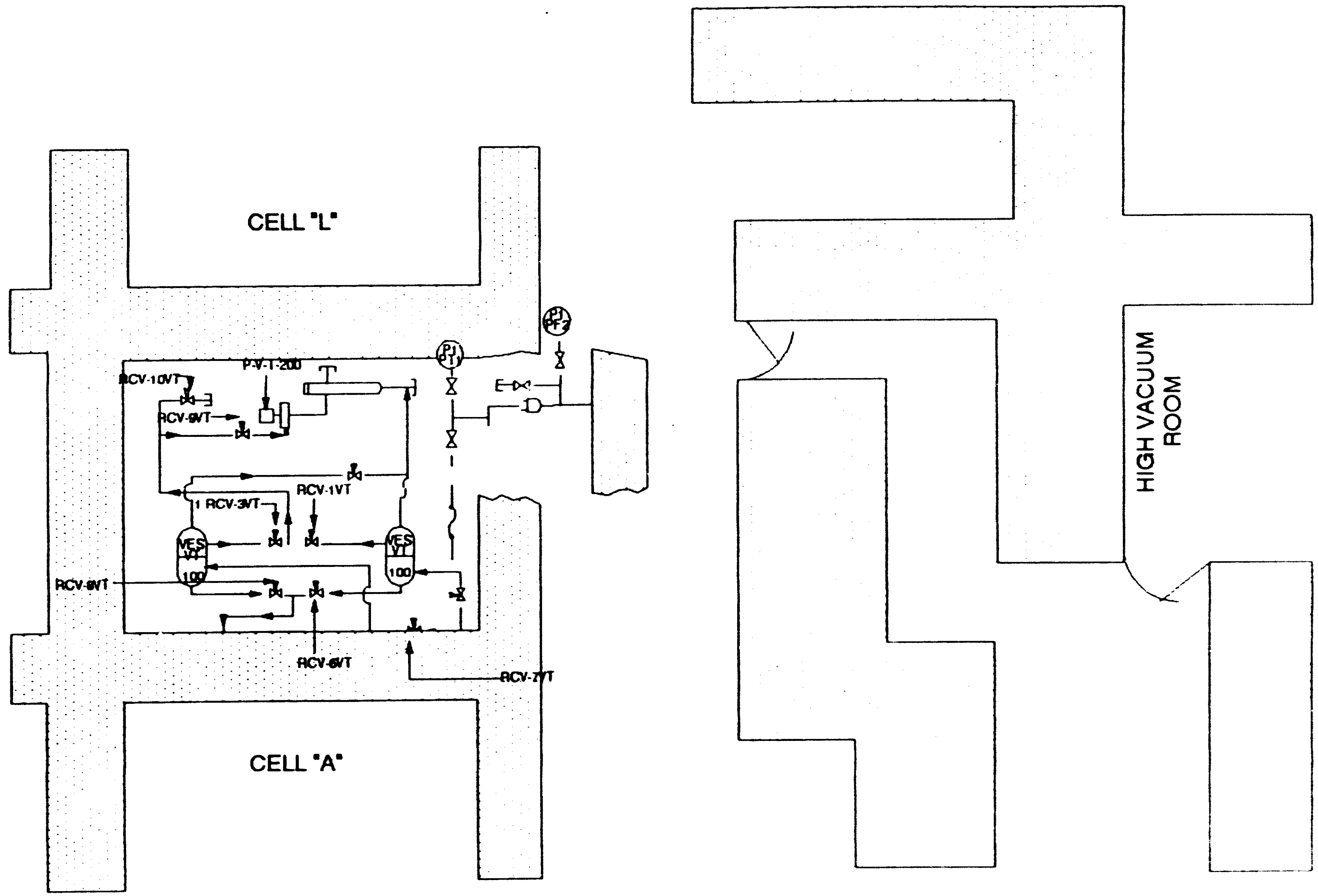

Figure B-38. High Vacuum Cell.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: WINCO			
PROJECT: **Waste Calcining Facility (WCF) CPP-633**					
PROJECT PRIORITY:		PRIORITY BASIS: RCRA Part A permitted facility. Closed under 40 CFR 265.110 and 265.113 (A&E).			
SCHEDULE DURATION: 9 yrs +		SCHEDULE ID:			
TOTAL ESTIMATED COST: $6,715k		ESTIMATE BASE: FY 1994			
FUNDING SOURCE: Civilian (DOE)		ADs No.: 1309		WBS No.: 1.2.16.1.1.1	
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: RCRA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $195k	FY 1994: $ 102k	FY 1995: $102k	FY 1996: $102k	FY 1997: $874k	FY 1998: $946k
FY 1999: $935k	FY 2000: $1,048k	FY 2001: $1,168k	FY 2002: $1,243k	FY 2003: $ 0k	FY 2004: $0k
TOTAL WASTE VOLUME ESTIMATE: m^3				ESTIMATE BASE YEAR: 1992	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): 1200 m^3			
TRU WASTE:		SOIL WASTE:		CARBON STEEL WASTE:	
HAZARDOUS WASTE:		CONCRETE WASTE:		STAINLESS STEEL WASTE:	
MIXED WASTE:		RUBBLE WASTE:		COMBUSTIBLE WASTE:	
MUNICIPAL/SANITARY WASTE:		LIQUID WASTE:		COMPACTIBLE WASTE:	
		OTHER WASTE:			

NOTE: Total Estimated Cost includes FY 1993 and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which does not include contingency or escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

Priority determination is based upon RCRA based closure requirements and the potential for release of hazardous materials to worker occupied areas at the ICPP and the general environment.[1]

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimate Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

WCF was the world's first plant-scale facility built to achieve safe, efficient disposal of high-activity radioactive wastes resulting from reprocessing of nuclear fuels, shown in Figure B-39. The WCF converted high-level radioactive liquid wastes into granular solids which were less corrosive, more immobile, and occupied less storage volume. First-cycle solvent-extraction waste from reprocessing spent nuclear fuels was sprayed into a hot, air-fluidized bed of granular solids where water flashed off and the metallic slats were converted to their corresponding oxides and fluorides.

The WCF was designed for direct maintenance of equipment during periodic shutdowns.

Operation of the WCF with the radioactive wastes began in 1963 and terminated in 1981. During that time over 4,000,000 gallons of aqueous waste was calcined producing approximately 77,000 cubic feet of solids. Due to its deteriorated condition the WCF was replaced by a new Waste Calcining Facility (NWCF) which was completed shortly after WCF was shut down.[2]

All of the WCF D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimensions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

The facility is a multi-level structure of masonry, reinforced concrete, and structural steel[1] with approximately 20,000 ft^2 of floor space. The processing cells lie underground in two banks with the service corridors lying between them. Nonradioactive service areas for the facility are located in the concrete block structure above grade.[2]

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Figure B-39, Cutaway sketch of Waste Calcining Facility (copy directly from reference 1).

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

The WCF contains a silica-gel adsorber media (-25 cubic meters) and several RCRA regulated wastes. The silica-gel media was an adsorber of highly radioactive off-gas byproducts and is a high radiation source. The RCRA regulated wastes include acid residues contaminated with heavy metals, elemental lead (Pb), and asbestos. The major radionuclide waste include cesium and ruthenium.[1]

PERMITTING REQUIREMENTS:

The facility currently contains a number of high radiation areas and is Part A-permitted under RCRA. RCRA Closure activities are currently in progress.[2]

SURVEILLANCE and MAINTENANCE STATUS:

Minimal surveillance and maintenance have been conducted since 1981 and many systems within the WCF have deteriorated significantly. Repair of the utility systems, decon piping systems, and instrumentation, to meet DOE Order 5480.19, will be required before initiation of the decon effort.[1]

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

The risk of releasing RCRA regulated material and/or radiological material to the environment increases as the WCF's deterioration continues. The WCF process system in building CPP-633 presents an increased risk to on-site personnel, because of the increasing probability of containment migration beyond the system and building.[1]

D&D RECOMMENDED METHODOLOGY:

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

The D&D closure will require handling and packaging of low level radioactive waste for disposal. Structural removal will require rad-con demolition and waste handling and packaging. Specialized tools are anticipated.[1]

WASTE VOLUME ESTIMATE BASIS:

1200 m^3 of low-level waste.[1]

FACILITY REUSE CONSIDERATIONS:

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

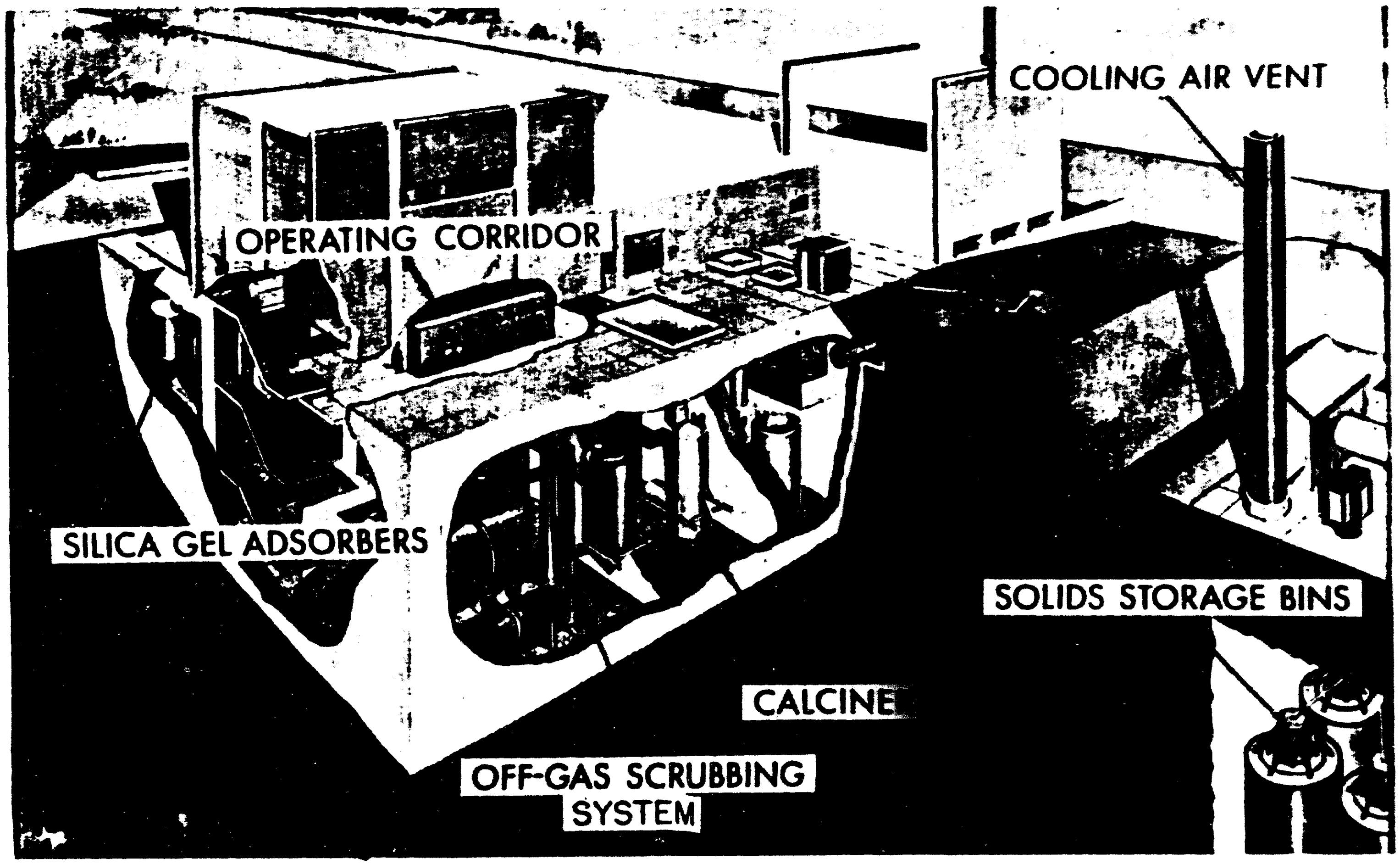

Figure B-39. Cutaway sketch of the Waste Calcining Facility.

DECONTAMINATION and DECOMMISSIONING UNIT
ENVIRONMENTAL RESTORATION PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: WINCO			
PROJECT: **High Level Waste Tank Farm (HLWTF)**					
PROJECT PRIORITY:		PRIORITY BASIS: RCRA Part A facility closed in compliance with 40 CFR 265.110 and DOE Order 5820.2A			
SCHEDULE DURATION: 6 yrs		SCHEDULE ID:			
TOTAL ESTIMATED COST: $ 3,488k		ESTIMATE BASE: FY 1994			
FUNDING SOURCE: Defense		ADs No.: 1310		WBS No.: 1.2.20.1.1.1	
SAR REQUIREMENT: Use Existing SAR (REVISE EXISTING or PREPARE NEW)			RCRA/CERCLA: CERCLA Driver (APPLICABLE REQUIREMENTS)		
FY 1993: $0k	FY 1994: $ 0k	FY 1995: $102k	FY 1996: $567k	FY 1997: $670k	FY 1998: $846k
FY 1999: $1,303k	FY 2000: $0k	FY 2001: $ 0k	FY 2002: $ 0k	FY 2003: $0k	FY 2004: $ 0k
TOTAL WASTE VOLUME ESTIMATE: m^3				ESTIMATE BASE YEAR: 1993	
HIGH-LEVEL WASTE:		LOW-LEVEL WASTE (Totals): m^3			
TRU WASTE:		SOIL WASTE:		CARBON STEEL WASTE:	
HAZARDOUS WASTE:		CONCRETE WASTE:		STAINLESS STEEL WASTE:	
MIXED WASTE:		RUBBLE WASTE:		COMBUSTIBLE WASTE:	
MUNICIPLE/SANITARY WASTE:		LIQUID WASTE:		COMPACTIBLE WASTE:	
		OTHER WASTE:			

NOTE: Total Estimated Cost includes FY 1993 estimates and outyear planning numbers. FY 1993 Cost estimate numbers are based upon FY 1993 EAC. All other cost estimate numbers are based upon FY 1994 planning, which does not include contingency of escalation. All planning values are in constant FY 1994 dollars.

PROJECT PRIORITY DETERMINATION:

This facility is on the DOE Surplus Facilities List and therefore affected by DOE Order 5820.2A, Chapter 5. Other regulatory drivers include the Federal Facilities Agreement and Consent Order (FFACO), 40 CFR 260.34, and 40 CFR 265 subpart J.

PROJECT COST ESTIMATE BASIS:

Refer to Cost Estimating Basis data contained in FY 1994 Cost Account Plans (CAPs) and outyear (FY 1995 - FY 2002) planning package documentation.

FACILITY DESCRIPTION:

HISTORY and USE OF FACILITY: [Including start and finish operational years]

High level liquid radioactive waste is generated at ICPP as a result of fuel reprocessing activities. This waste is collected in a network of eleven (11) interconnected 300,000 gallon stainless steel tanks. The solutions are stored in these tanks for subsequent treatment in the new waste calcining facility (NWCF). The tanks with their associated vaults are approaching the end of their design like and are scheduled to be declared surplus upon completion of a replacement project which is currently in progress. Five of these tanks will be declared surplus in 1997.[2]

All of the HPP D&D Project is considered contaminated.

PHYSICAL DESCRIPTION OF FACILITY: [Including type of construction (cast in place concrete, concrete block, steel frame/siding, etc.), overall dimenstions of floors, walls, foundations, etc.,number of floors and relative elevations, number of sub-facilities]

OVERVIEW OF FACILITY CONTAMINATION: [Confinement integrity status, active confinement equipment requirements, and contamination data]

PLAN and VERTICAL VIEWS OF FACILITY: [Plot plans, facility detail plans (horizontal and vertical)]

Sectional view of a Typical First-Cycle Liquid Waste Tank at ICPP (copy enlargement from reference 2).

CONTACT INFORMATION: [Name, title, company affiliation, location, phone, mailstop,etc.]

D&D/S&M PREVIOUS ACCOMPLISHMENTS:

UNIQUE CONDITIONS/SPECIAL CIRCUMSTANCES:

PERMITTING REQUIREMENTS:

SURVEILLANCE and MAINTENANCE STATUS:

SAFETY and ENVIRONMENTAL CONSIDERATIONS:

There is the further potential of degradation to the environment from the contamination.

D&D RECOMMENDED METHODOLOGY:

SPECIALIZED CAPITOL EQUIPMENT and TOOLS REQUIRED:

WASTE VOLUME ESTIMATE BASIS:

FACILITY REUSE CONSIDERATIONS:

REFERENCES:

1. INEL Decontamination and Decommissioning Long Range Plan, PR-W-79-005, Revision 8, dated September 1991, prepared by R. Buckland and M. Sekot, Appendix B, Facility Description Forms.

2. WINCO information received by the EG&G Idaho, ER&WM, D&D Projects Unit, on June 30, 1993, from D. A. Peterson with the WINCO IFP-D&D Programs.

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