NOTICE!

ALL DRAWINGS
ARE LOCATED
AT THE END OF
THE DOCUMENT

KAISER•HILL
COMPANY

August 10, 1998

98-RF-04043

Gary W Schuetz
Nuclear Material Safeguards
DOE, RFFO

BUILDING 771 DECOMMISSIONING OPERATIONS PLAN AND RECONNAISSANCE LEVEL CHARACTERIZATION REPORT - VMP-015-98

Ref (a) K A Klein ltr (01836) to G M Voorheis, Building 771 Decommissioning Operations Plan, April 28, 1998

Attached are the revised Building 771 Decommissioning Operations Plan (DOP) and the Reconnaissance Level Characterization Report (RLCR) These documents incorporate the comments provided in Reference (a) The documents have been cleared for off-site release

If you have any questions, please contact Greg Meyer at Extension 4827

VM Pizzuto

Victor M Pizzuto
Director, 771/774 Closure Project
Nuclear Operations

gjh

Orig and 1 cc - G W Schuetz

Attachments
As Stated

cc
Fred Gerdeman - DOE,RFFO
John Rampe - DOE,RFFO

Kaiser-Hill Company, L L C
Courier Address Rocky Flats Environmental Technology Site, State Hwy 93 and Cactus, Rocky Flats, CO 80007 • 303 966 7000
Mailing Address P O Box 464, Golden, Colorado 80402-0464

Bldg. 771/774 Closure Project

Decommissioning Operations Plan

Revision 0

August 06, 1998

Building 771/774 Closure Project

Decommissioning Operations Plan

Revision 1

Approvals

Prepared By P K Vacca 8-6-98

P K Vacca — Date

771/774 Closure Project

Approved By: D G Hamrick 8/6/98

D G Hamrick — Date

771/774 Closure Project Manager

Reviewed By. J G Meyer 8/6/98

J G Meyer — Date

Deputy Director 771/774 Closure Project

Approved By: V M Pizzuto 8/10/98

V M Pizzuto — Date

Director 771/774 Closure Project

Approved By. _____ /

Department of Energy — Date

Approved By: _____ /

CO Dept of Public Health & Environment — Date

Executive Summary

The end of the Cold War moved the Department of Energy's (DOE) focus from nuclear weapons production to the stabilization and cleanup of previously operating facilities Many production facilities that once operated with a high priority are now considered surplus or excess Rocky Flats Environmental Technology Site (RFETS), which was significantly impacted by this transition of DOE missions, has embarked on the process of planning the closure of a major nuclear facility This document describes the closure process for the Buildings 771/774 cluster and its associated buildings Hereinafter this project will be referred to as the "771/774 Closure Project"

Building 771 was used for processing plutonium and actinides with a wide variety of processes between 1951 and 1989 This included many modifications, a substantial variation in operations and several upsets resulting in radiological contamination of the facility The Plutonium Vulnerability Study determined Building 771 to be the "most dangerous building in America " Since that time a significant quantity of Special Nuclear Material (SNM) has been removed, lowering the risks involved Now, RFETS is undertaking the task of planning a closure project which will safely and cost-effectively deactivate, decontaminate and decommission the cluster

Both "No Action" and "Reuse" alternatives were considered for the area after deactivation However, it was determined that the cluster should be removed for the following reasons 1) due to the age of the cluster, as well as the radiological contamination levels, it is more economical to remove the cluster rather than renovate them for some undefined future use, 2) removal of the cluster will allow, if needed for remediation of the soil beneath, and 3) removal of the clusters will allow for a significant reduction of risk at RFETS

Strategic End Points for the Building 771/774 Closure Project are

- Material in the building is removed and the building is then ready for demolition leaving the slab in place Disposal of the contents will be either Low Level Waste (LLW), Transuranic (TRU), Mixed Waste (MW), Hazardous Waste or Industrial Waste
- Characterization of the remaining materials and characteristics in the slab and nearby soil will be documented to support a monitoring program as needed for future environmental remediation
- A monitoring plan will be written in cooperation with the Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE) and the Defense Nuclear Facility Safety Board (DNFSB) as needed
- This DOP covers decommissioning activities up to but not including demolition of Buildings 771 and 774 Demolition or remediation activities will be added in a future revision to the Decommissioning Operations Plan (DOP)

The 771/774 Closure Project utilizes a phased approach This approach includes a parallel approach where deactivation, decontamination and decommissioning activities may occur at any time within the facility The project is also broken into six phases as shown below

Phase I	- Major Hazard Reduction	o	Phase IV	-	Utility System Shutdown
Phase II	- Equipment Dismantlement	o	Phase V	-	Building Demolition
Phase III	- Building Decontamination	o	Phase VI	-	Site Remediation

This phased approach enables Building 771 to begin closure in a number of areas allowing for the most efficient utilization of resources It also accelerates closure schedules for the cluster This will reduce the costs associated with the surveillance and maintenance of the cluster allowing these costs to be reallocated towards other risk-reduction activities at RFETS Throughout this approach a number of established programs will be employed, including Environmental, Health & Safety, Waste Management and Quality Assurance

In many cases, this document is a "road map," pointing the reader to existing documentation and processes that are implemented on site In undertaking such a large task, there will be cases where circumstances are not as were predicted Therefore, this document details the decision process that will be utilized throughout the project

The closure process for the cluster has already begun with initial hazard reduction activities The completion date for closure (~2005) is projected from the schedule and budget in conjunction with the Closure Project Baseline Currently, activities are underway to develop logic tied, resource-loaded schedules for the closure of Building 771/774 and its associated facilities It is expected that this effort will result in a significantly accelerated project completion date which will be incorporated into the Closure Project Baseline

Wastes resulting from this activity will be managed in accordance with all applicable Federal, State, and local requirements Packaging of radiological waste will follow RFETS procedures An estimated 870,000 ft^3 of Low Level Waste, 2,200 ft^3 of Low Level Mixed waste and 61,000 ft^3 of TRU waste are expected to be generated as a result of this project

All contaminated wastes will be managed in accordance with applicable regulations and ultimately sent to the appropriate off-site storage or disposal facility such as Envirocare, Nevada Test Site (NTS) or the Waste Isolation Pilot Plant (WIPP) Non contaminated rubble and debris will be disposed in accordance with solid waste regulations The strategy of the Building 771/774 Closure Project is to safely and cost-effectively close the facility in compliance with all applicable Federal, State and local rules and regulations This will eliminate the costs associated with the surveillance and maintenance (S&M) of this facility allowing these savings to be reallocated towards other risk-reduction activities at RFETS Furthermore, the closure of the Building 771/774 Closure Project will result in a significant reduction of risk at RFETS and help to achieve the Rocky Flats vision

1. Introduction

On July 19, 1996, the Rocky Flats Clean-up Agreement (RFCA) was signed by the DOE, CDPHE and EPA RFCA is the document which will govern the clean-up and decommissioning of RFETS facilities The clean-up actions will be completed as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal actions In compliance with RFCA, DOE has developed this Decommissioning Operations Plan (DOP) which outlines how the RFETS decommissioning activities for the 771/774 Cluster will be managed and controlled RFCA requires that a DOP be developed for the most hazardous facilities at RFETS As the Integrating Management Contractor (IMC) at RFETS, Kaiser-Hill Company, L L C (K-H) has developed a Decommissioning Program Management Plan (DPMP), a Site wide management and project planning document to identify how the RFETS decommissioning program will be implemented and monitored The referenced procedures and project documents are identified to add clarity to this DOP The DOP will be transmitted to the Lead Regulatory Agency (LRA) for approval in accordance with RFCA In addition, the Reconnaissance Level Characterization Report (RLCR) will be submitted for informational purposes

RFCA identifies six facilities which will require a DOP and states that other facilities may require a DOP The necessity for a DOP is based on the hazards identified in the facility RLCR Cluster 771/774 is one of the identified facilities This DOP covers Building 771 and 774 only All other ancillary buildings and trailers currently associated with Building 771 and 774 are included for information only

The scope of this DOP includes decommissioning activities but does not address final building demolition or subsequent environmental remediation Internal demolition may be conducted as necessary for stripout or decontamination The information was derived from walkdowns of the facilities, information obtained from the RLCR and actions completed during deactivation to achieve the identified end points which are included in Appendix 9

1.1 Background

The end of the Cold War moved DOE's focus from nuclear weapons production to the stabilization and cleanup of previously operating facilities Of the over 700 facilities identified at RFETS, eight are contaminated with plutonium, twelve are contaminated with both uranium and plutonium, thirty-four have minor radiological contamination and the remainder have no known history of radiological contamination Many of these facilities were used to conduct production operations while others were ancillary facilities used for storage, administration and support services

Building 771 was used for processing plutonium and other actinides with a wide variety of processes between 1951 and 1989 This included many modifications, a substantial variation in operations and several upsets resulting in radiological contamination of the facility References found in Appendix 1 provide historical details of the building through 1992 as well as a comprehensive summary of the current status of the building and its contents

1 2 "Contractor Blind" Approach

This DOP details what is required to accomplish the project, regardless of which contractor organization will have management responsibility for conduct of various project tasks Once the project's tasks are defined, decisions as to which organization will have responsibility will be determined Roles and responsibilities are detailed in Section 10

2. Building/Cluster Description

The 771/774 Closure Project scope includes the deactivation, decontamination and decommissioning of Building 771/774 and the ancillary support structures, including trailers, plant systems and utilities, underground tank systems and waste sites These areas are referred to as the 771/774 cluster in the Closure Project Baseline

Removal of the Building 771/774 structures, foundation and underground utilities (including process waste system pipes and ancillary underground equipment), as well as remediation of soil contamination will be completed as necessary during the subsequent environmental remediation phase These demolition or remediation activities are not included as part of this DOP, they will be added in a future revision to the DOP This revision, which would include the Final Building Survey plan and the demolition plan, would be a Major Modification as defined by RFCA Implementation Guidance document RF/RMRS-97-043 paragraph 3 10 1 As such, the revision would require advance written notification and a public review comment period Demolition/disposition of Type 1 and 2 buildings in the 771/774 cluster will be conducted in accordance with the Decommissioning Program Plan, sections 3 4 5 and 3 4 6

The location of each building/facility is shown graphically in Figure 2-1 A complete list of these buildings with a brief description is shown in Table 2-1 A complete list of systems involved in this project is shown in Table 2-2

Table 2-1 Buildings and Structures

Identifier #	Description of Building/Facility
262	Diesel fuel tank
714/714A	Hydrofluoric (HF) storage (operationally empty)
714B	Emergency Breathing Air
715	Emergency generator #1
716	Emergency generator #2
717	Magnahelic Gauge Building
728	Process waste pit / underground storage tank (No underground work)
770	Maintenance and offices
771	Former Plutonium Recovery Facility
771B	Carpenter shop
771C	Nuclear waste packing/drum counting (Annex)
772/772A	Fluorine/acid storage bldg
773	Guard post

774	Pu waste treatment facility
775	Sanitary lift station
N/A	Exhaust Stack
T771A-H & J- L	Various trailers
771A	Corridor F Office Area

Table 2-2 771 Facility Systems

Ambient air particulate samplers
Breathing Air
Building chemical/gas support (HF, Ar, F, N_2, O_2, NaOH, KOH, Propane)
Continuous Air Monitoring
Criticality Alarm System
Domestic water (hot and cold)
Electrical distribution
Emergency Diesel Generators and Diesel Fuel Oil (no underground work)
Eye wash and safety showers
Fire detection (Glovebox Overheat, plenum deluge, Contamination control (CC) cell, risers, fire phones, and pull stations)
Fire suppression (sprinklers, dry chemical, plenum deluge, hose stations, mains, and hydrants)
Footing
Grounding and lightning protection
Health-physics vacuum system
Heating, Ventilation, and Air Conditioning (HVAC) Zones I, IA, II, III, IV
Inert Systems (Nitrogen, Argon) with oxygen analyzers
Instrument Air
Life Safety/Disaster Warning System
Natural gas
Plant Air
Process chilled water
Process cooling water
Process systems
Process waste
Roof Drains
Sanitary waste
Security System (door and vault alarms, video monitors)
Steam and condensate
Tank purging and venting system
Telecommunication/Local Area Network
Uninterruptible power supply (UPS)
Vacuum transfer system

2.1 Interfaces

2 1 1 System Interfaces

A number of systems are interconnected between Building 771/774 cluster and other facilities on site These systems are listed below Consideration for the interfaces will be given as closure is planned for each portion and actions will be taken to prevent unexpected disruption of services

- Electrical - connected to the 515/516 Substation
- Nitrogen - connected to the Nitrogen plant
- Argon Tank - connected to a tank outside the facility
- Plant Air - received from Building 776
- Breathing Air - received from Building 707/708
- Criticality System - connected to the plant-wide system
- Water - received from Building 124
- Steam - received from Building 443
- Sanitary Sewer - connected to the plant-wide system
- Liquid Process Waste - connected to the plant-wide system
- Natural Gas - connected to the plant-wide system
- Telephone System - connected to the plant-wide system
- Fire Protection Systems - connected to the plant-wide system
- Security Protection Systems - connected to the plant-wide system

2 1 2 Physical Interfaces

There are three tunnels that connect Buildings 771/774 to other structures

- 267 ft tunnel connects Building 771 to Building 776 for purposes of moving materials
- 170 ft utility tunnel connects Building 771 to Building 774
- 140 ft exhaust duct tunnel connects Building 771 to the exhaust stack

The grounding/lightning system is interconnected between Building 771, Building 715 and Building 774

The underground tunnels and utilities associated with the 771/774 Closure Project are not within the scope of this closure project These items will be capped and left in place Remediation and/or monitoring will be completed by Environmental Remediation

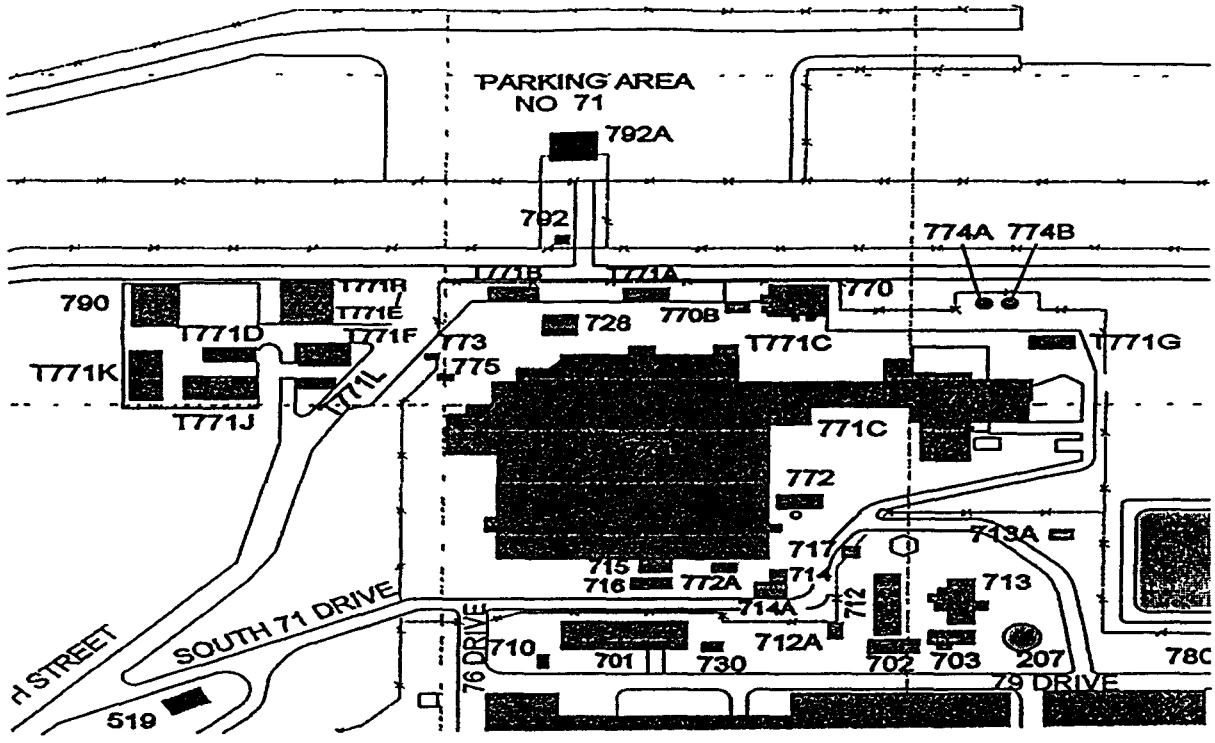


Figure 2-1 Rocky Flats Environmental Technology Site Building 771/774 Closure Project

3. Alternative Analysis and Selection

Several alternatives were considered for the near-term management of the 771/774 Closure Project The preamble to RFCA and the Rocky Flats vision statement both contain the objective that buildings will be decontaminated as required for future use or demolition The evaluation of the scope of work for the 771/774 Closure Project considered the following three alternatives

- Alternative 1 - Decontamination/Decommissioning of the 771/774 Closure Project facilities
- Alternative 2 - No Action with Safe Shutdown Maintenance
- Alternative 3 - Reuse of the 771/774 Closure Project facilities

The alternatives were evaluated for effectiveness, implementability and relative costs The results of the alternative analysis are summarized in Table 3-1 Alternative 1 is the selected alternative Decontamination and decommissioning of the 771/774 Closure Project facilities clearly supports the RFETS vision of safe, accelerated and cost-effective closure This alternative has the lowest life-cycle costs, the fastest risk reduction and is integrated with the operations of the site This alternative also maintains long-term protection of public health and the environment Short-term impacts to the environment (i e , impacts during the duration of the action) can be physically and administratively controlled There are no significant negative aspects to decontamination and decommissioning of the clusters at this time A full discussion of the impacts is provided in Section 8

Alternative 2, No Action with Safe Shutdown Maintenance, does not immediately achieve RFETS goals This alternative does not accomplish accelerated closure and defers decontamination and decommissioning This results in an increase in the life-cycle cost of closure The short-term protection of public health and the environment is achieved by inaction However, this protection decreases over time due to continued degradation of systems and equipment through aging Furthermore, waste and debris requiring treatment and/or disposal and the risks associated with managing them, are not eliminated from the cluster under this alternative

Alternative 3, Reuse, is not feasible as evidenced in evaluations that indicated that reuse of the 771/774 Closure Project facilities is neither required nor beneficial Furthermore, as with Alternative 2, implementation of this action will result in the deferral not elimination of eventual decontamination and decommissioning necessary for final closure

Table 3-1 Alternative Analysis Summary

Alternative	Description	Effectiveness	Implementation Feasibility	Relative Cost
1- D&D	Decontamination and Decommissioning (D&D) activities will follow area-specific plans approved in accordance with RFCA Activities consist of decontamination as deemed necessary, and decommissioning to include dismantlement and demolition	D&D is effective in achieving the long-term goals of the RFCA preamble and the Rocky Flats Vision The mortgage costs are eliminated and the risks and hazards are significantly reduced	Technology currently exists to achieve the objectives of this alternative Integration with other site activities can be accomplished	Immediate D&D has the lowest life-cycle costs since the cluster must eventually incur these costs as part of its baseline Immediate closure achieves minimal landlord and D&D costs
2 - No Action	No action will maintain the 771/774 Closure Project in its current configuration No additional equipment would be removed unless the present safe shutdown status of the cluster becomes compromised	No Action delays the closure activities that must eventually be performed to meet the goals of RFCA Deferring the closure could make funding available to other site closure activities Long term goals could be jeopardized if the integrity of the mothballed facilities increases risk to workers and the environment	No Action would cause a disruption to the long-term plans for RFETS and is not ideally implementable since the closure of the cluster is planned to occur early in the site closure process	No Action results in higher costs than immediate D&D since landlord costs would continue to be incurred until D&D is eventually completed These costs are estimated at $5 million per year for the period the building stands inactive D&D costs (adjusted for future value) would still be required
3 - Reuse	Reuse of the 771/774 Cluster would keep the facilities in their current configuration A new mission for the facilities, in support of the present site Cleanup Mission, would be assigned by the site Utilization Review Board Depending on the nature of the new mission, additional removal of equipment may be necessary The current utilities and equipment would be maintained until a new mission was defined	Reuse of the 771/774 Closure Project was evaluated by the Sites Facility Use Committee and it was determined that there was no further mission for the cluster Use of the cluster for an alternative off-site use was evaluated in accordance with DOE Order 4300/ 1C, Subparagraph g, Disposal of Government -Owned Land Improvements No further use was identified	Because no new mission has been identified for the cluster and because the closure of the cluster is identified through the Life-Cycle baseline to begin soon, implementation of this alternative is not considered administratively feasible	This alternative would result in the greatest life-cycle costs as the reuse mission would more than likely require expenditures for modifications to the buildings in addition to existing landlord/surveillance costs Furthermore, D&D costs (adjusted for future value) would still be required

4. Project Approach

A number of strategies were used in the development of the 771/774 Closure Project scope, work logic, schedule performance, basis of estimates and costs The strategies employed in the 771/774 Closure Project are similar to as those employed by the Site's Ten Year Planning Exercise, "Accelerated Cleanup Focus on 2006"

- Maintain the site's safety envelope ensuring the continued safety of site workers, the public and the environment during cleanup activities
- Eliminate highest priority risks first. High priority risk activities primarily involve stabilization, consolidation, interim storage and off-site shipment of SNM
- Reduce the site's high nuclear facility baseline costs by accelerating closure of these facilities through expedited stabilization, consolidation and off-site shipment of SNM
- Demolish site facilities and infrastructure to eliminate future funding and safety liabilities, ongoing maintenance and surveillance and residual radioactive material management
- Clean up environmentally contaminated areas to the extent that sources of contamination that pose a significant risk are mitigated and controlled Site cleanup is performed to the extent necessary to support the land uses described in RFCA and to ensure that downstream water quality standards are met
- Reduce infrastructure and management costs at a steady pace throughout the life of the cleanup project
- Comply with all applicable laws, regulations and agreements

4.1 Strategic Project Phases

4.1 1 Integrated Approach to Closure

The 771/774 Closure Project supports the DOE Strategic plan by closing a major nuclear facility at RFETS

The 771/774 Closure Project utilizes a more efficient approach to closure This approach moves away from the sequential "deactivation, decontamination and decommissioning" in series and moves towards a well-integrated parallel approach where all three of these activities may occur at any time, simultaneously, within the facility This approach is expected to be more cost-effective as it allows more work to be accomplished with fewer resources in less time It also significantly reduces exposure of the workers to hazards For example, in the typical series model, workers would perform radiological surveys and other necessary characterization activities, enter each glovebox and sweep down the box to remove holdup Then, much later, the workers would return to that same box, redo the necessary radiological surveys, etc and begin the removal process Instead, by performing closure activities in parallel the team can simply perform the characterization activities once The team can then complete the removal of holdup and the removal on the equipment immediately thereafter, thus eliminating the risk in a shorter time, with fewer resources, and less exposure

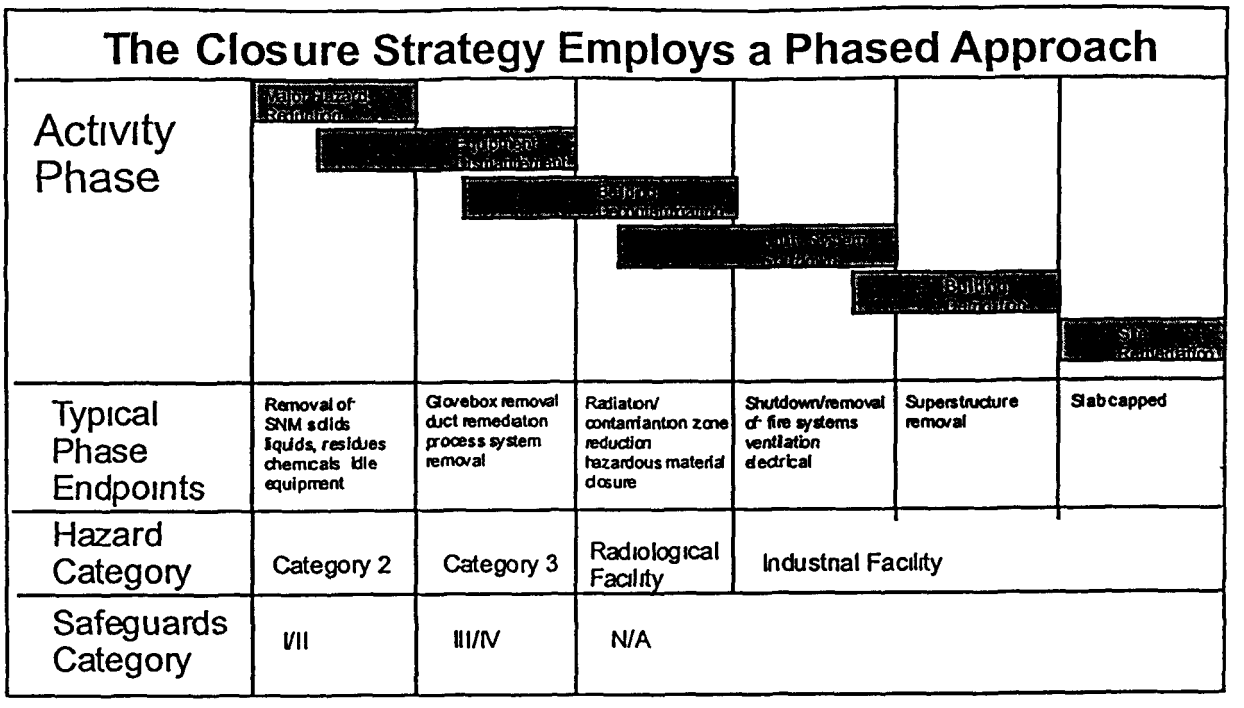


Figure 4-1 Phased Approach to Closure

4 1 2 Phased Approach to Closure

The 771/774 Closure Project will utilize a phased approach to the closure of the associated facilities The following is an overview of the activities that occur in each of the phases and are described below in more detail (Note This DOP covers only project Phases I-IV, a future revision will cover Phase V)

Phase I - Major Hazard Reduction

- Remove combustibles
- Disassemble and remove loose/free SNM to address criticality concerns
- Drain lines (process, steam, chemical, etc)
- Drain liquid process tanks
- Remove equipment internal to gloveboxes
- Wipe down gloveboxes
- Waste characterization and disposal
- Reduce surveillances
- Isolate and contain material within the building that may migrate
- Remove stored SNM material
- Stabilize radiological contamination and seal gloveports

- Remove radiological contamination and stabilize Rm 141

Phase II - Equipment Dismantlement

- Remove process piping
- Remove process vessels
- Remove glovebox off-gas and ventilation ducting legs
- Ambient Air Monitoring in place
- Remove Zone I HVAC system
- Remove gloveboxes
- Remove hoods
- Remove process pumps

Phase III - Building Decontamination

- Remove hazardous and radiological contamination to minimize hazardous/radioactive material dispersion during demolition and minimize waste disposal cost
- Remove non-load bearing walls to minimize waste disposal cost
- Remove remaining asbestos, lead, mercury, etc

Phase IV - Utility System Shutdown

- Isolate steam to facility
- Isolate water to facility
- Isolate sewer line
- Isolate and liquid effluent discharges
- Deactivate HVAC system
- Remove remaining HEPA filters
- Remove/reconfigure electrical switch gear
- Remove remaining operational system that supported previous phases
- Isolate fire system
- Remove accumulated waste and remaining office furniture
- Isolate pressurized air systems
- Isolate inert systems (N_2, Ar) and O_2 analyzers
- Isolate diesel generators, UPS, and grounding/lightning protection
- Deactivate criticality system
- Deactivate building chemical/gas support

Phase V - Building Demolition

- Demolish building
- Monitor for releases during building demolition
- Disposal of rubble

Phase VI - Site Remediation

- Monitor site for any environmental impacts
- Cap building slab to contain hazardous materials

Documentation - All Phases

- Documentation of End Points performance and completion

- Gathering and transfer of facility records for archive purposes

4.2 Enabling the Goals of Closure

A major piece of the overall closure strategy focuses around how equipment will be selected, prioritized and dispositioned in order to enable the goals of closure The first step taken was to select the equipment groups or geographical areas that would be defined as worksets This selection process resulted in 81 worksets being identified for the 771/774 Closure Project These worksets were then evaluated using the criteria located in Appendix 3 Weighting factors were applied to the criteria in order to provide a preliminary prioritization of the worksets This preliminary prioritization, combined with solid engineering judgment, enabled the project team to make informed decisions concerning the order in which equipment is removed from the cluster A complete list of the worksets is located in Appendix 4

It is important to understand however that this prioritization is not necessarily final, but rather will be used as a planning guide for activity order The order in which worksets are removed may be affected by several issues Activities may be either delayed or brought forward based on budget, available resources and approval status Flexibility in the actual completion of the work sets will allow a more efficient closure of the facilities In no case will a lower priority activity be performed when it is not safe or economical to do so For example, the plenum removal (priority 57) would not be performed prior to the removal of the gloveboxes as it would not be safe to do so This type of error would be prevented by the health and safety controls described in Section 5 Therefore, changing of priorities will not necessitate a resubmittal of this document

4.3 Determining Project End Points

With the worksets selected and prioritized, specific end points were developed for each set The individual sets and associated end points can be found in Appendix 9

4.4 Characterization Approach

The 771/774 Closure Project requires that the physical, chemical and radiological condition of each workset be assessed Characterization is the process of identifying what physical, chemical, biological and radiological hazards are associated with a workset and/or facility The hazard may be contained (e g , acid in a tank) or loose (e g , radioactive material on a floor) The hazard may be potential (e g pressurized steam line) or immediate (e g , a leaking pipe that contains radioactive material) Characterization is achieved through a combination of facility walkdowns (physical walkdowns), review of historical records, information from similar buildings, interviews of personnel familiar with building operations, direct measurement, non destructive assay and sample collection for laboratory analysis The characterization data will be utilized for assessing actual and potential hazards as a basis for the development of the technical approach to work activities, and to support the proper disposal of property and waste

This section discusses the types and phases of characterization that have been and will be completed for the 771/774 Closure Project A Characterization Protocol is being developed for the site, scheduled for implementation in October 1999, it will be followed for future characterization activities

Scoping Characterization

The Scoping Characterization phase is the process of gathering information about facilities' hazards from existing sources The main sources of this information are historical records, routine survey records, facility walkdowns and interviews with facility personnel and former facility personnel Note that no additional sampling or surveys are necessary in this characterization phase The compilation of this information is used as the basis for preliminary evaluations of proposed decommissioning activities The Scoping Characterization phase feeds information into the Reconnaissance Characterization phase

The 771/774 Closure Project's Scoping Characterization phase is complete The documents that were reviewed in gathering this information are identified in the project files

Reconnaissance Level Characterization

The Reconnaissance Level Characterization phase establishes a definitive baseline of information about the facility's hazards The Reconnaissance Level Characterization Report (RLCR) describes the presence of materials and isotopes that will impact the closure of the 771/774 cluster The importance of the presence of these items is based on both worker safety and waste disposal/regulatory concerns Each of the isotopes or materials have been identified through investigation of facility related documents, walkdowns of the facility, a review of historical data and process knowledge The RLCR may be used as a basis to define the required sampling needed to support facility deactivation, decontamination and structural demolition Additionally, the RLCR provides information to support ALARA (As Low As Reasonably Achievable) planning for the protection of the workers and environment This was completed on June 29, 1998

In-Process Characterization

To supplement the Reconnaissance Characterization, additional radiological, chemical samples and safety surveys will be completed as necessary, to prepare appropriate work authorization documents such as Radiation Work Permits (RWP) and a Job Hazard Analysis (JHA) If conditions have changed, reviews will be performed as appropriate to determine if other actions/controls are necessary As the work continues and hazards are removed, further characterization is completed to verify the effectiveness of the decommissioning work efforts This continued sampling and surveying is called In-Process Characterization

Final Building Survey

The Decommissioning Program Plan (DPP) requires that "at the end of the decommissioning, Site personnel will confirm that their activities have achieved the release standard for buildings destined for reuse or the completion of building disposition for buildings that are demolished such that only environmental restoration activities remain "

Accordingly, the Final Building Survey is conducted to demonstrate that the radiological and industrial contaminants within the facility have been reduced to levels that comply with the established release criteria If unable to reach free-release criteria (see para 4 7 1), the building will be disposed of as LLW A Sampling and Analysis Plan, developed in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), is intended to be utilized to execute the characterization of the

remaining slab The plan will be included with the DOP revision for building demolition (see section 2) The Final Building Survey report will be included as part of the project's administrative record and turned over to the Contractor's Environmental Remediation Department for final site remediation

Slab/Under Building Characterization

This sampling and analysis will be conducted to characterize the remaining building slab and under building contamination The results of this survey will be used to prepare for environmental monitoring and remediation

Independent Verification Survey

This survey will be conducted to verify that the facility and/or material removed meets established release criteria This survey will not be conducted for material being released as LLW The independent verification survey provides an independent review of the Final Decommissioning Survey methodology and survey data Comparisons are made between the independent verification and final surveys and anomalies are identified and addressed

Physical Characterization

Full physical walkdowns of the facility are being conducted to obtain the physical characterization of the facility This includes dimensional data as well as physical details such as the amount of lead shielding, Benelex, number of HEPA filters, etc It will also gather data concerning physical items contained within the equipment such as tools, pumps, vessels, etc

4 4.1 Radiological/SNM Characterization

4 4 1 1 Radiological Contamination/Penetrating Radiation Characterization

The radiological characterization of the facility and equipment will make use of the existing operational radiation protection survey supplemented by additional surveys to determine the presence and/or level of radiological contamination The radiological monitoring of radiation exposure levels, contamination and airborne radioactivity will comply with the requirements of 10 CFR 835, RFETS Radiological Control Manual, NUREG 5849, "Manual for Conducting Surveys in Support of License Termination, Decommissioning Characterization Protocols" and applicable site procedures The characterization surveys will be performed by trained and qualified personnel using instruments that are properly calibrated and routinely tested for operability The results of radiological surveys will typically be documented on a diagram The documentation will contain sufficient detail to permit identification of original survey and sampling locations

Using the facility operations and radiological history, sampling locations will be selected to quantify radioactivity based on suspected or known contamination at a given location Examples include horizontal surfaces such as the tops of gloveboxes and piping in overhead areas Other random locations of unaffected areas will be selected to confirm no radiological concerns exist Examples of these include office areas and areas where radioactivity is not expected

It is not intended to consider this characterization the final assessment by which worker protection and safety decisions will be made Additional characterizations will be performed as required to prepare work

authorization documents This type of characterization will typically be performed shortly before work is initiated to ensure conditions have not changed and to more accurately assess those hazards This characterization will be used to determine appropriate personal protective equipment to ensure worker health and safety

4 4 1 2 SNM Holdup

Holdup is defined as the amount of nuclear material remaining in process equipment (e g gloveboxes, ventilation ducts) and facilities after the in-process material, stored materials and product are removed Holdup has been found in Building 771 as oxides (Safeguards and Security attractiveness type C) or low grade materials (type D)

To ensure the accuracy of the measurements determining the amount of remaining holdup, all background radiation sources (e g waste drums) will be removed from the area being measured All packaged fissile material will be removed from the gloveboxes and a radiological survey conducted prior to the measurements All measurement sites must be free of external radiological contamination to insure that measurement equipment is not contaminated and remains usable Measurements are conducted in accordance with the approved site holdup measurement plan 4-81232-97-PLAN-HOLDUP-001, Revision 1 that will determine the types and quantities of isotopes present

4 4 2 Chemical Characterization

The chemical characterization of the facility will make use of existing process knowledge supplemented by sample analysis The characterization activities will

- evaluate the chemical characteristics of hazardous material contamination
- assess the environmental parameters that affect potential human exposure from existing or residual chemical contamination
- support the preparation of work plans to enhance safety of the worker
- allow for estimation and compliant management of generated wastes
- ensure worker and public safety
- ensure compliant management of chemicals

4 4 2 1 Asbestos Characterization

The objective of the asbestos material characterization is to determine the type, quantity and location of asbestos containing building material (ACM) The characterization of the building will be conducted in several phases These phases will correspond to the work areas identified by the overall building closure schedule Work areas will be characterized prior to the disruption or removal of suspect materials

Asbestos material characterization includes a review of documents detailing facility history, facility construction drawings, facility walkdowns, sample collection and analysis and evaluation and documentation of results and conclusions The asbestos characterization survey will be designed and

managed by a qualified individual per the requirements of 29 CFR 1926 1101 Samples will be collected at locations identified during the review of facility drawings and walkdowns Surveys will be performed by trained individuals following written procedures All samples will be tracked from sample collection, transport and analysis and all samples will be analyzed at a certified laboratory Data will be recorded in an orderly and verifiable manner and will be reviewed by a qualified Building Inspector for accuracy and consistency A report will be prepared summarizing laboratory results including sample location, sample description, asbestos type and percentage, non-asbestos fiber types, matrix types and sample color

4 4 2 2 Beryllium Characterization

Work areas and equipment where beryllium is known or suspected of being present will be surveyed prior to disruption or removal of such items or surfaces Beryllium smears will be collected and analyzed from various equipment and equipment surfaces within the facility Sampling plans and analysis will be conducted by trained individuals in accordance with the RFETS Beryllium Control Program

4.4.2.3 Lead Characterization

Lead shielding and lead-based paint are known to be present in the facility Accordingly all painted surfaces are presumed lead-bearing unless proven otherwise This approach will minimize characterization costs and ensure worker protection Known lead will be disposed of appropriately and suspect lead will be sampled Selected lead sampling will be conducted by collecting media samples for analysis and/or with portable lead detection equipment The sampling and analysis will be conducted by trained individuals using written procedures

4 4 2 4 Polychlorinated Biphenyls (PCBs) Characterization

Polychlorinated biphenyl, also referred to as PCB is a term given to a series of chemical compounds produced industrially by the chlorination of biphenyl with anhydrous chlorine and iron filings or ferric chloride as a catalyst PCBs have been linked to liver damage and to a lesser degree, kidney damage

Human exposure levels to PCBs are regulated by OSHA OSHA guidelines will be implemented as appropriate to minimize worker exposure to PCBs Other than the potential for PCBs in oil (contained in equipment or resulting from spills from equipment maintenance), adhesives and paints (in high temperature areas) and lighting ballasts, no additional contamination is suspected In any event, OSHA guidelines will be implemented where PCBs are identified and the appropriate personal protective equipment (PPE) will be donned by workers The 771/774 Closure Project will manage all materials <50ppm PCBs as non-Toxic Substance Control Act (TSCA) regulated

4.5 General Closure Approach

This section provides a general description of the sequential steps which will be followed to decommission rooms/areas within the 771/774 Closure Project The detailed technical approach to decommission an area/room of the Closure Project will be developed and approved in accordance with the Integrated Work Control Process (IWCP) The IWCP contains detailed instructions for performing work on-Site and

contains specific controls and requirements to ensure protection of the workers, public and environment Provided in Appendix 5 is a flow chart of this process

Following is a summary description and typical sequence of operations that will be employed during the closure of worksets within the 771/774 Closure Project These activities will be controlled and authorized and may be modified as appropriate to address a specific condition or hazard in a particular workset

- Additional radiological, chemical, industrial hygiene, environmental and safety characterization will be performed as necessary to prepare appropriate work authorization documents This characterization process will be an ongoing process throughout the closure process to ensure the work area hazards are adequately quantified and proper personnel and environmental protection is provided
- Prior to starting any activities, all involved personnel will participate in a pre-evolution briefing to discuss the proposed work and to review the applicable safety requirements
- If asbestos containing materials will be disturbed as part of the scope of activity, the area will be abated by a qualified contractor prior to start of work that could disturb the asbestos containing material The abatement activity will be carefully coordinated to minimize interference with other activities
- Equipment and horizontal surfaces within a work area/room will be vacuumed and/or wiped down Damp cloth and decontamination fluid and/or tack rags may be used This housecleaning will be performed to minimize personnel exposure to potentially contaminated dust during subsequent decommissioning activities This action would also remove any loose (asbestos, lead, beryllium) radiological contamination
- Electrical power to components/systems to be removed will be de-energized and locked out/tagged out and disconnected Electrical system conduit that cannot be de-energized or is required for continued closure activities will be clearly identified Temporary power may be utilized and will be clearly identified and controlled
- Temporary ventilation may be used as necessary
- Piping systems and equipment will be drained, isolated and locked out/tagged out prior to any work on the system/equipment All liquids collected will be appropriately sampled and managed/dispositioned in accordance with site waste management procedures
- Interconnecting system piping, conduit, bracing and supports will be removed as necessary to remove equipment and components from the room
- Equipment within the work area/room will be removed As a general rule, equipment located at floor level will be removed first to allow better access to overhead areas Equipment removal may include the disassembly and decontamination of the equipment if it is determined to be cost-effective or necessary to ensure safety The decontamination efforts may be completed in place or the equipment/glovebox may be moved to another area for decontamination and size reduction A variety of decontamination techniques may be used including a simple wipe down, use of abrasive material such as scotch brite, steel wool or sandpaper More aggressive methods discussed in the DOE

Decommissioning Handbook, (DOE/EM - 0142P) may be used if necessary All equipment and components to be free released will be surveyed in accordance with the RFETS Radiation Control Manual and associated implementing procedures prior to release

Gloveboxes, B-Boxes and Hoods will be decommissioned using the following approach

- Equipment and components will be removed from the internal portions of the contamination containment device (i e , glovebox) as needed to facilitate waste packaging
- Internal surfaces will be wiped down using tack rags, non-ionic clean solution, loose materials will be swept up as required More aggressive techniques may be used such as abrasive grit blast or other methods discussed in the DOE Decommissioning Handbook
- Based on radiological survey measurements, a strippable coating may be applied to fix surface contamination during size reduction operations When appropriate, the strippable coating may be applied and removed several times to reduce surface contamination levels
- Prior to the size reduction of a glovebox, B-Box or hood it will be enclosed in a contamination control containment Depending on the layout of the room, the size of the component to be size reduced and radiological contamination levels, a containment may be erected around the equipment in place or the equipment may be moved to a semi-permanent size reduction facility located within Building 771, but in another room/area The size reduction system is a remotely operated device such as a robotic manipulator arm which will perform the size reduction Building staff would move gloveboxes and tanks either whole or in large sections into the containment All cutting operations would then be performed remotely under programmed control or under operator control utilizing approved working procedures Cut pieces would be bagged-out of the containment for assay and final packaging In any case the contamination control containment will be equipped with High Efficiency Particulate Air (HEPA) ventilation to control the spread of contamination and minimize worker exposure during size reduction and waste packaging operations
- Workers may size reduce the component using a variety of methods including nibblers, saws and other metal cutting techniques Size reduction may be performed to minimize waste volume and allow packaging in approved containers All waste material will be characterized and packaged in accordance with site Waste Management procedures as described in Section 6 0
- After all equipment and systems have been removed from the room/area the exposed room surface will be radiologically decontaminated and abated for lead and/or PCBs in painted surfaces, as necessary The surfaces will be sampled/surveyed to determine the need for further decontamination and to verify the effectiveness of the decontamination process Room surfaces will typically be decontaminated by wipe down and/or surface scarification methods such as scabbling or other similar technique

As the equipment and systems are cleared from each section of the building workers will complete the removal of all remaining utilities to the area This will include the ventilation systems and all electrical power within the area The section will then be sealed off until demolition of the building commences

4.6 Regulatory Strategy

The 771/774 Closure Project will meet all applicable regulations and compliance agreements, including RFCA, the site RCRA permit, and the Residue Compliance Order #93-04-23-01

4 6 1 RCRA Strategy

Appendix 6 provides a listing of the CHWA/RCRA units within the Building 771/774 Closure Project Closure of permitted and interim status areas will be conducted in accordance with 6CCR1007-3, Parts 264 or 265 The operating record of each RCRA unit will be reviewed to determine the hazardous wastes and the constituents relevant for closure performance Closure Description Documents (CDD) are written to meet the requirements called out in the permit or Interim Status Unit Closure Plan, CDDs will be submitted to CDPHE in accordance with the appropriate Closure Plan or this DOP If a CDD is submitted pursuant to this DOP, then the waste associated with that closure activity is remediation waste Throughout the closure process, efforts may be made to bring each RCRA unit to a RCRA stable configuration, thus reducing inspections

4 6 2 CERCLA Strategy through RFCA Compliance

4.6.2.1 Background

RFETS has implemented the CERCLA cleanup process using the RFCA. RFCA describes the process to undertake cleanup of the site through the facility disposition process Due to the significant levels of contamination found within the 771/774 Closure Project Buildings 771/774, are considered to be Type 3 facilities

4 6 2 2 Transition to a CERCLA Regulated Facility

The 771/774 Closure Project will transition to a CERCLA facility during the closure process This transition will occur after deactivation activities are completed within each area For the purposes of RFCA, deactivation is a set of activities that occurs primarily in buildings that were used as part of the nuclear weapons production mission RFCA does not regulate deactivation activities, instead, they are regulated pursuant to the Atomic Energy Act (AEA) and other applicable requirements and overseen by the Defense Nuclear Facilities Safety Board (DNFSB) The discussion included here is for the purpose of establishing the end of AEA deactivation and the beginning of RFCA decommissioning

4 6 2 2 1 Deactivation Activities

Deactivation activities remove the cluster of facilities from operation and prepare them for turnover—possibly to another contractor—for decommissioning or conversion/release to a new use meeting applicable safeguards, hazardous category or other completion criteria Specific deactivation activities include developing work summary plans, IWCP development, removal of hazardous and non hazardous materials, holdup removal and emptying storage areas to reduce fire loading Activities may include inventory and removal of unattached hazardous materials from the facilities and immediate areas, such as regulated hazardous chemicals, beryllium and gas cylinders RCRA unit closures may be completed

(waste generated in these closures would be process waste) An economic disposition determination shall be made for unneeded property In general, minimal deactivation will be conducted in B771/774 since the intent is to decommission the facility as soon as possible

Physical Deactivation activities reduce the potential liability and risks posed by excess contaminated equipment, RCRA issues and general hazards The deactivation work included within Physical Deactivation also results in additional baseline costs reductions by eliminating or further reducing the surveillance and maintenance activities currently required Other activities include the shipping of materials and waste in order to further deactivate areas within these facilities It also may include removal of contaminated tooling that is easily removed and removal of clean equipment, tanks and gloveboxes that have never been integrated within the building systems and are free of contamination Specific activities include

Empty storage cabinets,

Reduce the fire load,

Relocate classified tooling and parts,

Prepare equipment for removal,

Remove miscellaneous and equipment deemed excess,

Remove tooling,

Remove excess chemicals,

Remove radiological check sources,

Complete housekeeping cleanup,

Release excess equipment and material to PU&D,

Properly label contaminants prior to disposal,

Remove hazardous chemicals and materials,

Complete RCRA closure of units not required for Decommissioning,

Identify and label contaminants prior t disposal,

Package and stage waste for off-site disposal, and

Deenergize and secure HVAC units not needed for decommissioning

Completion of representative activities above would be the starting point for decommissioning work regulated by this DOP Current deactivation activities include Tap & Drain and removal of liquid process piping and closure of Mixed Residue tanks Activities such as waste chemical removal, disposition of excess property, chemical hazards reduction and placement of RCRA units into RCRA stable condition or their closure may occur either during deactivation or decommissioning With the shift from deactivation to decommissioning comes a shift in LRA from the DNFSB to CDPHE

4 6.2 2 2 Decommissioning Activities

The following list of examples of decommissioning activities should help delineate that portion of the disposition continuum that is regulated as decommissioning under RFCA and is therefore covered by this DOP

- characterization of contamination
- hazards identification
- decontamination in preparation for release, reuse or dismantlement
- strip out and removal of gloveboxes, ducts and tank/process equipment
- size reduction of gloveboxes, ducts and tank/process equipment
- waste minimization activities associated with decommissioning
- dismantlement
- demolition

Before Decommissioning activities are conducted in accordance with this DOP, the DPP requires a readiness evaluation be conducted The scope of this evaluation will be determined using the site's Activity Screening Process and the Readiness Determination Manual The LRA may participate in the development and oversight of the readiness evaluation

4 6 2 2.3 Waste Management Strategy

RFCA provides that process wastes and wastes generated during deactivation are CHWA/RCRA-regulated, whereas wastes generated during decommissioning are CERCLA-regulated (RFCA ¶¶s 70-71) However, as described above, this project will be engaged simultaneously in deactivation and decommissioning At such times, it may prove safer, more cost-effective and more expeditious from an operational stance, to manage the wastes generated from both activities in the same manner For example, if site personnel engaged in deactivation and decommissioning in different rooms of the same building are generating both process and remediation mixed transuranic wastes, the project manager may choose to store all such wastes in a single area and commingle such wastes in common containers If this practice occurs, the wastes will be managed under CHWA/RCRA However, in most cases, process wastes will be managed separately from remediation wastes RCRA closures conducted under this DOP can be managed as remediation waste Section 6 contains more details

A variety of means will be employed to enable the worker to ensure compliance with the correct regulation depending on the work being performed Work authorization packages will be reviewed prior to the start of work to ensure that the waste will be properly handled, segregated and categorized as appropriate Additional methods of control may include administrative controls, such as identification of the activity and regulating agency on the work authorization package and physical controls, such as locking waste containers At all times, process wastes will be managed to the current Federal, State and Local regulations, as mandated by current site procedures Remediation wastes will be managed in accordance with Section 7, Applicable or Relevant and Appropriate Regulations (ARARs)

4 6 2 2 4 Documentation

4 6 2 2 4 1 Administrative Record File

The 771/774 Closure Project Administrative Record File (ARF) is comprised of documents that are considered to be relevant to the selection of this response action This file will be maintained as an ARF until the remedial action is approved A Site Technical Administrative Record Review meeting is held to review the file for completeness and DOE then certifies completion of the file Once the decision document is signed, the file becomes the Administrative Record for the 771/774 Closure Project

The 771/774 Closure Project ARF was created in accordance with the applicable Site and Federal requirements EPA, after consultation with CDPHE when necessary, makes the final determination of whether a document is appropriate for inclusion in an ARF EPA and CDPHE participate in compiling the ARF by submitting documents to DOE RFFO as they deem appropriate DOE RFFO forwards these documents to the RFETS ARF The 771/774 Closure Project ARF will be reviewed and approved by DOE RFFO, EPA, and CDPHE before the file is closed at the signing of this DOP

Four information repositories have been established to provide the public with access to the 771/774 Closure Project ARF A copy of the 771/774 Closure Project ARF is accessible to the public at times other than RFETS normal business hours through the Public Reading Room at Front Range Community College

Information Repositories

U.S Environmental Protection Agency
Region VIII
Superfund Records Center
999 18th Street, Suite 500
Denver, Colorado 80202-2466
(303) 293-1807

Citizens Advisory Board
9035 Wadsworth Parkway
Suite 2250
Westminster, Colorado 80021
(303) 420-7855

Colorado Department of Public Health and Environment
Information Center, Bldg A
4300 Cherry Creek Drive South
Denver, Colorado 80220-1530
(303) 692-3312

U S Department of Energy
Rocky Flats Public Reading Room
Front Range Community College Library
3 645 West 112th Avenue, Level B
Westminster, Colorado 80030
(303) 469-4435

4 6 2 2 4 2 Closeout Reports

Completion documentation will be compiled for each of the identified worksets A final Closeout Report will be prepared for the 771/774 Closure Project when work is completed and the analytical data has been received The report will consist of a brief description of the work that was completed, including any modifications or variations from the original decision document The report will also include analytical results, including the results of any confirmatory sampling taken to verify completion of the action to the specific performance standards A discussion of the quantity and characteristics of the actual wastes produced and how the wastes were stored or disposed will also be provided

The report will state that the goals and objectives of the early action were met and if not, what additional work is required The complexity of the Closeout Report and the level of detail will reflect the scope and duration of the action The expected outline for the Closeout Report is shown below (although the format may change to meet the needs of the project)

- Introduction
- Remedial action description
- Verification that remedial action goals were met
- Verification of treatment process (if applicable)
- Radiological analysis (if applicable)
- Waste stream disposition
- Site reclamation
- Deviations from the decision document
- Demarcation of wastes left in place
- Dates and durations of specific activities (approximate)
- Final disposition of wastes (actual or anticipated)
- Lessons learned

4.7 Building Cleanup Criteria

The purpose of this section is to identify the cleanup criteria (acceptable level) which will be used to release the 771/774 Cluster facilities

4 7 1 Radiological Release Criteria

The purpose of this section is to provide the radiological contamination cleanup criteria for the 771/774 Cluster Section 4 4 Facility Characterization, Appendix 9, Set Description End Points and Hazard Matrix, and the RLCR for this project, identify the contaminants which are expected to be present at the start of decommissioning. The characterization information is used to ensure that workers are protected from the hazards in the work area, contamination is contained to protect the environs and the waste generated is properly and safely handled, packaged, labeled and moved

In accordance with RFCA, the residual radiological contamination levels present on building structures, equipment and building debris remaining after decommissioning will meet the EPA's preliminary regulation (40 CFR 196) that calls for an effective dose equivalent (EDE) of 15/85 mrem from the Site in any single year above background Until this regulation is finalized, accepted industry standards for specific residual surface contamination levels which have been agreed to by the LRA will be used These accepted industry standards for the release of materials are identified in "Radiation Protection of the Public and

Environment", DOE Order 5400 5 as referenced in RFCA and *Termination of Operating Licenses for Nuclear Reactors,* NRC Regulatory Guide 1 86 *The Health and Safety Practice Transfer and Unrestricted Release of Property and Waste,* P73-HSP-1810 Appendix 1

4 7 2 Equipment Unconditional Radiological Release Criteria

The unrestricted release of equipment to be removed from the site will comply with the RFETS Radiological Control Manual, the Health and Safety Plan (1-P73-HSP-1810, Appendix 1), DOE Order 5400 5, "Radiation Protection of the Public and the Environment" (Figure IV-1) and applicable radiation protection implementing procedures If 10 CFR Part 834 is approved, all applicable practices and procedures will be reviewed and modified accordingly to ensure compliance The RFETS Radiological Control Manual currently contains the most comprehensive table and includes all of the applicable RFETS radiological limits for the release of materials and equipment

4 7 3 Beryllium Release Criteria

The beryllium release criteria and survey methods will conform with current RFETS policies and procedures Building surfaces and equipment suspected of being contaminated with beryllium will be surveyed to assess the level of contamination The surface contamination housekeeping limit for beryllium is 25 $\mu g/ft^2$ Current RFETS practice for protecting personnel from beryllium is to utilize the ALARA (As Low As Reasonably Achievable) principle This includes the use of engineering controls to minimize exposure, medical screening of personnel, and the reduction of limits and the proposed establishment of lower action levels The limit for beryllium is currently being reviewed and a lower action level is being considered The airborne limit for beryllium has been reduced from 2 $\mu g/m^2$ to 0 5 $\mu g/m^2$ All personnel are trained in beryllium awareness and all sampling for beryllium is performed by qualified personnel

4 7 4 Asbestos Containing Materials (ACM) Release Criteria

Prior to and during the course of the closure project a comprehensive assessment and abatement program will be implemented in accordance with the OSHA Standard 1926 1101, Colorado Reg 8 and the site specific Heath and Safety Practices Manual Characterization, sampling/survey and abatement will be performed by qualified personnel per the requirements of OSHA, EPA and NIOSH The clearance standard or maximum allowable asbestos level (MAAL) for areas after abatement was performed is as follows

- 0 01 fibers/cc^2 utilizing the phase contrast microscope means of analytical technique
- 70 structures/mm utilizing the transmission electron microscopy technique

4 7 5 Polychlorinated Biphenyls (PCBs) Release Criteria

The 771/774 Cluster's building surfaces will be below the release limit for PCB contamination The limit for release of PCB containing material is less than 50 parts per million (ppm)

4 8 Project Approach Summary

The 771/774 Closure Project will take a number of years to complete As the work progresses there will be cases where circumstances are not as they were predicted Therefore, rather than writing a document which will detail each step to be taken, this project has taken the approach of detailing the methodologies to be used, rather than explicit decisions In doing so, it allows more work to be done in a shorter time, as work will not be delayed until the final planning is completed for all 81 worksets Rather, as planning is completed for each workset, work will be allowed to progress in parallel with planning for future worksets This process also allows the project to easily integrate lessons learned on prior worksets into the planning for future worksets

All 81 worksets have been identified and prioritized The criteria for workset identification and priority is located in Appendix 3 By utilizing this criteria the worksets were prioritized in an order that allows both work on multiple worksets as well as planning for needed staging areas within the facility

Figure 4-2 details the overall methodology for closure Within this approach, the facility is broken down into discrete worksets These worksets, which consist of a room, a group of equipment, or a separate piece of equipment, are then given endpoints From this point on, planning is done on a workset-by-workset basis Using the endpoints, tasks are drafted for the activities to be performed These tasks are evaluated based on costs and risks, in order to finalize the planned tasks Based on the characterization needs identified in the RLCR, additional characterization is performed on the workset Lessons learned from other worksets are evaluated to determine if the draft tasks need revision A JHA is performed on the tasks to determine the appropriate controls to mitigate or eliminate risks With this information a final approach for the workset will be determined (the flowsheet from a generic workset is provided in Appendix 5 for information) The activity will be evaluated using the site's Activity Screening Process and the Readiness Determination Manual and a determination of readiness will be conducted if necessary Only after the completion of these preparatory actions will the tasks then be implemented N the event that an unexpected situation is uncovered, RFET's procedure at that point is to stop the evolution, evaluate the hazard, determine appropriate protective measures and other actions necessary to proceed safely and in compliance with all rules and regulations and with these measures approved and in place, proceed with the activity

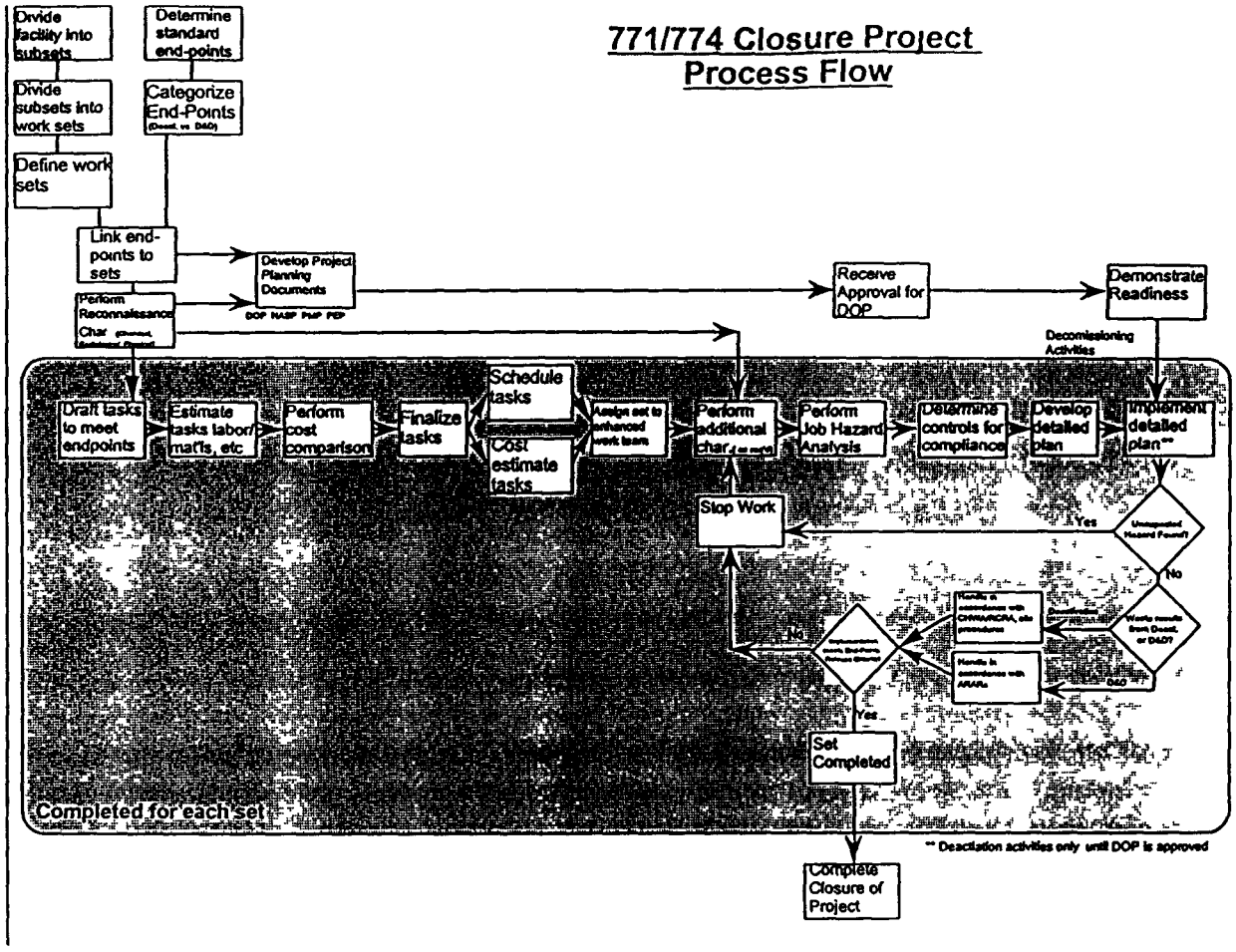


Figure 4-2 Project Approach Flowchart

All of the above work is governed by strategies that encompass the entire project Details on these strategies are found in the sections listed below

- Health & Safety (Section 5)
- Waste Management (Section 6)
- Compliance with ARARs (Section 7)
- Environmental Consequences of the Action (Section 8)
- Quality Assurance (Section 9)

5. Health & Safety

In preparation for the decommissioning of the 771/774 Cluster, key elements of the Health and Safety Program will be in place prior to starting the decommissioning efforts Some of the key elements of this program are

- General safety training for all workers involved in physical decommissioning work activities
- Specific safety training for workers and supervisors depending on the job task and hazards involved
- Supervisory safety task assignments criteria
- The development of safety communication vehicles (i e , safety toolbox meetings, bulletin board information, safety newsletters), etc
- Designations of competent persons
- Establish employee stop work authority process
- Establish process for all employees to correct safety and health hazards

In addition to the safety items outlined above, the facility will operated under an Authorization Basis (AB) document An AB is the document or collection of documents recognized by the DOE as the contractual vehicle used to manage the risk associated with operating a nuclear facility and its associated support facilities

5.1 Authorization Basis Strategy

Building 771 is currently operating under the 771 Basis For Operation (BFO) This BFO is being revised to include Building 774 and most closure activities In this revision, the authorization basis is being modified to address the defined scope of closure work qualitatively judged to pose the bounding hazards associated with closure This will establish a safety envelope with a suite of controls adequate to address known hazards of anticipated closure activities The BFO is updated on an annual basis

5 1 1 Reduction of Controls

The authorization basis controls will contain the tailored set of safety management system elements necessary to protect personnel and the environment Each major infrastructure program (configuration control, quality assurance, conduct of operations, radiological control, etc) will be addressed An authorization agreement will define the set of applicable orders and requirements using a graded approach

The authorization bases will enable this graded approach through three methods

- A portion of the Limiting Conditions of Operations (LCOs)/Technical Safety Requirements (TSRs) is already written with applicability statements and as the hazard is eliminated the requirement to

perform the control will be eliminated For example, when Benelex is removed from the facility, the controls needed in the safety basis will no longer be required

- In many cases the safety bases will point to programs on site which utilize a graded approach much like the LCOs, where when the hazard is eliminated, the control is eliminated For example, as radiological contamination areas are decontaminated the surveys and controls required by the Radiation Control Program will be eliminated as well
- Finally, in some cases as a hazard is eliminated, a written justification will be necessary to document why controls are no longer appropriate and with DOE approval, the controls will be eliminated

At some point in the facility closure, it is expected that the BFO will contain only the program controls necessary to protect the worker against normal industrial hazards in a radiological facility Because of the low amounts of plutonium necessary to recategorize Category 2 nuclear facilities as Category 3 nuclear facility status and recategorize Category 3 nuclear facilities as radiological facility status, it would be extremely difficult to change status until late in the closure process However with few or no nuclear facility controls (e g , LCOs/TSRs), there would be little efficiency gained through category changes, since the controls would have already been eliminated and cost savings are minimal

5 1.2 Evaluation of new activities/hazards

Closure activities not specifically addressed by the AB will be evaluated against that envelope using the Unreviewed Safety Question (USQ) process The AB controls suite will be adjusted as respective hazards are reduced or new ones introduced The authorization basis safety envelope may require adjustment (via the USQ or the annual AB update process with RFFO concurrence) as configuration of the facility is changed, new activities are planned, or new hazards are identified The work will be performed under the defined safety controls and programs by trained workers Reviews and authorization to proceed with activities will ensure recognition of the AB safety envelope

The nature of closure activities requires continuous reviews and feedback to verify proper hazard identification and operational controls Through these reviews process improvements are expected The current approved safety bases for Building 771 is maintained by the facility

5.2 Assessment of Hazards

5 2 1 Known Hazards

The predominant hazard is radiological contamination Buildings771 and 774 were used for the recovery of plutonium between 1953 and 1989 During that period a number of leaks, spills and a fire in 1957 have contaminated virtually the entire facility at one time or another It has always been standard operating practice to decontaminate an area after spills, leaks or fire, although the level of decontamination is often not known Measuring these levels today after layers of paint and in the presence of elevated background radiation levels, would reveal only the hot spots It will therefore be assumed that an area is contaminated unless otherwise known and verified

Two areas in Building 771 are of special concern Room 141, a pump room, experienced repeated leaks of nitric acid contaminated with plutonium The room became so contaminated that about 20 years ago the door to the room was welded shut and all piping in or out of the room was sealed No one has entered the room since that time Another area of concern is the Line 7A fluorinator which has historically been a high radiation area

A number of chemicals have been used in Building 771 both for processing and in the analytical labs Most of these chemicals are well documented and are in relatively small quantities One notable exception is hydrofluoric acid (HF) The system that used HF is operationally empty but has not been flushed

Beryllium is known to exist in a limited number of gloveboxes Machine, hydraulic and lubricating oil and greases exist in various machines, gearboxes and equipment PCBs are also likely to be encountered in transformers and electrical components, paint, roofing materials and adhesives Due to the age of the facilities, the building is assume to have ACMs (both radioactively contaminated and non-contaminated) Lead is also present in the glovebox shielding and some of the building materials (i e paint)

Aside from the radiological and chemical hazards, Building 771 has industrial hazards expected of any former chemical processing/lab area

Building 774 has much the same operational history as Building 771 Radiological hazards will predominate followed closely by the chemical hazards Although radiological contamination is present in the processing sections of Building 774 the levels are lower than those experienced in Building 771

Building 774 used chemicals strictly for waste processing These chemicals are well defined from procedures and process knowledge

The remainder of the facilities in the Building 771 facility can, with three exceptions, be considered as having the normal industrial hazards The first exception are those buildings that were used for the storage of HF As noted before, this system is operationally empty, but has not been flushed The second exception is the acid storage facility After the acids are removed, this facility will present no special hazard The third hazardous facility is the Building 728 process pit The pit may have been used as a process waste storage pit, with the attendant chemical and radiological hazards The known hazards are detailed in the RCLR and highlighted in Appendix 9

5 2 2 Potential Hazards

In addition to the known hazards in each area there are also potential hazards These hazards, suspected due to process knowledge, lessons learned, or past practices, must also be dealt with in a safe, controlled manner Through the RCLR and the Hazards and Safety Procedures (HASP), potential hazards have been identified In planning each activity, additional characterization is performed, precautions against both known and potential hazards are determined and implemented during the execution of that activity

In the process of cleaning up and closing down a facility, there is a potential that there will be occasions where an unexpected situation is encountered RFETS' procedure at that point is to stop the evolution, evaluate the hazard, determine appropriate protective measures and other actions necessary to proceed

safely and in compliance with all rules and regulations and with these measures approved and in place, proceed with the activity

5 3 Worker Safety

Worker involvement is a key consideration and a significant Lessons Learned from PUREX "Worker involvement and a graded approach to the levels of safety analysis required for various deactivation tasks are keys to making the safety analysis process useful, efficient, and satisfactory to all concerned The graded approach is cost-effective in that it does not demand a high level of analysis for simple jobs already covered in established procedures Worker involvement is also cost-effective in that it provides a higher level of assurance that workers are participating willingly and without hesitation in the jobs that are required for facility deactivation "

5 4 Integrated Safety Management (ISM)

Each of the above subsections combines and works together to form the Integrated Safety Management process that is essential for safe operations at RFETS The IMC and its subcontractors are committed to using a single integrated system to perform all work safely at the site This integrated system combines a diverse group of people and risk graded infrastructure programs to satisfy the multiple safety environmental and health needs uniformly In addition, the use of Enhance Work Planning (EWP is the natural implementation vehicle to involve workers) By incorporating the five key elements of the DNFSB Recommendation 95-2, --work scope reviewed and prioritized, work scope analyzed for hazards and categorized bases on risk, controls established based on hazards, risk and experience of workers, work performed safely, efficiently, with appropriate degree of supervision, and continuous improvement and lessons learned—encompass the essence of an effective, efficient and safety conscience work process

safely and in compliance with all rules and regulations and with these measures approved and in place, proceed with the activity

5.3 Worker Safety

Worker involvement is a key consideration and a significant Lessons Learned from PUREX "Worker involvement and a graded approach to the levels of safety analysis required for various deactivation tasks are keys to making the safety analysis process useful, efficient, and satisfactory to all concerned The graded approach is cost-effective in that it does not demand a high level of analysis for simple jobs already covered in established procedures Worker involvement is also cost-effective in that it provides a higher level of assurance that workers are participating willingly and without hesitation in the jobs that are required for facility deactivation "

5 4 Integrated Safety Management (ISM)

Each of the above subsections combines and works together to form the Integrated Safety Management process that is essential for safe operations at RFETS The IMC and its subcontractors are committed to using a single integrated system to perform all work safely at the site This integrated system combines a diverse group of people and risk graded infrastructure programs to satisfy the multiple safety environmental and health needs uniformly In addition, the use of Enhance Work Planning (EWP is the natural implementation vehicle to involve workers) By incorporating the five key elements of the DNFSB Recommendation 95-2, --work scope reviewed and prioritized, work scope analyzed for hazards and categorized bases on risk, controls established based on hazards, risk and experience of workers, work performed safely, efficiently, with appropriate degree of supervision, and continuous improvement and lessons learned—encompass the essence of an effective, efficient and safety conscience work process

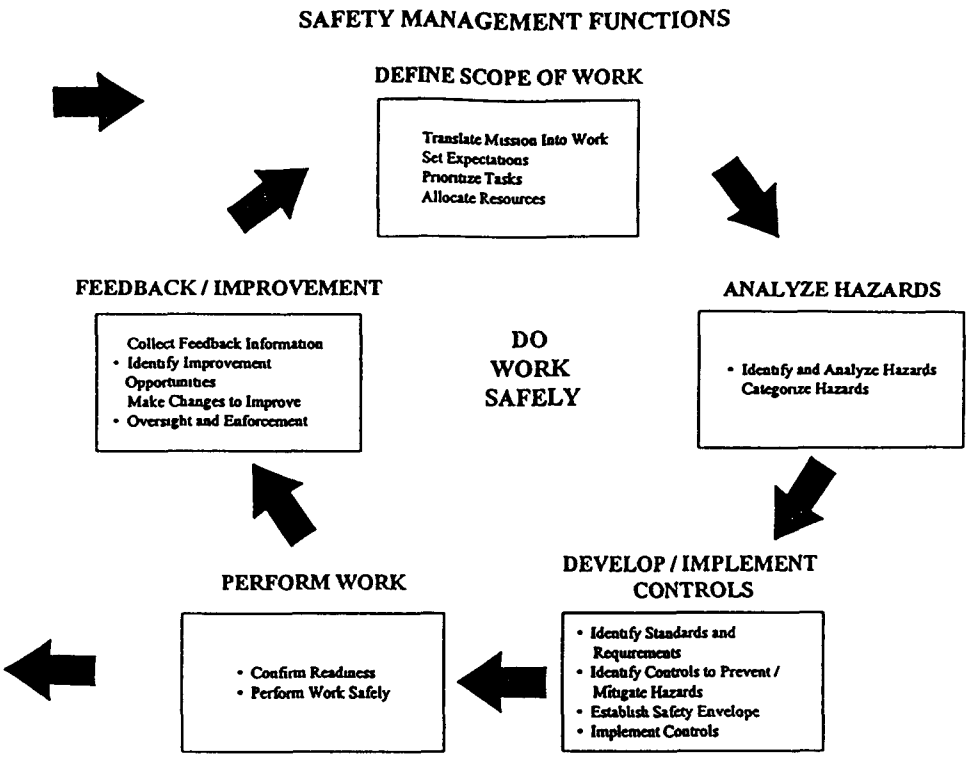


Figure 5-1 Integrated Safety Management Process

6. Waste Management

Waste types which will result from the decommissioning of the 771/774 Closure Project are radioactive, mixed, hazardous, toxic and solid waste Waste generated as a result of decommissioning activities will be managed in accordance with relevant RFETS waste operations procedures State and Federal regulations and DOE Orders have been incorporated into the RFETS waste operations procedures Table 6 1, Summary of Waste Management for the 771/774 Closure Project, identifies the estimated volumes, types of waste anticipated, and the final dispositioning for the waste form

6.1 Transuranic Waste

Transuranic waste (TRU) is defined as waste that is contaminated with alpha-emitting transuranic radionuclides having half-lives greater that 20 years and concentrations greater than or equal to 100 nCi/gram at the time of assay Transuranic waste as defined will result from the decommissioning of Building 771/774 Duct and glovebox work activities will result in the production of TRU waste TRU and TRU Mixed Waste will be generated, characterized and packaged in accordance with the RFETS TRU Waste Management Plan (WMP) and the RFETS WIPP Waste Characterization Quality Assurance (QA) Project Plan

6.2 Low Level Waste

Low level waste (LL) is defined as radioactive waste that is not classified as TRU waste, spent nuclear fuel, or by-product material as identified in DOE Order 5820 2A, Radioactive Waste Management Low level waste contains less than 100 nCi/gram TRU radioactivity Based on economical and technical constraints items will be decontaminated to free release conditions Items that have been decontaminated to a free release condition (Reference Radioactive Material Transfer and Unrestricted Release of Property and Waste, 1-P73-HSP-1810) will be transferred for use at a different location within RFETS, for use at a different DOE facility or sent to the Property Utilization and Disposal (PU&D) organization for appropriate handling Only materials that meet recycle/reuse criteria identified in the Property Management Manual will be sent to PU&D As appropriate, low level and low level mixed waste will be generated, characterized, and packaged in accordance with the RFETS Low Level WMP

6.3 Mixed Waste

At RFETS, mixed waste is defined as RCRA hazardous waste containing measurable amounts of radioactive isotopes Mixed waste is characterized as either low level or TRU based upon the amount of radioactivity at the time of assay The type of mixed waste that may be generated includes, but is not limited to, radioactively contaminated lead, glovebox gloves, used pump oil and leaded glovebox windows Mixed waste generated from decommissioning activities will be stored in temporary units prior to shipment to an approved off-Site disposal site Treatment of mixed waste will be performed in accordance with the RCRA permit

6 4 Hazardous Waste

Hazardous waste is defined as waste that is listed or exhibits the characteristics of corrosivity, ignitability, reactivity, toxicity or that is listed in 6 CCR 1007-3, Section 261, or 40 CFR 261, Subpart D The 771/774 Closure Project anticipates some amount of hazardous waste in addition to the mixed waste mentioned in Section 6 3

6.5 Industrial Waste

Industrial waste is characterized as that waste which meets RCRA Subtitle D requirements Industrial waste will be generated as a result of the 771/774 Closure Project This waste will be managed in accordance with applicable rules and regulations

6.6 Toxic Substances Control Act Waste and Mixed Waste

The Toxic Substances Control Act (TSCA) addresses all chemical substances manufactured or processed in or for the United States A chemical substance is defined in broad terms as any organic or inorganic substance of a particular identity including those substances identified in 15 CFR, Paragraph 2602(2)(A)(I-VI) and which may present unreasonable risk of injury to health and the environment Of particular significance to the 771/774 Closure Project are PCBs as regulated under 40 CFR Part 761 Further segregation may occur as in-process characterization is performed in support of the waste determination

In addition, other suspect PCB containing materials include oils, paints, adhesives and roofing tars Characterization of suspect materials will be performed in suspect areas prior to decommissioning of that area Materials characterized as TSCA regulated will be managed in accordance with 40 CFR Part 761 if determined to contain $\geq$ 50 ppm PCBs

6.7 Waste Minimization

Waste minimization, as committed to in the FY97 Waste Minimization Program Plan, will be integrated into the planning and management of the 771/774 Closure Project decommissioning wastes Project Management and Decommissioning workers will incorporate waste minimization practices into work procedures Unnecessary generation of radioactive and mixed waste will be controlled by utilizing work techniques that prevent the unnecessary contamination of areas and equipment, preventing unnecessary packaging, tools and equipment from entering radiologically contaminated areas and reusing contaminated tools and equipment when practical Waste minimization will be accomplished using a waste life cycle cost approach and an economic disposition plan has been developed to use as guidance If the cost to demonstrate that the item is not contaminated exceeds the cost for waste disposal, the item will be disposed of as waste in accordance with the Property Management Manual, 1-MAN-009-PMM The evaluation may include disassembly, decontamination and survey costs Elimination and reduction of waste generated as a result of decommissioning is a high priority Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented Most of the bulk building structural material is expected to be free released and will be

removed from the Site for recycle or disposal as appropriate Table 6-1 identifies the amount and types of waste which are expected to be generated

6.8 Waste Management Strategy

The overall strategy for managing waste resulting from the decommissioning of the 771/774 Closure Project is to evaluate the generation and waste management on a workset-by-workset basis In general waste materials will be sorted at the time of removal and prepared for further decontamination, survey, recycle, processing and packaging in another area of the771/774 Closure Project, away from the point of generation The existing RFETS Waste Management Program and procedures will be used to ensure the waste has been generated, packaged and surveyed to meet the final disposal Waste Acceptance Criteria (WAC) Materials identified for transfer to PU&D include, but are not limited to, office equipment such as desks, chairs, tables, carts, bookshelves, equipment and instruments which are located in non-contaminated areas or have been located in contaminated areas but confirmed as non-contaminated through radiological survey Utilizing waste minimization, (Section 6 6), the maximum amount of materials (economically feasible) will be released and sent to PU&D for disposition The waste generation estimates anticipated as a result of the 771/774 Closure Project are summarized in Table 6-1 The types and volumes of waste have been estimated based on the following assumptions

- WIPP facility will be on-line and approved to accept TRU/TRU-Mixed waste in June 1998,
- The RFETS on-site Waste Operations facility will accept and assay all waste prior to shipment to off-site waste disposal facilities,
- Contents of the 771 office area, 771 trailer complex, 129 maintenance shop, Building 770 and the carpenter shop are non-contaminated The contents will be free-released to PU&D,
- Non contaminated rubble and debris will be disposed of at an approved off-site landfill, in accordance with solid waste regulations,
- One hundred percent of the Building 771 and 774 internal structures (floors, walls, ceilings) are contaminated,
- No attempt will be made to decontaminate the Building 771 and 774 internal structures or contents to a free-release category,
- Decontamination methods will be utilized as necessary to reduce the Building 771 and 774 structures to a low level waste category,
- Building 771 and 774 structures will be disposed of as low level waste, and
- All non-contaminated lead will be shipped to PU&D for recycling

The quantity of crates and drums were estimated using the following information On average, 7 8 cubic feet of material can be contained in a 55 gallon drum while 112 cubic feet can be contained in a standard waste crate Lead and waste resulting from decontamination (such as dry combustibles) will be placed into 55 gallon drums All other materials will be placed into standard waste containers except those materials designated for PU&D which will be shipped directly to PU&D The number of standard waste containers (crates) was calculated by dividing the volume by 112 cubic feet and rounding up to the nearest whole number The number of 55 gallon drums was calculated by dividing the volume of waste designated for containment in drums by 7 8 cubic feet then rounding up to the nearest whole number

6.9 Waste Characterization

The characterization process discussed in Section 4 0 was used to estimate the type and volume of waste to be generated by the project The Building 771 WSRIC book is used to describe each of the processes which are performed in Building 771 The process descriptions identify the different types of chemicals used and wastes which are generated in completing the various processes The WSRIC is being used to assist in characterization of the residual materials left in Building 771 (Reference Section 4 0)

In general, waste generated from decommissioning includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes and facility structural materials Decontamination will be performed to remove radiological contamination and hazardous constituents as appropriate Newly discovered containerized hazardous materials and excess chemicals will be managed as process waste in accordance with the ARARS identified in this DOP Containerized or packaged mixed waste will be stored on-Site, in accordance with the Hazardous Waste Requirements Manual until the material can be shipped for final disposal Initial Waste Volume Estimates are identified in Table 6-1

The 771/774 Closure Project contains many pieces of equipment which will be released to PU&D for redistribution, disbursement or recycle as scrap material

6.10 RCRA Units

A complete listing of RCRA units located in Buildings 771/774 is located in Appendix 6 of this DOP

6.11 Idle Equipment

Presently, hazardous materials contained in idle equipment are processed by building operations personnel in compliance with the Management Plan for Material Contained In Idle Equipment, 94-MP/IE-0017 Hazardous materials contained in idle equipment in the 771/774 Closure Project have been identified for dispositioning during deactivation Remaining idle equipment will be managed in accordance with the Idle Equipment Consent Order (97-08-21-01 "Compliance Plan for Management of Material Contained in Idle Equipment") During decommissioning and residual wastes will be considered remediation wastes

6 12 Off-Site Release of Wastes and Applicability

CERCLA wastes that are managed on-site must comply with the substantive requirements of the proposed ARARs for the project RCRA is an ARAR for the Building 771 decommissioning project and making an LDR determination is a substantive requirement Currently, there are no plans to dispose of the RCRA hazardous remediation wastes on-site Therefore, in accordance with the requirements in 6 CCR 1007-3 Section 261 3, the LDR determination applies to the waste at the point of generation For wastes that will be managed or disposed of off-site, it is the subsequent administrative requirements under Part 268 (e g , storage prohibition) that do not apply on-site until the waste is shipped off-site for management and disposal

In addition, the facility accepting CERCLA wastes must meet the requirements of the final Off-Site Rule (58 CFR 49200) The primary purpose of the Off-Site Rule is to clarify and codify CERCLA's requirement to prevent wastes generated from remediation activities conducted under CERCLA from contributing to present or future environmental problems at off-site waste management facilities Only facilities that meet EPA's acceptability criteria can be used for off-site management of CERCLA waste The Off-Site Rule applies to both hazardous and non-hazardous wastes generated from remedial and removal actions funded or authorized, at least in part, by CERCLA

Release of non-contaminated material, debris and equipment from a site contaminated with hazardous materials is accomplished by

- demonstrating the materials or wastes do not exhibit any of the characteristics of hazardous waste and are not listed hazardous waste, as identified in Subpart C of 6 CCR 1007-3 SS261,
- or are excluded under the provision in 40 CFR 268,Subpart D, and
- the off-site waste management facility meets requirements of the CERCLA Off-Site Rule

Process knowledge and operating history related to the facilities can also be used to segregate hazardous contaminant areas from unaffected areas Further sampling and analysis of wastes may be required during the project to determine if the wastes are regulated as LDR, or if the wastes can be exempted under the "hazardous debris rule " LDR requirements are integrated into RFETS waste and characterization procedures to ensure compliance with designated TSD facilities and on-Site WAC

The release of hazardous and/or mixed hazardous waste from the Site to an off-site waste management facility is accomplished by

- all applicable LDR standards are met,
- meeting all DOT requirements,

- ensuring that the off-site waste management facility meets the requirements of the CERCLA Off-Site Rule,
- using approved waste management vendors, and
- meeting the receiving facility's waste acceptance criteria

Under the "hazardous debris rule" provision, and in accordance with the debris treatment standards defined in 6 CCR 1007-3 §268 45, treated hazardous debris is exempted from the definition of hazardous waste, provided that the debris is treated to the performance or design and operation standards by an extraction or destruction technology and the treated debris does not exhibit the characteristic of a hazardous waste The exempted debris can be disposed in an industrial landfill (6 CCR 1007-3, Section 268, Subpart D) rather than a RCRA permitted landfill (6 CCR 1007-3, Section 268, Subtitle C) Note that these exemptions apply to disposal of certain LL radioactive mixed wastes if they meet the receiving Sites WAC for hazardous debris

TRU and TRU Mixed Waste destined for disposal at WIPP are not subject to the LDR standards since the facility received approval of its No Migration Petition These wastes must meet the following standards prior to shipment to WIPP

- all applicable DOT requirements,
- WIPP's WAC, and
- that off-site waste management facility meets requirements of the CERCLA Off-Site Rule

6 13 Chemical Compliance Order On Consent

The Compliance Order on Consent for Waste Chemicals, 97-8-21-02, was issued to DOE on August 21, 1997 by CDPHE to establish compliance objectives and resolve RCRA violations concerning management of waste chemicals. The "Order on Consent" requires DOE and K-H to manage waste chemicals, unless excluded, in accordance with the Waste Chemical Plan, hereafter call the Plan The Plan provides for the management, storage and disposal of waste chemicals located at RFETS Activities associated with the Waste Chemical Management Plan require completion by December 31, 1999

Waste chemicals located within the 771/774 Closure Project will be managed in accordance with the "Order on Consent " As each facility comes into compliance in accordance with the "Order on Consent," waste chemicals will be managed in regulatory compliance with RCRA

6 14 Individual Hazardous Substance Sites (IHSS)

The Building 771/774 Closure Project has numerous IHSS's located adjacent to it The IHSS's are part of Operable Units 8 and 9 The designation of these IHSS's is based mostly on documented leaks in process tanks and piping associated with the liquid waste processing operations in Buildings 771 and 774 There are isolated incidents, with the exception of the IHSS 150 1 This IHSS designates the paved area along the north side of the building due to multiple historic spill events This area is the most widely used access for the building, hence the numerous spill/leak events

Table 6-1 Waste Quantities

	Bldg 771	Bldg 774 and B O C	Decontamination	Demolition	Totals
LL					
Boxes	1,381	177	0	8,520	10,078
Drums			2,816		2,816
Cubic Feet	116,004	14,868	20,698	715,680	867,250
LLMW					
Drums	287				287
Cubic Feet	2,109				2,109
Pounds	251,125				251,125
TRU/TRM					
TRUPACT-II SWB	891				891
Cubic Feet	60,321				60,321

B O C Balance of Cluster

6.15 Completion Report

Upon completion of the Project a completion report will be prepared This report will include a listing of the wastes removed from the building, characterization data and waste dispositioning information (e g , size reduction, decontamination, or treatment) which contributed to the final forms and volumes of the wastes resulting from this Project

7. Applicable or Relevant and Appropriate Requirements

Pursuant to RFCA ¶16a, the procedural requirements to obtain Federal, State, or local permits are waived as long as the substantive requirements that would have been imposed in the permit process are identified (RFCA ¶17) Furthermore, the method used to attain the substantive permit requirements must be explained (RFCA ¶17c) The following discussion is intended to complement other descriptions provided in this DOP in a manner that satisfies the RFCA permit waiver requirements

7.1 Air

Closure activities have the potential to generate particulate, radionuclide, fugitive dust and Hazardous Air Pollutant (HAP) emissions 5 CCR 1001-3, Regulation No 1, governs opacity and particulate emissions Regulation No 1, Section II addresses opacity and requires that stack emissions from fuel-fired equipment must not exceed 20% opacity Regulation No 1, Section III addresses the control of particulate emissions Fugitive particulate emissions will be generated from demolition and transport activities Control methods for fugitive particulate emission should be practical, economically reasonable and technologically feasible During demolition activities, dust minimization techniques such as water sprays may be used to minimize suspension of particulates In addition, demolition operations will not be conducted during periods of high wind The substantive requirements will be incorporated into a control plan that defines the level of air monitoring and particulate control for the project

CR 1001-3, Regulation No 3, provides authority to CDPHE to inventory emissions Regulation No 3, Part A, Section describes Air Pollutant Notice (APEN) requirements If applicable, RFETS will prepare an APEN to facilitate the CDPHE inventory process

The Kaiser-Hill Air Quality Management organization provides monitoring support for RFETS specifically directed toward compliance with all State and Federal environmental laws originating from the Clean Air Act and its amendments The existing Radioactive Ambient Air Monitoring Program (RAAMP) continuously monitors for potential airborne dispersion of radioactive materials from the site into the surrounding environment Thirty-one samplers compose the RAAMP network Twelve of these samplers are deployed at the site perimeter and are used for confirmatory measurements of off-site impacts The others are used for backup should there be a need for determining local impacts from closure projects During the demolition of the 771/774 Closure Project, additional monitors within the existing ambient network located in the immediate area of Building 771/774 will be identified The frequency of filter collection and filter analysis at those locations will be adjusted as necessary to provide timely information of potential project emissions Air emissions from strip-out activities will be monitored by the existing effluent air monitoring system currently in place in the facilities' plenums, or other appropriate air monitors

Additionally, the National Emission Standards For Hazardous Air Pollutants (NESHAP) (5 CCR 1001-10, 40 CFR 61 Subpart H) have been identified as a chemical-specific (for radionuclides) ARAR to evaluate potential radionuclide emissions The EDE will be calculated for all radionuclide emissions anticipated from the operations associated with facility closure Estimated controlled radionuclide emissions are not expected to exceed the EPA notification and approval threshold of 0 1 mrem per year EDE (40 CFR 61, Subpart H) Radionuclide emission from the project will be included in the site radionuclide annual report

7.2 Waste Storage

The wastes generated during the closure activities governed by this DOP are remediation wastes (See RFCA ¶25bf and RFCA Appendix 3, the Implementation Guidance Document, section 3 1 10) Remediation waste generated during this removal action will be evaluated consistent with the requirements of RCRA Part 261 Identification and Listing of Hazardous Waste, specifically Subparts A through C Solid remediation waste will be generated and managed in accordance with the Colorado Solid Waste Disposal requirements 6 CCR 1007-2 In addition, sections of Part 268, Land Disposal Restrictions, applicable to off-site shipment and disposal of hazardous waste are ARAR

If necessary, remediation waste will be managed in a temporary unit (TU) established pursuant to §264 553 The requirements governing TUs are applicable to tanks and containers used for storage and treatment of hazardous remediation wastes generated in conjunction with the decommissioning Incompatible wastes, if encountered, will be segregated within the units An assessment will be performed to determine the need for secondary containment Secondary containment will be provided, as appropriate, when liquid wastes are stored or treated in tanks or containers Waste characterization will be provided, as appropriate, in accordance with the RLCR Inspection frequency and approval for the use of temporary units will be negotiated with the LRA. Training for individuals generating and handling waste will be implemented using the framework identified in the RFETS Part B permit To close a TU, wastes will be removed, as appropriate When tanks are physically empty, berms providing secondary containment will be removed to facilitate equipment removal The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

7.3 Waste Treatment

Any waste, soil/waste mixture, debris, liquid or remediation wastes that is identified as a hazardous waste requires treatment to the LDR standards for wastewater or non-wastewaters, as appropriate (See 40 CFR §268 40, Treatment Standards for Hazardous Wastes)

Solidification of characteristic hazardous remediation wastes may be conducted within a temporary unit For example, scabbling of low level, RCRA characteristic lead-based paint may result in a remediation waste form amenable to solidification The solidification would be conducted within competent tanks or containers and subject to waste analysis conditions imposed in the WMP There would be no treatment for wastes that the site would put in a CAMU, if a CAMU is approved The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

7.4 Debris Treatment

Where appropriate, the project decontamination pad (located in the in Building 771) or one of the site-wide Decontamination Facilities (Pad D903 located in the contractors yard) may be configured to perform low level, hazardous or mixed waste debris treatment in accordance with 40 CFR §262 34, §268 7(a)(4) and §268 45 The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

Solid residues from the treatment of debris containing listed hazardous wastes will be collected and managed in accordance with RCRA hazardous waste management ARARs Any solid residues from

debris treatment that exhibit a hazardous waste characteristic will also be managed in accordance with RCRA hazardous waste management requirements

Liquid residues from the treatment of debris containing listed hazardous wastes are subject to RCRA hazardous waste management ARARs until they are placed into the Building 891 Wastewater Treatment Unit Headworks Any Building residues that result from the treatment of listed debris will carry the same listing as the listed debris from which it originated Alternatively, liquid residues that meet acceptance criteria may also be treated in Building 374 or the sewage treatment plant in compliance with the RCRA and National Pollutant Discharge Elimination System (NPDES) permits

7.5 Wastewater Treatment

Remediation wastewaters generated during decommissioning may be transferred to the Consolidated Water Treatment Facility (CWTF/ Building 891) for treatment when this facility is completed Until that time one of the other alternatives will be utilized Remediation wastewaters that contain listed RCRA hazardous wastes or exhibit a RCRA characteristic are not subject to compliance with RCRA hazardous waste requirements because the wastewaters are CERCLA remediation wastes being treated in a CERCLA treatment unit The CWTF will treat the remediation wastewater to meet applicable surface water quality standards under a NPDES ARARs framework Waste generated at Building 891 as a result of treatment of a listed remediation wastewater will be assigned the corresponding listed waste code All wastes generated at Building 891 will also be evaluated for hazardous characteristics The information in this paragraph is being provided to satisfy the permit waiver conditions in RFCA ¶17

Alternatively, remediation wastewater may be transferred to Building 374, to the sewage treatment plan (Building 995) or directly discharged in compliance with the administrative and substantive terms of the RFETS NPDES Permit Because these wastewater management alternatives are authorized in the NPDES Permit, no permit waiver is required

7.6 Asbestos

Compliance with asbestos requirements is an applicable ARAR and will be achieved in accordance with 5 CCR 1001-10 Regulation 8 Specifically, Section III, C 7 6, provides maximum allowable asbestos levels and section C 8 2(b), (d) and (f) provides requirements for handling asbestos waste materials In addition, the project will adhere to regulatory notification requirements for asbestos abatement mandated in Regulation 8, Part B, Section III B

Regulation 8 also governs work practices aimed at the protection of the worker/public and is virtually identical to the OSHA requirements in 29 CFR 1926 1101 At RFETS this is controlled through the Industrial Hygiene and Safety group in accordance with HSP 1-62200 HSP-9 09 NESHAP standards for asbestos will be implemented through specific operational directions in IWCPs in accordance with Regulation 8, Part B

7.7 Polychlorinated Biphenyls

Screening for PCBs will be performed on suspect materials prior to demolition The RLCR details the current areas suspected of PCB contamination (transformers and electrical components, paint, roofing materials and adhesives) For example, fluorescent light ballasts are a potential source of PCBs in the 771/774 closure project Light ballasts marked "No PCBs" or "PCB Free" will be managed as solid waste and disposed at a sanitary landfill Ballasts marked "PCBs" or not marked and not leaking will be packaged for disposal at an TSCA-permitted facility Leaking PCB light ballasts and unmarked light ballasts will be managed as fully regulated PCB articles

Any other materials identified through In-Process Characterization as suspect of containing $\geq$50 ppm PCBs, will be managed in accordance with 40 CFR Part 761, Disposal Of Polychlorinated Biphenyls Radiologically contaminated PCBs will be managed in accordance with the applicable Federal Facilities Compliance Agreement (FFCA) until a final storage facility is approved A site procedure for PCB management is currently under development, once approved and issued for use, that procedure will be followed

7.8 Radiological Contamination

In the event that radiological contamination is identified, 10 CFR 835will be followed to ensure protection of the workers, the public, and environment In addition, DOE Order 5420 2A, "Radioactive Waste Management" has been identified as TBC and contains the requirements for the management and packaging of LLW waste

Table 7-1 Federal And State ARARs for the 771/774 Closure Project

Action	Requirement	Prerequisite	Citation	ARAR
Air Quality	Compliance with air emissions	Control of emissions for smoke, particulate, and volatiles of concern Implemented for construction activities, haul roads, haul trucks, demolition activities	5CCR 1001-3 Reg 1 5CCR 1001-9 Reg 7	Applicable
Air Quality	Compliance with NESHAP	Regulated radionuclide emissions from DOE facilities with a limit of ten mrem/yr site standard	5CCR 1001-10, Reg 8 40 CFR 61 Subpart H	Applicable
Air Quality	Compliance with NAAQS	Maintain quality of ambient air for criteria pollutants	5 CCR 1001-14	Applicable
Air Quality	Emission standards and compliance with asbestos work practice requirements	Standards for demolition, storage, and handling of waste Implemented through specific operational directions in IWCPs	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with Hazardous Air Pollutant Requirements	Implemented if the remedial action involves a specific regulated pollutant, e g , lead	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with ozone depleting compound requirements	Ensure refrigerants are disposed of properly Approved vessel recovery method must be used	5 CCR 1001-19 Reg 15	Applicable
Solid Waste	Solid Waste Disposal Act	Requirements for disposal of solid wastes	6 CCR 1007-2	Applicable
TSCA	Disposal of PCBs	Ensure that any materials within $\geq$ 50 ppm for PCBs are managed according to TSCA and FFCA	40 CFR Part 761 FFCA	Applicable
Hazardous Waste	Compliance with Colorado Hazardous Waste Act	Identification and characterization of hazardous waste	40 CFR 261 6CCR 1007-3, Part 261	Applicable
Generator Standards	Standards Applicable to Generators of Hazardous Waste	Generator prepares a manifest if hazardous remediation wastes are disposed of off-site	40 CFR, Part 262 6 CCR 1007-3	Applicable
TSD Facility Standards	Temporary unit container and tank storage requirements	Requirements for operation of temporary tank and container storage areas	40 CFR 264 553 6 CCR 1007-3, 264 553	Applicable
Closure	Closure of Permitted RCRA Units	Implemented if RCRA permitted units are closed	40 CFR Part 264 6 CCR 1007-3 Part 264	Applicable

Table 7-1 (Continued)

Action	Requirement	Prerequisite	Citation	ARAR
Closure	Requirements for Closure of RCRA Interim Status Units	Implemented if RCRA Interim Status Units are closed	40 CFR Part 265 6 CCR 1007-3 Part 265 as provided in RFCA Attachment 10	Applicable
LDR	Treatment standards for hazardous waste	Requirements for treatment and land disposal of hazardous waste	40 CFR 268 6 CCR 1007-3, Part 268	Applicable
Universal Waste Management	Requirements for Universal Waste Management	Governs batteries, pesticides and thermostats	40 CFR Part 273	Applicable
Used Oil Management	Requirements for Used Oil Management	Implemented if used oil is managed	40 CFR Part 279	Applicable
Water	NPDES Requirements for discharging water into surface water bodies	Requirements for discharge of stormwater or treated wastewater into surface water bodies	40 CFR Part 122 and 125 5 CCR 1002-8	Applicable
Low Level Waste Disposal	Low Level Waste Disposal	Requirements governing off-site disposal of low level radioactive waste	10 CFR Part 61 6 CCR 1007014	Applicable
Radiation Protection	Standards for radiation protection	Establishes the criteria for the protection of human health and the environment.	10 CFR 835	Applicable
Radioactive Waste Management	Radioactive Waste Management	Requirements for the management and packaging of LLW	DOE Order 5420 2A	TBC

C - Chemical Specific ARAR
L - Location Specific ARAR
TBC - To Be Considered

8. Environmental Consequences of the Action

Environmental effects associated with the D&D of the 771/774 Cluster are described as follows

8 1 1 Environmental Impact Issues

As described in earlier chapters, the 771/774 Closure Project is located entirely within the (secured) Protected Area of the site's Industrial Area (see Figure 2-1) Initial investigations show that many interior surfaces, process drains, piping, gloveboxes, filters, sumps and other equipment are radioactively contaminated

The proposed closure activities for the 771/774 Closure Project involve asbestos abatement, decontamination of interior surfaces and equipment by vacuuming and wiping, disconnection of electrical power, draining of piping systems and equipment, removal of gloveboxes and other equipment, further decontamination by wiping, washing, scabbling, and other methods, and dismantling and demolition of the buildings Many of these activities could qualify as categorical exclusions under DOE's NEPA regulations (e g , removal of asbestos from buildings (B1.16), demolition/disposal of buildings (B1 23), disconnection of utilities (B1 27), and minor activities to place a facility in an environmentally safe condition, no proposed uses (including reducing surface radiological contamination, but not including conditioning, treatment, or processing of spent nuclear fuel, high-level waste, or special nuclear materials) (B1 28)

Given the existing environment and industrial setting environmental impact issues associated with the 771/774 Closure Project are limited in scope The proposed activities should not result in discernible adverse effects to biological resources, including vegetation, wetlands, wildlife habitat and State and Federal sensitive (e g , threatened and endangered) species populations or habitat The buildings to be closed are not located in a floodplain and the proposed activities will not be affected by, or themselves affect, any floodplain However, due to the building's proximity to the segment of the Walnut Creek drainage located in the Protected Area, this activity may require consulting with the US Fish and Wildlife Service (USFWS) for downstream impacts to the Preble's habitat A USFWS consultation would determine mitigation measures required by to be employed as appropriate No wild and scenic rivers, prime agricultural soils, parks or conservation areas or natural resources will be affected The proposed activities will provide employment for a very small number of people, most from the current site work force, thus the activities are unlikely to result in adverse socioeconomic effects. Closure is not expected to be noticeable off site and thus is not expected to result in major changes in visual quality of the RFETS community area

Therefore, this discussion of environmental impact issues focuses more intensely on the following areas of potential impacts

- Mobilization of radioactive and other contaminants into the environment via soils, air, surface waters, or groundwater,

- Health and safety of workers who may be exposed to radioactive and toxic or hazardous materials (including lead, asbestos, and PCBs), and health and safety of the public, both during normal closure activities as well as accidents,
- Environmental issues associated with waste management, including the contribution of wastes generated by the proposed activities to the decreasing site-wide capacity for interim storage and transportation of waste,
- The physical removal of Building 771 as an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities at RFETS, and
- This project's contribution to site-wide cumulative impacts

8 1 2 Geology and Soils

Closure activities in the 771/774 Closure Project will disturb minor land acreage most of which has been previously disturbed Activities such as excavation could cause localized landslides or slumping to occur Some recontouring of the soils may occur after buildings are removed to restore soil in areas disturbed by demolition equipment There will be short-term increases in soil erosion and siltation and small temporary losses of soil productivity Volatile Organic Compound (VOC)and radionuclide contamination already exists in the Building 771 footprint and adjacent areas Additional contamination of soils from closure activities is not expected because building structures will be decontaminated prior to demolition of the structures themselves

8 1 3 Air Quality

Potential impacts to air quality resulting from the closure of the 771/774 Closure Project buildings include asbestos emissions resulting from asbestos removal, Beryllium emissions resulting from the decontamination and removal of equipment and building materials, radionuclide emissions resulting from the decontamination and removal of equipment, hazardous air pollutant from removal of chemical systems and fugitive dust emissions resulting from transportation activities associated with the closure and demolition activities Air emissions from these activities will be controlled and monitored in accordance with the Site Health and Safety Program

Asbestos is present in several areas, primarily in the form of pipe insulation These materials will be removed by a properly certified contractor in accordance with applicable State and Federal regulations Assuming that the removal, transportation, and final disposition are in accordance with applicable regulations, there is minimal risk of an asbestos release to the air

Some equipment within Building 771 is potentially contaminated with beryllium The housekeeping action level for beryllium contamination is 25 $\mu g/ft^2$ Cleanup and removal of materials and equipment contaminated with beryllium has a very small potential to cause a release to the air Management of the contaminated materials and equipment in accordance with current site procedures will result in minimal risk to both on- and off-site personnel

Decontamination, size reduction, removal and ultimate disposal of equipment and materials in Building 771 have the potential to release radionuclides to the air Decontamination and size reduction activities take place within containment (either glovebox, B box or hood) that is equipped with a HEPA filter In addition the building room exhaust is equipped with HEPA filters This essentially eliminates the potential for a radionuclide release short of an accident during the transportation of the contaminated material Stack monitoring is also conducted to ensure the integrity of the HEPA filtration equipment

Decontamination, size reduction, removal and ultimate disposal of equipment and materials in Building 771 also have the potential to release chemicals to the air Mitigative actions may be taken to reduce the resulting emissions as appropriate

Fugitive dust emissions will result from the transportation of materials and wastes from the 771/774 Closure Project There will be significant, short term fugitive dust emissions during the demolition of the structure itself without taking mitigation measures Building 771 is a reinforced concrete and cinder block construction that will require the use of heavy equipment to reduce Because of the distance of the Cluster from site boundaries impacts will be short-term to personnel working in areas approximate to the 771/774 Closure Project

Miscellaneous chemicals and other hazardous materials will be removed from several structures within the 771/774 Closure Project These materials will be managed in accordance with existing site procedures and there will be little risk for air emissions

8.1 4 Water Quality

Because the scope of work authorized by this DOP does not include the demolition of Building 771 and 774, and since no other structures of the 771/774 Closure Project will be removed below ground level completion of the 771/774 Closure Project is not expected to change storm water runoff, storm water percolation or surface water flow characteristics (Changes resulting from remediation activities outside this project will be dealt with in their documentation)

Because 771/774 Closure Project will remove portions of ancillary structures (trailers) off ground level, some new bare ground is expected to be exposed to wind or water erosion If appropriate in specific instances silt fencing or similar protective device would be installed to prevent or minimize the possibility of water-borne soil leaving the immediate area and entering drainage ways Demolition activities may, however, deposit small debris on the surrounding pavement or ground surface that could be carried away by storm water runoff Quantities of such material are expected to be small

Among the techniques under consideration for decontamination of the 771/774 Closure Project are the use of water or steam to remove radiological contamination and loose debris While this technique is effective in removing radiological contamination, it also generates large volumes of potentially contaminated water and may even contribute to the spread of radiological contamination Surface water samples from the 771/774 Closure Project drainage sub-basin will be collected using an automated station located to pull samples from the entire sub-basin's runoff Water used for decontamination will be treated *prior to release*

Because no work will be done below ground level ground water should not be affected

8 1 5 Human Health Impacts

Closure has the potential to expose involved workers, non-involved workers and expose the public to radiological and other chemical contamination because the nature of the work is to remove or fix-in-place contamination Disruption of contaminants or hazardous materials increases the chance of the contaminant or materials being dislodged, becoming airborne, and being inhaled by or deposited on humans

8.1 6 Radiological Impacts

For involved workers, closure activities at Building 771 are estimated to result in an average yearly dose of 100-200 mrem to each worker involved in closure of the Building Cluster Annual exposures are expected to decline over the life of the project, as higher risk activities are addressed early on in the process This exposure would be expected to result in less than 1 (0 07) latent cancer fatalities, assuming the same worker group conducted both deactivation and decontamination activities Doses to co-located workers from closure operations at Building 771 alone have not been evaluated However, the annual radiological exposure of a maximally exposed co-located (unprotected) worker as a result of site-wide closure activities is estimated at 5 4 mrem (a mrem is 1/1000 of a rem) The corresponding risk of a latent cancer fatality to this worker is two in 1,000,000 (Cumulative Impact Document (CID), Section 5 8 1)

Annual dose to the maximally exposed off site individual from site closure activities is estimated at 0 23 mrem, with a corresponding excess latent cancer fatality of 1 in 10,000,000 The annual dose to the public as a result of all activities in the RFETS closure project at the peak time of exposure (1997 - 2006) is expected to be a total of 23 rem for all of the 2 7 million people projected to be living within 50 miles of the site in 2006 This annual dose of 23 person-rem would be expected to result in less than one (0 01) latent cancer fatality in the entire Denver area population Estimated annual dose to the maximally exposed off-site individual is well below the applicable standard of 10 mrem/year (CID, Section 5 8 2)

Estimated doses from the 771/774 Closure Project are expected to be a small fraction of those estimates for site-wide activities as described above For comparison purposes, DOE's annual limit for occupational exposure as a result of all activities and through all exposure pathways is 5,000 mrem (5 rem) per person Natural background radiation in the Denver area results in an annual exposure of approximately 350 mrem per person

Exposures to workers and the public will be controlled and monitored in accordance with the RFETS radiation safety program

8 1.7 Non-Radiological Impacts

Non-radiological health effects (from exposure to chemicals) are measured by a hazard index A hazard index greater than one is considered to be a basis for concern, and the greater the index is above one, the greater the level of concern

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1 2 has been calculated for a co-located worker who is chronically exposed during working hours to all chemicals of concern simultaneously (as described in the CID) over the entire period of site closure The corresponding cancer risk is 5 in 100,000 (CID Section 5 8 3)

For the full suite of site closure activities (including closure of all buildings), a hazard index of 1 5 has been calculated for a member of the public who is chronically exposed every day for 70 years to all chemicals of concern (as described in the CID) simultaneously (a highly unlikely event) A more reasonable scenario of exposure to a single chemical showed hazard indices of well below one for each potentially released chemical, analysis of potentially carcinogenic air pollutants indicates a cancer risk of 3 in 10,000,000 for the maximally exposed off site individual (CID Section 5 8 4)

Estimated non-radiological impacts from the 771/774 Closure Project are expected to be a fraction of those estimated for site-wide activities, as described above Exposures to workers and the public will be controlled and monitored in accordance with the RFETS toxic/hazardous materials and chemical safety program

8 1 8 Occupational Hazards

In addition to exposure to radiological and chemical hazards, workers at the site are exposed to a variety of industrial hazards such as heavy machinery, repetitive motion tasks, and physical agents such as heat and cold Using a general industry rate for construction to estimate injury and illness cases, site closure activities are estimated to result in 584 cases of injury and illness during the peak activity period (1997 - 2006) (CID, Section 5 8 3) The portion of these cases that would be estimated to result from the Building 771 closure alone would be less than the total site figure

The general industry rate of injury and illness is considerably higher than the historic incidence rate for the site, occupational hazards will be controlled, mitigated and monitored in accordance with the RFETS occupational health and industrial safety programs

8 1 9 Plants and Animals

Because the 771/774 Closure Project is located in the previously disturbed Industrial Area, impacts to plants and animals are expected to be minimal Possible minor impacts to other vegetative areas may result as fugitive dust may distribute undesirable materials among existing plant species Additional impacts may occur to vegetation associated with increased traffic in order to accommodate the closure equipment Increased traffic, both vehicular and pedestrian, could result in some vegetation disturbance

Some of these mammals such as rats, mice and raccoons are known to be residents of or visitors to the Industrial Area These mammals would be displaced and some mortality would occur as a result of closure activities Bird nests attached to buildings planned for demolition would be destroyed, although no direct bird mortality is anticipated

8 1 10 Waste Management

Environmental impact issues associated with waste management are related to human health issues, storage capacities, and transportation In general, waste generated from the 771/774 Closure Project includes contaminated and uncontaminated equipment, tools, electrical conduit systems, piping systems, gloveboxes and facility structural materials

Closure activities will be performed to remove radiological contamination and hazardous constituents Items that have been decontaminated to a free release condition will be transferred for use at a different

location within RFETS, for use at a different a DOE facility, or sent to the PU&D organization for appropriate handling Mixed waste generated from closure activities will be stored in permitted areas on-site, or where feasible, shipped to an approved off-site disposal site On-site storage of mixed waste will be in accordance with approved site procedures until the material can be shipped for final disposal Hazardous materials and excess chemicals will be managed as waste, where applicable, and disposed of in accordance with established procedures Materials and waste will be characterized, stored and disposed of in accordance with the requirements of approved site waste management procedures that meets state and Federal regulations

Waste minimization will be utilized in the planning and management of the 771/774 Closure Project closure wastes Elimination and reduction of waste generated as a result of closure is a high priority Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented

With respect to transportation concerns, the 771/774 Closure Project closure project would generate and package materials suitable to meet DOT transportation requirements

8 1 11 Historic Resources

The environmental impact issue related to historical resources is the loss of Building 771 as a historic structure eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities A related cumulative impact is discussed in a subsequent section

Sixty-four buildings within the site's Industrial Area, including Building 771, have been identified as important to the historic role of the site in manufacturing nuclear weapons components during the Cold War Building 771 was originally constructed in 1951, with a number of additions between 1962 and 1974 While this building like the others is less than 50 years old, it is considered historically significant as an essential component of the weapons production activities at RFETS

Negotiations have been completed between DOE and the State Historic Preservation Officer (SHPO) concerning the appropriate mitigative measures applicable to these buildings, Building 771 will be subject only to documentation requirements (collection or creation of construction drawings and photographs), rather than preservation No modification of or damage to the building will occur prior to completion of such an agreement and completion of documentation according to standards accepted by the SHPO

8 1.12 Noise

Closure and demolition of the 771/774 Closure Project are not expected to significantly increase noise levels in the Rocky Flats area Most activities will take place inside the associated building so noise levels, if elevated over ambient levels, will be confined to the 771/774 Closure Project structures in which they are generated Other less common activities such as scabbling (use of a machine to remove layers of concrete), blasting (use of various materials such as sand, dry ices, or other abrasives to remove surface radiological contamination), and demolition by backhoe ram, hydraulic cutters, or other devices are expected to generate noise levels higher than ambient noise levels However, workers involved in those activities will use appropriate hearing protection devices during activities expected to generate high

noise levels Outdoor activities will take place at a distance from unprotected workers and the public and thus are not expected to increase noise levels to these populations to an unsafe level

8 1 13 Socioeconomic Effects

Potential impacts from the 771/774 Closure Project would contribute to a net overall loss of employment in the long run The current on-site work force in the building would either be drawn into the closure activities for the building (and potentially for the entire site) or voluntarily lose employment In the short run, the closure activities could actually increase the employment level due to increased work force levels associated with closure activities Additionally a modest increase of purchases (raw materials, etc) may result due to closure activities in the short run

Under the worse case scenario, if the entire work force currently housed in the 771/774 Closure Project all opted for voluntarily unemployment, the net overall impact would not have a great adverse effect on the Denver Metropolitan area nor would it adversely effect Boulder or Jefferson Counties, where the majority of the work force reside Taken as a single building, the net effects are expected to be minimal

8 1 14 Cumulative Effects

Impacts associated with the 771/774 Closure Project would contribute incrementally to potential site-wide cumulative impacts associated with the overall site closure program

Some of these cumulative impacts may ultimately prove to be beneficial to the environment, assuming that the activities result, as expected, in the restoration of much of the site's original, natural condition prior to construction (Remediation is currently scheduled to follow building demolition) Removing human occupation, structures, and paved surfaces and reestablishing native grasses and other vegetation could restore native plant communities and increase wildlife habitat, including threatened and endangered species Cleaning up contamination will reduce health risks to human and animal populations

For other cumulative impacts, including the final remediation phase that will be conducted outside of this project further study may be warranted As with the 771/774 Closure Project, decontamination and closure of structures site-wide will generate transuranic, low-level, low-level mixed waste, and industrial (landfill) waste Existing on-site interim storage for radioactive waste is limited (DOE/EA-1146), and eventually, as site-wide closure progresses, additional storage capacity may be needed The same is true for industrial waste

Also, demolition of the 771/774 Closure Project is part of a potential cumulative effect to historic resources Demolition will result in the physical removal of a historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities Other historic structures within this district are also proposed for closure and presumed demolition The cumulative effect of these removals may be significant (see mitigation measures below) Also, the collective effect of removing most or all of the structures would be visually dramatic High profile structures that have dominated the site and the local skyline for 45 years would be eliminated The landscape would take on a less industrial and more open, rural appearance, similar to the rangeland that characterized the area before the plant was constructed

8 1 15 Mitigation Measures

Mitigation measures are prescribed to reduce or avoid potentially adverse effects associated with a proposed activity For the decontamination and closure of the 771/774 Closure Project, mitigation measures will be considered in the areas of human health, worker safety, release of emissions and mobilization of contaminants and cultural resources

Closure will be conducted in accordance with applicable worker and public health and safety programs and activities will be managed so that emissions and discharges are within applicable regulatory limits As required, closure will take place within containment of existing buildings or temporarily constructed facilities (e g , tents) with functioning drainage, air filtration and other safety and environmental protection systems commensurate with risks inherent in the activities being conducted

Precautions will be taken to ensure compliance with the Migratory Bird Act that prohibits destruction of birds or their nests, active or inactive without a permit Building surveys for such nests in the 771/774 Closure Project will be conducted prior to demolition

No closure activities will take place in or near habitat of known threatened or endangered species

No modification or damage to buildings determined to be eligible for the National Register of Historic Places will occur prior to completion of the documentation requirements in accordance with the standards set forth in the Memorandum of Agreement with the SHPO

8.1.16 Unavoidable Adverse Effects

The 771/774 Closure Project closure activities if conducted as proposed will have the following unavoidable adverse effects

- Physical removal of an historic structure that is eligible for the National Register of Historic Places and a secondary contributor to a potential Historic District comprised of Cold War Era facilities,
- Short-term increases in air emissions and water discharges,
- Radiation and chemical exposures to workers, co-located workers, and the public, resulting in a small, but increased risk of adverse health effects,
- Possible industrial accidents, resulting in injury and illness, and
- Increased noise levels for the duration of closure activities

8 1 17 Short-Term Uses and Long-Term Productivity

Unlike most projects that commit a Site to a particular use for a period of time, the effect of closure will be to undo past commitments concerning use of the Site and open up a new and broad range of potential future uses Closure does not commit the Site to a particular land use rather, closure of the 771/774 Closure Project will be one step in the process of ending one use and opening consideration for a variety of other possible future short- and long-term uses

8 1 18 Irreversible and Irretrievable Commitments of Resources

Closure is essentially a destruction project eliminating existing uses not a construction project consuming land and building materials The completion of the 771/774 Closure Project will release land and perhaps some buildings for other uses Funds, labor, equipment, fuel, tools, personal protective equipment, waste storage drums and similar items are resources that will be irretrievably committed to the Closure Project

8.2 Overall Cumulative Impacts Analysis for RFETS Site Closure

The following is a summary of insights gained from the CID impacts analysis and risk assessments relative to human health, safety and the environment

- Both the radiological and non-radiological risks to the workers, co-located workers and public as a result of normal operations are lower than during the weapons production years
- Radiological and non-radiological risk to the workers, co-located workers and public as a result of normal operations is minimal and well below the Clean Air Act and EPA standards
- Radiological risk to the workers, co-located workers and public as a result of normal operations is dominated by SNM activities, residue stabilization and individual facility disposition of the plutonium facilities Once these activities are completed, doses and excess latent cancer fatalities to the workers, co-located workers and public become insignificant
- For the baseline case, radiological accident risks dominate the overall risks to the workers, co-located workers and public However, of the closure case, risks to the workers, co-located workers and public are initially dominated by radiological accident risks, until around 2006, when residue stabilization, SNM consolidation activities and initial deactivation efforts that remove or fixate holdup are completed Then the risks are dominated by normal operations involving the individual facility disposition process and environmental restoration as the plutonium buildings' nuclear ventilation systems go through the individual facility disposition process
- Probability of a seismic event contributes over 90% of the risk to the co-located worker, maximally exposed off-site individual and 50 mile population for both overall baseline case accident risks and to the overall closure case accident risk during the peak year

The following closure operations and activities contribute the most to reducing the risk of accidents caused by seismic events and thereby overall accident risk to the workers, co-located workers, and public in the following order of priority based on the projected schedules:

- consolidating plutonium oxides into building 371,
- repackaging the dispersible residues into the pipe/drum component or storing in building 371,
- removing plutonium hold-up,
- shipping TRU/TRM waste drums to WIPP,
- transferring SNM from building 371 to the ISV or shipping off-site,
- shipping other TRU/TRM waste to WIPP and shipping LL/LLM waste off-site

The CID provides a comparative summary of the two cases in terms of the expected environmental impacts The following are some insights gained from the ecological risk assessments and impacts analysis relative to the environment

Short-term impacts on wetlands, sensitive habitats, wildlife and species of special concern may occur as a result of extensive site closure activities There is however, no natural resource injury expected Closure activities are not expected to result in the irretrievable or irreversible commitment of any natural resources of the site Closure activities will be evaluated in light of the potential for natural resource injury and applicable mitigation measures will be taken to minimize the potential for natural resource injury to the extent practicable

The closure case anticipates use of a flow-through water management system for on-site water management ponds and then the eventual conversion of the ponds to wetlands This action may initially reduce the open-water habitat on the site created by the water management ponds, but as the ponds are converted to wetlands, wetland species diversity would increase and overall biodiversity at the site would be improved over the long term All other on-site environmental impacts are considered low for both cases and no natural resource injury is expected

Cumulative impacts are impacts on the environment resulting from the incremental impacts of an action when added to other past, present and reasonably foreseeable future actions carried out both by the federal agency and other entities within the geographical region Significant impacts could result from several smaller actions, that, by themselves, may not have significant impacts Cumulative impacts associated with either case and any potential developments in the region of the site would include

- Increased surface runoff and decreased groundwater discharge because of the use of on-site landfill or Corrective Action Management Unit (CAMU) caps
- Short term impacts to wetlands habitat, riparian habitat, open water habitat, aquatic habitat, native grasslands communities and species of special concern However, once the water management ponds are converted to wetlands, biodiversity is expected to increase
- Minor cumulative impacts to surrounding land uses primarily along state routes and local roadways
- Increased traffic volume resulting from off-site shipments of Pu Pits and wastes potentially causing congestion problems
- Increased traffic accidents resulting in fatalities and potential latent cancer illnesses related to motor vehicle emissions, fugitive dusts and brake/tire wear
- Socioeconomic impacts from reductions in the site's workforce will not substantially affect surrounding region due to additional growth projected in the area

Overall, substantial cumulative impacts are not anticipated from the closure of Building 771

9. Quality Assurance Strategy

9.1 Background

The work to be performed under this Plan must be accomplished in accordance with regulatory and contractual Quality Assurance requirements that are common to nuclear facilities across the DOE complex The regulatory document is 10 CFR 830 120, *Quality Assurance Requirements* (the Price-Anderson QA rule) The contractual document is DOE Order 5700 6C, *Quality Assurance*

10. Project Organization

The following section is provided for information purposes only The site can change this information as necessary to support the goals of the project without regulatory approvals

10 1 1 Organization / Resources

The team may consist of personnel from a number of the K-H team subcontractors, although primarily from Safe Sites of Colorado (SSOC) and Rocky Mountain Remediation Services (RMRS) A teaming agreement is underway in Building 779 with SSOC, RMRS and K-H to facilitate a seamless evolution through the various stages of the closure project Developed as part of the major reengineering project on site, this arrangement will maximize the core competencies of the major subcontractors, maximize the efficiency of the available work force and improve safety of the workers This teaming agreement may be utilized in Building 771/774 Closure Project

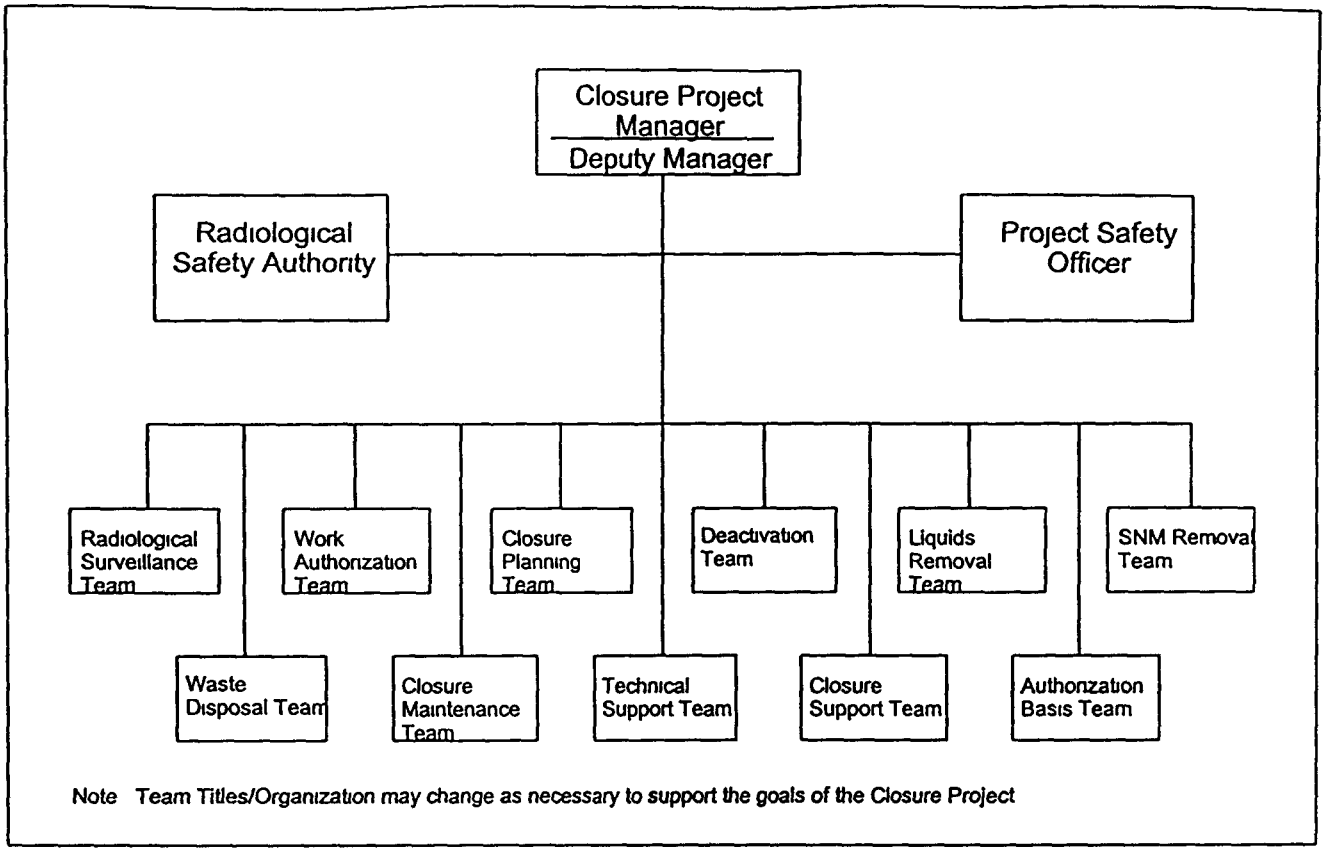


Figure 10-1 Organization Structure

The detailed roles and responsibilities of the positions are included at the end of this section, but in brief, there is a clear line of responsibility from the integrator to the closure project manager, through the work release manager, to the execution project managers and finally to the enhanced worker teams

- The Closure Project Manager is the senior leader of the closure project and has the responsibility to set expectations for performance, establish principles of behavior and provide the primary senior external interface for the closure project
- The Work Authorization Team Leader is the focal point who maintains the safety and regulatory envelope for the project This person provides the primary external interface to the site-level safety and regulatory direction and is the link to the conduct of operations improvement It provides the project constraints to the Project Execution Managers and then gives the day to day authorization to proceed with work similar to the function currently provided by a shift manager
- The Closure Planning Team Leader is the primary interface to external organizations that are working on other site closure projects Within the closure project this person has the responsibility to maintain the project closure plan and to coordinate the distributed planning resources that are under the direct wing of the Project Execution Managers The plan includes the entire closure project, the three year plan, as well as the annual, monthly, and weekly plans The resource needs must be projected to

allow adequate time for the Technical Support Manager to acquire the resources for distribution to the Project Team Leaders

- The Project Team Leaders are an extremely important function It is "where the rubber meets the road" on executing the defined project work scope The work scope definition comes from the Closure Planning Team For example, a Project Team Leader would be assigned to glovebox removal or to excess equipment removal
- The Technical Support Manager is responsible for filling a number resource needs of the Project Team Leaders as predicted by the Closure Planning Team Leader These resources include all technical aspects including Nuclear Safety, Criticality Safety, Environmental Safety, Engineering, etc This person is the focal point for setting resource priorities The Closure Project Manager sets the absolute Priorities
- The Enhanced Worker Teams are teams that have the self contained resources to complete the assigned project activity Some resources would be temporarily assigned to the activity, however, it is the responsibility of the Technical Support Manager to assure that the necessary external resources are provided at precisely the right time There will be several modes of self direction depending upon the team experience This includes self identification of hazards in the spirit of 95-2 Specific resources required are detailed as part of the resource-loaded schedule

Appendix 1 References

"Building 771 Walkdown Report", Draft, Rev 1 3, 8/29/96

BDP-771-001, "Building 771 Cluster Initial Project Scope,", Revision 0, July 24, 1996

Combining Integrated H&S Strategy with Enhanced Work Planning An implementation approach for PUREX facility, 10/29/96

Conduct of Engineering Manual

Conduct of Operations Manual

Configuration Change Control Program Manual

DOE /EM-0246, Decommissioning Resource Manual , 8/15/95

DOE/EH-0486, Integrating Safety & Health During Deactivation with Lessons Learned from PUREX, 9/29/95

DOE/EM-0318, Facility Deactivation Guide, 12/01/96

Final Rocky Flats Cleanup Agreement, 7/19/96

Health and Safety Practices Manual

Integrated Work Control Program Manual

Management Plan for Material Contained in Idle Equipment

MOU Governing Regulation and Oversight of DOE Activities in the RFETS Industrial Area, 2/15/96

RCRA Closure Plan for Mixed Residue Container Storage Units

SSOC Quality Assurance Program

SSOC Quality Assurance Program Plan

Waste Stream and Residue Identification and Characterization, Building 771

Weaver, et al , "Facility History for Building 771 at the Rocky Flats Plant", April 1992, referred to as the "Weaver Report"

"A Discussion of Inventory Difference, Its Origin and Effect," EG&G Rocky Flats, INC , Safeguards and Security Program Support, N J Roberts, Revision 4, (August, 1994)

"Action Plan for Implementation of Peer Review Recommendations," EG&G Rocky Flats, INC , Safeguards Measurements Group, SMDA-91 053, July 11, 1991

"EG&G Rocky Flats Duct Holdup Measurement Program Major Observations and Recommendations of the Peer Review," Los Alamos National Laboratory, LA-UR-91-2104 (June 1991), Appendix G A Sheppard, N Ensslin, R Picard, and J Malanify, "Technical Peer Review of Rocky Flats Duct Holdup Measurement Program," Los Alamos National Laboratory, N-1-91-580, (May, 1991)

Ensslin and H A Smith, Jr , "Attributes and Semi-quantitative Measurements," Chapter 20 in Passive Nondestructive Assay of Nuclear Materials, NUREG/CR-5550, T D Reilly, N Ensslin, and H A Smith, Jr , Eds , Los Alamos National Laboratory document LA-UR-90-732 (1991)

"Quantification of Holdup," Rocky Flats Environmental Technology Site, 4-X60-SMP-3001, Written February 18, 1997

Safeguards and Security Definitions Guide, U S Department of Energy, Office of Safeguards and Security Affairs, December 20, 1993

Site Holdup Measurement Plan, 4-81232-97-Plan-Holdup-001, Revision 1,

Appendix 2 Definitions/Acronyms

DEFINITIONS

Closure Takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement These actions are taken at the end of the life of the facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment For those buildings in which no deactivation occurs, the term includes characterization as well as the above activities The ultimate goal of closure is unrestricted release, or if unrestricted use is not feasible, restricted use of the site

Cluster A group of buildings, facilities and equipment that make up a project for a defined task such as closure or deactivation

Deactivation The process of placing a facility in a safe and stable condition to minimize the long-term cost of a surveillance and maintenance program that is protective of workers, the public, and the environment until closure is complete Actions include the removal of fuel, draining and/or de-energizing of non-essential systems, removal of stored radioactive and hazardous materials and related actions As the bridge between operations and closure, based upon facility-specific considerations and final disposition plans, deactivation can accomplish operations-like activities such as final process runs, and also decontamination activities aimed at placing the facility in a safe and stable condition Deactivation does not include decontamination necessary for the dismantlement and demolition phase of closure, i e , removal of radiological contamination remaining in fixed structures and equipment after deactivation Deactivation does not include removal of contaminated systems, system components, or equipment except for the purpose of accountability of SNM and nuclear safety It also does not include removal of radiological contamination except as incidental to other deactivation or for the purposes of accountability of SNM and nuclear safety

Decommissioning For those buildings, portions of buildings, structures, systems or components (building) in which deactivation occurs, all activities that occur after the deactivation It includes surveillance, maintenance, decontamination and/or dismantlement for the purpose of retiring the building from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted use or, if unrestricted use is not feasible, restricted use of the buildings

Decontamination The removal or reduction of radioactive or hazardous contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning or other techniques to achieve a stated objective or end condition

Dismantlement The disassembly or demolition and removal of any structure, system, or component during closure and satisfactory interim or long-term disposal of the residue from all or portions of the facility

End-Point Criteria The defined objective(s) or goal(s) that represent the agreed upon facility condition to be achieved during the closure process

Enhanced Work Planning (EWP) EWP is a process that evaluates and improves the program by which work is identified, planned, approved, scheduled, coordinated, controlled, and executed

Facilities Buildings and other structures, their functional systems and equipment, and other fixed systems and equipment installed therein, outside plant, including site development features such as landscaping, roads, walks, and parking areas, outside lighting and communication systems, central utility plants, utilities supply and distribution systems, and other physical plant features

Graded Approach A process that assures safety analysis and documentation preparation is commensurate with the magnitude of the hazards being addressed and the complexity of the facility and/or systems being relied on to maintain an acceptable level of risk

Hazard A source of danger (i e , material, energy source, or operation) with the potential to cause illness, injury, or death to personnel, or damage to a facility or the environment without regard for the likelihood or credibility of accident scenarios or consequence mitigation

Job Hazard Analysis An analysis of procedurally controlled activities that uses developed procedures as a guide to address and consider the hazards due to any exposures present during implementation of (job) procedures, the use and possible misuse of tools and other support equipment required by the procedures and the behavioral motivations of the people performing them A type of hazard analysis process which breaks down a job or task into component steps, examines each step to determine what hazard(s) exist or might occur and establishes actions to eliminate or control the hazard

Operationally Empty (as defined in the Mixed Residue Tank System Management Plan - Update July 31, 1997) The condition of the tank following removal of as much material as possible using ancillary equipment Operationally empty tanks may contain varying amounts of material depending upon design

Physically Empty (as defined in the Mixed Residue Tank Systems Management Plan - Update July 31, 1997) The condition of a tank or ancillary equipment in which no liquid remains after verification from personnel familiar with the tank system or a proven technology For example, verification can be done by draining at low points or by non-destructive testing

RCRA Stable Tanks and ancillary equipment emptied to the maximum extent possible using readily available means with objective achievement of less that 1% by volume of holdup in tanks and ancillary equipment No significant amount of sludge and no significant risk with remaining residues

Safety Analysis Report (SAR) A report that documents the adequacy of safety analyses for a nuclear/non-nuclear facility to ensure that the facility can be constructed, operated, maintained, shut down and decommissioned safely and is in compliance with applicable laws and regulations

Safety and Health As defined in this report, a conditional state in which both the public and workers are free from harm It is also defined as the practice and application of techniques to help prevent illness, injury, death and property loss as a result of unintentional and undesirable conditions and acts

Safety Authorization Basis The combination of information relating to the control of hazards at a facility (including design, engineering analyses, and administrative controls) upon which DOE depends for its conclusion that activities at the facility can be conducted safely

Safety-Critical Items Equipment, systems, or components that are necessary to prevent or mitigate the harmful consequences of hazardous materials release

Set A discrete piece of work scope, such as an equipment group, single piece of equipment or geographical area that is ranked and prioritized for the 771/774 closure project

Standards As defined by the Department's Standards Committee, standards include "Federal, state, and local laws and regulations, Department Orders, nationally and internationally recognized standards, and other documents (such as industrial standards) that protect the environment and the safety and health of our workers and the public "

Surveillance and Maintenance (S&M) A program established during deactivation and continuing until phased out during closure to provide containment of contamination, physical safety and security controls and maintenance of the facility in a cost-effective manner that is protective of workers, the public and the environment

Unreviewed Safety Question (USQ) A process to allow contractors to make physical and procedural changes and to conduct tests and experiments without prior DOE approval as long as the changes do not explicitly or implicitly affect the safety authorization basis of the facility It also requires that issues with a potential impact to the safety authorization basis be brought to the attention of DOE

USQ Screening Process A technique/tool that uses a checklist approach to help determine if suggested changes require a full USQ determination of any effect on the safety authorization basis of the facility

Work Sets Discrete units of work arranged by system or area with specific endpoints assigned

Work Task A discrete activity made up of procedures performed in steps to achieve an objective goal such as removal of plutonium from gloveboxes, removal of a chemical from a storage area or removal of asbestos from a facility area

ACRONYMS

AB	Authorization Basis
ACM	Asbestos Containing Material
AEA	Atomic Energy Act
ALARA	As Low As Reasonably Achievable
APEN	Air Pollutant Notice
Ar	Argon
ARF	Administrative Record File
ARARS	Applicable or Relevant and Appropriate Regulations
BFO	Basis for Operations
cc	cubic centimeter
CAMU	Corrective Action Management Unit
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CID	Cumulative Impact Document
CFR	Code of Federal Regulations
CHWA	Colorado Hazardous Waste Act
CWA	Clean Water Act
CWTF	Consolidate Waste Treatment Facility
D&D	Decontamination and Decommissioning
DPMP	Decontamination Program management Plan
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOP	Decommissioning Operations Plan
EDE	Effective Dose Equivalent
EPA	Environmental Protection Agency
EWP	Enhanced Work Planning
F	Fluorine
GB	Glovebox
HF	Hydrofluoric Acid

HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilation and Air Conditioning
IHSS	Industrial Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMC	Integrated Site Baseline
ISM	Integrated Safety Management
IWC	Integrated Work Control Package
JHA	Job Hazard Analysis
KOH	Potassium Hydroxide
LCO	Limiting Condition of Operation
LL	Low-Level Waste
LLM	Low-Level Mixed Waste
LRA	Lead Regulatory Agency
m	meter
MAAL	Maximum Allowable Asbestos Level
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
mg	milligram
mm	millimeter
MW	Mixed Waste
nCi	nanocuries
N_2	Nitrogen
HaOH	Sodium Hydroxide
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NTS	Nevada Test Site
O_2	Oxygen
OSHA	Occupational Safety & Health Administration
PCB	Polychlorinated Biphenyls

PPE	Personal Protective Equipment
PU&D	Property Utilization & Disposal
PUREX	Plutonium-Uranium Extraction Facility at Hanford
Pu	Plutonium
QA	Quality Assurance
RAAMP	Radioactive Ambient Air Monitoring Program
RCM	Radiological Control Manual
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLCR	Reconnaissance Level Characterization Report
RMRS	Rocky Mountain Remediation Services, L L C
RTR	Real-Time Radiography
RWP	Radiological Work Permit
S&M	Surveillance and Maintenance
SHPO	State Historic Preservation Officer
Site	Rocky Flats Environmental Technology Site
SNM	Special Nuclear Material
SSOC	Safe Sites of Colorado, L L C
TBC	To be considered
TRM	Transuranic Mixed Waste
TRU	Transuranic
TSCA	Toxic Substances Control Act
TSD	Temporary Storage and Disposal
TSR	Technical Safety Requirement
TU	Temporary Unit
UPS	Uninterruptible Power Supply
USFWS	US Fish and Wildlife Service
USQ	Unreviewed Safety Question

WA	Work Authorization
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plan
WMP	Waste Management Plan
WSP	Work Summary Plan

Appendix 3 Equipment Selection Criteria

Group A· Physical Constraints

- Dedicated work space and accessibility
- Work space does not conflict with other operational activities
- Activities cannot disable needed utility and support systems
- Consideration should be given, for diversity sake, to deal with a variety of equipment/systems for future groups

Group B Workforce

- Workforce is trained and experienced to carry out the activities
- Organize activities to increase efficiency (production team) – consider similar type activities at same time
- ALARA must be considered, dose reduction achieved by equipment removal-balanced by available dose budget

Group C. Operational / Technical Issues

- Consider removal of cold process systems with high potential for cross contamination
- Pick activities to accomplish major hazard reduction while ensuring a sufficient number of necessary "practice" activities
- Ensure closure and spare equipment available for activities chosen
- Consider life expectancy/recent failures

Group D Management

- Choose activities with regulatory path forward (authorization basis, criticality evaluations, permits, etc)
- Consider activities that yield early successes and easy to measure metrics

Group E Cost

- Excess materials (recycle) when there is an identified need
- Choose equipment/systems to eliminate high S&M costs

Group F. Waste

- Little effort required to meet waste disposal criteria (WIPP, NTS, Envirocare/ Site/etc)
- Few different waste types involved with the activity
- Available, easy to accomplish size reduction and decontamination technologies need, location, costs

Appendix 4 771/774 Closure Project Equipment Sets by Priority

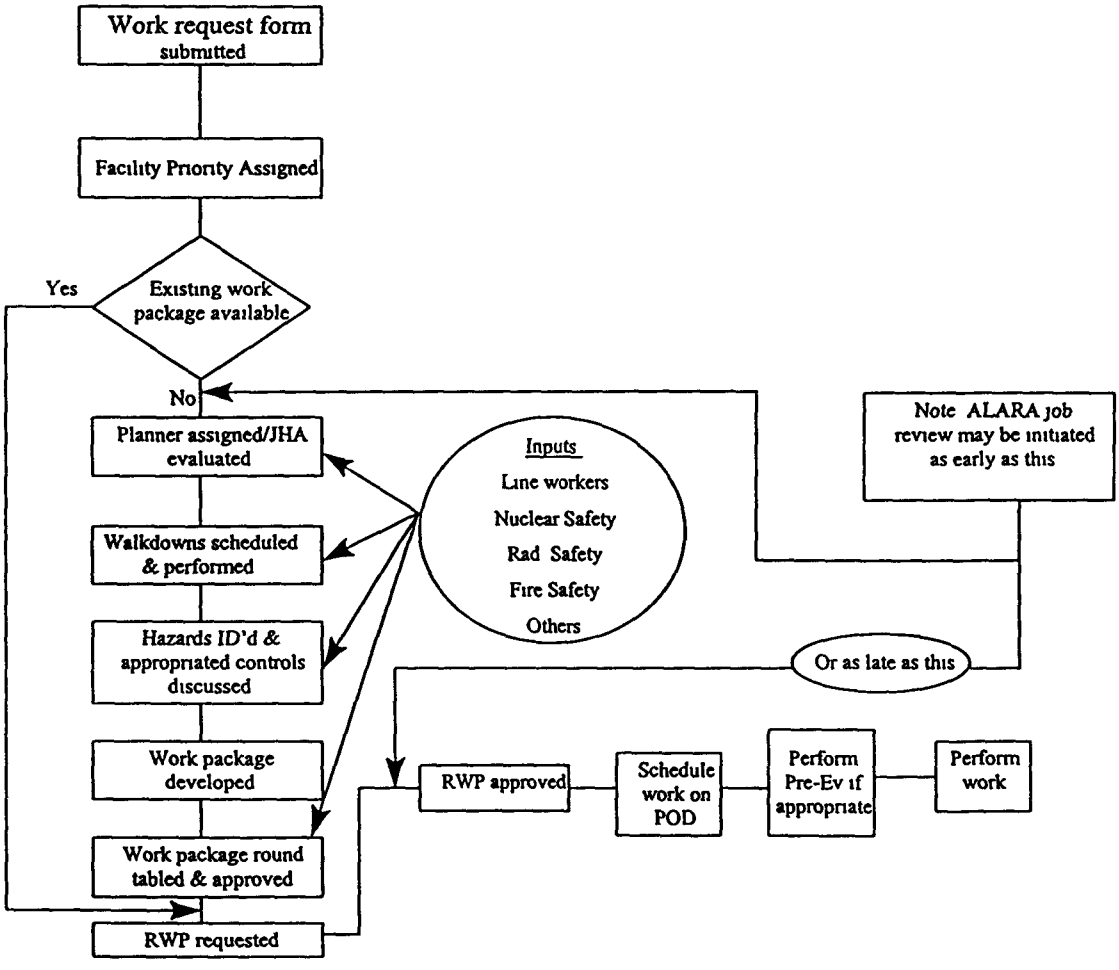
Priority	Set #	Set Description
1	37	Rm 181A Boxes, Vessels, & Piping
2	40	Rm.183 Storage Area
3	32	Rm 149 Unused Glovebox #30, vessels & piping
4	34	Rm 148 Process Area
5	44	Rm.179 Maintenance Area
6	38	Rm.182 Gloveboxes
7	45	Rm 174 Process Area
8	43	Rm.180A-F &K Process Area
9	42	Rm.180 Office Area
10	41	Rm 186 Process Area
11	36	Rm.146 Process Area
12	17	Rm.114 Process Room, GB#17
13	50	Rm 158 Lab Analysis
14	49	Rm.157 Stock Room Area
15	10	Rm.114 GB#5
16	3	Locker Room Area
17	35	Rm 147 Office Area
18	7	Rm.114 GB#2
19	14	Rm.114 GB #14
20	22	Rm.149 Incinerator GB #33,37,38,39
21	1	Corridor B Office Area
22	15	Rm. 114 GB#13, Old #14
23	48	Rm 153 Process Area
24	27	Rm 149 Process Area old GB#30
25	8	Rm 114 GB #3
26	30	Rm 149 Process Area GB# 42

27	26	Rm 149 Process Area GB# 29
28	24	Rm 149 Process Area GB# 26
29	25	Rm 149 Process Area GB# 27 (Cold)
30	6	Rm 114 GB# 1
31	33	Rm. 149 Process Area Tank Farm
32	9	Rm. 114 GB# 4, 5A, 9A, 22
33	59	Indirect/Direct Evaporative Cooling Area
34	29	Rm. 149 Process Area GB# 40, 44
35	2	Corridor F Office Area
36	39	Rm. 182A gloveboxes
37	51	Rm. 149 Utility Support Area
38	13	Rm 114 GB# 11, new 14
39	12	Rm. 114 GB# 8, 8E, 9
40	16	Rm. 114 GB# 15, 16
41	46	Rm 164 Lab Area
42	11	Rm 114 GB# 6, 7, 7A
43	4	Rm. 129 Maintenance Area
44	28	Rm 149 Process Area GB# 31, 50
45	18	Rm 114 GB# 18
46	57	309 Tank Area
47	23	Rm. 149 Process Area GB # 23, 24, 25
48	31	Rm. 149 Process Area GB # 43A-43D
49	58	Corridor A, D, R, G, H, Stairwell #1-3, 127 Utility Rm
50	19	Elevator Area
51	56	Rm. 249 HVAC Exhaust and Utilities Area
52	52	Rm. 190 Deluge Process Area
53	5	Rm. 141
54	20	Annex Area

55	21	Rm 149 Process Area C-Cell
56	53	Main Plenum Area
57	54	283 HVAC Exhaust & Utilities Area
58	55	235 HVAC Supply & Utilities Area
59	61	202 Process Area
60	62	241 Process Area
61	63	250 Storage Area
62	64	212 Storage Area
63	65	103 Process Area
64	66	102 Process Area
65	67	210 Process Area
66	68	200 Dock Area
67	69	203 Process Area
68	70	341 Utilities Area
69	71	441 Utilities Area
70	72	320 Utilities Area
71	73	200-300 Office Area
72	77	771/774 Out Buildings
73	79	Rm. 114/114A Process Rooms
74	78	Rm. 181A Size Reduction Area
75	80	Rm. 183 Drum Counter
76	60	771 HVAC
77	74	774 HVAC
78	47	Rm. 151 Radiation Control
79	76	771/774 Utilities
80	75	771/774 Cluster Facilities
81	81	771A Outbuildings

Appendix 5 Integrated Work Control Package Development

IWCP Process Flow



RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
181A	771 1 (Old Unit 90 23)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
182	771 1 (Old Unit 90 24	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
Annex	771 1 (Old Unit 90 25)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
186	771 1 (Old Unit 90 32)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
172	771 1 (Old Unit 90 64)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
184	771 1 (Old Unit 90 65)	Container Storage (Vault)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
146C	771 1 (Old Unit 90 83)	Container Storage (Vault)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
163	771 1 (Old Unit 90 115)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
164	771 1 (Old Unit 90 116)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180A	771 1 (Old Unit 90 117)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180E	771 1 (Old Unit 90 119)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180F	771 1 (Old Unit 90 120)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180K	771 1 (Old Unit 90 121)	Container Storage (GB)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
187	771 1 (Old Unit 90 122)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
183	771 1 (Old Unit 90 129)	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
180D	771 3	Hydroxide Precip (Treatment)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
149	90 21	Container Storage Area	None	MR Container Units Closure Plan	45 Day Notice
114	90 22	Container Storage Area	None	MR Container Units Closure Plan	45 Day Notice
180B	90 84	Container Storage (Vault)	None	MR Container Units Closure Plan	45 Day Notice
146	90 114	Container Storage Area	None	MR Container Units Closure Plan	45 Day Notice
146	90 114	Container Storage (GB)	None	MR Container Units Closure Plan	45 Day Notice
149	90 21	Container Storage (GB)	None	MR Container Units Closure Plan	45 Day Notice
114	90 22	Container Storage (GB)	None	MR Container Units Closure Plan	45 Day Notice
159	90 14	Container Storage (GB-4 only)	None	MR Container Units Closure Plan	45 Day Notice
149	771 3	Incinerator	None	Need One	Closure Plan
114	53	Misc. Cementation (Treatment)	None	Need One	Closure Plan
114	90 001	Tank D-500	None	Need One	Closure Plan
114	93 002	Tank D-501	None	Need One	Closure Plan
114	93 003	Tank D-502	None	Need One	Closure Plan
114	93 004	Tank D-503	None	Need One	Closure Plan
114	93 005	Tank D-504	None	Need One	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg Status	Type of Closure Plan in Effect	What to Publish Next
114	93 006	Tank D-505	None	Need One	Closure Plan
114	93 007	Tank D-506	None	Need One	Closure Plan
114	93 008	Tank D-507	None	Need One	Closure Plan
114	93 009	Tank D-508	None	Need One	Closure Plan
114	93 010	Tank D-A	None	Need One	Closure Plan
114	93 011	Tank D-B	None	Need One	Closure Plan
114	93 012	Tank D-529	None	Need One	Closure Plan
114	93 013	Tank D-530	None	Need One	Closure Plan
114	93 014	Tank D-544	None	Need One	Closure Plan
114	93 015	Tank D-545	None	Need One	Closure Plan
114	93 016	Tank D-546	None	Need One	Closure Plan
114	93 017	Tank D-547	None	Need One	Closure Plan
114	93 018	Tank D-548	None	Need One	Closure Plan
114	93 019	Tank D-549	None	Need One	Closure Plan
114	93 020	Tank D-550	None	Need One	Closure Plan
114	93 021	Tank D-551	None	Need One	Closure Plan
114	93 022	Tank D-552	None	Need One	Closure Plan
114	93 023	Tank D-553	None	Need One	Closure Plan
114	93 024	Tank D-554	None	Need One	Closure Plan
114	93 025	Tank D-705	None	Need One	Closure Plan
114	93 026	Tank D-706	None	Need One	Closure Plan
114	93.027	Tank D-713	None	Need One	Closure Plan
114	93 028	Tank D-714	None	Need One	Closure Plan
114	93 029	Tank D-949	None	Need One	Closure Plan
114	93 030	Tank D-951	None	Need One	Closure Plan
114	93 031	Tank D-952	None	Need One	Closure Plan
114	93 032	Tank D-953	None	Need One	Closure Plan
114	93 033	Tank D-954	None	Need One	Closure Plan
114	93 034	Tank D-955	None	Need One	Closure Plan
146	93 035	Tank D-1001	None	Need One	Closure Plan
146	93 036	Tank D-1002	None	Need One	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
146	93 037	Tank D-1003	None	Need One	Closure Plan
146	93 038	Tank D-1004	None	Need One	Closure Plan
146	93 039	Tank D-1005	None	Need One	Closure Plan
146	93 040	Tank D-1006	None	Need One	Closure Plan
146	93 041	Tank D-1007	None	Need One	Closure Plan
146	93 042	Tank D-1008	None	Need One	Closure Plan
146	93 043	Tank D-1009	None	Need One	Closure Plan
146	93 044	Tank D-1010	None	Need One	Closure Plan
146	93 045	Tank D-1011	None	Need One	Closure Plan
146	93 046	Tank D-1012	None	Need One	Closure Plan
146	93 047	Tank D-1013	None	Need One	Closure Plan
146	93 048	Tank D-1022	None	Need One	Closure Plan
146	93 049	Tank D-1032	None	Need One	Closure Plan
146	93 050	Tank D-1014	None	Need One	Closure Plan
146	93 051	Tank D-1065	None	Need One	Closure Plan
146	93 052	Tank D-1066	None	Need One	Closure Plan
149	93 089	Tank D-208	None	Need One	Closure Plan
149	93 090	Tank D-360	None	Need One	Closure Plan
149	93 091	Tank D-361	None	Need One	Closure Plan
149	93 092	Tank D-362	None	Need One	Closure Plan
149	93 093	Tank D-363	None	Need One	Closure Plan
149	93 094	Tank D-364	None	Need One	Closure Plan
149	93 095	Tank D-451	None	Need One	Closure Plan
149	93 096	Tank D-452	None	Need One	Closure Plan
149	93 097	Tank D-453	None	Need One	Closure Plan
149	93 098	Tank D-454	None	Need One	Closure Plan
149	93 099	Tank D-466	None	Need One	Closure Plan
149	93 100	Tank D-467	None	Need One	Closure Plan
149	93 101	Tank D-468	None	Need One	Closure Plan
149	93 102	Tank D-469	None	Need One	Closure Plan
149	93 103	Tank D-470	None	Need One	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
149	93 104	Tank D-472	None	Need One	Closure Plan
149	93 105	Tank D-921	None	Need One	Closure Plan
149	93 106	Tank D-922	None	Need One	Closure Plan
149	93 107	Tank D-923	None	Need One	Closure Plan
149	93 108	Tank D-927	None	Need One	Closure Plan
149	93 109	Tank D-928	None	Need One	Closure Plan
149	93 110	Tank D-931	None	Need One	Closure Plan
149	93 111	Tank D-932	None	Need One	Closure Plan
149	93 112	Tank D-933	None	Need One	Closure Plan
149	93 113	Tank D-934	None	Need One	Closure Plan
149	93 114	Tank D-971	None	Need One	Closure Plan
149	93 115	Tank D-972	None	Need One	Closure Plan
149	93 116	Tank D-973	None	Need One	Closure Plan
149	93 117	Tank D-974	None	Need One	Closure Plan
149	93 118	Tank D-975	None	Need One	Closure Plan
149	93 119	Tank D-976	None	Need One	Closure Plan
149	93 120	Tank D-980	None	Need One	Closure Plan
174	93 121	Tank D-1081	None	Need One	Closure Plan
174	93 122	Tank D-1082	None	Need One	Closure Plan
174	93 123	Tank D-1083	None	Need One	Closure Plan
174	93 124	Tank D-1087	None	Need One	Closure Plan
174	93 125	Tank D-1088	None	Need One	Closure Plan
180A	93 126	Tank D-1803	None	Need One	Closure Plan
180A	93 127	Tank D-1804	None	Need One	Closure Plan
180A	93 128	Tank D-1805	None	Need One	Closure Plan
180	93 129	Tank D-1809	None	Need One	Closure Plan
180A	93 130	Tank D-1810	None	Need One	Closure Plan
180A	93 131	Tank D-1811	None	Need One	Closure Plan
180A	93 132	Tank D-1813	None	Need One	Closure Plan
180A	93 133	Tank D-1816	None	Need One	Closure Plan
180A	93 134	Tank D-1817	None	Need One	Closure Plan

RCRA Units in Building 771 and Current Closure Status

Room No.	RCRA Unit No.	Description	Part Reg. Status	Type of Closure Plan in Effect	What to Publish Next
180A	93 135	Tank D-1818	None	Need One	Closure Plan
180A	93 136	Tank D-1819	None	Need One	Closure Plan
180K	93 137	Tank D-83	None	Need One	Closure Plan
180K	93 138	Tank D-84	None	Need One	Closure Plan
180K	93 139	Tank D-85	None	Need One	Closure Plan
181A	93 140	Tank D-1401	None	Need One	Closure Plan
181A	93 141	Tank D-1402	None	Need One	Closure Plan
181A	93 142	Tank D-1406	None	Need One	Closure Plan
181A	93 143	Tank D-1407	None	Need One	Closure Plan
181A	93 144	Tank D-1408	None	Need One	Closure Plan
181A	93 145	Tank D-1410	None	Need One	Closure Plan
181A	93 146	Tank D-1411	None	Need One	Closure Plan
180K	93 149	Tank D-80	None	Need One	Closure Plan
180K	93 150	Tank D-81	None	Need One	Closure Plan
180K	93 151	Tank D-82	None	Need One	Closure Plan
114	93 152	Tank D-950	None	Need One	Closure Plan

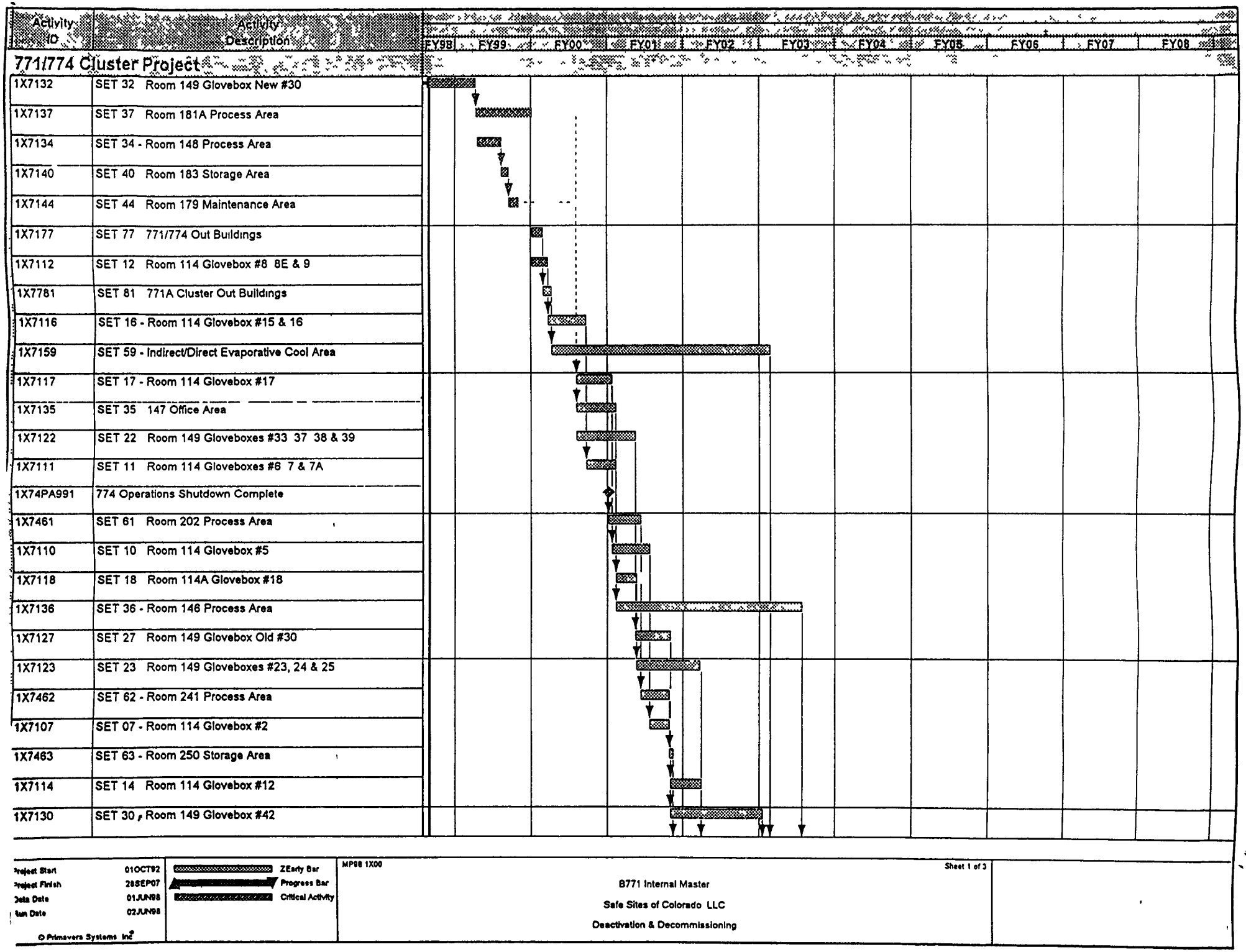
RCRA Units in Building 774 and Current Closure Status

Room No.	RCRA Unit No.	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
241	774 1	Container Storage Area	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
210	774 3A	Misc Waste Solidification (Trtmnt)	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
103	774 3B	Tank T-40	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 201	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 202	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 203	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
241	774 3B	Tank 204	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
220	774 2	Tank T-102	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
220	774 2	Tank T-103	Permitted	Part X of Permit 97-05-30-01	Closure Description Document
202	55.01	Tank T-1A	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 02	Tank T-1RF	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 03	Tank T-4L	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 04	Tank T-10	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 05	Tank T-4R	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 07	Tank T-70	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 08	Tank F-5	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 09	Tank C-1	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 10	Tank T-9	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 11	Tank T-2F	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 12	Tank T-12F	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 22	Vacuum Filter B (Treatment)	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 23	Tank T-73B	Interim Status	I S Closure Plan Pending	Closure Description Document
102	55 24	Tank T-210A	Interim Status	I S Closure Plan Pending	Closure Description Document
202	55 25	Tank T-71	Interim Status	I S Closure Plan Pending	Closure Description Document
103	55 27	Tank 40	Interim Status	I S Closure Plan Pending	Closure Description Document
210	56 01	Tank T-1 Waste Oil Tank	Interim Status	I S Closure Plan Pending	Closure Description Document
210	56 02	Tank T-2 Waste Oil Tank	Interim Status	I S Closure Plan Pending	Closure Description Document
210A	56 03	Tank T-13 Waste Oil Tank	Interim Status	I S Closure Plan Pending	Closure Description Document
210A	56 04	Tank T-14 Waste Oil Tank	Interim Status	I S Closure Plan Pending	Closure Description Document
210	56 05	OASIS-Glovebox Mixer (Trtmt)	Interim Status	I S Closure Plan Pending	Closure Description Document
210	56 07	Tank T-374A Waste Oil Tank	Interim Status	I S Closure Plan Pending	Closure Description Document
UST	55 13 (also	Old Tank T-40	Interim Status	I S Closure Plan Pending	RFCA Decision Document *

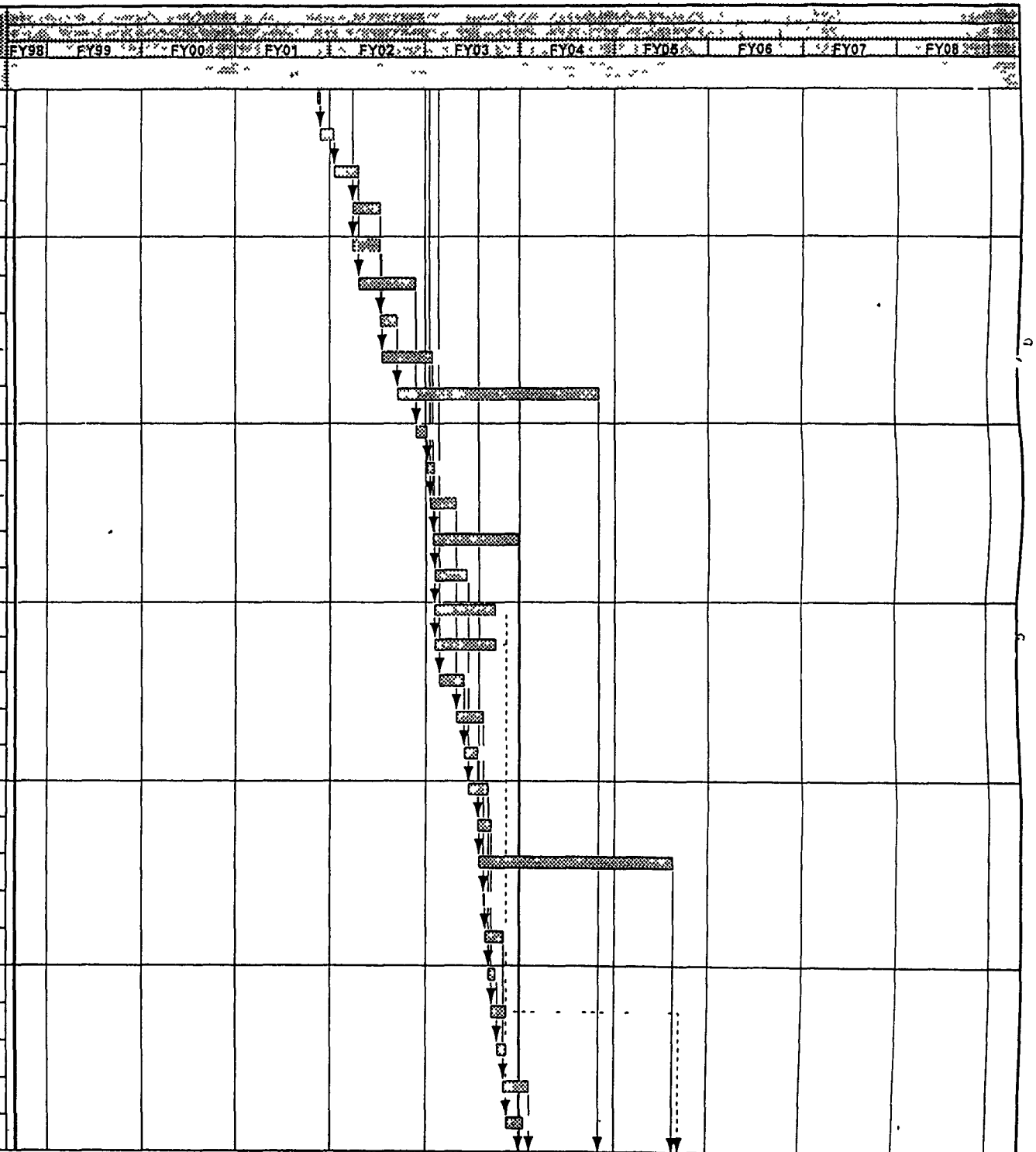
RCRA Units in Building 774 and Current Closure Status

Room No	RCRA Unit No	Description	Unit Reg. Status	Type of Closure Plan in Effect	What to Publish Next
	IHSS 215)				
UST	55 14 (also IHSS 124 2)	Tank T-66	Interim Status	I S Closure Plan Pending	RFCA Decision Document *
UST	55 15 (also IHSS 124 3)	Tank T-67	Interim Status	I S Closure Plan Pending	RFCA Decision Document *
UST	55 16 (also IHSS 124 1)	Tank T-68	Interim Status	I S Closure Plan Pending	RFCA Decision Document *

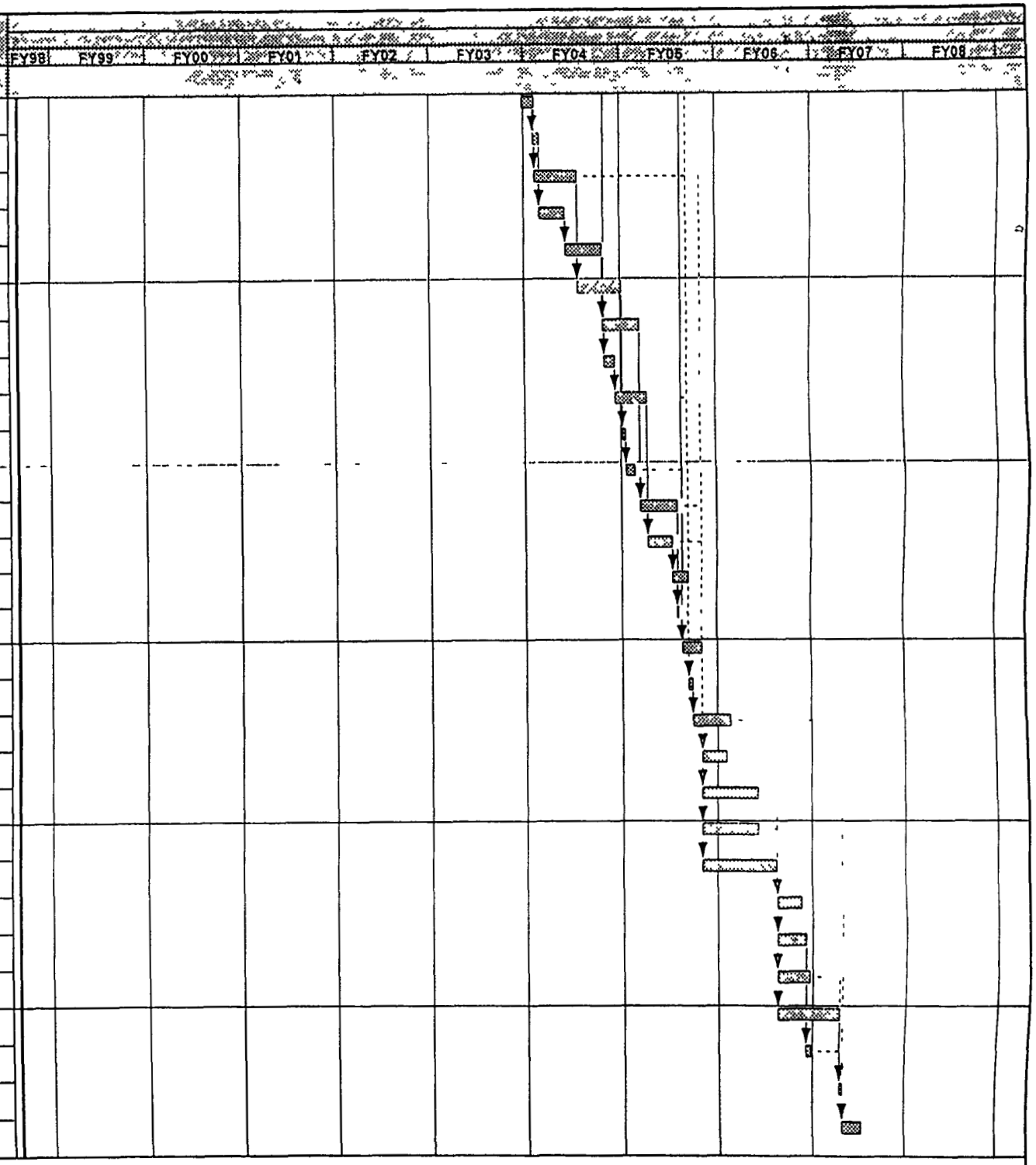
* RFCA Decision Document may or may not be necessary since tanks were drained and filled with foam


Activity ID
Activity Description
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05
FY06
FY07
FY08
771/774 Cluster Project
1X7132 SET 32 Room 149 Glovebox New #30
1X7137 SET 37 Room 181A Process Area
1X7134 SET 34 - Room 148 Process Area
1X7140 SET 40 Room 183 Storage Area
1X7144 SET 44 Room 179 Maintenance Area
1X7177 SET 77 771/774 Out Buildings
1X7112 SET 12 Room 114 Glovebox #8 8E & 9
1X7781 SET 81 771A Cluster Out Buildings
1X7116 SET 16 - Room 114 Glovebox #15 & 16
1X7159 SET 59 - Indirect/Direct Evaporative Cool Area
1X7117 SET 17 - Room 114 Glovebox #17
1X7135 SET 35 147 Office Area
1X7122 SET 22 Room 149 Gloveboxes #33 37 38 & 39
1X7111 SET 11 Room 114 Gloveboxes #6 7 & 7A
1X74PA991 774 Operations Shutdown Complete
1X7461 SET 61 Room 202 Process Area
1X7110 SET 10 Room 114 Glovebox #5
1X7118 SET 18 Room 114A Glovebox #18
1X7136 SET 36 - Room 146 Process Area
1X7127 SET 27 Room 149 Glovebox Old #30
1X7123 SET 23 Room 149 Gloveboxes #23, 24 & 25
1X7462 SET 62 - Room 241 Process Area
1X7107 SET 07 - Room 114 Glovebox #2
1X7463 SET 63 - Room 250 Storage Area
1X7114 SET 14 Room 114 Glovebox #12
1X7130 SET 30 Room 149 Glovebox #42
Project Start 01OCT92
Project Finish 28SEP07
Data Date 01JUN98
Run Date 02JUN98
© Primavera Systems Inc
ZEarly Bar
Progress Bar
Critical Activity
MP98 1X00
Sheet 1 of 3
B771 Internal Master
Safe Sites of Colorado LLC
Deactivation & Decommissioning

Activity ID	Activity Description
771/774 Cluster Project	
1X7464	SET 64 Room 212 Storage Area
1X7465	SET 65 Room 103 Process Area
1X7466	SET 66 Room 102 Process Area
1X7131	SET 31 Room 149 Gloveboxes #43A, B, C & D
1X7115	SET 15 Room 114 Glovebox #13 & Old 14
1X7467	SET 67 Room 210 Process Area
1X7121	SET 21 - Room 149 Process Room & C-Cell
1X7108	SET 08 Room 114 Glovebox #3
1X7143	SET 43 Room 180A-F & K Process Area
1X7468	SET 68 Room 200 Dock Area
1X7469	SET 69 Room 203 Process Area
1X7126	SET 26 Room 149 Glovebox #29
1X7106	SET 06 Room 114 Glovebox #1
1X7470	SET 70 Room 341 Utilities Area
1X7474	SET 74 774 HVAC
1X7476	SET 76 - 774 Utilities All
1X7103	SET 03 Locker Room Area
1X7124	SET 24 Room 149 Glovebox #26
1X7101	SET 01 Corridor B Office Area
1X7471	SET 71 - Room 441 Utilities Area
1X7102	SET 02 - Corridor F Office Area
1X7138	SET 38 - Room 182 Process Area
1X7125	SET 25 - Room 149 Glovebox #27
1X7133	SET 33 - Room 149 Tank Farm
1X7472	SET 72 - Room 320 Utilities Area
1X7104	SET 04 - 129 Maintenance Area
1X7473	SET 73 - Rooms 200-300 Office Area
1X7129	SET 29 - Room 149 Glovebox #40 & 44
1X7475	SET 75 - 774 Cluster Fac , Structures & Cap

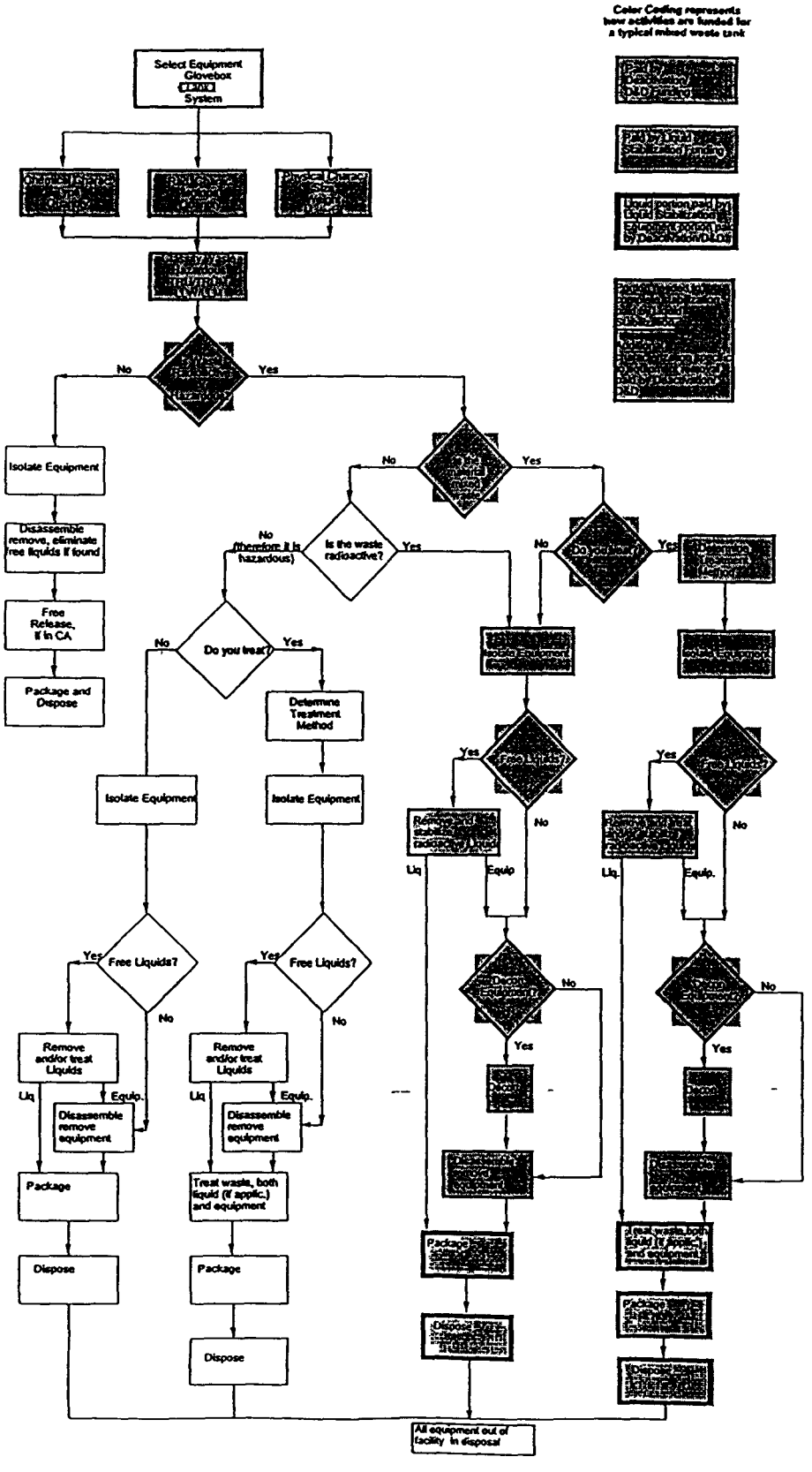


Activity ID	Activity Description
771/774 Cluster Project	
1X7109	SET 09 Rm 114 Gloveboxes #4, 5A, 9A & 24
1X7151	SET 51 149 Utilities Support Area
1X7113	SET 13 Room 114 Glovebox #11 & New 14
1X7128	SET 28 Room 149 Gloveboxes #31 & 50
1X7145	SET 45 Room 174 Process Area
1X7105	SET 05 Room 141 (Infinity Room)
1X7148	SET 48 153 Process Area
1X7179	SET 79 Room 114/114A Process Rooms
1X7150	SET 50 158 Lab Area
1X7119	SET 19 Elevator Area
1X7120	SET 20 Annex Area
1X7146	SET 46 164 Lab Area
1X7141	SET 41 Room 186 Process Area
1X7142	SET 42 180 Office Area
1X7149	SET 49 157 Stock Room Area
1X7139	SET 39 - Room 182A Process Area
1X7147	SET 47 151 Radiation Control Area
1X7158	SET 58 - Corr A D,E G H Strwls 1-3 Util & Tnnl
1X7155	SET 55 235 HVAC Supply & Utilities Area
1X7160	SET 60 771 HVAC
1X7176	SET 76 771 Utilities All
1X7156	SET 56 249 HVAC Exhaust & Utilities Area
1X7152	SET 52 190 Deluge Process Area
1X7178	SET 78 Room 181A Size Reduction Area
1X7153	SET 53 Main Plenum Area
1X7154	SET 54 283 HVAC Exhaust & Utilities Area
1X7180	SET 80 Room 183 Drum Counter
1X7157	SET 57 309 Tank Area
1X7175	SET 75 - 771 Cluster Fac , Structures & Cap ,



Appendix 8 Equipment Removal Flowchart

Equipment Removal Flowchart



Appendix 9 Set Description, End Points and Hazards Matrix

Appendix 10 Comments and Comment Disposition Summary

ADMIN RECORD

Appendix 10
Building 771 DOP Comment Resolution

No	Commentor	Location	Comment	Comment Disposition
1	Schuetz	Pg x Executive Summary	Does the "771 Closure Waste Management Plan exist?	No The Plan does not exist Reference removed
2	Schuetz	Pg 1-1, Introduction	RFCA does not require LRA approval of the RLCR, only the DOP The last sentence identifies the cluster as one building, which should be corrected to be consistent with the Section 2 description	Changed to reflect comments
3	Schuetz	Pg 1-1 Background	Add other to actinides, since plutonium is also an actinide	Changed to reflect comments
4	Schuetz	Pg 2-1 Building/Cluster Description	Clarify how the "demolition and remediation" phase will be revised into this DOP Will it include a public review cycle prior to execution?	Changed to reflect comments
5	Schuetz	Pg 2-4 Figure 2-1	Is it possible to improve this diagram before it is sent to the public?	Attempting to find new diagram Not changed currently
6	Schuetz	Pg 4-1 Project Approach	Add consolidation after stabilization and replace removal with "off-site shipment"	Changed to reflect comment
7	Schuetz	Pg 4-1 Strategic Project Phases	First sentence, replace new with "more efficient" and in the second sentence, replace typical with "sequential" In the third sentence, add "expected to be" after approach is	Changed to reflect comments
8	Schuetz	Pg 4-2 Strategic Project Phases	The reference to Phases I-IV would be better connected to the preceding Figure 4-1 if the figure had the Phases identified in it	Currently not able to open graphic file Will continue to work on this
9	Schuetz	Pg 4-5 Section 4-4	Clarify the implementation of this "Characterization Protocol" for this project	Changed to reflect comments
10	Schuetz	Pg 4-5 Section 4-4	This section needs to explain that the contaminants will be demonstrated to be at levels acceptable for demolition	Changed to reflect comments
11	Schuetz	Pg 4-5 Section 4 6 2 2	Identify and reference the issued SNM Holdup Measurement Plan	Changed to reflect comment
12	Schuetz	Pg 4-12 Section 4 6 2 2 1	Delete EPA	Changed to reflect comment
13	Schuetz	Pg 4-14 Section 4 6 2 2 4 2	Add a "Lessons Learned Report" to the list	Changed to reflect comment
14	Schuetz	Pg 4-17, Section 4 8	Where this section describes the determination of readiness, add that LRA involvement will include the consultative process and implement the RDM	Changed to reflect comment
15	Schuetz	Pg 6-3, Section 6.8	Clarify that this waste will be disposed iaw the solid waste regs	Changed to reflect comment
1 6	Schuetz	Pg 6-4, Section 6 9	Add to the beginning of the third sentence "Containerized or packaged	Changed to reflect comment

Appendix 10
Building 771 DOP Comment Resolution

No	Commentor	Location	Comment	Comment Disposition
17	Schuetz	Pg 6-5, Section 6 11	This specific "Consent Order" is not familiar Please identify with number and date and add to references	Changed to reflect comment
18	Schuetz	Pg 6-7, Section 6 14	Appendix 10 is used for review Comments and the document does not seem to have an IHSS list anywhere	Changed to reflect comment
19	Schuetz	Pg 7-2, Section 7 2	This requirement should be checked out. I recall that the controls can not be relaxed until the tanks are physically empty See the Mixed Residue Tank Management Plan	Changed to reflect comment
20	Schuetz	Pg 7-2, Section 7 3	Delete one of the "treatment to" statements	Changed to reflect comment
21	Schuetz	Pg 7-2, Section 7.4	The first sentence describes a "project decontamination pad and "site-wide Decontamination Facilities (located in the contractors yard)" Where are these specifically located?	Changed to reflect comment
22	Schuetz	Pg 7-3, Section 7 5	The second paragraph is confusing If the wastewater is acceptable for treatment, why can it be directly discharged?	Comment noted
23	Schuetz	Pg 7-3, Section 7.6	In the first sentence, "Regulation 8" of what?	Changed to reflect comment
24	Schuetz	Pg 7-4, Section 7 8	Hasn't the DOE Order 5400 5 been replaced with a CFR? Table 7-1 should be fixed also	Changed to reflect comment
25	Schuetz	Pg 8-1, Section 8 1 1	In the second paragraph, several parentheticals (B1 16), (B1 23), (B1 27), (B1 28) are included What are these referring to?	No change made These numbers are the task numbers which are preceded by the task in the document
26	Schuetz	Pg 8-3, Section 8 1 4	The third paragraph identifies "the 771/774 Closure Project drainage sub-basin" What is this referring to	Greg Meyers to discuss with Schuetz
27	Schuetz	Appendix 2	Add Physically Empty to the list.	Changed to reflect comment
28	Schuetz	Appendix 6	Clarify Unit 771 1 with specific information for rooms, vaults and gloveboxes	Changed to reflect comment
29	Schuetz	General	Scope of the document is not clearly defined 1 There exist confusing and sometimes conflicting statements about the scope 2 The starting point for decommissioning activities is not defined This is important not only from several standpoints including regulatory compliance, waste management (process vs Remediation waste, demands by CDPHE that it be defined Consider including key deactivation endpoints for each set by adding another column to the tables in Appendix 9	The general overall changes made to the document will clarify these comments Changes to Appendix 9 were made by utilizing an * for these items

Appendix 10
Building 771 DOP Comment Resolution

No	Commentor	Location	Comment	Comment Disposition
30	Schuetz	General	An assessment needs to be made by the RFFO NEPA compliance officer to determine if the document adequately covers the activity One specific area that needs to be looked at is the coverage of transportation of wastes generated by this activity	Comment noted
31	Schuetz	Pg 2-11 Section 7 2	1 Based on CDPHE's process vs Remediation waste letter, the inspection frequency will likely cause a negative reaction 2 the issue of waste management is very important and conflicts ARAR and waste sections seem to be largely resolved However, it still appears that the waste management issues haven't been resolved or well thought out. For example the second paragraph should explain the criteria that would make it "necessary" to use a TU and why the decision cannot be made now	Comment noted
32	Schuetz	Appendix 2	Definition of decommissioning is overly broad and broadens the scope of the document (see comment #1) Also, its lineage is highly questionable Why is it necessary to redefine a term that is already defined in RFCA?	Changed to reflect comment
33	Schuetz	Pg 6-7 Table 6-1	All waste volumes should be in cubic meters and this table seems misplaced	Comment noted
34	Schuetz	Pg 6-3 Section 6 8	Seems to be several over-commitments in this section	Comment noted
35	Gerdeman	Pg x Executive Summary	Why are we preparing a separate waste management plan? What is the driver	Comment noted
36	Gerdeman	Pg ix Executive Summary	1 The fourth bullet appears to be a direct conflict with Tim Howell's stance on submitting a separate demolition plan and it conflicts with a statement related to a DOP revision on page 2-1 2 The phases need to conform exactly with those listed in the RLCR and the decommissioning strategy	1 Changed to reflect comment 2 Comment noted
37	Gerdeman	Pg 4-5 Section 4 4	Scope and use of the RLCR is broader than required by RFCA Reassess if the report ill be used as stated Same comment applies to similar statements in the RLCR itself	Changed to reflect comment.

Appendix 10
Building 771 DOP Comment Resolution

No	Commentor	Location	Comment	Comment Disposition
38	Gerdeman	Pg 4-6 Section 4 4	1 The reference to 272 appears to be an error 2 Recheck commitment, rewrite sentence to clarify and specify the drivers for the survey and/or release criteria	1 Changed to reflect comment 2 Changed to reflect comment
39	Gerdeman	Pg 4-10	Submitting separate closure plans appears to be an unnecessary expense and over commitment Specifically state why this approach is being taken	Comment noted
40	Gerdeman	Pg 4-11 Section 4 6 2 2 1	The deactivation end points will likely start the usual argument Suggest deleting or explaining them (See also, suggestion in comment #1)	Comment noted
41	Gerdeman	RLCR comment	Need to explain that document is being produced at early deactivation stage vs Beginning of decommissioning as envisioned in RFCA	RLCR comments not addressed
42	Gerdeman	RLCR comment (page 11)	1 Do not concur with statement that a process similar to DQO was used and no explanation of the process that was used is included to back up the assertion 2 Why is the EPA definition of the DQO process included when you did not follow it? Seems disingenuous	RLCR comments not addressed
43	Gerdeman	RLCR comment	Improved, but still confusing mixing of terms like hazardous material, hazardous substance, chemical, contaminants, hazardous contaminants, radionuclide, SNM, isotope, radioactive substance, oils, oils and lubricants, oils in the form of lubricants, oil lubricants, lubricating oils	RLCR comments not addressed
44	Gerdeman	RLCR comment	List of possible PCB sources still does not conform with what is in the DOP	RLCR comments not addressed
45	Gerdeman	RLCR (page 12) comment	Very concerned about statement about potential for new unrelated hazards is also possible Need to bound	RLCR comments not addressed
46		Pg 2-1 Section 2	This table provides a list of buildings and structures each with an identifier number It is not clear how this list correlates with the set numbers designations described later in the document or how priorities are applied to these structures Consider adding a statement referring to the more detailed descriptions in Appendix 9 and workset priorities in Appendix 4	Comment noted

Appendix 10
Building 771 DOP Comment Resolution

No.	Commentor	Location	Comment	Comment Disposition
47		Pg 4-4 Section 4 2	The last sentence of the first paragraph states that a complete list of prioritized sets is located in Appendix 9 However, the list in Appendix 9 is not prioritized The prioritized list is provided in Appendix 4 Both lists should be referred to for clarity	Changed to reflect comment
48		Pg 4-5 Section 4 4	The characterization process as described in this section is inadequate • This section states that if additional characterization is needed (beyond gathering of existing information) then this characterization (e g material sampling) may be conducted in process (i e after work has begun) If additional characterization is needed, this should be completed before work begins • This section does not state what process will be used for data collection and analysis For example, if the EPA's Data Quality Objectives process will be used, this should be stated • This section does not indicate how characterization data will be used to plan and control work	Comments noted
49		Pgs 5-2 & 5 3 Section 5 2	This section on Assessment of Hazards does not mention criticality (e g from SNM holdup), fire or electrical hazards	Comment noted
50		Pg 7-3 Section 7 5	This section states that wastewater will be transferred to the Consolidated Water Treatment Facility (B891) for treatment The Consolidated Water Treatment Facility does not currently exist and plans for this project have been canceled	Changed to reflect comment
51	Gilbreath		Request copy of building map with sets identified	UNCI information Will be provided to Chris Gilbreath only
52	Gilbreath		As previously discussed, additional language regarding transition from deactivation to decommissioning is necessary for activities including tap and drain, rip and strip, waste removal SNM holdup, etc	Changed to reflect comment

Appendix 10
Building 771 DOP Comment Resolution

No.	Commentor	Location	Comment	Comment Disposition
53	Gilbreath	Pg 2-1	Demolition or remediation activities are not included as part of this DOP, they will be added in a future revision to the DOP Define what information will be added (generically) when and how the information will be incorporated and approved Public comment period should be planned	Changed to reflect comment
54	Gilbreath	Pg 4-2 Section 4 1 2	This DOP will at some point include Phase V	Changed to reflect comment
55	Gilbreath	Pg 4-5	Status of Site Characterization Protocol?	Will be provided to Chris Gilbreath when available
56	Gilbreath	Pg 4-5	Final building survey, define established release criteria, MARSSIMs, NUREG 1 86 Define submittal and approval mechanism for final survey detail demolition plan	Changed to reflect comment
57	Gilbreath	Pg 4-6	Independent survey, yes or no?	Changed to reflect comment
58	Gilbreath	Pg 4-7	Measurement plan, to be developed in accordance with what guidance? DOE Order, NRC, other?	Changed to reflect comment
59	Gilbreath	Pg 4-8	Submit Be and Pb sampling plan to LRA What Pb sampling is planned?	Changed to reflect comment Plans will be provided to Chris Gilbreath when available
60	Gilbreath	Pg 4-10	Further detail on size reduction, location, size, type, etc	Changed to reflect comment
61	Gilbreath	Pg 4-12	Waste chemical removal, to be removed prior to decommissioning	Changed to reflect comment
62	Gilbreath	Pg 4-14	Add "lessons learned" section	Changed to reflect comment
63	Gilbreath	Pg 4-17	Incorporate consultative process language Elaborate on determination of readiness Is this an RA, management review or other?	Changed to reflect comment
64	Gilbreath	Pg 6-2	What is the decommissioning vs disposal decision based on? Provide criteria and or/program used	Changed to reflect comment
65	Gilbreath	Pg 6-4	Define the ARARs for newly generated remediation waste See CDPHE guidance letter	Changed to reflect comment
66	Gilbreath	Pg 7-2	TU - see notes	Changed to reflect comment
67	Gilbreath	Pg 7-4	Provide PCB management plan once developed	Plan will be provided to Chris Gilbreath when developed

Appendix 9

1	Corridor B Office Area This set includes all of Corridor B and Offices 116 117, 117A, 118 119 119A 119B 119C 119D 124 125 125A 125B 125C 125D 125E, 126 126A and 126B Room 116 contains the connection point to the plant fiber optics system Asbestos containing materials are expected to exist in building components such as wall board, thermal systems insulation and solid surfacing components	Ensure sanitary drains in rooms 124 and hallway are isolated Remove/dispose 771B office areas HVAC supply and recirculation ducting Remove/dispose HVAC supply fan S 11 in room 124 Remove/dispose steam heating coils for HVAC supply S 11	Asbestos sampling	None	PPE	Free Release
2	Corridor F Office Area This set includes Room 103 104 105 105A, 105B 107 109 110 110A and 110B Corridor F Criticality Panel and walls Asbestos containing materials are expected to exist in building components such as wall board, thermal systems insulation and solid surfacing components CFC s exist in window air conditioners	Ensure sanitary drains in room 110A are isolated Remove/dispose freon from roof mounted A/C unit for HVAC supply S 10 Remove/dispose steam heating coils for HVAC supply S 10 Remove/dispose corridor F office areas HVAC supply and recirculation ducting Remove/dispose roof mounted A/C unit for HVAC supply S 10 Remove/dispose HVAC supply fan S-10 in room 110 Remove/dispose HVAC exhaust fan and associated ducting in room 110	Asbestos sampling Sampling cooling system for CFC s	None	PPE	Free Release
3	Locker Room Area This set includes both the Men s and Woman s locker rooms, the janitor s closet and the laundry	*Ensure sanitary drains (sinks, showers and toilets) are isolated.	Asbestos sampling	PPE	Free Release, LLW	

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	cage in the Men s locker room. This equipment consists of lockers benches and plumbing fixtures Asbestos containing materials are expected to exist in building components such as wall board, thermal systems insulation and solid surfacing components					
4	129 Maintenance Area this set includes Room 129 129A 129B 129C, 129D 129F 130 131 132 and 132A Dock 2 machine tools wall and roof Asbestos containing materials are expected to exist in building components such as wall board, transite, stems insulation and solid surfacing components Lead shielding was machined and formed in the maintenance area CFC s such as freon was used for refrigerant in Air conditioners and was stored in the Maintenance area. PCB s may exist as a result of historical storage of electrical components	Ensure sanitary drains in room 129 are isolated Remove/dispose freon from A/C unit located on a platform in room 129 Remove/dispose compressed gas cylinders and associated piping Remove spare parts, stock items and hand tools Remove/dispose steam heating coils for HVAC supply S 12 Remove/dispose A/C unit for HVAC supply S 12 Remove/dispose HVAC supply fan S-12 in room 129 Remove/dispose 129 HVAC supply ducting. *Remove/dispose ventilation hoods (4) in rooms 129 and 131 *Remove/dispose fabrication equipment.	Asbestos sampling Radiological surveys Sample oil lubricants for radioactive Sample for CFC s and PCB s Sample for lead	None	PPE	Free Release LLW

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		Remove/dispose HVAC exhaust fans and ducting associated with ventilation hoods (4) in rooms 129 and 131				
5	**Room 141** This set includes Room 141 concrete pedestals, concrete walls and presents a significant Pu contamination problem Room 141 was an SNM storage vault and then a pump room Operational problems with the pumping operation on Room 141 resulted in radionuclide bearing acidic solution spills that contaminated the concrete floor and pedestal The contamination occurrences were so great that the operation was eventually phased out. Subsequent remediation actions to remove the contaminated concrete resulted in high airborne concentrations of Pu and the room was eventually sealed. Lead shielding existed during the pump operation period. It is expected that acid spills may have deposited lead contamination in the concrete structures It is estimated that several grams of SNM hold-up are present in the room and structures	Remove material from Infinity room (141) to minimize waste and costs associated with packaging and management for those high level wastes Remove fiber pacs from the room. Remove radioactive and hazardous materials to preclude additional exposure during forth coming phases	Radiological surveys for Pu and U Sample for lead and acid SNM hold up evaluation	Potential high radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM
6	**Room 114 Glovebox 1** This set includes glovebox 1 Tanks D-705 D 706 D-713 D 714 D-715 D-716 D 764 and D 765 piping and valves Glovebox 1 was used to precipitate Am for solution and is highly contaminated. Am is a contaminant of the Pu process Glovebox 1 was used to purify the Am stripped from the Pu processes Pu and Am contamination exists as a result of the processing and several grams of SNM hold-up exists in this system. Lead shielding such as plate, gloves and leaded glass windows are present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed lines to the process. Oxalic acid was used in the precipitate process Additionally ammonium thiocyanate was used as a reagent chemical in the process Residual quantities of these chemicals may	Drain/dispose of cold solutions in piping Remove/dispose stored containerized chemicals *Remove/dispose of loose SNM from glovebox and equipment. *Disconnect/isolate electrical feeds *Disconnect/isolate piping *Remove/dispose of equipment in glovebox.	Sampling for Asbestos and lead Radiological surveys for Pu and Am. SNM hold up evaluation. Chemical sampling for ammonium thiocyanate, acids and basics	Potential high radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	exist.	Remove/dispose of glovebox Remove/dispose of tanks air mover and pump				
7	Room 114 Glovebox 2 This set includes Glovebox 2 piping and the shielded drum storage area on the south wall of Room 114 Glovebox 2 was used for Pu metal dissolution and other miscellaneous processing Pu contamination in this system is a result of the purpose of the system itself, several grams of SNM hold up exist in the dissolution system. The dissolution process included the use of acid Lead hielding such as plate, gloves and leaded glass windows are present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process Small quantities of U was processed in this system in the 1960 s and should be considered when planning removal actions	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and associated piping Drain/dispose of process solutions in piping from glovebox. Remove/dispose of loose SNM from glovebox and equipment. Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping. Remove/dispose glovebox. Remove/dispose off-gas and ventilation ducting *Remove/dispose equipment internal to glovebox.	Sampling for Asbestos and lead Radiological surveys for Pu and Am SNM hold up evaluation Chemical sampling for ammonium thiocyanate acids and basics	Potential high radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM
8	Room 114 Glovebox 3 This set includes Glovebox 3 vault storage areas and hot tool storage cabinets. Glovebox 3 was the dissolution line for Plutonium Oxides	*Remove/dispose of loose SNM in glovebox.	Radiological surveys for Pu	None	PPE Additional	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

Appendix 9

	Plutonium oxide was dissolved in heated acid and residual contamination including multiple kilograms of SNM hold up exist Lead shielding such as plate gloves and leaded glass windows are present Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process	*Disconnect/isolate piping connections to glovebox Disconnect/isolate electrical feeds to glovebox Remove/dispose vessels in glovebox Remove/dispose process piping to glovebox Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose off gas and ventilation ducting legs	Sampling for Asbestos and lead SNM hold up evaluation Chemical sampling for Acids		radiological controls ALARA principles	
9	Room 114 Gloveboxes 4 5A, 9A and 22 This set includes Gloveboxes 4 A, 9A and 22 tanks D-6 and D-967 piping, valves, motors and control panels Gloveboxes 5A and 9A contain vacuum pumps for lines 16 & 5 Glovebox 4 contains a blower for the pneumatic transfer system. Oil is expected to be contained in equipment reservoirs and lubricated components. Gloveboxes 5A and 9A are both H4 Nash vacuum systems Pu bearing acidic and basic solutions were drawn into the vacuum systems. Nash vacuum pumps utilizes a water based seal liquid that was also passed through a heat exchange system. Asbestos in the form of thermal systems insulation is expected to be present on the heat exchange system. Glovebox line 22 was used to burn Pu metal chips to produce oxide. Be metal coatings may have existed with the Pu. Several hundred grams of SNM hold	Drain/dispose of cold solutions in piping. Drain/dispose of process solutions in vessels *Drain/dispose of process solutions in piping. Remove/dispose loose SNM in glovebox. *Disconnect/isolate electrical feeds *Disconnect/isolate piping connections to/from glovebox *Remove/dispose vessels in glovebox.	Radiological surveys for Pu Sampling for Asbestos and lead. SNM hold up evaluation Sampling for Beryllium. Sample oil lubricants for radioactive contamination Chemical sampling for Acids	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	up are known to exist in these gloveboxes Lead shielding such as plate gloves and leaded glass windows are present	Remove/dispose process piping to/from glovebox Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose off gas and ventilation ducting legs Remove/dispose of vessels				
10	**Room 114 Glovebox 5** This set includes Glovebox 5 Tanks D-548 D 549 D 550 D-551 D-552,D-609 and D 610 This system was a hot nitric acid spray leaching system used to remove (leach) metals from Pu objects and fixtures U and Be metals were removed from Pu components through acid dissolution There are 3 spray leach hoods 2 FulFlo filters and a heat exchanger Multiple kilograms of SNM hold-up exists in process lines and equipment. Asbestos in the form of thermal systems insulation is expected to be present on the heat exchange system. Benelex and lead shielding is present on this glovebox. Oil is expected to exist in equipment reservoirs	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds *Remove/dispose vessels in glovebox Remove/dispose process piping. Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. *Remove/dispose equipment internal to	Radiological surveys for Pu and U Sampling for Asbestos SNM hold up evaluation. Sampling for Beryllium. Chemical sampling for Acids Sample oil lubricants for radioactive contamination	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		glovebox Remove/dispose vessels				
11	**Room 114 Gloveboxes 6 7 7A** This set includes Gloveboxes 6 7 and 7A Tank D 7 cinderblock shielding walls electrical control panels pumps piping and valves Glovebox 7A contains the Nash Vacuum pump for Lines 6 and 7 Glovebox contains the Hydrofluorinator and Glovebox 6 has the Flourinator Hydrofluorinator Scrubber The main feed for this system consisted of Pu bearing solids resulting in contamination of the process system. Multiple kilograms of SNM hold-up exists in these systems Hg may be present in analytical instruments Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process Lead in the form of shielding of the glovebox walls, gloves and windows is present. Oils are expected to be present in equipment reservoirs KOH (potassium hydroxide a basic solution) was used to scrub the acidic off gasses from the hydrofluorinator	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping *Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. Remove/dispose vessels	Radiological surveys for Pu Sampling for Asbestos SNM hold up evaluation Chemical sampling for Acids and Mercury Sample oil lubricants for radioactive contamination	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
12	**Room 114 Gloveboxes 8, 8E, 9** This set includes Gloveboxes 8 8E and 9 piping and valves These were used for storing calcined Pu oxide. Containers were moved by pneumatic transfer from other process lines to these boxes for storage of Pu oxide. Lead in the form of shielding of the glovebox walls, gloves and windows is present. Multiple kilograms of SNM hold-up exist in the	*Disconnect/isolate electrical feeds Remove/dispose equipment internal to glovebox. Remove/dispose glovebox.	Radiological surveys for Pu. Sampling for lead SNM hold up evaluation.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	transfer lines and filters	Remove/dispose off gas and ventilation ducting legs Remove/dispose of loose SNM material				
13	**Room 114 Gloveboxes 11 (New) 14** This set includes Gloveboxes 11 and 14 (new) Tanks D 507 D-508 D 509 D 510 Glovebox 11 was used for evaporating Pu nitrate solutions Equipment used in this process includes tanks pipes pumps evaporator and condenser Pu contamination exists as a result of the operation of this process several hundred grams of SNM hold up exists Acids may exist in process piping and vessels Mercury may be present in analytical instruments Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process CFC s may be present in process cooling equipment. Lead in the form of shielding of the glovebox walls gloves and windows is present Oils are expected to be present in equipment reservoirs	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox *Remove/dispose equipment internal to glovebox. Remove/dispose vessels	Radiological surveys for Pu Sampling for Asbestos and lead SNM hold up evaluation Chemical sampling for Acids and Mercury Sample oil lubricants for radioactive contamination Sample waterwalls for Chromates	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
14	**Room 114 Glovebox 12** This set includes Glovebox 12, valves, piping, Tanks D 949 D-950 D-951 D-952, D-953 D-954 D-955 D-546 D-547 D-553 and D-554 Also included is shielding wall around the tank farm. Pu nitrate from various sources was stored in these tanks The glovebox was used as a sampling station for those tanks	*Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. Remove/dispose of loose SNM material	Radiological surveys for Pu Sampling for Lead Chemical sampling for	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	listed above. Benelex a id lead shielding around the tanks and gloveboxes is present Pu contamination is present in all of the tanks piping and the glovebox	Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels	Acids			
15	**Room 114 Glovebox 13 and (Old) 14** This set includes Glovebox 13 which is attached to Glovebox Old 14 and Tanks D-500 D-501 D-502, D 503 D-504 D 505 D-506 D-507 D-508 D-509 D-510 D-544 and D-545 Also included is a shielding wall around the tank farm and piping in the overhead. Glovebox 13 is a piping manifold system used for batching solutions for the precipitation process Lead in the form of shielding of the glovebox walls, gloves and windows is present. Various contaminants of concern associated with other processes in B771 are also expected to be present. Several hundred grams of SNM hold-up is present in this system. Glovebox 14 (old) contains a steam heated evaporator used to concentrate plutonium solutions for batch processing. Nitric acid Pu bearing solutions were the primary feed for	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping Remove/dispose off-gas and ventilation	Radiological surveys for Pu and U Sampling for Asbestos and lead SNM hold up evaluation Chemical sampling for Acids Sample oil lubricants for radioactive contamination Sample water for Chromates	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
* Deactivation activities

Appendix 9

	this process, several hundred grams of SNM hold-up exists in process equipment Lead in the form of shielding of the glovebox walls gloves and windows is present Additional benelex shielding is present on the glovebox and surrounding the associated tank farm Oils are expected to be present in equipment reservoirs Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process	ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels				
16	**Room 114 Glovebox s 15 and 16** This set includes Gloveboxes 15 and 16 electrical control panels pumps piping and valves Glovebox 15 was used for Pu peroxide precipitation and Glovebox 16 was used for calcination of plutonium peroxide to Pu oxide Glovebox 15 is a purification step for solutions from high level dissolution Thi.. process uses tanks, pumps pipes various filters, vessels and a precipitation digester Pu contamination in this system is a factor of the purpose of the system itself. Several hundred grams of SNM hold-up exist in line 15 equipment. Acids including nitric and sulfuric were used in this process. Oils are expected to be present in equipment reservoirs Lead in the form of shielding of the glovebox walls, gloves and windows is present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process. CFC s are present in the precipitator digester cooling systems. Glovebox 16 removes excess nitric acid moisture from the Pu peroxide cake formed in the precipitation process The process uses a screw feeder rotary tube calciner scrubber filter hot plate, scale and transfer system. Pu contamination in this system is a factor of the purpose of the system itself. Multiple kilograms of SNM hold-up are present in the line 16 systems. Mercury may exist in	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox	Radiological surveys for Pu Sampling for Lead SNM hold up evaluation Chemical sampling for Acids Sample oil lubricants for radioactive contamination Sample cooling system for CFC s	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	analytical instruments Lead in the form of shielding of the glovebox walls gloves and windows is present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process					
17	**Room 114 Glovebox 17** This set includes Room 112 and 114B Glovebox 17 two motor generator sets ovens and control panels This set contains the glovebox system for Reduction and Button Break Out. This glovebox system was inerted with nitrogen when it was operational The process was to convert Pu tetraflouride to Pu metal Several hundred grams of SNM hold-up exist in the glovebox and associated equipment This process resulted in contamination of the process components Additional operations included machining of the Pu metal to collect QA samples Oils may exist as cutting fluids or in equipment reservoirs Lead in the form of shielding of the glovebox walls, gloves and windows is present.	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. *Remove/dispose tools and unattached equipment. *Drain/dispose water from shielding walls and doors around lines 6, 7 11 new 14 15 16 and 17 in rooms 114 and 114B	Radiological surveys for Pu Sampling for Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Sample water for Chromates	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

Appendix 9

		Remove/dispose calcium metal in storage cabinet located in room 114B Remove/dispose Pyrotechnic material box for initiators located in room 114B Remove/dispose freon from refrigeration unit in line 11 Remove/dispose Nitrogen bottle rack and associated piping located in room 114B Disconnect/isolate HVAC ducting to the hot tool storage cabinets in room 114 Remove/dispose room 114 hot tool cabinet off gas and ventilation ducting legs Remove/dispose pumps Remove/dispose hot tool storage cabinets Remove/dispose crucible oven in room 112 Remove/dispose computer control panel in room 112. Remove/dispose pumps and associated piping Remove/dispose oxygen analyzer and piping in room 114B				

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

Appendix 9

		Remove/dispose zero gas bottle cabinet and piping in room 114B Remove/dispose refrigeration unit in the east end of line 11				
18	Room 114A Glovebox 18 This set includes Glovebox 18 Tanks D 70 D 71, D 72 and D 73 motors pumps piping and valves Glovebox 18 contains two H6 high volume Nash Vacuum pumps to produce negative pressure to transfer radionuclide bearing acidic solutions This is commonly known as the 'House Vacuum System' Pu and U contamination of the pumps and the glovebox is a result of system operation Oils such as lubricants exist in process equipment. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process Lead in the form of shielding on the glovebox walls gloves and windows is present.	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated	Radiological surveys for Pu and U Sampling for Asbestos and Lead Sample oil lubricants for radioactive contamination Sample water for Chromates Chemical sampling for Acids	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		piping				
19	**Elevator Area** This set includes Rooms 142 145 and 242 electrical control panel elevator cage and hydraulic unit The presence of oils is expected in equipment reservoirs and as a lubricant on machine parts	Drain/dispose cold solutions in pumps and associated piping Drain/dispose process solutions in pumps and associated piping Remove/dispose pumps and associated piping Remove/dispose material from sump (raschig rings) underneath elevator	Sample oil lubricants for radioactive contamination	None	PPE	LLW
20	**Annex Area** This set includes Rooms 301 302 303 304 305 and 306 Drum counters and scales exhaust fans and motors interior walls and doors Oils in the form of lubricants on equipment and other machinery exist. Fixed radionuclide contamination is present as a result of past operations Lead shielding is present in the material storage areas	*Remove/dispose tools and unattached equipment. Remove/dispose HVAC fan HV 1 in room 303 Remove/dispose HVAC filters Remove/dispose of drum counters (3) Remove/dispose HVAC fans and motors F 5 F-6 F-8 and F 9 on the annex roof	Radiological surveys for Pu U and Am. Sampling for Lead Sample oil lubricants for radioactive contamination	None	PPE	LLW LLMW
21	**Room 149 Process Room and C-Cell** This set includes the Contamination Control Cell and Air Handling Unit. Radionuclide contamination exists on exposed surfaces of the contamination control cell as a result of past operations	Remove/dispose storage bins in room 149 *Remove/dispose ethylene glycol from dual refrigeration unit in room 149 *Remove/dispose freon from dual refrigeration unit in room 149	Radiological surveys for Pu, U and Am.	None	PPE Additional radiological controls ALARA principles	LLW TRU

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		Drain/dispose process solutions in pumps and associated piping Disconnect/isolate HVAC ducting to C Cell located in room 149 Remove/dispose pumps and associated piping Remove/dispose dual refrigeration unit Remove/dispose C-Cell HVAC off gas and ventilation ducting legs				
22	**Room 149 Gloveboxes 33 37 38 and 39** This set includes Gloveboxes 33 37 38 and 39 and Tanks D-5 D 176 D-177 This system was used to incinerate Pu contaminated combustibles Glovebox 33 is a caustic fume scrubber filtration system It is expected to contain residual radionuclide bearing acids and bases remaining from operations. Lead in the form of leaded glass glovebox windows and lead lined glovebox gloves is present. Several grams of SNM hold-up exist Chromates are expected to be present in the cooling water system. Glovebox 37 is the incinerator glovebox. Radionuclide contamination is a result of the incineration of contaminated scrap combustibles. Multiple kilograms of SNM hold-up is present. Mercury is expected to be contained in analytical equipment and instruments Asbestos in the form of firebrick, insulation, gaskets and transite is present. Lead in the form of lead plate shielding, leaded glass windows and lead lined gloves exists Glovebox 38 contains a milling and grinding operation to pulverize radionuclide bearing ash from the incinerator	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping. Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to	Radiological surveys for Pu and U Sampling for Asbestos and Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Sample water for Chromates Chemical sampling for Acids Base and Mercury	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

Appendix 9

	Several hundred grams of SNM hold-up is present. Oils in the form of lubricants exist on the grinding and material transfer equipment. Asbestos containing fireproofing materials are present Chromates are expected to be present in the cooling water system. Glovebox 39 contains a H4 Nash vacuum system to provide negative pressure for the Glovebox 33 scrubber system. This system is contaminated as a result of operation Chromates are expected to be present in the cooling water system.	glovebox Remove/dispose vessels and associated piping				
23	**Room 149 Gloveboxes 23 24 and 25** This set includes Gloveboxes 23 24 and 25 Tank D 928 shielding wall piping and valves Gloveboxes 23 24 and 25 were used as cascade dissolver lines Glovebox 24 'High Level Dissolution" dissolves high gram value Pu Oxides Primary feed for this system was impure oxides and fluorides from in house operations Gloveboxes 23 and 25 "Low Level Dissolution dissolves high impurity/low Pu content residues to recover Pu in two identical process lines Pu bearing materials processed in these lines has led to Pu contamination through out the gloveboxes and the high potential for SNM hold-up in the process equipment. Multiple kilograms of SNM hold-up is contained in these systems. Acids were present in each of these systems as the primary method of dissolution is in acid dissolvers. Lead in the form of shielding of the glovebox walls, windows and gloves is present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process Chromates are expected to be present in both water wall shielding and cooling water systems Additionally the feed materials sand, slag and crucible wastes have exhibited regulated levels of Chromium metal	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox	Radiological surveys for Pu Sampling for Asbestos and Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Sample water for Chromates Chemical sampling for Acids and Base	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		Remove/dispose vessels and associated piping				
24	Room 149 Glovebox 26 This set includes Glovebox 26 Tanks D 979 D 980 Scrubbing Towers and D 982 piping, valves pumps and motors Glovebox 26 contains the Fume Scrubber recalculation pumps for recalculating KOH through the scrubber towers to scrub fumes from dissolution off gas systems and evaporator off gases Asbestos insulation on steam and cooling water systems is present. Oil lubricants are present on equipment and within reservoirs Acids and bases are contained in system piping Chromates are expected to exist in cooling water piping The cooling vater refrigeration system contains CFC s	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping	Radiological surveys for Pu Sampling for Asbestos Sample oil lubricants for radioactive contamination Sample water for Chromates Chemical sampling for Acids and Base Sampling cooling system for CFC s	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
25	Room 149 Glovebox 27 This set includes Glovebox 27 storage racks and non load bearing walls. This was a former SNM staging area for materials to be counted for	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in	Radiological surveys for Pu	None	PPE	LLW LLMW

PPE is determined by IH&S and Radiological Control as appropriate
* Deactivation activities

	Pu value. Leaded glass windows and lead lined gloves are present on GB 27 Additionally lead shielded containers are present	vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox	Sampling for Lead			
26	Room 149 Glovebox 29 This set includes Glovebox 29 and Tanks D-360 D-361 D-362, D-363 and D-364 piping and valves Glovebox 29 was a laboratory waste processing glovebox with a chloride ion exchange. Glovebox 29 "Cation Exchange" processed radionuclide bearing chloride solutions from various site sources. This process involved ion exchange to separate out the Pu content and the resulting Pu bearing nitric acid elute was then compatible with the remainder of the B771 processes Pu contamination in this system is a factor of the purpose of the system itself, several grams of SNM hold-up in the	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material *Disconnect/isolate piping *Disconnect/isolate electrical feeds	Radiological surveys for Pu, Am and U Sampling for Asbestos and Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

	process equipment exists. Acids were utilized as a feed material and to strip/clean the ion exchange resins Asbestos is considered to be a contaminant concern for set 26 by association with surrounding thermal systems insulation Lead in the form of shielding of the glovebox walls gloves and windows is present. Other effluent from this system contain a wide range of other contaminants from the feed materials including U AM and Cr	*Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping	Sample water for Chromates Chemical sampling for Acids			
27	Room 149 Glovebox (old) 30 This set includes Glovebox 30 (old) and Tanks D-302, D-204 D-205 D-206 D-207 D-208 D 218 and D-219 piping and valves This system was used to dissolve Am salts and separate Pu from Am in acid dissolvers Several hundred grams of SNM hold-up is present in the old line 30 process KOH (base) was used to neutralize the acids Thermal systems insulation on steam lines feeding the process is expected to contain asbestos Lubricating oils were used on components and is expected to be contained in equipment reservoirs Lead shielding is present inside the glovebox surrounding the process columns	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs	Radiological surveys for Pu and Am. Sampling for Asbestos and Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Chemical sampling for Acids and Base.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

		Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping				
28	Room 149 Gloveboxes 31 and 50 This set includes Gloveboxes 31 and 50 Tanks D-920 D 921 D 922 D 923 and D-927 piping and valves Glovebox 31 is used for tank sampling and glovebox 50 is used for filtration of liquids Glovebox 31 is a sampling glovebox used to collect samples from tanks D921 D922, D923 and D927 Glovebox 50 contains a manifold filtering system to filter out solids from the tanks noted above. Tanks D921 and D922 received caustic (base) waste from the acid fume scrubber system (line 33) Lead in the form of shielding, lead lined gloves and leaded glass windows are present on both gloveboxes. Thermal systems insulation on the steam feed to the gloveboxes is expected to contain asbestos	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. *Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated piping.	Radiological surveys for Pu Sampling for Asbestos and Lead Chemical sampling for Acids and Base	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

Appendix 9

29	**Room 149 Gloveboxes 40 and 44** This includes Gloveboxes 40 and 44 Tanks D 78 and D-79 piping and valves Glovebox 40 contains two Bingham vacuum pumps for the house vacuum system. Glovebox 44 contains a Bingham pump for the house vacuum system Pu contamination has resulted from house vacuum applied to various tanks containing Pu bearing acidic solutions and gloveboxes Caustic (base) pump seal liquids were replaced by water seal liquid during the operating life Lubricating oils were used on the pump equipment. Lead in the form of shielding, lead lined gloves and leaded glass windows are present on both gloveboxes	*Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping *Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox. *Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping.	Radiological surveys for Pu Sampling for Lead Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
30	**Room 149 Glovebox 42** This set includes Glovebox 42, Tanks D-451 D-452, D-453 D-454 D-456 D-457 D-466 D-467 D-468, D-469 D-470 D-472, D-971 D-972, D-973 D-974 D-975 and D-976 Also included is piping, valves, shielding walls around tank farm and electrical	*Drain/dispose of cold solutions in piping *Drain/dispose of process solutions in vessels and glovebox	Radiological surveys for Pu and U Sampling for Asbestos and Lead.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	control panel Glovebox 42 is one of the Anion Exchange Purification Gloveboxes Anion exchange removed elemental impurities from Pu nitrate solutions Pu contamination is present by virtue of the process additionally uranium, beryllium and cadmium may have existed as an impurity in the feed solutions Several hundred grams of SNM hold-up is present in the process piping and tanks Acids were utilized to both strip the exchange columns and was a component of the feed material Lead in the form of shielding of the glovebox walls gloves and windows is present. Asbestos in the form of thermal systems insulation is expected to be present on process equipment and steam heat feed to the process Oils are expected to be present in equipment reservoirs Basic solutions were also used as a function of the process Benelex shielding is also present in this set.	Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping. Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping	SNM hold up evaluation Sampling for Beryllium and Cadmium. Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination			
31	Room 149 Gloveboxes 43A, B, C and D This set includes Gloveboxes 43A 43B 43C and 43D· piping and valves Glovebox 43A is graphite scarfing, pipe clean-out and filter disassembly Radioactive material contamination is a result of these operations Lead in the form of shielding of the glovebox walls, gloves and windows is present. Several hundred grams of SMN hold-up is present in this system. Glovebox 43B is used for grinding of sand, slag and crucible waste Radioactive material contamination is a result of these operations Lead in the form of shielding of the glovebox walls, gloves and windows is present.	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material *Disconnect/isolate piping. *Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox.	Radiological surveys for Pu, U and Am. Sampling for Asbestos and Lead. SNM hold up evaluation Sampling for Beryllium. Chemical sampling for Acids	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

	Several hundred grams of SMN hold-up is present in this system Oils in the form of lubricants is expected to exist in the equipment reservoirs Glovebox 43C included a ball mill for pulverizing the sand slag and crucible waste Radioactive material contamination is a result of these operations Lead in the form of shielding of the glovebox walls gloves and windows is present. Several hundred grams of SMN hold up is present in this system. Oils in the form of lubricants is expected to exist in the equipment reservoirs Glovebox 43D is a Anion Exchange Purification Glovebox Radionuclide and Be bearing acidic solutions were processed through this system. Multiple kilograms of SNM hold up are present. Lead shielding is present on the glovebox walls gloves and windows Asbestos in the form of thermal systems insulation is expected to be present on steam heating components	Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox	Sample oil lubricants for radioactive contamination			
32	Room 149 Glovebox (new line 30)- This set includes Glovebox 30 (new) Tanks D-1925 D 1926 D 1927 D 1928 D-1930 D-1931 D-1932, D-1934 D-1935 D-1936 D 1937 D 1939 D-1940 D1941 D1942, D-1943 D1944 and D-1945 This new glovebox system, tanks electrical control panel valves and piping were never put into service There are also two large water wall shielding walls that are cold. This is a 35 x 40 foot area that the equipment removal would free up work space for other projects in Room 149. The system was never tied into the process system. Lead shielding is present on the exterior of the glovebox and the 18 tanks Oil lubricants are expected in the pumps. The two waterwalls are known to contain liquid and are expected to contain chromates	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. Remove/dispose of loose SNM material *Disconnect/isolate piping. *Disconnect/isolate electrical feeds *Remove/dispose vessels in glovebox. Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs	Radiological surveys Sampling for Lead. Sample oil lubricants for radioactive contamination Sample waterwalls for Chromates	None	PPE	Free Release LLW

PPE is determined by IH&S and Radiological Control as appropriate
* Deactivation activities

Appendix 9

		Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose control panels (A B and C) for line 30 Remove/dispose vessels and associated piping Remove/dispose Raschig rings in tanks 1925 1926 1927 1928 1930 1931 and 1932 Remove/dispose support structures for line 30 Remove/dispose water walls around tanks in room 149				
33	Room 149 Tank Farm This set includes Tanks D-931 D-932, D-933 D-934 and the shielding walls around the tanks, piping and valves This tank farm was used for storage of Pu nitrate solutions The tank farm is surrounded by a Benelex, Plexiglas and lead shielded walls SNM hold-up is expected in these tanks, however it has not yet been measured	Drain/dispose of process solutions in tanks Remove/dispose SNM in vessels and associated piping. Disconnect/isolate electrical systems to vessels Disconnect/isolate piping connections to/from vessels Remove/dispose of vessels and associated	Radiological surveys for Pu Sampling for Lead. SNM hold up evaluation Chemical sampling for Acids	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

		piping				
34	**Room 148 Process Area** This set includes Room 148 Tanks D1 976 D 197 D 1978 D 1979 D 1984 D 1987 D 1990 D 1991 D 1992 and D-1993 This area has lead shielded annular tanks that were never put into service and should be cold (non-contaminated) Radioactive material contamination is known to exist under the stainless steel floor cover Asbestos is expected to be present in the form of thermal systems insulation on pipes in the area.	Remove waste drums from area Disconnect/isolate electrical systems to vessels Disconnects/isolate piping connections to/from vessels Remove/dispose vessels and associated piping	Radiological surveys for Pu Sampling for Asbestos and Lead	None	PPE Additional radiological controls ALARA principles	LLW Free Release
35	**147 Office Area** This set includes Rooms 140B C D & E 147 147A B C D & E, training glovebox and the internal walls and doors These rooms were used as offices Pu can scanners and storage This was originally designated as the process control room. Residual/fixed radiological contamination from past operations exists Asbestos is expected to be present in the floor tiles and pipe insulation Various chemical containers are stored in these areas and are expected to contain oil, CFC s, etc	*Drain/dispose water windows in rooms 140B C D E, 147 147B C and D Remove/dispose storage racks in room 147	Radiological surveys for Pu and U Sampling for Asbestos and Lead Sample oil lubricants for radioactive contamination Sample cooling system for CFC s	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
36	**Room 146 Process Area** This set includes Rooms 146 146A and 146C, Gloveboxes MT1 MT2, MT3 MT4 MT5 MT6 MT7 MT8 SR11 and SR12, Tanks D-1001 D-1002, D-1003 D-1004 D-1005 D-1006 D-1007 D-1008 D-1009 D-1010, D-1011 D-1012, D-1013 D-1014 D-1019 D-1020 D-1022, D-1023 D-1024 D-1032, D-1033 D-1044 D-1050 D-1051 D-1053 D-1054 D-1062, D-1063 D-1064 D-1065 D-1066 D-1067 and D-1069 These gloveboxes, tanks, pipes and vaults were used for a process called Special Recovery Special Recovery was a set of processes to recover Pu from materials containing other contaminates. This area also contained a fluidbed	Dram/dispose of cold solutions in piping *Dram/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material *Disconnect/isolate piping Disconnect/isolate electrical feeds *Remove/dispose vessels in glovebox.	Radiological surveys for Pu, Am, U and additional Mixed Fission Products Sampling for Asbestos Lead and Mercury SNM hold up evaluation Sample oil lubricants for radioactive contamination	Potential High Radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
Deactivation activities

	flourination system and a vault type storage room. The special recovery operations consisted of Pu stripping from unique radionuclide bearing solutions The variety of process feed included waste lab samples solvents and specially made up chemical formulations Asbestos containing insulation is present on steam heat feeds and surrounding various equipment. Benelex shielding is present around the tank farms lead shielding is present on the gloveboxes CFC s and Chromates are expected to be present in the cooling systems Several hundred grams of SNM hold up is present in the gloveboxes and transfer piping Lubricating oils are present on components and equipment reservoirs Room 146A contains gloveboxes SR11 and SR12 that are pilot plant designed fluidbed hydrofluorination process This project supported the onsite prove in of additional processing facilities The fluidbed hydrofluorinator has no organic lubricants The SR11 glovebox is shielded with both Benelex and lead, a water wall surrounds the glovebox Multiple kilograms of SNM hold-up is present in SR11 SR12, and associated equipment. Room 146C is a former vault area used to store low level residues The vault is surrounded by both Benelex and lead shielding Minor residual radionuclide contamination is expected.	Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Drain/dispose water wall in room 146A Remove/dispose SNM storage bins in room 146 *Drain/dispose ethylene glycol from refrigeration unit in room 146 Drain/dispose freon from refrigeration unit in room 146 *Check for Mercury in drain system prior to dismantlement. *Drain/dispose of process solutions in pumps and associated piping Remove/dispose material from sump (Raschig rings) in room 146 Remove/dispose pumps and associated piping.	Sample water for Chromates Chemical sampling for Acids and Base Sample cooling system for CFC s Sampling for Beryllium. Sampling for RCRA listed chemicals possible			

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

		*Disconnect/isolate electrical systems to vessels Remove/dispose of vessels				
37	**Room 181A Process Area** The west end of the room contains 55 gal drums of High Level Mixed Waste This material will need to be moved before an NDA assessment can be performed to get an accurate value of the SNM hold up This set includes Room 181A, Glovebox SR14 Tanks D 1400 D 1401 D-1402, D-1406 D-1407 D 1409 D-1410 D-1411 D-1414 and D-1415 an electrical panel a scrubber refrigeration unit and associated valves and piping. SR14 is a solvent extraction process for U bearing acidic solutions Acids and bases were used in the stripper/scrubber and residual amounts are expected to be present. CFC s and chromates are present in the chiller/refrigeration unit Oils and lubricants are expected to be present on components and equipment reservoirs Lead plate shielding, leaded glass windows and lead lined gloves are present on the glovebox	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox Remove/dispose control panel for line SR 12	Radiological surveys for Pu and U Sampling for Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Sample water for Chromates Chemical sampling for Acids and Base. Sample cooling system for CFC s Sampling for RCRA listed chemicals possible.	None	PPE Additional rad ological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
* Deactivation activities

Appendix 9

		Remove/dispose freon in chiller unit in room 181A Drain/dispose of process solutions in pumps and piping Remove/dispose pumps and associated piping Remove/dispose chiller evaporation unit in room 181A Remove/dispose compressor in room 181A Remove/dispose SNM from vessels and associated piping Disconnect/isolate electrical systems to vessels Remove/dispose vessels and associated piping				
38	**Room 182 Process Area** This set includes Room 182, Gloveboxes 201 202, 203 204 205 206 207 208 209 213 214 215 221 223 224 225 227 228 229 241 242 and an overhead conveyor system. The room contains a number of gloveboxes that are new and were never placed into service. These boxes would be removed first so as not to contaminate them. Removal of the rest of the equipment would follow	*Drain/dispose of cold solutions in piping *Drain/dispose of process solutions in vessels and glovebox. Remove/dispose of loose SNM material *Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox	Radiological surveys for Pu and U Sampling for Asbestos, Lead and Mercury SNM hold up evaluation. Sample oil lubricants for radioactive contamination. Sample for PCB s		PPE Additional radiological controls ALARA principles.	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Drain/dispose of process solutions in pumps and associated piping Disconnect/isolate electrical service to control panels Remove/dispose of control panels (16) Remove/dispose pumps and associated piping Disconnect/isolate electrical systems to vessels Remove/dispose of vessels and associated piping	Chemical sampling for Acids Sampling for Beryllium. Sampling for RCRA listed chemicals possible			
39	**Room 182A Process Area** This set includes Gloveboxes 261 262, 263 264 269 270 662 and a hydraulic press and piping. Gloveboxes 261 264, 269 270 and 662 are used for Pu metal storage and sampling. Glovebox 262 and 263 are used for storage of Pu metals	Drain/dispose of cold solutions in piping *Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material	Radiological surveys for Pu and U Sampling for Lead. Chemical sampling for	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate
* Deactivation activities

	and oxides Each of these gloveboxes have lead shielding, windows and gloves RCRA regulated solvents were used to strip oils and grease from metal samples U metal samples were periodically processed.	Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox.	Acids and Base. Sample oil lubricants for radioactive contamination Sampling for RCRA listed chemicals possible			
40	**Room 183 Storage Area** This set includes Room 183 184 and 185 Room 183 is full of High Level Residue drums Room 184 is a residue storage vault for SNM Room 185 is a small storage room. Residual fixed radiological contamination from past glovebox operations exists Insulated piping in the overhead areas is expected to contain asbestos.		Radiological surveys for Pu and U Sampling for Asbestos	None	PPE	LLW
41	**Room 186 Process Area** This set includes Room 186 186A, 186B 187 and 188 Gloveboxes 862, 863 864 865 866 187A, 187B 187C, 187D 187E and Hood 187F This was an R&D area (186/187) and an SNM storage vault (188) The office area (186A) has desks and cabinets and Room 187 has a set of cabinets that are cold, the rest of the equipment, gloveboxes and B-Boxes are Tru-Waste. Room 186 is a R&D metallurgical lab The equipment used for sample testing includes a large hydraulic press and misc hand tools to prepare samples of Pu metal. A refrigeration unit in the room has CFC's, lead plate shielding, lead	Drain/dispose of cold solutions in piping. *Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material *Disconnect/isolate piping *Disconnect/isolate electrical feeds	Radiological surveys for Pu and U Sampling for Asbestos, Lead and Mercury SNM hold up evaluation. Sample oil lubricants for radioactive contamination.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	gloves and leaded windows Present storage of other wastes make accurate SNM hold-up counting problematic Room 186 A is an office. A refrigerator in the office contains CFC s Room 186B is a storage closet. Drywall partitions exist and are suspected of containing asbestos Room 187 is an R&D analytical lab for dissolution of metals Lead lined gloveboxes leaded windows and lead lined gloves are used. Insulation of steam lines is suspected of containing asbestos Various chemical such as acids bases and solvents were used in this lab Mercury in analytical instruments is likely to be present. Room 188 is a storage vault with lead shielding and water wall containers The water walls are suspect of containing chromates The room has been washed down and RCRA closed.	*Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Ensure sanitary drain (sink) is isolated in room 187 Drain/dispose of process solutions in pumps and associated piping Remove/dispose material from sump (Raschig rings) in room 187 Remove/dispose pumps and associated piping	Sampling for RCRA listed chemicals possible			
42	180 Office Area This set includes Room 180G 180H, 180I, 180J and 180L. This is an office area and a corridor (L) This area contains cabinets and office furniture. Insulation and solid surfacing materials are present and expected to contain asbestos Various RCRA listed chemicals were formerly stored in these rooms.		Sampling for Asbestos Sampling for RCRA listed chemicals possible.	None	PPE	LLW
43	Room 180A thru F and K Process Area This set includes Rooms 180A, 180B 180C, 180D 180E, 180F and 180K, Gloveboxes A10 A20 A30 A31 A32, A51 A52, A53 D1 D2, D3 B10 E11 E20 E30 E31 E32, E50 E51 F20 F30 F60 F70 K10 K20 and K30- Tanks	*Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox.	Radiological surveys for Pu, U and other Mixed Fission Products Sampling for Asbestos and	Potential high radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	D-1803 D 1804 D-1805 D-1809 D-1010 D-1811 D-1813 D-1816 D 1817 D-1818 D-1819 D-2, T 5 %-6 T 7 T-8 T 22 T 25 T-26 D-1830 D 1831 D-728 D-729 D-730 D 80 D-81 D 82, D 83 D-84 D-85 and K 30 There are some cold gloveboxes and tanks in R180D all remaining waste is expected to be Tru Waste Room 180A is a process simulation lab used for R&D work to define process parameters Radionuclides acids bases solvents and other chemical formulations are present. Lead plate shielding, gloves and windows are present. A water wall shield is expected to contain chromates Lubricating oils are used on pumps and other equipment. A refrigeration unit exists and is expected to contain CFC s Room 180B is a vault that has been cleaned out and RCRA closed. Water wall shielding is known to contain lead and is expected to contain chromates Room 180C is an extension of 180A and shares much of the same contaminants. Room 180D includes two clean gloveboxes and one glovebox used for hydroxide precipitation and neutralization of lab wastes. This included radionuclide bearing acids and bases Room 180E is a furnace casting and metal storage for R&D operations. Multiple kilograms of SNM hold-up is present in the 180E gloveboxes and process lines. Room 180F is a R&D analytical lab for radionuclide bearing acidic and basic samples. Room 180K is a R&D processing and storage facility for aqueous radioactive solutions. Asbestos insulation, lead plate, lead lined glovebox gloves and leaded glass windows exist in each of the 180 area rooms. The 180 area is the origin of the 1957 fire, resulting in wide spread radioactive contamination. Many	*Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. Ensure sanitary drain (sink) is isolated in room 180K. Drain/dispose water from shielding walls and doors around lines A10 A20 A30 A31 and A32 in room 180A. Drain/dispose process solutions in vessels and associated piping. Disconnect/isolate electrical systems to vessels. Remove/dispose of vessels and associated piping.	Lead SNM hold up evaluation Sample oil lubricants for radioactive contamination Sample cooling system for CFC s Sampling for RCRA listed chemicals possible.			

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	areas were painted to fix contamination, that is still present.					
44	**Room 179 Maintenance Area** This set includes Rooms 178 179 179A and Glovebox 179A. This area contains lathes mills saws and other maintenance equipment that may become low level waste Asbestos insulation and solid surfacing materials are present. Lead and other metals were machined and formed on the shop tools Lubricating oils cutting oils and solvents were used and stored here Additionally Freon was commonly used as a degreasing cleaner The glovebox in room 179A was primarily used for maintenance of contaminated equipment	Remove/dispose jib crane located at column D 7 in room 179 Remove/dispose spare parts Remove/dispose machine tools Remove/dispose hot tool storage cabinet Disconnect/isolate electrical feeds to glovebox. Remove/dispose off gas and ventilation ducting legs Remove/dispose equipment internal to glovebox Remove/dispose glovebox	Radiological surveys for Pu Sampling for Asbestos and Lead Sample oil lubricants for radioactive contamination Sample cooling system for CFC s Sampling for RCRA listed chemicals possible	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM
45	**Room 174 Process Area** This set includes Rooms 172, 174 175 and 176 Gloveboxes A1 A2, A3 A4 and A1097 Tanks D 1081 D1082, D01083 D-1084 D-1085 D-1086 D-1087 D-1088 D-1089 D-1095 D-091(N) and D-091(S)There are six storage cabinets and a refrigeration unit that are either cold or at the very least low level waste. The refrigeration unit is expected to contain CFC s and lubricating oils. Gloveboxes A1 and A4 are an nitric acid spray leach process to strip Pu contamination off of U components SNM hold-up for these boxes is expected to be several grams. Lead in the form of plate shielding, leaded glass windows and lead lined gloves are on the gloveboxes.	*Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material *Disconnect/isolate piping *Disconnect/isolate electrical feeds *Remove/dispose vessels in glovebox	Radiological surveys for Pu and U Sampling for Asbestos, Lead and Mercury SNM hold up evaluation. Sample oil lubricants for radioactive contamination. Chemical sampling for Acids and Base.	None	PPE Additional radiological controls ALARA principles.	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

	Gloveboxes A2 and A3 are evaporators for concentrating the spray leach chemicals from A1 and A4 Lead in the form of plate shielding, leaded glass windows and lead lined gloves are on the gloveboxes Mercury is expected to be contained in analytical instruments Insulation on the steam heat feed lines are likely to contain asbestos A caustic scrubber is connected to the gloveboxes to neutralize the acidic fumes Glovebox A1097 contains a H4 Nash vacuum pump that provided the primary negative pressure to transfer solutions to the storage tanks A heat exchanger cools the pump and is expected to contain chromates	Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox *Remove/dispose storage cabinets Drain/dispose freon from chiller unit in room 174 *Deactivate security systems to storage cabinets Remove/dispose pumps and associated piping *Disconnect/isolate electrical system to tanks Remove/dispose vessels and associated piping.	Sample cooling system for CFC s Sample water for Chromates			
46	164 Lab Area This set includes Room 154 155 155A, 156 156A, 161 162, 1o3 and 164 Gloveboxes 49 50 13 12, 104 105 106 107, 108 109 110, 111 112, 113 114 115 60 61 62, 63 64, 65 66 67 68, 69 72, 73 74 79A, 79B 80A, 80B 81A, 81B 82A, 82B 83A, 83B 98 99 100 101 102, 103 Flume Hood 77 Flame Hood 94 and Chemical Hood, Propane System; piping and valves. Laboratories typically receive samples from all other areas	*Drain/dispose of cold solutions in piping. *Drain/dispose of process solutions in vessels and glovebox. Remove/dispose of loose SNM material Disconnect/isolate piping.	Radiological surveys for Pu, Am, U and additional Mixed Fission Products. Sampling for Asbestos Lead and Mercury SNM hold up evaluation	Potential high radiation	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

	of the facility Therefore many types of materials and contaminants are present. Many of the gloveboxes contain mercury filled instruments asbestos insulation lubricants, solvents lead shielding acids and caustics Additional equipment including refrigeration units calciner furnaces, propane gas burners and general laboratory fixtures are present.	Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Remove/dispose storage cabinets Remove/dispose pumps and associated piping Disconnect/isolate electrical system to tanks Remove/dispose vessels and associated piping. *Ensure sanitary drains (sinks and showers) are isolated. Remove/dispose miscellaneous lab equipment. Remove/dispose material from sump (Raschig rings) in room 161	Sample oil lubricants for radioactive contamination Chemical sampling for Acids and Base Sample cooling system for CFC s Sampling for Beryllium Sampling for RCRA listed chemicals possible			

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		Remove/dispose pumps and associated piping Remove/dispose of associated gas piping in room 164				
47	**151 Radiation Control Area** This set consists of Rooms 135A 135B 151 151A, 151B 151C 151E, 151F and 152 This includes the RCT areas selective alpha air monitor (SAAM) alarm panel Radcon support lab doffing area and decontamination showers Room 152 has many lead bricks The partition walls are expected to contain asbestos fibers	*Ensure sanitary drains (sinks and showers) are isolated in room 151E and F	Sampling for Asbestos and Lead	None	PPE	LLW
48	**153 Process Area** This set includes Gloveboxes 153A 153B 153C 153D 153E, HC1 HC2, HC3 HC4 HC5 and HC6 and tanks Also included is piping, remote manipulators and water walls The 153 area is a R&D area that includes hot cells and various test equipment. Gamma and neutron emitting lab samples were analyzed and or processed in this area. Various types of shielding, including Benelex, Lead and Plexiglas are present. Asbestos insulation is present on steam lines Mercury filled instruments are present. Various other chemicals were used, including acids bases, oils and solvents	*Drain/dispose of cold solutions in piping *Drain/dispose of process solutions in vessels and glovebox *Remove/dispose of loose SNM material *Disconnect/isolate piping Disconnect/isolate electrical feeds *Remove/dispose vessels in glovebox. Remove/dispose process piping. Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. *Remove/dispose equipment internal to	Radiological surveys for Pu, Am, U and additional Mixed Fission Products Sampling for Asbestos Lead and Mercury SNM hold up evaluation Sample oil lubricants for radioactive contamination. Chemical sampling for Acids and Base.	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		glovebox. Remove/dispose storage cabinets Remove/dispose pumps and associated piping Disconnect/isolate electrical system to tanks Remove/dispose vessels and associated piping Drain/dispose water wall around the hot cell in room 153 Drain/dispose water wall between room 153 and locker room.				
49	157 Stock Room Area This set includes Room 157 This area was an R&D support area until it was converted to a stock room/storage area in 1992. Asbestos in the form of solid surfacing materials and pipe insulation are expected. Residual contamination from past operations may exist, in inaccessible areas.		Sampling for Asbestos	None	PPE	LLW
50	158 Lab Area This set includes Rooms 158 1 59 160 165 166A, 166B 168 and 169· Gloveboxes 158 North, 158 South, BX1 BX2, BX3 ·BX4 BX5 BX6 BX7 BX8 BX9 Hood 2, 663A, 663B 663C and 664 This set contains gloveboxes and B-Boxes used for laboratory analysis of Pu, Am and U This area also contains the calorimeters and the Standards Laboratory where standards for counting equipment were fabricated. Residual radioactive contamination from laboratory radionuclide bearing chemical samples is present. Rooms 158 and 159	Drain/dispose of cold solutions in piping. Drain/dispose of process solutions in vessels and glovebox. *Remove/dispose of loose SNM material Disconnect/isolate piping. *Disconnect/isolate electrical feeds.	Radiological surveys for Pu, Am and U Sampling for Asbestos and Lead. Sample oil lubricants for radioactive contamination Sample cooling system for	None	PPE Additional radiological controls ALARA principles.	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

	are the radiochemistry labs. Room 160 is the calorimeter lab and the equipment cooling system is expected to contain chromates and CFC s Room 165 is the smear counting room that has cooling systems and may contain residual radioactive contamination Room 166A is the electronics maintenance shop solvents have been used and stored here Lead solder was also commonly used in the instrument shop Room 166B was used as a R&D metal casting laboratory and is expected to contain ACM insulation, oil and grease lubricants and radioactive contamination Room 168 is a janitors closet and storage area. Room 169 is the standards fabrication and calorimeter analysis lab The calorimeter includes a cooling system where chromates and CFC s may be present. Many lead brick are also stored here.	Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Ensure sanitary drains (sinks) are isolated in room 168 Drain/dispose freon from refrigeration unit Check for Mercury in drain system prior to dismantlement. Remove/dispose of process solutions in pumps and associated piping *Remove/dispose material from sump (Raschig rings) in room 168 *Remove/dispose calirimeters and associated piping in rooms 160 and 169 Remove/dispose pumps and associated piping.	CFC s Sample water for Chromates Chemical sampling for Acids and Base			
51	149 Utilities Support Area This set includes Room	*Ensure sanitary sewer drains in rooms	Sample for Asbestos.	None	PPE	LLW Free

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

Appendix 9

	149A, 149B 149C, 149D and 149E, plumbing fixtures condensate tanks pumps and piping Room 149A contains the steam condensate collection tanks for the utilities condensate system. Water is collected then pumped to cooling towers These tanks are insulated and asbestos is expected Room 149B and 149C are currently used as a storage rooms Vinyl asbestos floor tile and asbestos containing mastic are expected. Room 149D is the new condensate collection system which was never put into service. Rooms 149A and 149D have pumps that contain lubricating oils Room 149E is a maintenance storage closet. A sump is also located here	149B and 149C (toilets and sinks) are isolated. Drain/dispose of process solutions in pumps and associated piping Remove/dispose material from sump (Raschig rings) in room 149E Remove/dispose pumps and associated piping Drain/dispose cold solutions in vessels and associated piping. Disconnect/isolate electrical systems to vessels. Remove/dispose vessels and associated piping.	Sample oil lubricants for radioactive contamination			Release
52	**190 Deluge Process Area** This set includes Room 190 Tank V 2, piping, exterior walls and roof Tank V 2 collects fire suppression water from the zone 1 plenums These liquids are known to be contaminated with the particulate from glovebox exhaust.	Remove/dispose of roof for access to tanks *Drain/dispose of process solutions in vessels and associated piping. *Remove/dispose SNM in vessels and associated piping. *Disconnect/isolate electrical systems to vessels. Remove/dispose vessels and associated piping.	Radiological surveys for Pu and U	None	PPE Additional radiological controls ALARA principles	LLW Free Release

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

53	**Main Plenum Area** This set includes Room 280 281A, 280B 281 281A, 281B,2 282A 282B 282C and 282D filter elements cinderblock walls and doors Tanks 309E/309W collect liquid from sumps sinks and decon showers in B771 The primary filter bank contains 525 filters The secondary filter bank contains 391 filters All airborne particulate from the all of the processes and process rooms are deposited into the filter media.	Remove/dispose HVAC filters	Radiological surveys for Pu Am, U and additional Mixed Fission Products Sampling for Lead Sampling for Beryllium. Sampling for Cadmium. Sample water for Chromates	None	PPE Additional radiological controls ALARA principles	LLW Free Release
54	**283 HVAC Exhaust and Utilities Area** This set includes Rooms 283 283A, 283B 283C, 283D 283E, 283F 283G 283H, 283I and 283J the six main exhaust fans and motors office walls, Uninteruptable power supply system, main electrical switch gear and control room panels PCB s have been removed from the existing electrical components, however residual contamination may remain as a result of past spills. Asbestos in the form of thermal systems insulation, solid surfacing materials and electrical components. Mercury filled instruments were used and residual contamination of the concrete may exist. Lead exists in electrical components Oils for cooling electrical components and as lubricants for other machinery are present.	Remove/dispose concrete contaminated with PCB s in room 283 Remove/dispose plenum HVAC ducting. Remove/dispose emergency generator control panel Remove/dispose HVAC fans, motors and housings for AHU-2, AHU 3 S-8 Exhaust # 1 2, 3 4 5 and 6 Remove/dispose UPS batteries in room 283 Remove/dispose cold solutions in vessels and associated piping.	Sampling for Asbestos Lead and Mercury Sample oil lubricants for radioactive contamination Sample for PCB s	None	PPE	LLW Free Release

PPE is determined by IH&S and Radiological Control as appropriate

* Deactivation activities

Appendix 9

		*Disconnect/isolate electrical systems to vessels Remove/dispose vessels and associated piping				
55	235 HVAC Supply and Utilities Area This set includes Rooms 232, 233 234 235 236 237 238 238A 239 240 240A, 240B 240C, 240D 240E and 240G supply fans motors, plenums and walls This is the building air intake system consisting of filters, heaters, blowers and dampeners Asbestos pipe insulation on steam lines for the heating units. Oil and grease lubricants on equipment.	Remove/dispose HVAC fans motors and housings for S 1 S 3 S-4 S-5 S-6 S 7 S 9 E 8 FN-6 and new plenum for locker room. Drain/dispose of cold solutions in vessels and associated piping Disconnect/isolate electrical systems to vessels Remove/dispose vessels and associated	Sampling for Asbestos Sample oil lubricants for radioactive contamination	None	PPE	LLW Free Release
56	249 HVAC Exhaust and Utilities Area This set includes Rooms 229 230 231 241 245 246 246A, 247 248 and 249 Zone 1 Filter Plenums fans, motors and ductwork; Chem Make Up tanks; piping and valves These are the reagent chemical supply tanks for building operations The filter plenums are contaminated and have the potential to contain any thing that was exhausted from the gloveboxes. Room 245 was a instrument repair shop and may contain residual mercury contamination. Room 247 is the wet chemical make-up system. Acids, Bases and other process chemical feeds were formulated. Multiple kilograms of SNM hold-up is present in the plenum. Cooling water systems in this set are suspected of containing regulated levels of chromium. Asbestos pipe insulation is likely to be present on steam heat lines	Drain/dispose of cold solutions in vessels and associated piping Disconnect/isolate electrical systems to vessels Remove/dispose vessels and associated piping *Ensure sanitary sewer drains in rooms 231 239 and 247 (toilets and sinks) are isolated. Remove/dispose HVAC fans and motors E-7 east. Remove/dispose HVAC fans and motors	Radiological surveys for Pu, Am, U and additional Mixed Fission Products Sampling for Asbestos Lead and Mercury SNM hold up evaluation Sample oil lubricants for radioactive contamination. Chemical sampling for Acids and Base. Sample cooling system for	None	PPE Additional radiological controls ALARA principles	LLW TRU TRM

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

		FN 1A-and FN 1B associated with FU 1 Remove/dispose HVAC filters Remove/dispose HVAC fans and motors F 1 F 3 FN 3 and F-4 associated with FU 2 Remove/dispose bottle racks Remove/dispose HVAC fans and motors Fn 1 and FN 2 associated with FU-1E Check for Mercury in drain system prior to dismantlement. Drain/dispose of cold solutions in pumps and associated piping Drain/dispose of process solutions in pumps and associated piping Remove/dispose pumps and associated piping Remove/dispose HVAC contamination C-Cell blower and motor Remove/dispose HVAC ducting to 180 hood exhaust and motor Remove/dispose H/P vacuum electric motor and air pump (2) Remove/dispose hydraulic motor and	CFC s Sampling for RCRA listed chemicals possible			

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		pump in corridor J Remove/dispose HVAC filters FU 1 FN 1A, FN 1B FU 1E, FN 1 FN 2 FU 2A FU 2B FN 3 and FN-4 Remove/dispose HVAC east general exhaust fan Remove/dispose HVAC incinerator fans (F 1 F 2 and F 3) incinerator blower and plenum with 48 filters				
57	309 Tank Area This set includes room 309 Tanks D309E and D309W two outside walls piping and valves The tanks collect liquids from the building sumps, sinks and decontamination showers for sampling prior to release to waste processing Lubricating oils and greases are present on pumps and equipment.	Drain/dispose of cold solutions in vessels and associated piping *Drain/dispose process solutions in vessels and associated piping. Disconnect/isolate electrical systems to vessels Remove/dispose vessels and associated piping.	Sample oil lubricants for radioactive contamination	None	PPE	LLW
58	Corridors A, D E, G, H, Stairwell 1,2,3 127 Utility Room and Tunnel Area This set includes Corridors A, D E, G and H, stairwells 1 2 and 3 Room 127 Tunnel (only to south outer wall of Bldg. 771) security electronics equipment, lockers, doors and piping. Residual contamination from the 1969 fire and the Building 776 water main break is expected. Radionuclide bearing acidic and basic chemicals have been transferred in pipe lines above the drop ceilings. Asbestos in the form of steam line insulation, solid surfacing materials and floor tile exist.	*Drain/dispose of cold solutions in associated piping Remove/dispose piping in the overhead. *Remove/dispose security systems *Remove/dispose bottle rack. *Remove/dispose drum counter in floor	Radiological surveys for Pu and U Sampling for Asbestos Chemical sampling for Acids and Base.	None	PPE	LLW
59	Indirect/Direct Evaporative Cooling Area This set	*Drain/dispose of cold solutions in pumps	None	None	None	Free Release

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

Appendix 9

	includes the 8 new intake air systems, piping, valves electrical distribution and control panels and the metal building This comprises new ventilation equipment that has never been put into service No contamination from building operations is expected. Unused commercial chemical products may exist in this area and should be reviewed for hazardous constituents	and associated piping Remove/dispose pumps and associated piping Remove/dispose HVAC fans motors and filters associated with IDEC system (8 total)				
60	771 HVAC This set includes Zone 1 and Zone 2 HVAC ducts and the concrete stack. Zone 1 ducts contain radioactive contamination and SNM hold-up of multiple kilograms of material Zone 2 ducts are known to contain residual contamination as a result of spills and internal releases Asbestos containing insulating materials are expected on some sections of duct work. Oils and grease lubricants are present on ventilating equipment.	Remove/dispose associated HVAC duct work for FU 2 zone 7 Remove/dispose associated HVAC duct work for FU 2 zone 6 Remove/dispose associated HVAC duct work for FU 1E zone 5 Remove/dispose associated HVAC duct work for FU 1 zone 2A Remove/dispose associated HVAC duct work for FU 1 zone 2B Remove/dispose associated HVAC duct work for FU 1 zone 6 Remove/dispose associated HVAC duct work for FU 1 zone 7 Remove/dispose associated HVAC duct work for FU 1 zone 9 Remove/dispose associated HVAC duct work for FU-1E zone 4	Radiological surveys for Pu, U and Am. Sampling for Asbestos Sample oil lubricants for radioactive contamination	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.

		Remove/dispose associated HVAC duct work for FU 1 zone 1 Remove/dispose associated HVAC duct work for FU 1E zone 8 Remove/dispose associated HVAC duct work for FU 2 zone 1 Remove/dispose associated HVAC duct work for FU 2 zone 2A. Remove/dispose associated HVAC duct work for FU 2 zone 2B Remove/dispose associated HVAC duct work for FU 2 zone 3 Remove/dispose associated HVAC duct work for FU 2 zone 4 Remove/dispose associated HVAC duct work for FU 2 zone 5 Remove/dispose associated HVAC duct work for FU-1E zone 3 Isolate HVAC exhaust duct tunnel to the main stack. Remove/dispose HVAC main stack.				
61	774 Room 202 Process Area 201 202A This set	Drain/dispose of cold solutions in piping.	Radiological surveys for	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

	includes Rooms 201 202 and 202A, Gloveboxes 5 6 7 8 and a pump Tanks 1A, 1RF 2F 3 4L, 4R, 5 70 71 73 and a new tank. This area is know as the "First Stage' processing for solutions from B771 This area contains three gloveboxes nine tanks a microwave chiller and a motor control center The piping transfer tunnel from B771 enters at the southwest corner of the room. Remaining radionuclide bearing solutions including acids and bases are processed for disposal Lead in the form of plate shielding, leaded gloves and leaded glovebox windows are present. Oils and greases used as lubricants are expected to be present on equipment and in reservoirs Asbestos in the form of steam line insulation is expected to be present. CFC s are expected to be present in the chiller system.	Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated piping	Pu, U and Am. Sampling for Asbestos and Lead Chemical sampling for Acids and Base. Sample oil lubricants for radioactive contamination Sample cooling system for CFC s			
62	774 Room 241 Process Area This set includes Room 24 Tanks T 201 T 202, T-203 T 294 T 205m T 206 T 207 T 208 and T210B 4 tanks are reagent tanks and 4 are batching tanks for precipitation Radionuclide contamination is present in these tanks, additionally acidic and basic solutions were stored and prepared. Oils and greases used as lubricants are expected on equipment and in reservoirs.	*Drain/dispose of cold solutions in vessels and associated piping. Drain/dispose of process solutions in vessels and associated piping. Disconnect/isolate electrical systems to vessels.	Radiological surveys for Pu, U and Am. Chemical sampling for Acids and Base. Sample oil lubricants for radioactive contamination.	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

		Remove/dispose vessels and associated piping				
63	**774 Room 250 Storage Area, 251** This set includes Room 250 and 251 This area was to be a replacement for the precipitation process equipment. Since this did not become operational, the rooms became a storage area.		None	None	None	Free Release
64	**774 Room 212 Storage Area** This set includes Room 212 This area is used to store Powders for the OASIS process (oil/grease processing)		None	None	None	Free Release
65	**774 Room 103 Process Area, 105** This set includes Rooms 103 and 105 Gloveboxes 13 and 355 Tanks T-40 D-351 and KOH Receiver This area is in the basement and is a support area to the second stage precipitation process Radionuclide bearing acidic and basic solutions were processed and stored here. Asbestos in the form of insulation materials is expected. Oils and greases used as lubricants are expected to be contained in equipment and in reservoirs Lead in the form of leaded glass windows and lead lined gloves is present.	Drain/dispose of cold solutions in piping *Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping Remove/dispose off-gas and ventilation ducting legs. Remove/dispose glovebox. *Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated	Radiological surveys for Pu, U and Am. Sampling for Asbestos and Lead. Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

Appendix 9

		piping				
66	**774 Room 102 Process Area, 101 104** This set includes Rooms 101 102 and 104 Gloveboxes 9 10 11 and 12 Tanks T 5 T 9 T 10 T 11L, T 11R, T 12 T 74 T 210A and C 1 This area is in the basement and is a support area for first stage precipitation /neutralization process There is one storage area and stairwell entry from the second floor into Rooms 102 and 103 Radionuclide bearing acidic and basic solutions were processed and stored here Asbestos in the form of insulation materials is expected. Oils and greases used as lubricants are expected to be contained in equipment and in reservoirs Lead in the form of lead plate shielding, leaded glass windows and lead lined gloves is present.	*Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping. Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox Remove/dispose vessels and associated piping.	Radiological surveys for Pu, U and Am. Sampling for Asbestos and Lead Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination	None	PPE	LLW
67	**774 Room 210 Process Area** This set includes Room 210 and 201A, Gloveboxes 1 2, 4 15 206 Microwave and OASIS, Tanks 1 2, 7 8, 13 14 374A and caustic waste receiver This area is located on the second floor	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox.	Radiological surveys for Pu, U and Am. Sampling for Asbestos and	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

	above ground level Operations performed are microwave vitrification cementation for organics neutralization and cementation of waste solutions at the bottle box Radionuclide bearing oils, acids and caustic/basic solutions were processed and stored here. Asbestos in the form of insulation materials are expected. Oils and greases used as lubricants are expected to be contained in equipment and in reservoirs Lead in the form of lead plate shielding leaded glass windows and lead lined gloves is present. CFC's are present in the chiller system.	Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping. Remove/dispose off-gas and ventilation ducting legs Remove/dispose glovebox. Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated piping	Lead Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination Sample cooling system for CFC s Sample for PCB s			
68	774 Room 200 Dock Area This set includes Room 209 and 220· Tanks T 3 T 102 and T 103 This area is located on the second floor ground level and is the shipping and receiving area of drums and crates for B774 There are two large waste oil storage tanks in Room 220 Approximately 10 000 gallons of radionuclide bearing waste machining oils are presently stored. These oils are known to contain PCB s, Transite siding is present on the outer walls	Drain/dispose of cold solutions in vessels and associated piping. Drain/dispose of process solutions in vessels and associated piping. *Disconnect/isolate electrical systems to vessels. Remove/dispose vessels and associated piping	Radiological surveys for Pu and U Sampling for Asbestos. Sample oil lubricants for radioactive contamination Sampling for RCRA listed chemicals possible.	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

			Sample for PCB s			
69	774 Room 203 Process Area This set includes Room 203 Glovebox 17 Tanks T-40(Old) and T-42 This area is on the second floor above ground level and was the second stage precipitation area. It is currently used as a step off pad when the rooms are posted as a Contamination Area (CA) Radionuclide bearing acids and bases were used in the precipitation process Glovebox 17 has lead shielding and each of the gloveboxes are expected to have lead lined gloves and leaded glass windows Oils and greases used as lubricants are expected to be on components and in equipment reservoirs Asbestos in the form of thermal systems insulation is expected to be present.	Drain/dispose of cold solutions in piping Drain/dispose of process solutions in vessels and glovebox Remove/dispose of loose SNM material Disconnect/isolate piping Disconnect/isolate electrical feeds Remove/dispose vessels in glovebox. Remove/dispose process piping Remove/dispose off gas and ventilation ducting legs Remove/dispose glovebox Remove/dispose equipment internal to glovebox. Remove/dispose vessels and associated piping	Radiological surveys for Pu, U and Am. Sampling for Asbestos and Lead Chemical sampling for Acids and Base Sample oil lubricants for radioactive contamination	None	PPE	LLW
70	774 Room 341 Utilities Area This set includes Rooms 341 342, 343 344 and exhaust plenum. This area is on the third level and contains a ventilation filter plenum. Radioactive contamination as a result of B774 glovebox	Remove/dispose HVAC filters. Remove/dispose HVAC fans F 201 F 202, F 203 and FP 204	Radiological surveys for Pu and U Chemical sampling for	None	PPE	LLW

PPE is determined by IH&S and Radiological Control as appropriate.

* Deactivation activities

Appendix 9

	exhaust. The room 241 tanks extend through the floor to room 342. These tanks are included in the room 241 description	Remove/dispose plenum FP 201 FP 202 and FP 204	Acids and Base.			
71	774 Room 441 Utilities Area This set includes Room 441 and 442 This area is on the fourth level of the facility and contains a ventilation filter plenum and an UPS This is the room air exhaust and recirculation plenum. Radioactive contamination as a result of spills and leaks is present. Oils and greases used as lubricants on components and in equipment reservoirs is present Lead and acid exist in the UPS batteries	Remove/dispose HVAC fans system 3 Remove/dispose HVAC filters for system 3 Remove/dispose plenum for system 3	Radiological surveys for Pu and U Sampling for Lead. Chemical sampling for Acids Sample oil lubricants for radioactive contamination	None	PPE	LLW
72	774 Room 320 Utilities Area This set includes Room s321 321 322 This area is located on the third level and is the utilities support to the 200 dock area. There are two filter plenums, an office and electrical switchgear The filter plenums are radioactively contaminated as a result of past operations PCB s may be present in the electrical switchgear and are know to be contained in the waste oil tanks. Asbestos in pipe insulation is expected to be present. Residual silver contamination may exist from a defunct silver reclamation process	Remove/dispose HVAC filters Remove/dispose HVAC fans F 2, F 3 F-4 and F 5 Remove/dispose plenum FP 203	Radiological surveys for Pu and U Sampling for Asbestos Sample oil lubricants for radioactive contamination Sampling for RCRA listed chemicals possible. Sample for PCB s			
73	774 Rooms 200-300 Office Area This set includes Rooms 204 205 207 208 301 302, 303 304 305 and 306 This area includes the control room, offices, conference room, break room and rest rooms Asbestos is expected as pipe insulation and structural materials		Sampling for Asbestos	None	PPE	LLW Free Release

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

74	774 HVAC This set includes Zone 1 and Zone 2 HVAC Ducts Radioactive contamination in the ducts is a result of operations and the ventilation of contaminated systems	Reduce/dispose SNM from duct work to addrss criticality concerns during disposal Remove/dispose associated HVAC duct work for system 2 Remove/dispose associated HVAC duct work for system 3 Remove/dispose associated HVAC duct work for system 1 zone 1 1A and 2	Radiological surveys for Pu and U	None	PPE	LLW Free Release
75	771/774 Cluster Facilities,771 and 774 Structures and Cap This set includes demolition of Buildings 771 and 774 This is the demolition of the remaining structure. Residual contamination in the building structure is expected. Additionally transite siding will be included in this set.	*Decontaminate 771 reducing levels to meet established dispersion limits during demolition Decontaminate 774 reducing levels to meet established dispersion limits during demolition Demolish 771 building and seal 771/774 tunnel Demolish 774 building and seal 774/771 tunnel Cap 771 foundation to minimize the potential of migration of hazardous materials Cap 774 foundation to minimize the potential of migration of hazardous materials Establish environmental monitoring to	Radiological surveys for Pu Am, U and Mixed Fission Products Sampling for Asbestos and Lead. Sample oil lubricants for radioactive contamination Sampling for RCRA listed chemicals possible Sample for PCB s	None	PPE	LLW Free Release

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

Appendix 9

		quantify environmental impacts Complete and maintain site monitoring procedures including preventive maintenance requirements and data collection frequency				
76	Utilities All This set includes security fire, steam, plant air instrument air breathing air domestic water process water gas sanitary waste, process waste and electrical systems	Isolate/blank 771/774 cluster liquid waste receiving lines to building 774 from other buildings *Isolate/blank 771/774 cluster waste oil line Isolate/blank 771/774 cluster natural gas/propane supply Remove/dispose 774 waste oil tanks (102 and 103) and associated piping Remove/dispose 771/774 cluster waste oil piping. Isolate/blank 771/774 cluster plant air supply Isolate/blank 771/774 cluster argon supply Isolate 771/774 cluster electrical supply and redistribute to supply continuing operational site services. Isolate/blank cluster nitrogen supply	Radiological surveys for residual contamination	None	None	LLW Free Release

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities

		Isolate/blank cluster steam supply Isolate/blank cluster emergency lighting electrical supply Isolate/blank cluster sanitary sewer discharge Isolate/blank cluster fire water supply Isolate/blank cluster domestic water supply Isolate/blank cluster breathing air supply Isolate/blank 771/774 cluster process water supply *Remove/dispose 771/774 cluster steam piping *Remove/dispose 771/774 cluster argon tank and associated piping *Remove/dispose 771/774 cluster conduit. *Remove/dispose 771/774 cluster above grade process sewer piping. *Remove/dispose 771/774 cluster electrical distribution centers Remove/dispose 771/774 cluster propane				

PPE is determined by IH&S and Radiological Control as appropriate.
* Deactivation activities

Appendix 9

		tank and associated piping *Remove/dispose 771/774 cluster cooling water towers on the roof Remove/dispose 771/774 cluster plant air piping Remove/dispose 771/774 cluster cooling water piping Remove/dispose 771/774 cluster argon piping Remove/dispose 771/774 cluster domestic water piping. Remove/dispose 771/774 cluster fire system piping Remove/dispose 771/774 cluster above grade sanitary sewer piping Remove/dispose 771/774 cluster breathing air piping. *Remove/dispose 771/774 cluster natural gas/propane piping. *Remove/dispose 771/774 cluster nitrogen piping *Remove/dispose 771/774 cluster emergency lighting fixtures.				

PPE is determined by IH&S and Radiological Control as appropriate.
Deactivation activities