

**ENVIRONMENTAL
RESTORATION
PROGRAM**

**HAZWOPER Project Documents for Demolition
of the Waste Evaporator Facility, Building 3506,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

This document has been approved for release
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MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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LOCKHEED MARTIN ENERGY SYSTEMS, INC

Post Office Box 2008
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March 29, 1996

Mr. M. R. Jugan
Environmental Restoration Division
Department of Energy, Oak Ridge Operations
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Oak Ridge, TN 37831

Dear Mr. Jugan:

HAZWOPER Project Documents for the Demolition of Waste Evaporator Facility, Building 3506, at Oak Ridge National Laboratory, Oak Ridge, Tennessee (ORNL/ER-347)

The Environmental Restoration Program is pleased to transmit your copy of the subject plan. This document is comprised of the Health and Safety Plan and Project Work Plan which are used by Allied Technology Group in the performance of demolition activities at the Waste Evaporator Facility (WEF).

Transmittal of this document satisfies one of the deliverables stipulated in the WEF Project Plan (Task Order Proposal).

Please contact me at 576-5557, if you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "G. J. Mandry".

G. J. Mandry
WEF Project Manager

cc: D.G. Cope
G.R. Hudson, DOE-ORO
ER DMC - RC



Energy Systems Environmental Restoration Program

**HAZWOPER Project Documents for Demolition
of the Waste Evaporator Facility, Building 3506,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

Date Issued—March 1996

Prepared by
Allied Technology Group, Inc.
Oak Ridge, Tennessee 37830
under subcontract 18X-KEP03V

Prepared for the
U.S. Department of Energy
Office of Environmental Management
under budget and reporting code EW 20

Environmental Management Activities at the
OAK RIDGE NATIONAL LABORATORY,
Oak Ridge, Tennessee 37831-8169
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. Department of Energy
under contract DE-AC05-84OR21400



PREFACE

This document, *HAZWOPER Project Documents for Demolition of the Waste Evaporator Facility, Building 3506, at Oak Ridge National Laboratory, Oak Ridge, Tennessee* was prepared to ensure that activities associated with the demolition of the Waste Evaporator Facility, Building 3506, have undergone a hazard evaluation process, that proper health and safety considerations for the workers and the environment have been implemented, and that compliance with the Occupational Safety and Health Act of 1970, Title 29, *Code of Federal Regulations*, 1910.120 has been procured. This document describes the work processes and the health and safety procedures to be utilized during the course of the subject activity. This work was performed under Work Breakdown Structure 1.4.12.6.2.01.12.05, Activity Data Sheet 3701, "Oak Ridge National Laboratory Decontamination and Decommissioning Program."

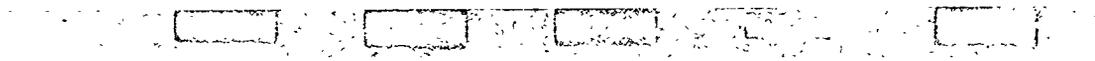
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ABBREVIATIONS

ACM	asbestos containing material
ACRM	asbestos containing roofing material
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATG	Allied Technology Group
<i>CFR</i>	<i>Code of Federal Regulations</i>
DAC	derived air concentration
DOE	U.S. Department of Energy
Energy Systems	Lockheed Martin Energy Systems
HAZWOPER	hazardous waste operations and emergency response
Hg	mercury
HP	Health Physics
HPC	HAZWOPER Program Coordinator
HEPA	high efficiency particulate air
IH	Industrial Hygienist
LLW	liquid low level waste
LSS	Laboratory Shift Superintendent
NRC	U.S. Nuclear Regulatory Commission
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Act of 1970
PAM	personnel air monitor
PCB	polychlorinated biphenyl
PEL	permissible exposure limit
PIC	pocket ionization chamber
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act of 1976
RP	Radiation Protection
RSO	Radiation Safety Officer
RWP	Radiation Work Permit
SHEST	Safety and Health Evaluation and Support Team
SWSA	Solid Waste Storage Area
TCLP	Toxicity Characteristic Leaching Procedure
TLD	thermoluminescent dosimeter
TSCA	Toxic Substance Control Act
WEF	Waste Evaporator Facility

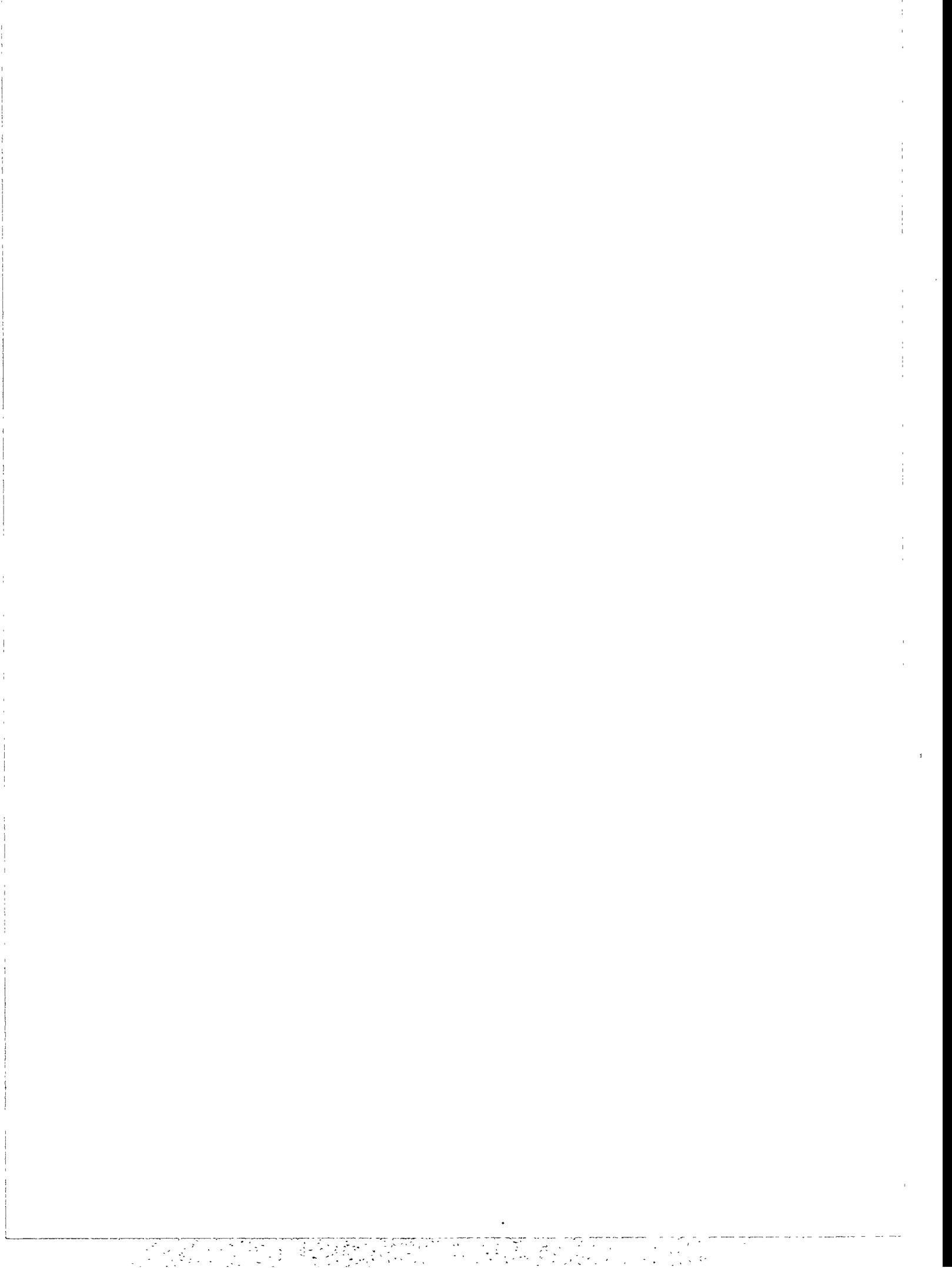


EXECUTIVE SUMMARY

This document, *HAZWOPER Project Documents for Demolition of the Waste Evaporator Facility, Building 3506, at Oak Ridge National Laboratory, Oak Ridge, Tennessee* has been developed by Allied Technology Group (ATG) in support of the Waste Evaporator Facility (WEF) demolition project and contains the *Project Work Plan* and the *Project Health and Safety Plan* for demolition and partial remediation actions by ATG at the Waste Evaporator Facility, Building 3506. Various activities will be conducted during the course of demolition, and this plan provides details on the work steps involved, the identification of hazards, and the health and safety practices necessary to mitigate these hazards.

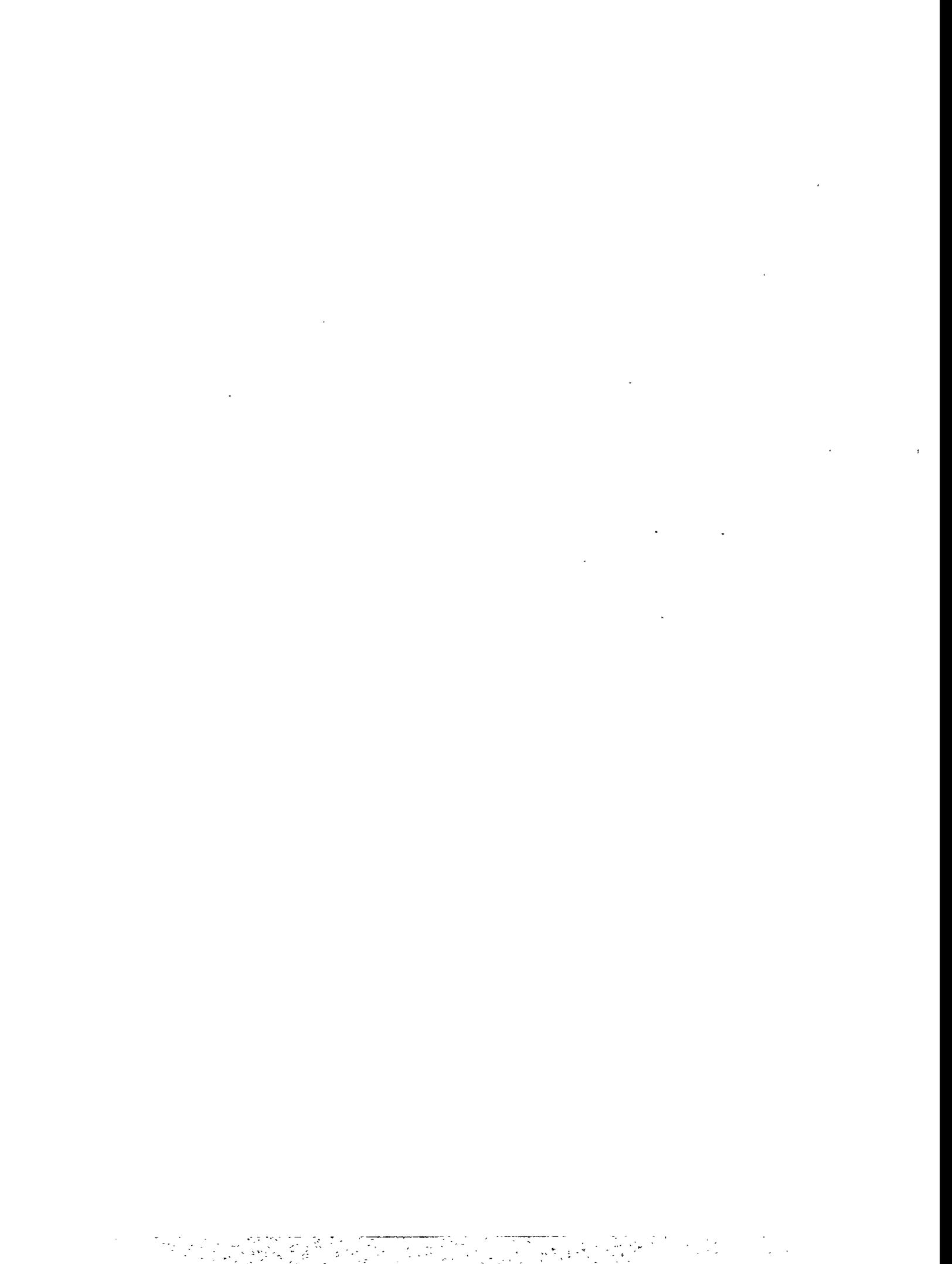
The objective of this document is to develop an approach for implementing demolition activities at the WEF. This approach is based on prior site characterization information and takes into account all of the known hazards at this facility. The *Project Work Plan* provides instructions and requirements for identified work steps that will be utilized during the performance of demolition, while the *Health and Safety Plan* addresses the radiological, hazardous material exposure, and industrial safety concerns that will be encountered.

This document was prepared by ATG, the demolition subcontractor, and complies with the requirements established by the Occupational Safety and Health Act of 1970, Title 29, *Code of Federal Regulations*, 1910.120 for conducting hazardous waste operations and emergency response. Adherence to this document will provide assurance that tasks will be performed safely, efficiently, and cost-effectively with appropriate protection of the environment and the health and safety of workers and the general public.



Part I.

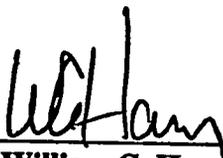
**Project Work Plan for Demolition and Partial Remediation
of the Waste Evaporator Facility, Building 3506,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**



APPROVALS

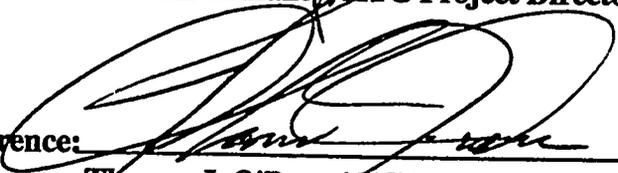
Part I.

Project Work Plan for Demolition and Partial Remediation
of the Waste Evaporator Facility, Building 3506,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee

Concurrence: 

William G. Haney, ATG Project Director

Date: 12/12/95

Concurrence: 

Thomas J. O'Don, ATG Project Manager

Date: 12/12/95

Concurrence: 

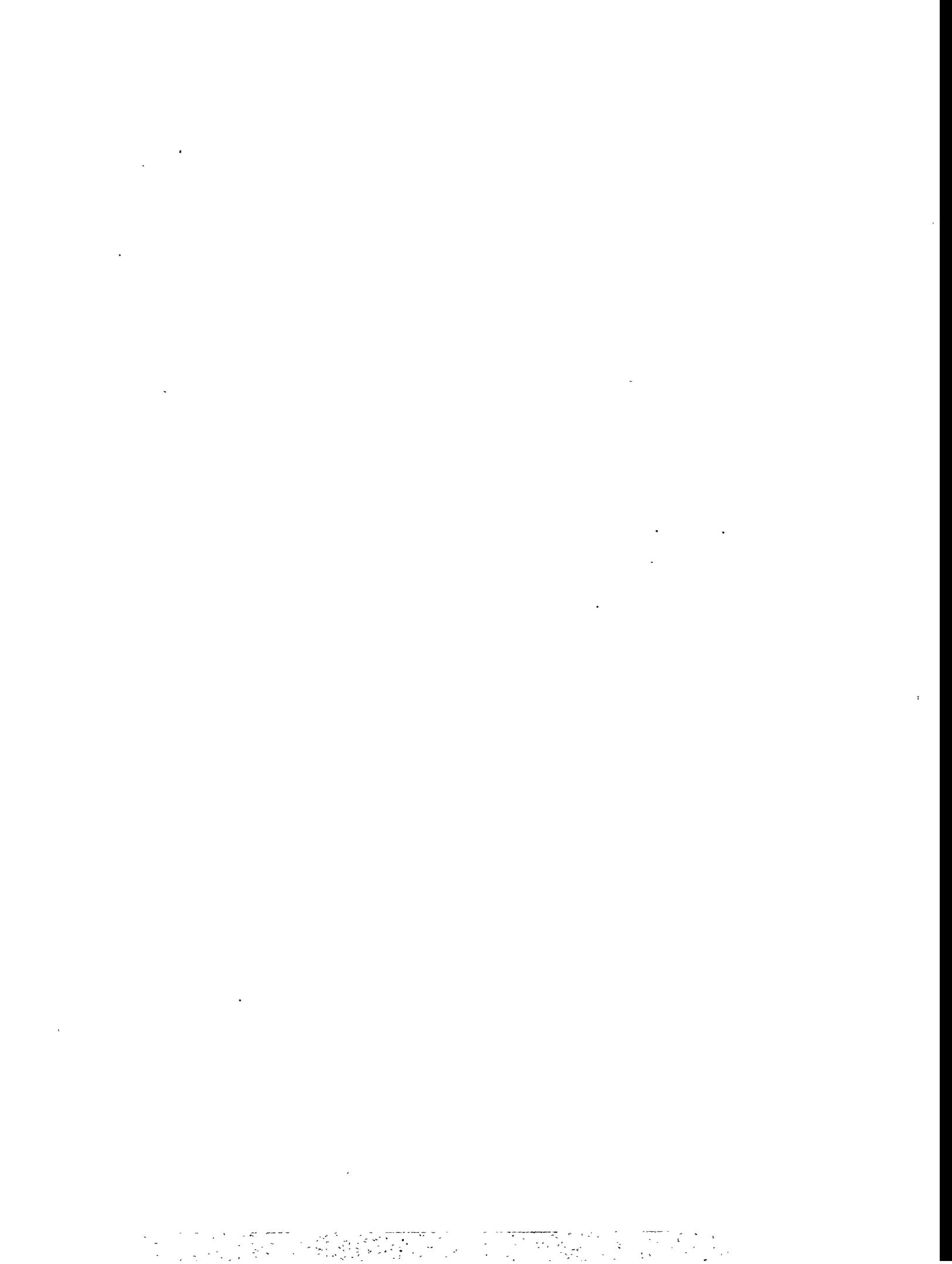
Jerry Mandry, LMES Project Manager

Date: 12/11/95

Concurrence: 

Brad Copeland, LMES Health & Safety Manager

Date: 12-11-95



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1. INTRODUCTION

This Allied Technology Group, Inc. (ATG) *Project Work Plan* details the limited decontamination and disassembly of the Waste Evaporator Facility (WEF) Building 3506 at the Oak Ridge National Laboratory (ORNL). This facility currently is not used and is contaminated with hazardous and radioactive materials as described in *Service Contract Specifications for Decontamination and Demolition of Building 3506*, Project Order No. 9440020.01, "Decontamination and Demolition of Building 3506 at Oak Ridge National Laboratory" (Energy Systems 1995a). Limited decontamination and disassembly will be accomplished by performing all tasks safely, efficiently, and cost-effectively with appropriate protection of the environment and the health and safety of workers and the general public. The work instructions and requirements of the ATG work plan for this project shall be reviewed with the work force prior to the start of work and shall be adhered to at all times while on the work site. Personnel entry into any work area is not permitted without prior approval of the ATG site supervisory staff.

1.1 HISTORY OF BUILDING 3506

From 1949 until 1954, Building 3506 received liquid, low-level waste (LLLW) from ORNL operations for concentration of radiochemical waste before disposal. Based on surveys performed during 1993 and 1994, the gallery has a few identified "hot spots" of radiological contamination. The cell area is contaminated. The highest levels of contamination are in the cell floor sediments and fixed within the cell's concrete floor. The primary radiological contaminant is the gamma-emitting isotope ¹³⁷Cesium. The general area exposure rate in the gallery is <1mR/hour and ranges from 1 to 5mR/hour in the cell. Sampling of the cell floor sediment indicted the presence of polychlorinated biphenyls (PCBs) greater than the Toxic Substances Control Act limit of 50ppm. Cadmium, chromium, lead, and mercury (Hg) were also detected in the cell floor sediment at levels that would be expected to fail the Resource Conservation and Recovery Act of 1976 (RCRA) Toxicity Characteristic Leaching Procedure (TCLP). Mercury was also detected in the crawlspace soil under the east gallery at a level expected to fail the TCLP analysis. There are also eight lead shielding plates attached to the interior walls that will be classified as low-level radioactive mixed waste.

1.2 DESCRIPTION OF BUILDING 3506

Building 3506 has a reinforced-concrete cell covered with three, steel deck plates, a concrete floor lined with stainless steel, and an operating gallery along the east side of the cell. The rectangular cell is 10.2 by 4m (28 by 13.5ft) and extends approximately 2.2m (6ft) below grade and 4.9m (13.5ft) above grade. The concrete walls are 0.7m (2ft) thick in the northern half and 1m (3ft) thick in the southern half of the cell. The operating gallery extends 11.6m (32ft) north to south and 3.3m (9ft) east to west. The walls were constructed primarily of concrete block. The floor is approximately 2.7m (7.5ft) high, and located under the gallery. The building originally had a second floor access to the north side of the building and a small box on the west side of the building where two pipes extend from the building into an unidentified piece of equipment (Bechtel 1994a).

2. SCOPE OF WORK

ATG shall provide all necessary personnel to decontaminate and demolish the Waste Evaporator Facility, Building 3506, at the Oak Ridge National Laboratory in a safe and efficient manner, in accordance with the Lockheed Martin Energy Systems (Energy Systems) "Request for Proposal No. KEP03-18" dated August 8, 1995. All work on this subject shall be controlled in accordance with regulatory and site specific requirements. This scope is based on preliminary assessment and potential hazards as identified in the *Site Characterization Report*, ORNL/ER/Sub/87-99053/72 (Bechtel 1994), and may be re-evaluated or modified to improve efficiency or worker safety with the concurrence of the ATG Corporate Health Physicist or the Director of Remediation.

2.1 SCOPE OF DECONTAMINATION

Remove, package, and perform decontamination on the following contaminated components, structures, and hazardous materials. The work to be performed shall be described in this work plan.

1. Remove and package all asbestos-containing material (ACM).
2. Remove and package all loose paint flakes as lead-containing waste.
3. Remove and package electrical conduit, electrical fixtures and other loose materials.
4. Remove and package the steel piping, equipment, supports, cast iron piping and other miscellaneous metals.
5. Remove, decontaminate and release the steel deck panel cell covers and stainless steel roof pan.
6. Remove, package and deliver lead patches to the Facility Manager, and decontaminate concrete areas (as required) located under patches.
7. Remove and package wall sections containing pipe sleeves located in the gallery/cell common wall.
8. Remove and package remaining roof materials, except for those in Item 5 above.
9. Remove and package doors, stud walls and miscellaneous wood items.
10. Remove and package mercury- and radionuclide-contaminated soil from the floor of the crawlspace.
11. Remove water from the cell; and remove contaminated sediment.
12. Core drill two drainage holes with a 1-in. minimum diameter (4-in. recommended); one through the cell sump and one through the below-grade wall of the crawlspace.
13. Decontaminate stained strip, approximately 15sq ft, on south cell wall.

The various waste streams will be segregated according to their hazard class such as Toxic Substance Control Act waste, RCRA waste, mixed waste, low-level waste, etc.

The materials from Building 3506 will be handled in accordance with requirements of the performance specification and Division 1, Section 01550, "Waste Disposal" of the *Service Contract Specifications for Decontamination and Demolition of Building 3506* (Energy Systems 1995a).

2.2 DOCUMENTATION

Data collection shall be fully documented on the appropriate data record and daily project logs. All records shall be as complete and thorough as possible, legible, and in ink. Personnel making a change to a record shall cross out the old entry with one line, add the new information, and initial and date the change. Under no circumstances shall the old entry be scratched out, whited out, erased, or otherwise removed or made illegible.

When applicable, an explanation should accompany the change or correction. The ATG Site Superintendent shall maintain all logs.

2.3 SCOPE OF DEMOLITION

Remove and package the components and structures as indicated below. The work to be performed shall be described in this work plan.

1. Remove gallery floor and building walls to 1ft below grade, and also remove exterior sidewalks and concrete pads. Use demolition concrete as clean fill in the below-grade volume of the building. Do not damage the Valve Pit.
2. Use demolition concrete which meets the definition of Category 2 material per the ORNL procedure, *Health, Safety, and Environmental Protection Procedure for Excavation Operations*, M-116, "Radiological Soil Handling Criteria" (see Appendix A of Part I) to fill crawlspace and cell volume to 1ft below grade. Minimize voids.
3. Excess building materials shall be transported to the Y-12 Sanitary Landfill for disposal. Only releasable materials will be sent to the Y-12 Sanitary Landfill.
4. Cover with geomembrane, backfill, compact, and seed the backfill.

The materials from Building 3506 will be handled in accordance with requirements of the performance specification, Division 1, Section 01550, "Waste Disposal" in the *Service Contract Specifications* (Energy Systems 1995a).

2.4 HOLD POINTS

The sequencing of the following work activities is at ATG's discretion. However, the following HOLD POINTS shall be adhered to:

1. Do not proceed with demolition without written approval from the Facility Manager.
2. All floor drains and perimeter wall openings which offer reasonable potential for allowing hazardous materials to enter the environment shall be plugged prior to hazardous material abatement. Notify the Facility Manager immediately upon completion of drain/opening plugging

for confirmation of acceptable plugging. Do not proceed with hazardous material abatement without written approval from the Facility Manager.

3. Hazardous and radioactive material removal shall be completed in accordance with Section 4 of the *ATG Health and Safety Plan* prior to building demolition. Removal of roofing and exterior equipment/materials may proceed concurrently with building interior decontamination. Notify the Facility Manager immediately upon completion of removal for confirmation of acceptable hazardous and radioactive material removal. The Energy Systems representative will verify that material is properly segregated and packaged prior to approval for disposition.

3. SITE PREPARATION

The following tasks shall be performed prior to actual remediation:

1. Before work begins, all tools and related equipment shall be screened for radioactive contamination by the Facility Manager's Health Physics (HP) personnel. After completion of work, tools and related equipment will be screened again and decontaminated as necessary.
2. A barrier shall be erected around all work areas and shall be properly posted for both radiological and industrial safety hazards.
3. Set up on-site facilities: control point, emergency decontamination facility, and entrance and exit points to controlled area.
4. Verify, physically and/or by test, that all utilities, including electrical services on the building, are disconnected. Contact the Facility Manager and verify that live control lines servicing other facilities have been relocated from the east corner of Building 3506. Verify that all water lines are depressurized or disconnected prior to demolition. Physical verification shall be performed periodically during demolition activities as well as prior to the initiation of each work shift. The Facility Manager will be responsible for lockout/tagout on all systems requiring lockout/tagout. ATG will be responsible for applying its overtags and locks in accordance with Division 1 specifications (Energy Systems 1995a).
5. Build protective structures around the valve pit and small but vital fixtures outside the building. If possible, the valve operators will be removed at the base, and will be reattached at the end of the project.
6. Energy Systems will specify the location(s) and ATG will prepare laydown areas for clean and contaminated materials.
7. Energy Systems will specify and ATG will remove unnecessary external structures to minimize obstructions and interference.
8. Build protective shoring for gallery roof. The shoring will be constructed of wooden support beams.
9. Plug all drains and holes, then get written permission from the Facility Manager to proceed.
10. A containment tent will be erected over the building prior to the start of work. The tent will be installed by ATG in accordance with the manufacturer's installation instructions.
11. The Facility Manager shall provide B-25 boxes and drums. These shall be placed in the appointed equipment storage areas.
12. Inform the Facility Manager immediately of any significant unusual or deteriorating conditions of the building discovered during work activities.
13. Appropriate personal protective equipment (PPE) and insulated tools will be used by ATG each time any electrical circuit (including those verified as de-energized) is to be cut.
14. Spill control kits that consist of a shovel and a 55-gal drum containing absorbent pigs, gloves, shoe scuffs, and a Tyvek suit will be on-site during this project.

4. FACILITY DECONTAMINATION

Workers shall decontaminate the gallery and other equipment as necessary in a manner to minimize waste generated during demolition and decrease the possibility of release of radioactive airborne activity inside the tent. The decontamination method for radiological contamination shall consist of soap and water solution and disposable towels. Any abrasive methods shall be performed with ATG Supervisor approval only. Locations where radiological decontamination is needed will be identified by the HP technicians by outlining contaminated areas with spray paint during the pre-job survey. The HP technicians shall then re-survey the areas after decontamination to ensure all contamination has been removed. If decontamination is unsuccessful after a third attempt, then the ATG Supervisor shall perform an evaluation before any further decontamination is allowed.

4.1 HEALTH PHYSICS CONTROL

After initial HP surveys, all work that involves exposing previously unsurveyed surfaces, shall be performed by HP. A daily routine survey schedule shall be established by HP. Radiological surveys shall be performed by HP technicians using hand-held ion chamber dose rate meters and Geiger-Müller friskers or equivalent. All instruments shall be in proper working order, response checked daily, and be within the calibration due date. Copies of calibration certificates shall be kept on-site. Surveys will be performed to identify the following radiological conditions:

- fixed surface contamination
- loose surface contamination
- general area dose rates
- "hot spot" identification (radiological "hot spots" are defined as a radiation source that is five (5) times general area dose rate and/or greater than or equal to 100mR/hr at 30cm)
- air quality

4.2 ASBESTOS-CONTAINING MATERIALS

ACM was found in the window putty and in the roofing felt in the gallery. This task will require workers who have successfully completed Asbestos Worker training and are trained in asbestos handling techniques and health/safety techniques associated with that function.

1. Remove gallery windows; asbestos in putty. The window putty will not need to be removed, windows can remain intact, and will be disposed of in plastic wrapping intact.
2. Remove gallery roof top (stainless steel). Survey roof top for possible clean release. Expose tar paper felt. The asbestos is in the roof felt.
3. Remove the roof felt by hand. Any felt that has adhered to roof top will be loosened with water and removed with flat head shovels.
4. PPE requirements for all work involving ACM will be described in Section 4.1.1. of the ATG *Health and Safety Plan*.

4.3 LEAD REMOVAL

Loose paint chips may exist on any painted surfaces. Removal will require workers who have successfully completed ATG Lead Worker training and are trained in lead handling techniques and health/safety techniques associated with that function.

1. Remove and package loose paint chips in the interior and on the exterior of the building. Scrape or chip old paint as necessary to prevent exposure to workers. Only loose flaking paint needs to be removed. Removal of loose paint chips will be performed with putty knives and catch basins.
2. Decontaminate, remove, package, and deliver to the Facility Manager the lead patches covering pipe sleeves in the west gallery wall and the six lead patches located on the east wall of the cell. This task will be performed under HP surveillance in the event that the components under the lead sleeves or patches may shield radiation "hot spots."
3. PPE requirements for all work involving lead will be described in Section 4.1.2. of the ATG *Health and Safety Plan*.

4.4 ELECTRICAL CONDUIT, FIXTURES, AND OTHER LOOSE MATERIALS

Electrical equipment in the building is assumed to be radiologically contaminated and not economical to clean and survey. Wiring may contain lead, PCBs and/or asbestos. The outside electrical equipment will be removed at the same time as the internal equipment. The inside and outside material shall be kept separate. The wire shall be staged as directed by the Facility Manager. The conduit from inside the building is to be disposed of as radioactive material inside B-25 boxes. The conduit from outside the building, may be used to fill voids in the boxed conduit from inside—not vice versa. Do not place electrical materials in the below-grade volume. All waste will be segregated prior to packaging.

1. Verify that all electrical power is disconnected before demolition of the conduit and cable.
2. Steel conduit and pipe protrusions will be cut with a portable band saw after cut location has been surveyed for radiological contamination by a HP technician.
3. The electrical wiring will be placed on pallets which will be stripped at a later date by Energy Systems.
4. Disconnect, remove, and package light fixtures. Remove and package brackets, stems, hangers, and other accessories. Lamps are to be removed from lighting fixtures, containerized and staged for pickup by the Facility Manager. Ballasts are also to be removed, handled as polychlorinated biphenyl (PCB) waste, containerized and staged for pickup by the Facility Manager. Remaining fixtures shall be handled in accordance with Division 1, Section 01550, "Waste Disposal" in the *Service Contract Specifications* (Energy Systems 1995a).

4.5 GALLERY CONTAMINATED PIPING/EQUIPMENT/METAL REMOVAL

1. Remove and package in B-25 boxes all equipment and associated piping, duct, tubing stands and supports inside the gallery and crawlspace.

2. All piping above the 1ft below grade elevation, with the exception of piping sleeves in the gallery west wall, shall be cut flush with the wall or floor and the cut pieces packaged in B-25 boxes.
3. All piping below the 1ft below grade elevation should be cut flush with floor or wall. All perimeter wall piping shall be sealed at the end by plugging.
4. Pipe sleeves running from the gallery to the cell in the common wall shall be removed intact when that portion of the common wall is removed.
5. In the gallery, remove and package in B-25 boxes all steel sheet metal covering support joists, manhole cover and any other miscellaneous metal.
6. Remove, decontaminate to levels as listed in Table IV-1, "Surface Contamination Limits" in U.S. Department of Energy (DOE) Order 5400.5, and stage the steel deck plate covers as directed by the Facility Manager.

4.6 GALLERY DISASSEMBLY

NOTE: There is severe deterioration of roof materials.
Use fall protection when above six ft.

DO NOT STAND ON THE GALLERY ROOF

Upon completion of gallery decontamination, the disassembly phase can begin.

1. Remove the gallery roof; severe deterioration; survey for release as clean material; box separately from hazardous material.
2. Remove gallery doors and wooden walls on east side; survey for release as clean; box with wood from roof.
3. Remove east walls (concrete block) (concrete may be clean) to expose gallery area inside walls.
4. Remove gallery south doors and walls; concrete may be clean.
5. Gallery floor will be cut by the subcontractor (Trentec) into moveable sections to reveal open crawlspace. This task will be performed by the subcontractor (Trentec) under ATG supervision, the ATG *Health and Safety Plan*, and the subcontractor's concrete cutting procedures.
6. Remove concrete wall of gallery to grade level.

4.7 MERCURY SAMPLE

The soil in the crawlspace will be sampled by an ATG Industrial Hygienist (IH) for Hg concentration. In addition, samples of air in the crawlspace will be taken to determine air quality, oxygen content, and presence of explosive or toxic gases. The HP technicians will survey soil and air for radiological contaminants.

4.8 MERCURY CONTAMINATED SOIL

The Hg contaminated soil will be removed using an Excavator/Backhoe or will be hand excavated and placed in B-25 boxes for disposal.

1. Cover ground between B-25 box and crawlspace with puncture resistant poly sheeting to contain loose dirt.
2. Remove all soil for entire length and width of crawlspace to a depth of 1.9 ft, or until refusal, or as directed by the Facility Manager.
3. PPE requirements for all work involving Hg will be described in Section 4.1.3 of the *ATG Health and Safety Plan*.

4.9 DECK PANEL CELL COVERS

The roof of the cell is constructed of diamond plate steel.

1. Remove covers from cell structures. Survey covers for radioactive material. Control the roof deck plate as radioactive until verification by radiological surveys.
2. The atmosphere and water inside cell will be sampled by the IH for oxygen, lower explosive limit, carbon monoxide, hydrogen sulfide prior to entry. HP technicians will also survey for radioactive contaminants.
3. Perform decontamination of deck panels as described in Section 4 of the *ATG Health and Safety Plan*.

4.10 CELL WATER REMOVAL

The cell contains approximately 1500 gallons of water. The sludge and sediment in the bottom is known to contain radiological, RCRA, and PCB contaminants.

1. After sampling and analysis are complete, the water will be treated "as found" by Energy Systems Waste Operations.
2. The remaining sludge will be removed with flat head shovels into plastic disposable containers used to transport the waste from the cell to the 55-gal drums designated for PCB storage.

4.11 CELL SURVEY

Upon completion of water and sludge removal, the cell shall be surveyed by the IH and HP technicians for heavy metals, PCBs, and radioactive contamination. The HP survey shall be performed in order to identify the following radiological conditions inside the cell:

- fixed surface contamination
- loose surface contamination
- general area dose rates

- “hot spot” identification (radiological “hot spots” are defined as a radiation source that is five (5) times the general area dose rate and/or greater than or equal to 100mR/hr at 30cm)
- air quality

4.12 CELL DECONTAMINATION

Upon completion of the HP survey as described in Section 4.11, cell decontamination can begin. This will consist of removal of radioactive material from the cell walls and floor, as well as the lead shielding patches. A review of the cell survey by HP supervision may warrant that the decontamination and packaging of the lead patches be performed outside the cell due to dose considerations. Remove and dispose of lead as per Section 4.3.2. PPE will be described in the Radiation Work Permit (RWP).

1. Provide high-efficiency particulate air (HEPA) filtered ventilation to cell.
2. Build access stairs to the cell below.
3. Lead decontamination will be performed as described in Section 4.3 of the ATG *Health and Safety Plan*.
4. Concrete radiological contamination will be removed by ATG decontamination technicians using concrete scabblers or other hand tools. Contamination levels on concrete must meet criteria of Category 2 in the *Health, Safety, and Environmental Protection Procedure for Excavation Operations*, M-116, “Radiological Soil Handling Criteria” (see Appendix A) to be placed in the below-grade area.

4.13 CELL PIPING, EQUIPMENT, AND SUPPORTS REMOVAL

Piping and materials will not require decontamination because it is not considered economical.

Components will be cut with a portable band saw to help minimize the spread of contamination potentially located inside. No components shall be cut without HP approval. *Each* location shall be surveyed for radiological contamination. Engineering controls will be used during all cutting, grinding, and welding on contaminated materials to prevent contamination from entering the workers breathing zone and the environment. Engineering controls shall consist of, but not be limited to HEPA ventilation, cursory decontamination, etc. PPE shall be designated in the RWP.

4.14 CELL DRAINAGE

Cell drainage will be attained by drilling two holes, 4–8 in. diameter, one in the crawlspace (if a foundation exists), and one in the hot cell floor.

1. Drainage holes will be filled with Number 4 course aggregate. Place a Trevera fabric (1120 or equivalent) cover over the holes. Twelve (12) in. of Number 4 course aggregate will be placed over the Trevera fabric to allow drainage to the holes.
2. Concrete cores shall be disposed of on-site in the below-grade volume in accordance with Category 2 criteria located in the, *Health, Safety, and Environmental Protection Procedure for Excavation Operations*, M-116, “Radiological Soil Handling Criteria” (see Appendix A).

5. BUILDING DEMOLITION

Remove and dispose of the east gallery, crawlspace walls, and cell area down to 1ft below grade (except for the north cell wall). Materials shall be segregated into Category 1 and Category 2 materials in accordance with the Interim Revision located in the *Health, Safety, and Environmental Protection Procedure for Excavation Operations*, M-116, "Radiological Soil Handling Criteria" (see Appendix A). Category 2 concrete shall be placed on-site in the cell and crawlspace in the below-grade volume on a space-available basis. Category 1 concrete may only be used to minimize void spaces if Category 2 material is not available. The available volume shall be filled with concrete to a minimum of 80% capacity. ATG will ensure that rebar does not protrude more than 2in from cut sections of the concrete in accordance with state land disposal restrictions. Excess Category 1 materials shall be transported to the sanitary landfill. Excess Category 2 materials, if any, shall be placed in B-25 boxes and staged for pickup by the Facility Manager. All effort will be made to minimize excess materials.

5.1 GALLERY DEMOLITION

Remove and dispose of the following components located in the east gallery:

1. Concrete masonry block south and east walls.
2. Remaining concrete west wall.
3. Concrete stair from ground level to the north door.
4. Concrete steps up to the south door.
5. Concrete floor.
6. Brick tile flooring (set in concrete) northwest corner.

5.2 CELL DEMOLITION

The cell walls will be cut into moveable blocks to facilitate removal. This task will be performed by the subcontractor (Trentec) under ATG supervision, the ATG *Health and Safety Plan*, and the subcontractor's concrete cutting procedures.

1. Remove south and west concrete walls to 1ft below grade.
2. Remove north concrete wall flush with the top of the valve pits.
3. Pipe penetrations protruding from the cut wall sections shall be cut flush with concrete, so that storage space in the cell will be conserved.
4. All work on contaminated material inside cell will be performed in accordance with Section 4.13. of the ATG *Health and Safety Plan*.
5. Remove crawlspace walls to 1ft below grade.

6. Remove, package, label, and stage for pickup by Energy Systems Waste Operations the following components exterior to Building 3506:
 - corrugated metal awnings,
 - metal stairs and handrails,
 - metal platforms and framing,
 - concrete walk on west side of the building up to the Valve Pit,
 - concrete walk and pad on south side, and
 - any miscellaneous material associated with Building 3506.

5.3 GEOTEXTILE FABRIC, SAND FILL AND COMPACTION, GEOMEMBRANE LAYER

1. Prior to the installation of the geotextile fabric, proofroll the demolition debris with a dozer and/or other heavy tracked equipment to stabilize fill, enhance consolidation, densify the surface, and to produce a smooth and reasonably uniform slope. Remove sharp objects such as jagged-edge rubble or concrete reinforcing bars, which could puncture the geotextile fabric. Demolition debris shall be proofrolled until the finished surface is acceptable to the Facility Manager.
2. Install geotextile fabric over compacted demolition debris in accordance with manufacturer's recommendations and as shown on Sketch SK-C02 (Energy Systems 1995a).
3. Spread a sand layer over the geotextile fabric in a manner which does not damage the geotextile fabric. Compact the sand with a minimum of four (4) one-way passes with a smooth steel-drum roller. Shape the sand layer to promote positive drainage away from the building. Adjust the moisture content of the sand as required for workability.
4. After placement of the sand layer, and prior to installation of the geomembrane liner, proofroll sand layer to remove ruts, ridges, sharp objects, and other imperfections. Areas that pump, rut, or deform excessively during rolling shall have additional sand material added and compacted until stabilized.
5. Install geomembrane liner as shown on Sketch SK-C02 and in accordance with manufacturer's installation procedures (Energy Systems 1995a).

5.4 SOIL FILL AND COMPACTION

1. Spread fill material to be compacted in lifts that will not exceed 6in after compaction.
2. After placement of loose material, adjust moisture content as necessary for workability and compaction.
3. Compact all lifts of soil fill using a minimum of four (4) one-way passes with a smooth, steel drum roller. Each lift shall be installed in a manner which does not damage the underlying geomembrane liner.
4. Grade to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes. Finished surfaces shall have a minimum slope of 0.5%.

5. Do not place fill material when weather conditions, condition of the subgrade, or condition of the fill material precludes obtaining adequate compaction. Do not use frozen material for fill, and do not place fill material on or against frozen surfaces.
6. After final grading has been achieved the soil layer shall be proof rolled with a smooth, steel drum roller. Areas that pump, rut, or protrude excessively during proof rolling shall be scarified, conditioned, and recompactd to stabilize areas. Areas that can not be conditioned to achieve an acceptable surface as determined by the Facility Manager shall be undercut and replaced as directed by the Facility Manager.

6. ENVIRONMENTAL PROTECTION

The following environmental concerns shall be addressed as follows:

1. Any required digging will be performed in accordance with the excavation and penetration permit (which can be obtained from the Facility Manager).
2. Provide dust control and dust monitoring throughout work activities to prevent visible dust emissions from reaching Third Street and Central Avenue on the ORNL property.
3. Control and monitor/sample for airborne radioactivity to ensure that concentrations of radioactive material in the air outside the project fence do not exceed values in Figure 1 (Energy Systems 1995a).
4. Provide packaging for loose waste and salvageable materials during transport. Ensure that no waste is allowed to fall off the trucks during transportation. In the event that waste is lost during transportation, ATG will be responsible for the cleanup. This includes both public highways and plant roads.

6.1. EROSION CONTROL

Control of surface water runoff and soil stabilization will be accomplished by installing slope protection and erosion control using straw bale barriers entrenched in a row (Energy Systems 1995a).

6.2. SEEDING

Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, seeding dates, and location of packaging. See Appendix C, "Foster Wheeler Environmental Corporation DOE-ORO ERWM Program—Seeding," in the *Service Contract Specifications* (Energy Systems 1995a).

If it is decided that the containment tent shall remain over the site upon completion of demolition activities, seeding of the area will not be necessary. Refer to the Facility Manager for direction.

Appendix A

**HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION
PROCEDURE FOR EXCAVATION OPERATIONS (M-116):**

RADIOLOGICAL SOIL HANDLING CRITERIA



INTRODUCTION

These soil handling criteria were developed to provide a safe and practical methodology for dealing with contaminated soil in the field. Radiological characteristics for Category 1 soil are based on current "green tag" limits. Radiological characteristics for Category 2 soil are based on an exposure rate reduction factor of 100 through use of at least one foot of uncontaminated backfill. Category 2 soil used as backfill in areas that will be continuously occupied should not result in dose rates greater than 0.25 mrad/h.

These criteria define radiological limits which are measurable with field instrumentation and provide an acceptable level of radiation safety for workers and persons exposed to this soil when used as backfill. **THESE CRITERIA ARE INTENDED FOR SOILS LOCATED ON AND REMAINING ON THE OAK RIDGE RESERVATION WHERE INSTITUTIONAL CONTROL IS IN PLACE.**

RADIOLOGICAL SOIL HANDLING CRITERIA

CATEGORY 1

This soil has unrestricted use on the Oak Ridge Reservation. Direct measurements taken at the surface of the soil are less than 300dpm/100 cm² alpha and less than 0.02 mrad/h beta/gamma. Smear counts from equipment that contacted the soil are less than 20 dpm/100 cm² alpha and less than 200 dpm/100 cm² beta/gamma. If there is historical evidence of alpha or low-energy beta contamination, the soil should be analyzed in the laboratory.

Depending upon the history of the area being excavated, the level of allowable activity will vary. If the excavation is in an area in which no radio processing or radioactive spills have occurred, it can be safely assumed that any alpha activity is due to natural uranium and/or thorium found in soils of ORNL. In this case the allowable limit for alpha activity is 0.8Bq/g gross alpha. However, if the excavation is in areas of know radio processing or radioactive spills, all alpha contamination will be assumed to be transuranic contamination and the allowable limit will be 0.33Bq/g gross alpha. The beta/gamma activity in any case must be less than 5Bq/g. Any soil with activity greater than these levels may not be used in an unrestricted manner, but must be considered "contaminated" soil. If there is, the allowable limit for alpha activity is 0.8Bq/g gross alpha. However, if the excavation is in areas of know radio processing or radioactive spills, all alpha contamination will be assumed to be transuranic contamination and the allowable limit will be 0.33Bq/g gross alpha. The beta/gamma activity in any case must be less than 5Bq/g. Any soil with activity greater than these levels may not be used in an unrestricted manner, but must be considered "contaminated" soil. If there is a result, if the measured value is greater than 1.645 times the measurement uncertainty divided by two, the result is statistically significant. If either of these limits are exceeded, the soil should be considered "Category 2." Soil with a uranium/thorium level in excess of 1 Bq/g can be approved as "Category 1" soil if it can be demonstrated that the uranium/thorium content is typical of that type of soil.

CATEGORY 2

Soil in this category may be used for limited backfilling. Measurements at the surface of this soil are greater than 300 dpm/100 cm² and less than 6000 dpm/100 cm² alpha and equal to or greater than 0.02 mrad/h but less than 5.0 mrad/h beta/gamma.

Soil in this category may be used for backfill at the site of origin or in a Contamination area of similar radiation levels, provided that the area to be backfilled is not intended for continuous human occupation. In each location where Category 2 soil is used as backfill, at least one foot of clean uncontaminated soil must be placed over the contaminated backfill, and the site must be identified as a maintained area and marked on maps that are kept updated. In no case should contaminated soil be used as backfill in uncontaminated areas.

Soil not needed for backfill shall be considered as Radioactive Waste (Category 3) and sent, after proper packaging, to the designated Solid Waste Storage Area (SWSA).

CATEGORY 3

Soil in this category may not be used for backfill but will be considered as Radioactive Waste and sent to the designated SWSA. Surface readings are equal to/greater than 6000 dpm/100 cm² alpha or equal to/greater than 5.0 mrad/h beta/gamma.

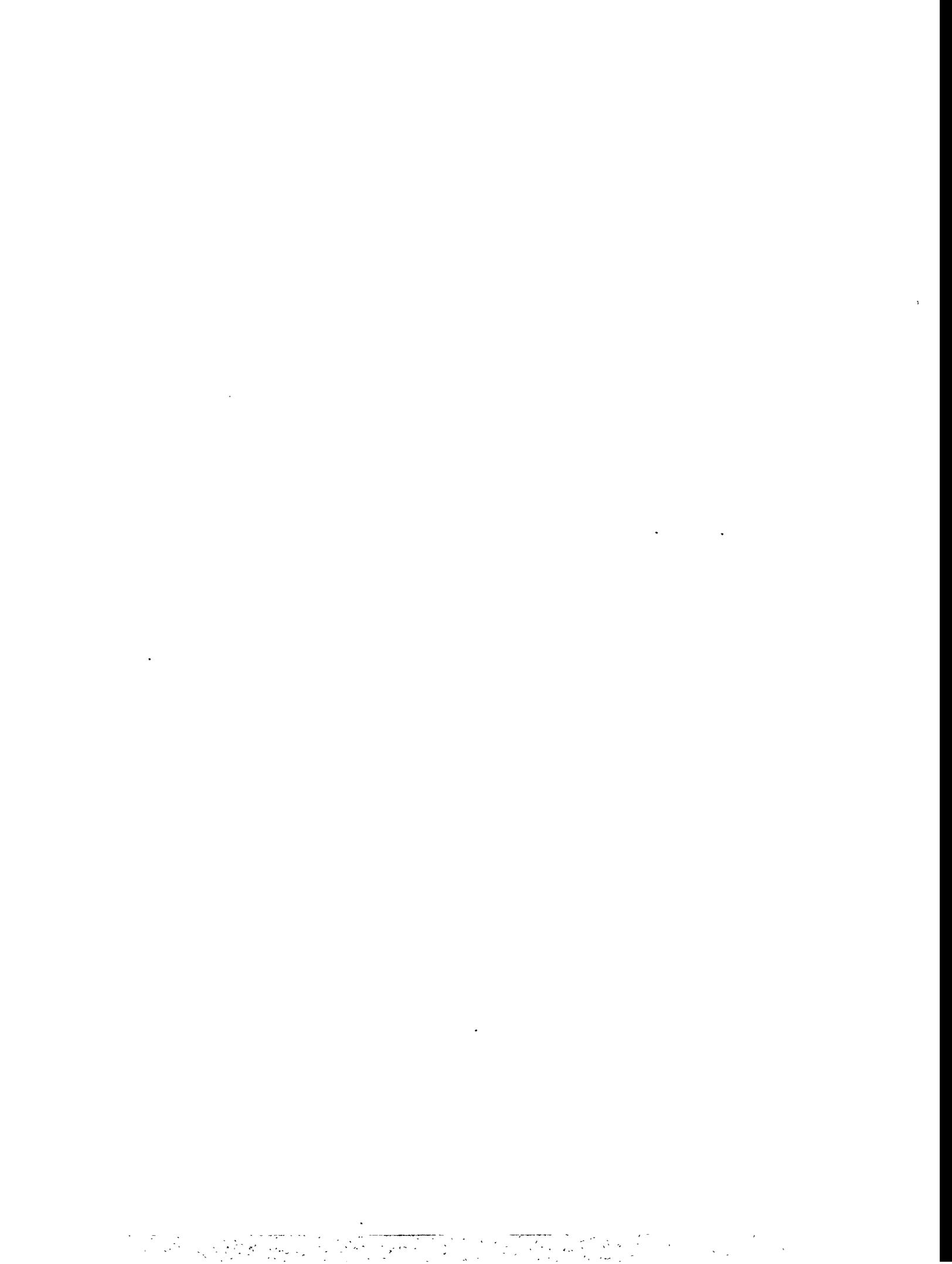
Appendix B

**WASTE EVAPORATOR FACILITY DEMOLITION PROJECT
SITE-SPECIFIC BEST MANAGEMENT PRACTICES PLAN**



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1. PROJECT PURPOSE AND DESCRIPTION

Building 3506, the Old Waste Evaporator Facility (WEF), was constructed in 1949 and housed the first liquid waste evaporator at ORNL. The WEF received liquid, low-level waste (LLLW) from laboratories and isotope processing areas for concentration. After the LLLW was processed, the condensate was transferred to the Process Waste System; the concentrate was then transferred to the Gunite Tanks in the North and/or South Tank Farms. In 1954, the WEF was replaced by Building 2531 (Radioactive Waste Evaporator Facility) and was subsequently used as an experimental radioactive waste incinerator and a rare-earth element separations experiment facility. In the 1980s, the facility was used as a changing room for personnel working in the North and South Tank Farm area.

Building 3506 is approximately 32ft by 23ft and consists of three main areas: north cell, south cell, and main gallery. The north and south cells are constructed of concrete walls that are 2 and 3ft thick, respectively, and extend to a depth of 6ft below grade. The concrete wall that once separated the north and south cells was removed to produce a single cell area. The roof over the cell area consists of 0.25 in. thick steel deck plates which must be removed to gain access to the area. The building originally included a second floor that provided access to the cells, but the second floor structure and interior stairs leading down into the cells have been removed. The gallery area is a wood structure except for the floor and west wall which are made of concrete. All equipment has been removed from the gallery, and cell areas and all piping entering/exiting the building have been removed and plugged. Based on the condition and the presence of radiological contamination within the facility, Building 3506 has been targeted for demolition to reduce or eliminate the potential for exposing personnel working in the North and South Tank Farm areas to residual contamination associated with the building.

The project will involve demolition of the above-grade portions of the Waste Evaporator Facility. This would remove an obstacle inhibiting access in the South Tank Farm and would facilitate the continued remedial activities at the Gunite and Associated Tanks Operable Unit. The proposed action includes:

1. Removing and packaging radioactive and mixed waste streams generated as a result of demolition activities;
2. Placing building concrete in the below-grade portion of the facility;
3. Providing limited decontamination to facilitate demolition;
4. Sampling and analysis for waste characterization and certification; and
5. Placing a geomembrane over the site, covering it with 1.5ft of backfill, compacting the backfill area, and seeding/stabilizing the backfill area.

2. EROSION AND SEDIMENTATION CONTROL

Waters of the State of Tennessee can be impacted via discharges from the ORNL storm sewer network. Guidance from the Tennessee Erosion and Sediment Control Handbook (attached) will be utilized for protection of the waters of the State through effective management practices during site

preparation and demolition activities. The goal of erosion and sedimentation controls is to minimize the impact project activities have on downstream water quality, including stormwater in ORNL storm sewers. Frequent vehicular traffic in vegetated areas, especially in the winter months, can create erosion and sedimentation problems. The stormwater in this area drains generally from northeast to southwest toward Third Street on the west side of the site and to a paved alley on the south side of the site. If significant disturbance of vegetated areas occurs, silt fences and/or straw bales will be placed along these boundaries to preclude sedimentation from the site.

Erosion and sedimentation controls will be installed, as needed, prior to the beginning of demolition activities and will be maintained throughout the duration of the construction phases. Silt fences will be installed down gradient of larger, disturbed areas to pond sheet flow runoff behind them and minimize sedimentation from the demolition site. Special sedimentation controls will be placed around nearby storm sewer catch basins which receive runoff from this site.

Straw bale barriers will be used in channels and oriented perpendicular to the channel, with ends of adjacent bales tightly abutting to one another. The straw bale barriers will be constructed so that water will flow through the barriers during low storm runoff. The barrier elevations will be designed so that a high flow storm runoff will over-top the barrier instead of running around the ends of the barrier. The silt fences and straw bale barriers will be inspected by the Construction Engineer or designee immediately after each rainfall and at least once daily during prolonged rainfall. Repairs will be made as necessary. The collected sediments will be removed when deposits reach one-third the height of the barrier. Collected sediments will be managed and labeled appropriately for final disposition by the Project Generator Certification Official.

Temporary seeding should be applied where final grading of exposed surfaces are to be completed within 15 days to a year. Areas where final grading is not planned for more than one year should be seeded under the permanent seeding guidelines. Such areas include denuded areas, soil stockpiles, dikes, dams, or temporary diversions. All erosion and sedimentation controls installed during the demolition will be modified as conditions change to protect the quality of runoff leaving the site.

3. STORMWATER DRAINAGE

Stormwater run-on will be diverted around the work area to prevent its contamination and need for treatment or detention before final disposition.

4. SITE RESTORATION

The below-grade portions of Building 3506 will contain construction debris from the above-grade portion of the facility to the maximum extent possible. A geomembrane will be placed over the site and covered with 1.5ft of backfill. Exposed soil will be graded and seeded or stabilized. Temporary erosion controls such as silt fencing and straw bales will be removed when all exposed soil is permanently and adequately stabilized.

5. TRAINING

ORNL employees receive a broad range of environmental, safety, and health training based on job requirements. Additionally, environmental awareness is raised by issuing periodic bulletins concerning topics such as spill control. Supervisors are responsible for providing on-the-job training with respect to hazardous materials handling and ORNL environmental policy.

6. SPILL PREVENTION AND WASTE DISPOSAL

All waste generated will be managed, stored and disposed of according to applicable statutes, regulations, DOE Orders, and Energy Systems procedures.

The ORNL Spill Prevention, Control and Countermeasures (SPCC) Plan provides details concerning the roles and responsibilities of personnel responding to releases of oils or other hazardous substances. Summarized below are portions of the SPCC that apply to the Waste Evaporator Facility Demolition Project.

The Construction Engineer is charged with responsibility to ensure that effective spill preventative measures are in place. A neat and orderly work environment will be maintained to reduce the possibility of spills or other environmentally deleterious incidents. The Office of Environmental Compliance and Documentation (OECD) Field Oversight personnel will provide oversight and guidance.

The ORNL SPCC Plan requires all possible precautions to be taken to minimize the likelihood of a spill or release. In the event of such, the Plan requires safe containment and/or recovery in a manner that best assures personnel safety and protection of the environment.

Tanks, drums, and other containers of oils, fuels, or hazardous or toxic materials, such as solvents, detergents, and degreasers will be stored such that a leak or spill will not flow into a storm sewer catch basin. If more than 110 gallons of any combination of these materials is stored on-site, secondary containment will be provided for the tank(s) or drum(s). Products should be kept in original labeled containers along with manufacturer' product information whenever possible.

Heavy equipment and mechanical equipment will be maintained in good repair to assure that slow leaks of engine, transmission or other oil are minimized. Idle equipment will be parked as far away from stream beds or drainage ways as practicable. At the request of the Construction Engineer, a drip pan will be placed under equipment with leak potential. Repairs to correct any substantial leaks will be completed as soon as possible.

Fueling operations will be performed carefully to prevent inadvertent small releases. All releases will be reported to the Construction Engineer and cleaned up as soon as possible.

Spill control kits will be located at the work site. Should a spill occur at the construction site, all safe and practical methods available should be used to prevent material from entering streams or flowing drainage ways. Absorbent pillows, temporary earth dikes, or other available means should be employed as appropriate, without risking personnel safety. Waste material generated during the cleanup of spills will be managed and disposed of appropriately.

7. SITE INSPECTIONS AND MONITORING

The project Construction Engineer will regularly inspect the areas immediately down gradient and downstream of the site to verify that water quality is not being significantly impacted. Record of these inspections and any observations will be maintained in the project file. ORNL OECD Division personnel will periodically inspect the site and verify regulatory compliance, long-term maintenance, and downstream water quality.

8. WASTEWATER DISPOSITION

The Construction Engineer will seek advance approval from the ORNL Liquid Waste Certification Officer to dispose of all waste water generated as a result of the Waste Evaporator Facility Demolition. Waste waters requiring approval include process waters, cooling water, contaminated stormwater.

Appendix C

**ENVIRONMENTAL MANAGEMENT PLAN FOR THE WASTE
EVAPORATOR FACILITY DEMOLITION
TASK ORDER PROJECT**



APPROVALS

Environmental Management Plan for the Waste Evaporator Facility Demolition Task Order Project

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ACRONYMS

ARARs	applicable and relevant or appropriate requirements
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
D&D	Decontamination and Decommissioning
DOE	U. S. Department of Energy
DOE-HQ	DOE Headquarters
DOE-ORO	DOE Oak Ridge Operations
EM	Project Environmental Manager
EMD	Environmental Management Division
EPA	U.S. Environmental Protection Agency
FPSC	fixed price subcontractor
GAAT	Gunite and Associated Tanks
GCO	Project Generator Certification Official
LLW	low level waste
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OECD	Office of Environmental Compliance and Documentation
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PCB	polychlorinated biphenyl
PCCB	Project Change Control Board
QA	quality assurance
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
S&M	surveillance and maintenance
SPCC	Spill Prevention Control and Countermeasures Plan
TBC	"to be considered"
TDEC	Tennessee Department of Environmental Compliance
TSCA	Toxic Substances Control Act
WEF	Waste Evaporator Facility
WMO	Waste Management Organization



1. INTRODUCTION

The mission of the Waste Evaporator Facility (WEF) Decontamination and Decommissioning (D&D) project is the safe, cost-effective, and efficient demolition of the facility with emphasis on protecting the environment, the safety and health of workers and the general public.

The following are specific elements of the project:

- demolition of the above-grade portions of the WEF and using the below-grade portion for containing building rubble to the maximum extent possible;
- protection of the environment, the safety and health of workers and the general public in the performance of project activities;
- proper management of wastes generated by project activities; and
- assurance of quality and cost-effectiveness in the performance of project activities.

1.1 ENVIRONMENTAL MANAGEMENT PLAN OBJECTIVE

The purpose of this Environmental Management Plan is to elaborate upon the environmental, regulatory, and compliance requirements for the D&D of the WEF as outlined in the project plan; define roles, responsibilities, and relationships needed to effectively implement requirements; define environmental management oversight activities; and establish environmental management documentation and reporting requirements.

The project Environmental Management Plan shall not be modified without written concurrence of the Project and Environmental Managers. Any changes to this Environmental Management Plan will be made in the form of an addendum to the document. The addendum will be approved by the Project and Environmental Managers.

1.2 SITE HISTORY

The WEF is located at the Oak Ridge National Laboratory (ORNL). It is situated near the intersection of Central Avenue and Third Street, on the west side of the South Tank Farm.

The WEF was constructed in 1949 and was the first liquid waste evaporator at ORNL. The facility was in operation from 1949-1954 and received liquid low level waste streams from ORNL laboratories and other processing areas for concentration prior to final disposition. Operations were suspended when the presently active evaporator facility (Building 2531) was brought on-line. Subsequent installations of experimental equipment were used to develop fission-product purification processes and demonstration of contaminated waste incineration.

The facility is a split-level building with approximate dimensions of 22 x 28 x 8 ft high and consists of an operating gallery and a hot cell. The operating gallery is a wood structure, except for the floor and west wall, and contains a crawl space under the floor. The hot cell is a stainless steel-lined, reinforced concrete cell which has walls 2 ft thick in the north half and 3 ft thick in the southern half. The hot cell extends approximately 6 ft below-grade. All process equipment has been removed from both the operating gallery and hot cell, except for some embedded pipes and a filter housing.

The WEF was accepted into the Surplus Facilities Management Program in 1976. Periodic surveillance and maintenance (S&M) has been performed since this time. The building structure is basically sound, although roof repairs were necessitated due to deterioration from rainwater inleakage. The interior was decontaminated prior to its use as an incinerator facility, resulting in low levels of contamination which are primarily associated with the piping and some surface contamination. The facility is unoccupied and locked, with personnel access only on an occasional basis.

1.3 PROJECT TECHNICAL OBJECTIVES

The technical objective of the WEF demolition project is to remove the above-grade portion of the facility which would facilitate continued remedial activities in the South Tank Farm.

The primary project objective of this Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Action is the demolition of the above-grade portions of the WEF. This action would remove an obstacle inhibiting access in the South Tank Farm and would facilitate the continued CERCLA response activities at the Gunite and Associated Tanks (GAAT) Operable Unit (OU). Additional objectives are to remove or reduce the potential health and environmental hazards associated with: (1) the polychlorinated biphenyl (PCB) and heavy-metal contaminated sediment located in the cell; (2) the mercury contaminated soil under the gallery; and (3) radiation exposure associated with radioactively contaminated dust, building surfaces, debris, and sediments. As building deterioration continues, it is possible that contamination could be transported off site through surface water runoff or air dispersal.

The potential for health and safety threats on site and for contaminant releases off site will increase over time if this structure continues to deteriorate. Removal of this structure would reduce associated occupational hazards. By removing Building 3506, unobstructed access to the South Tank Farm for personnel and equipment will be possible.

1.4 PROJECT SCOPE

The project scope includes the following activities:

- dismantling above-grade portions of the facility to 1-ft below grade (excluding valve pits)
- placing building concrete in the below-grade portion of the facility
- removing/packaging of mercury/radiologically-contaminated soil (500 ft³)
- removing/packaging of PCB contaminated sediment (approximately 10 gallons) - mixed waste
- removing of 1500 gallons of rainwater in cell (based on 1 ft of water in the cell)
- removing non-friable asbestos (window putty and roofing felt paper)
- removing lead plate - mixed waste (1 ft³)
- removing flaking lead paint - Resource Conservation and Recovery Act (RCRA) or mixed waste, small quantity
- removing remaining piping (below the gallery)
- placing geomembrane over site, cover with 1 ft of backfill

- procuring demolition subcontractor
- preparing site
- sampling and analyzing for waste characterization and certification
- limited decontamination (scabbling) - less than 100 ft²
- plugging penetrations on exterior walls
- coring drain hole in cell and gallery
- preparing/approval of Health and Safety Plan
- preparing/approval of Comprehensive Work Plan
- preparing/approval of Hoisting and Rigging Plan
- preparing/approval of Traffic Control Plan
- preparing Removal Action Report
- permits
- controlling of boundaries

1.4.1 Site Preparation

1.4.1.1 Building Preparation

Preparation of the site will consist of the following activities which will be performed by ORNL prior to the demolition of the building:

- removing materials stored in the gallery portion of the WEF;
- relocating the nitrogen line on the south side of the WEF;
- relocating/rerouting/protecting of utility lines and high voltage lines which are in close proximity or are attached to the WEF.

1.4.1.2 Building Demolition

Building demolition activities are those items which are detailed in the scope of this project. In general, the demolition of the above-grade structure of the WEF, removal of miscellaneous wastes from the below grade portions, and placement of concrete slabs in the below-grade portion of the facility, will comprise the demolition actions to be taken. Any excess construction debris will be surveyed for radiological contamination and if found to be below release limits, will be properly packaged, labeled, and transported to the construction debris landfill by the demolition subcontractor.

1.4.1.3 Project Completion

The project will be considered complete when:

- demolition activities are complete;
- site restoration is complete;
- all waste materials have been delivered to Waste Management Organization (WMO); and
- the Removal Action Report is issued.

2. REQUIREMENTS

2.1 REGULATORY REQUIREMENTS

2.1.1 CERCLA Requirements

The principle regulatory driver for the proposed activity at the WEF is CERCLA. CERCLA specifies compliance with applicable and relevant or appropriate requirements (ARARs) to the extent practicable where a removal action is being conducted. Time constraints, the scope, cost, and duration of the removal action will affect the degree of attainment of ARARs. Applicable requirements as defined by the National Contingency Plan (NCP) means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements as defined by the NCP means those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate. ARARs include requirements imposed by RCRA; Toxic Substances Control Act (TSCA); Clean Water Act (CWA); Clean Air Act (CAA); National Historic Preservation Act (NHPA) and similar state regulations. Tennessee regulations including the Air Quality Act, Solid Waste Disposal Act, and Hazardous Waste Management Act may be applicable. U. S. Department of Energy (DOE) Orders will provide "to be considered" (TBC) guidance. The TBC category consists of advisories, criteria, or guidance that were developed by the U.S. Environmental Protection Agency (EPA), other federal agencies, or states that may be useful in developing CERCLA remedies.

2.1.2 NEPA Requirements

Since the new Secretarial Policy on the National Environmental Policy Act (NEPA) directs DOE to rely on the CERCLA process to address NEPA values and public involvement procedures, no independent NEPA review of the project is required. However, in accordance with the Secretarial Policy the project was reviewed for compliance with the ARARs outline in the Engineering Evaluation/Cost Analysis for Building 3506 and found to be in compliance with the ARARs, as appropriate. This review is documented in the Project Review Summary for Removal of Old Waste Evaporator Facility, Building 3506 (2156X), issued August 24, 1994, and the Letter to File for Old Waste Evaporator Facility, Building 3506 (2255), issued February 24, 1995. The location-specific ARAR identified during the review of the project as needing attention was that for

compliance with the National Historic Preservation, which was satisfied through the ratification of the Memorandum of Agreement between the U.S. DOE Oak Ridge Operations Office and the Tennessee State Historic Preservation Officer submitted to the Advisory Council on Historic Preservation pursuant to 36 CFR 800.5 (e) (4) regarding gunite and associated tank remediation and demolition of buildings 3506 and 3515 on the Oak Ridge Reservation, Roane County, Tennessee, January 13, 1995.

2.1.3 TSCA Requirements

Electrical wiring and cable may contain PCBs and will be stored on pallets by the demolition subcontractor for future pick-up and management by ORNL Plant & Equipment Division. Ballasts that have an unknown concentration of PCBs are assumed to have a concentration ≥ 500 ppm. Ballasts will be sampled prior to final disposition in order to determine actual PCB concentrations.

2.1.4 CWA Requirements

A Site Specific Best Management Practice has been developed by ORNL Office of Environmental Compliance and Documentation (OECD). Any changes which might be proposed must be approved by the Project Environmental Manager (EM).

2.1.4.1 Spill Prevention Control and Countermeasures Plan (SPCC)

A SPCC Plan is in place for ORNL. The plan will be furnished to and complied with by the demolition subcontractor on the WEF Project.

2.1.5 CAA Requirements

Tennessee Department of Environmental Compliance (TDEC) air pollution control regulations and EPA regulations under 40 CFR 61, Subpart H are applicable to this activity. No ongoing processes or planned activities that result in emissions to the atmosphere will be conducted as a result of this project, therefore permitting requirements under TDEC rule 1200-3-9 will not apply. However, since fugitive emissions could occur when the building is demolished, TDEC rules under chapter 1200-3-8 would be applicable. These rules require that reasonable measures be implemented to mitigate the discharge of fugitive particulate matter and limits visible emissions. A containment tent will be erected around the facility prior to demolition activities to minimize the potential for fugitive emissions. EPA regulations under 40 CFR 61, Subpart H limit radioactive emissions to the atmosphere. In order to determine the applicability of those regulations, radioactive emissions must be estimated. The Air and Special Monitoring team has been consulted concerning potential radioactive emissions from demolition activities and has determined that 40 CFR 61, Subpart H will not apply.

2.1.6 Waste Disposal Requirements

The Project Team has prepared and submitted to WMO a Project Waste Management Plan. The plan identifies all waste generating activities, their quantities and the steps taken to manage the waste properly. This plan was reviewed and approved by WMO prior to the generation of waste. Deviations from the waste management plan must be approved by the Project Manager and concurrence by the EM. All wastes generated as a result of this project will be characterized and managed accordingly by the ORNL Project Generator Certification Official (GCO).

2.1.7 RCRA Requirements

Any hazardous waste generated as a result of this project will be managed by the Project GCO in a staging area in accordance with the substantive requirements of RCRA. A staging area for RCRA hazardous waste

will be setup prior to the start of construction activities by the Project and registered with Environmental Management Division (EMD) for the mixed waste.

The GCO managing the hazardous waste staging area will be required to attend:

- Waste Certification Officer-Module 4308, "Managers of Hazardous and Mixed Waste in Satellite and 90 Day Storage Areas, and
- Waste Handlers-Module 4318, "Hazardous Waste Generator Training"

Records on the hazardous waste staging areas will be maintained by the Project GCO, and copies will be placed in the project files.

2.1.7.1 Solid Non-Hazardous Waste

Any solid non-hazardous waste generated as a result of this project will be managed in a staging area prior to final disposition.

2.1.7.2 Radioactive Low Level Waste

Any radioactive low level waste (LLW) generated as a result of this project will be properly managed by the Project GCO. The waste will be appropriately packaged, labeled, and containerized awaiting final disposition.

2.1.8 Asbestos Handling Requirements

A Notice of Asbestos Demolition or Renovation was submitted to TDEC, 45 days prior to the start of asbestos demolition. The ORNL Asbestos Management Program will submit this notification.

3. ORGANIZATIONAL ROLES AND RESPONSIBILITIES

3.1 ROLES AND RESPONSIBILITIES

The roles and responsibilities of project members are defined as follows:

Project Manager - The project manager will have overall responsibility for ensuring that this project accomplishes its mission and objectives. This will include execution of the project within the schedule and cost criteria as part of this proposal. The project manager's responsibilities will be:

- promoting overall integration of the team members;
- developing the coordinated project plans required to meet objectives and missions;
- completing the project scope within cost and schedule baselines;
- ensuring the compliance of participants with project plans and objectives;
- chairing the Project Change Control Board (PCCB);
- approving the distribution for in-scope changes;

- establishing and staffing the team;
- approving all changes to the baseline as established in the PCCB;
- endorsing all other changes before they are submitted to a higher change control board;
- assuring the health and safety of project personnel while performing work;
- assuring environmental compliance;
- interfacing with DOE and the regulators;
- signing for core team concurrence with the award of subcontracts within the baseline estimate;
- implementing the project's overall Quality Assurance Project Plan (QAPP); and
- assisting DOE in regulatory and public interfaces.

Technical Manager - The technical manager will be responsible for integrating the various team member's technical efforts in support of project execution. The technical manager's specific responsibilities will be:

- managing project technical interface with all site support services, operational units, and other project participants;
- ensuring that technical requirements and constraints are adequately factored into project scope, cost, and schedule;
- overseeing field operations to assure health and safety of project personnel;
- participating in the proposal evaluation and recommendation of award of the demolition subcontractor;
- assuring the development of and compliance with project plans;
- maintaining overall project schedule status;
- ensure proper disposition of all wastes generated;
- ensure the preparation of the Removal Action Report; and
- participating as a member of the PCCB.

Business Manager - The business manager's responsibilities will be:

- ensuring the integrity, completeness, and timeliness of project cost accounting, funding and authorization control, and work order control;
- providing the project manager with timely and useful management information to support decision making and control of scope, schedule, and cost, including appropriate performance indicators;
- project reporting;
- maintaining the project estimate and schedule;

- maintaining the project baseline; and
- managing the task order project contract activities with DOE and other procurement actions.

Construction Manager - The Construction Manager for the project will be responsible for all construction activities, including proper disposition of construction waste and materials. The Construction Manager's specific responsibilities include:

- managing and administering the construction project;
- planning the construction activities;
- administering construction subcontracts;
- conducting oversight and surveillance of construction field activities to assure compliance with all applicable environmental regulations;
- participating as a member of the PCCB;
- assuring visitor and worker safety and health on the project site;
- processing construction field changes;
- monitoring the project baseline and recommending any required actions to the project manager;
- providing construction, financial, and schedule data to the business manager;
- preparing and submitting accident and occurrence reports for construction-related events through the DOE system;
- preparing responses to Notice of Violations for construction related events and submitting to the environmental manager;
- assuring development of the project Health and Safety Plan;
- assuring proper disposition of nonhazardous waste and materials; and
- assuring proper dispositioning of hazardous waste and materials generated by the demolition subcontractor.

Safety and Health Manager - The Safety and Health Manager is responsible for assuring the safety and health of the workers, public, and property during construction activities. The manager's duties include:

- identifying project hazards and anticipated hazards;
- evaluating the impact of the hazards on the workers, public, and property;
- assuring adherence to the Health and Safety Plan;
- identifying and implementing control measures;
- assuring total compliance to Occupational Safety and Health Administration (OSHA) and applicable DOE Order requirements;

- performing accident investigations;
- assuring applicable reporting and recordkeeping measures are maintained; and
- providing safety and health oversight and inspections.

Environmental Manager - The Environmental Manager will be responsible for overseeing the environmental compliance of the project. Specific responsibilities include:

- obtaining demolition subcontractor signatures on environmental compliance documents as needed;
- developing and implementing the environmental compliance strategy;
- coordinating with the DOE site office, DOE program manager and the regulators to obtain approvals and concurrences;
- developing and implementing environmental compliance oversight and inspections;
- maintaining records of all environmental inspections;
- serving as the primary project team contact for the environmental regulatory agencies;
- ensuring preparation of all environmental compliance documentation;
- serving as the primary interface with other plants and programs on environmental compliance issues;
- participating as a member of the PCCB; and
- preparing and submitting any Notice Of Violation responses to DOE.

Quality Assurance Manager - The Quality Assurance Manager will be responsible for overseeing the quality assurance (QA) of the project. Specific responsibilities include:

- assure the development of and compliance with the QAPP;
- participating as a member of the PCCB;
- providing oversight of QA related activities (eg., project QA surveillance); and
- assuring document control and records management.

DOE Program Manager - The DOE Program Manager will provide overall program oversight. Specifically, the DOE Program Manager's responsibilities will be:

- functioning as the primary interface with the DOE Headquarters (DOE-HQ) Program Office;
- recommending approval of the project baseline and any proposed changes;
- coordinating and resolving budget issues between DOE Oak Ridge Operations (DOE-ORO) and DOE-HQ;
- providing input to DOE organizations regarding changes to the managing and operating contract;

- monitoring compliance with environmental, safety, health, and QA requirements;
- reporting demolition subcontractor performance for payments;
- reviewing and analyzing the estimated cost and schedule for various project participants and elements to ensure that the authorized cost and schedule are reasonable for the scope of work to be performed;
- analyzing reports that reflect project status, cost and schedule trends, and funding needs.

DOE Project Manager - The DOE Project Manager will be the primary interface between DOE and the team. The DOE Project Manager's responsibilities include:

- providing DOE project oversight and special assistance and functioning as an advisor to the team;
- serving as the liaison, when necessary, between the ORNL project manager and the DOE Contracting Officer;
- monitoring project cost, schedule, and variances from the originally established baseline;
- monitoring for adequate and proper implementation of project-related environmental, safety, health, and QA requirements defined in the project plan;
- coordinating the Authorization/Directive System to ensure that funds are available for the authorized scope;
- reviewing and analyzing the estimated cost and schedule for project participants and elements to ensure that the authorized cost and schedule are reasonable for the scope of work to be performed;
- recommending the project baseline and any proposed changes to the DOE program manager for approval;
- participating in project status meetings advising on various problem areas, and assisting in resolution of these problems;
- advising DOE on technical, cost, and scheduling issues;
- evaluating demolition subcontractor performance and making recommendations on fee payment;
- working with the team and coordinating with the DOE-ORO matrix as necessary;
- analyzing reports on project status, cost, schedule trends, and funding needs;
- monitoring accomplishment of project objectives as initially established or as modified by approved changes;
- serving as technical/cost/schedule advisor to the DOE contracting officer for establishing task order terms and conditions;
- accept the completed authorized work; and
- maintaining the DOE project files.

Regulatory Agencies - Environmental regulatory agencies will maintain their traditional, independent oversight of this project. There will be enhanced consultation and early planning with regulatory agencies through the respective ORNL and DOE counterparts authorized to interface with them.

Other Stakeholders - The team will identify stakeholders for the project and involve them as appropriate in project planning and progress review activities.

4. REPORTING REQUIREMENTS

4.1 HAZARDOUS CHEMICAL INVENTORY

As required by 40 CFR 370, an inventory record, including amounts, of all hazardous substances (materials that require an MSDS) will be maintained by the demolition subcontractor and submitted to the Construction Manager at the end of the calendar year and at project closeout. The Hazardous Material Information System Office will incorporate the inventory record into the ORNL Site report for submission to regulatory agencies by March 1 of the following year.

4.2 TOXIC RELEASE INVENTORY

As required by 40 CFR 355, an inventory record, including amounts, of all toxic chemical release data will be maintained by the demolition subcontractor and submitted to the Construction Manager at the end of the calendar year and at project closeout. OECD will incorporate the inventory record into the ORNL Site report for submission to regulatory agencies by July 1 of the following year.

4.3 RELEASE REPORTING

The demolition subcontractor will report any release of petroleum products or hazardous substances immediately to the Construction Manager, the Facility Manager, or, in their absence, the Laboratory Shift Supervisor.

5. COMPLIANCE OVERSIGHT

The EM will assure assessment of project activities for compliance with environmental requirements. Observations will be documented in the project records and shared with the project team. Appropriate recommendations for improving compliance practices will be made to the project manager. It is anticipated that more effort will be devoted to assessment at the start and end of demolition activities. Specifically, prior to the start of demolition activities, the site will be checked to ensure that all devices and procedures to control fugitive air emissions, runoff storm water, petroleum and hazardous substance spills, and wastewater are in place and functional per plans and specifications. All material and waste staging areas will also be established prior to the start of demolition. Before the demolition subcontractor demobilizes, the site and records will be checked to ensure that the demolition subcontractor has completed all obligations relative to environmental compliance. Periodic assessments will be made by the EM during demolition; at a minimum the EM will make weekly observations of the site and activities. Simple, appropriate checklists will be developed and used, based on project requirements, in conjunction with the construction manager for conducting assessments. Completed checklists will become part of the project record. The following assessments schedule will be followed:

Activity/Requirement	Frequency			Notes
	Prior to Start of Demolition	Weekly	Demolition Close Out	
Fugitive Air Emissions		•		Perform weekly during demolition activities
Stormwater	•	•	•	Verify that storm drains are protected
SPCC	•	•		Ensure that spill kit is in place and properly stocked
RCRA Staging Area	•		•	Set up prior to waste generation Inspect area routinely

Part II.

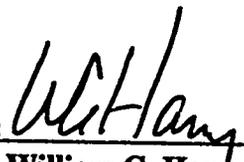
**Project Health and Safety Plan for Demolition and Partial Remediation
of the Waste Evaporator Facility, Building 3506,
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

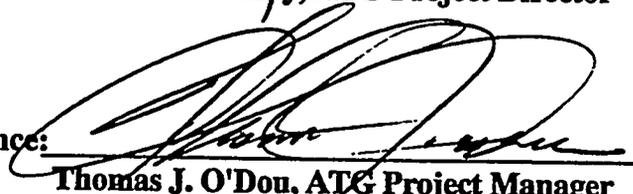


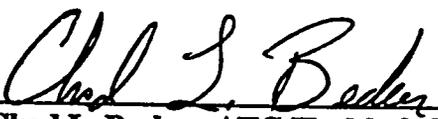
APPROVALS

Part II.

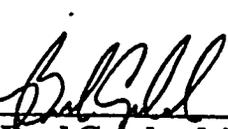
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Oak Ridge, Tennessee

Concurrence:  Date: 12/12/95
William G. Haney, ATG Project Director

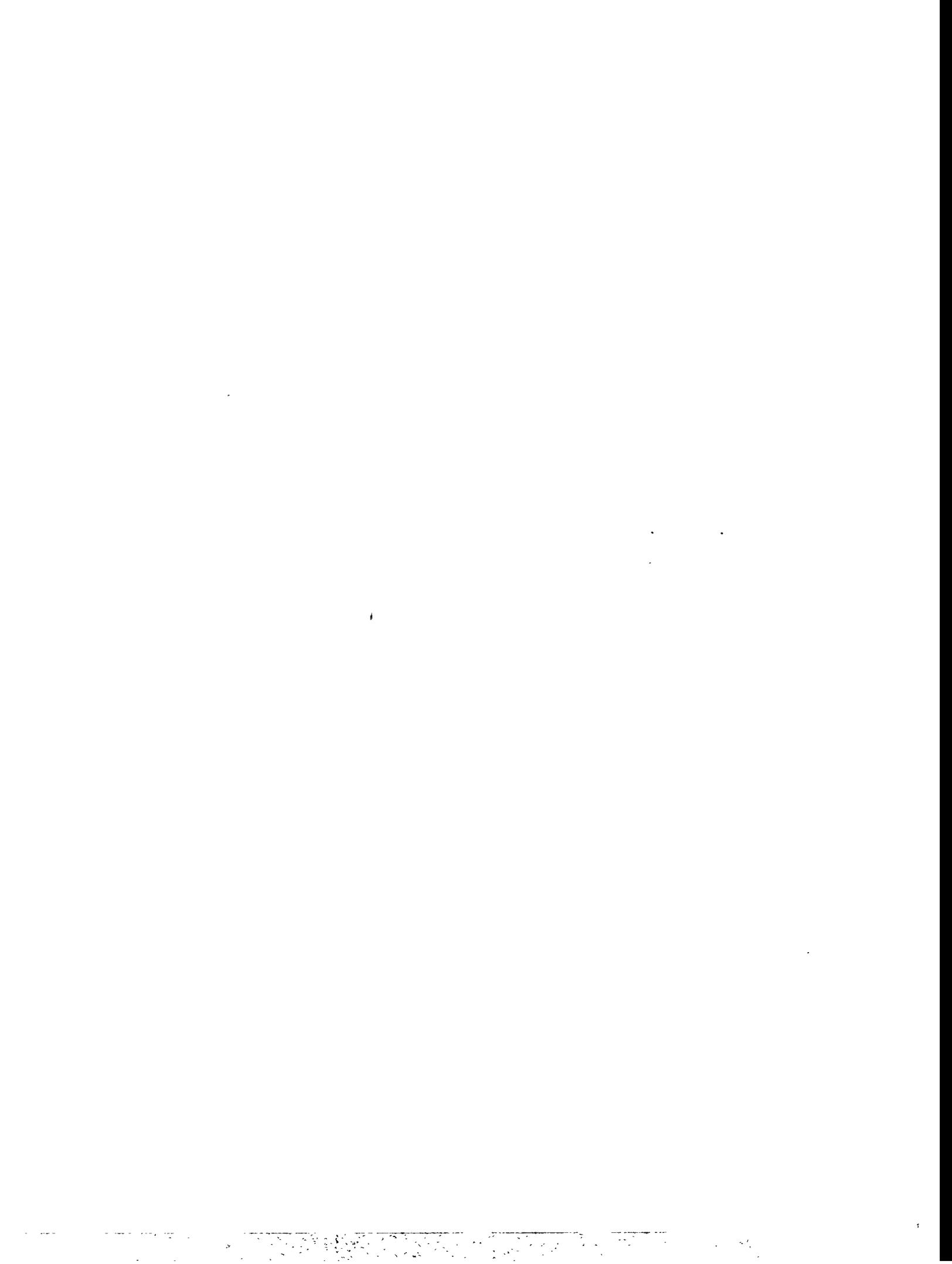
Concurrence:  Date: 12/12/95
Thomas J. O'Dou, ATG Project Manager

Concurrence:  Date: 12/12/95
Chad L. Becker, ATG Health & Safety Manager

Concurrence:  Date: 12/11/95
Jerry Mandry, LMES Project Manager

Concurrence:   Date: 12-11-95
Brad Copeland, LMES Health & Safety Manager
Phil Allen, ORP Health Physics Representative.

Concurrence:  Date: 12-11-95
Margie Skipper, LMES LSS



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1. INTRODUCTION

The Allied Technology Group, Inc. (ATG) *Project Health and Safety Plan* incorporates the health and safety procedures and practices to be followed during the activities specified in the *ATG Project Work Plan*. The *ATG Project Health and Safety Plan* will be used to support the project work activities and will be verified with the guidelines specified in the *ATG Corporate Health and Safety Plan*. The *ATG Project Health and Safety Plan* includes radiological, hazardous material exposure, and industrial safety concerns. This scope is based on preliminary assessments and potential hazards as identified in the *Site Characterization Report*, ORNL/ER/Sub/87-99053/72, (Bechtel 1994) and may be reevaluated or modified to improve efficiency or worker safety with the concurrence of the ATG Corporate Health Physicist or the Project Director.

2. SCOPE OF WORK

Sample collection, monitoring, and work with all radioactive and other hazardous materials will be performed by ATG personnel following the guidelines specified in the *ATG Project Work Plan*. The tasks associated with this project are detailed in Section 2 of the *ATG Work Plan*. For the purpose of this contract, all contaminated material will be handled with radiological and chemical contamination controls in place. This project involves mobilization, site setup, radiological and chemical monitoring, decontamination, demolition, and demobilization.

The personal protective equipment (PPE) that will be used on this project will involve three categories at a minimum Level D. The work tasks will be performed by trained and qualified personnel. Oversight and monitoring will be performed by trained and qualified personnel in accordance with the *ATG Health and Safety Plan* procedures.

Daily pre-entry briefings will be required for all personnel prior to work on-site. These briefings will cover work to be performed, proper PPE and work practices, health and safety concerns, and any items that the employees need to be made aware of.

3. HAZARD ASSESSMENT

Hazard assessment will be evaluated in two categories: (1) radiation and hazardous materials exposure, and (2) industrial hazards. Appropriate PPE, monitoring devices and data acquisition will be applied for all hazards.

3.1 RADIATION AND HAZARDOUS MATERIALS EXPOSURE

It is expected that an individual performing work on this project will receive an external occupational exposure of less than 100 mrem. The principal internal hazards are from radionuclides on the wall surfaces inside the hot cell, which are anticipated to be low level concentrations of fission products. Therefore, personnel working with contaminated surfaces and dusts require training in radiological contamination control practices. Proper training, high-efficiency particulate air (HEPA) ventilation, HEPA vacuums, and partial containments will be used when necessary to assure that the materials do not become an internal hazard to the workers or to members of the public. Breathing airborne contaminated dusts will be the most likely method of radioactivity entering the body and becoming an internal hazard. The airborne concentration of radionuclides shall be maintained below the acceptable airborne contamination concentration limit of less than 10% Derived Air Concentration (DAC) in order to assure that the material is not an internal radioactivity hazard. If 10% of 1 DAC is anticipated, respiratory protection shall be required.

External exposure to radiation will come from localized sources which are currently shielded in various areas of the cell. Exposure rates outside the cell will not be significant to personnel. However, all personnel in the job site will be monitored for external exposure to radiation.

Exposure to asbestos will be minimal and it is anticipated that the asbestos at the site is non-friable and entrained in the felt paper of the roof, or within the putty of the window frames. Personnel air sampling will be performed during removal to determine potential exposure levels.

Heavy metals are hazards that have been identified on the site. These are currently identified as lead, mercury, and cadmium.

Exposure to mercury in the soil of the mezzanine will be minimized. Direct reading instruments will be used to measure levels and appropriate controls will be implemented when action levels are approached.

Lead exposure is expected to be minimal during paint scraping operations and during cutting of concrete blocks which are coated with lead based paint. Lead exposure may result from scabbling operations and in the hot cell during removal of shielding material around some of the piping penetrations and on the cell wall. Personnel air sampling will be performed to determine exposure levels.

3.2 INDUSTRIAL HAZARDS

Lifting, suspending, moving and packaging of materials could cause wear and tear of equipment and fatigue to the workers. Mechanical failure will be reduced by using equipment in near new condition and not overloading the equipment. The equipment will be visually inspected daily by qualified personnel prior to each use. The site specifics on hoisting and rigging will be detailed in the *ATG Critical Lift Plan*. Safety shoes, hard hats, and safety glasses will be required for personnel working at the site. To minimize the noise exposure, hearing protection will be worn in work areas in close proximity to heavy equipment operation and the diamond wire saw when in operation.

Physical stress could occur if an individual tries to lift items that are too heavy or oversized. Individual lifting limits should be fifty pounds maximum. Items that are heavy, odd-shaped, or bulky will be lifted by more than one individual or by mechanical means. Complications from low temperature exposure, such as frostbite, will be handled by slowly warming the affected body parts and following up with medical treatment as deemed necessary by the Site Health and Safety Officer. To prevent the dangers of the cold work environment, clothes should be layered for maximum heat control. There will also be a heated break area for personnel.

Hazards from the use of a diamond wire saw will include a moving wire which is unshielded. Non-essential personnel will not be allowed in close proximity to this operation. The noise associated with this operation will require the use of hearing protection. The hoisting and rigging hazards will be identified in the *ATG Critical Lift Plan*.

The hoisting and rigging on-site will be in close proximity to a vital communication line and a Gumite tank (W-5). The location of equipment will be designated on the map and caution shall be used during operations in this area to prevent damage to com lines and the tank.

4. WORKER PROTECTION

4.1 PERSONNEL PROTECTION

ATG personnel will follow the guidelines stated in the Lockheed Martin Energy Systems (Energy Systems) Radiation Work Permit (RWP) and outlined with this ATG *Project Health and Safety Plan*. The specified PPE will be worn when working with radiological and/or hazardous materials or industrial hazards. Direct and passive monitoring will be performed to determine exposure levels and to ensure a safe working environment. ATG employees and subcontractor personnel will be properly trained in dealing with the hazards associated with this project. Only approved and inspected tools and equipment will be used by project personnel.

4.1.1 Asbestos

Asbestos is present in the window putty of the gallery area and in the felt tar of the roof. The window putty is cracked and flaking but will be removed with the window intact and bagged. The felt is dried and brittle in some spots. The PPE for this phase of the project will be Level C which includes Tyvek, full-face air purifying respirator, booties, and gloves. The permissible exposure limit (PEL) for asbestos is .1 f/cc per 8-hour time weighted average.

4.1.1.1 Description

- Roof patching material for the project may contain asbestos.
- Asbestos material is considered non-friable in its current state.
- Putty and roofing mastic are considered "intact incidental asbestos-containing roofing material (ACRM)" and work requirements shall be in accordance with *Code of Federal Regulations (CFR)*, Title 29, Part 1926.1101, Paragraph (g) (11). Work on the window putty and roofing felt shall be Class II material if the material becomes friable during demolition.
- Roofing felt shall be Class II material.
- Perform work in accordance with 29 *CFR* 1926.1101, 40 *CFR* 763, State of Tennessee Regulations, and additional job-specific requirements stated herein. The non-mandatory Appendixes B and F in 29 *CFR* 1926.1101 will be followed for this work.

4.1.1.2 Handling

- Bag asbestos-containing material (ACM) at the immediate removal area, move to a designated cleaning area within regulated area, and bag again into approved bags.
- Wrap, label, and seal large pieces of waste materials or building/equipment components containing asbestos with two layers of 6-mil polyethylene sheeting.
- Place asbestos waste material containing sharp-edged components (e.g., nails, screws, tin, sheeting, chicken wire, etc.) in labeled and approved disposal drums.
- Vacuum, wet wipe, or wash before removing bags, drums, and wrapped material from regulated area.
- Do not drop or throw to the ground asbestos material or disposal bags.

- Manually handle, load, and unload wrapped or bagged waste to prevent rupturing. Unload heavy plastic wrapped waste with fork lifts, cranes, or other suitable equipment. Sturdy drums and boxes may be unloaded by slowly raising the truck bed and allowing the containers to slide out of the truck. Place waste in the designated waste cell.

4.1.1.3 Temporary Storage

- Cover the ground below the double-bagged, wrapped, or drummed waste with 6-mil plastic sheeting.
- Cover the stored waste with 6-mil plastic sheeting.
- Place barrier tape of flagging, and asbestos warning signs around stored waste.
- Limit temporary storage to 30 calendar days.

4.1.1.4 Vehicle Information

Identify vehicles used to transport asbestos containing waste material, including transportation from regulated areas to temporary storage locations.

4.1.1.5 Material

- Use only surfactant or wetting agents sold for the purpose of asbestos wetting. Materials intended for other uses, such as household detergents are not permitted.
- Disposal bags: 6-mil polyethylene with preprinted labels in accordance with Standards 29 *CFR* 1926.1101 (k)(7)(iii) and 49 *CFR* 172.

4.1.1.6 Equipment

Equipment having HEPA filter requires testing before on-site use. HEPA filter replacement requires retesting of the equipment. Perform test in accordance with American Society of Mechanical Engineers (ASME) N510.

4.1.1.7 Communication of Hazards

In addition to the requirements of 29 *CFR* 1926.1101 (k), the following applies:

Signs. Signs shall be legible at least 20 ft away and conform to 29 *CFR* 1910.145 (red, black, and white).

Training. Asbestos Awareness (workers); Asbestos Supervisor (management).

4.1.1.8 Methods of Compliance

Conduct work using state of the art work practices and engineering controls as required in 29 *CFR* 1926.1101 (g) and Appendix F and perform tasks using the following routines:

- Equip portable hand tools used to drill, cut, or otherwise disturb ACMs with a HEPA-filtered exhaust ventilation. A HEPA-filtered vacuum cleaner, designated for asbestos, can also be used. Position the hose attachment in such a manner to ensure dust will be captured by the vacuum. Adequately wet ACMs with amended water before disturbing or removing.
- Contain loose ACM as it is removed. Assure all loose ACM is contained at the end of each work shift.

4.1.2 Lead

This section provides the requirement for controlling lead and lead containing materials. Using or working with lead materials shall be in accordance with 29 *CFR* 1926.62. There will be lead abatement in the gallery and the hot cell of the Waste Evaporator Facility which will include the removal of lead-based paint chips and the removal of lead shielding plates. The particles of lead-based paint chips will be collected through a HEPA vacuum system and properly labeled and disposed. The method of removal will be with various HEPA-filtered scabblers and needle guns.

The PEL for lead as stated in 29 *CFR* 1926.62 is 50 ug/m³ per 8-hour time weighted average. The action level is 30 ug/m³.

4.1.2.1 Medical Surveillance

ATG will provide a baseline blood test for lead. If the blood lead level meets or exceeds 50 ug/dl the physician will immediately notify ATG. If two consecutive tests within two weeks meet or exceed 50 ug/dl, then the employee will be medically removed from the project.

ATG will provide personnel air monitors (PAMs) to the employees involved in remediation for the purpose of determining the initial airborne concentrations.

If the PEL is exceeded, the employees will be notified as well as Energy Systems. There will be constant monitoring of the personnel during lead work areas by PAMs.

4.1.2.2 Personal Protective Equipment

Until initial lead levels have been determined, PPE will be Level C. PPE for Level C is as follows:

LEVEL C

- 1) Tyvek
- 2) Rubber inner-gloves
- 3) Rubber outer-gloves
- 4) Full-face air purifying respirator with GMC-H, or equivalent, cartridges
- 5) Rubber boots
- 6) Hard hat
- 7) Hearing protection if noise is \geq 85 decibels

4.1.2.3 Training

ATG will provide documented Lead Awareness Training to its employees and will have one Lead Supervisor.

4.1.2.4 Labeling

Lead work area will be properly labeled as follows:

**WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING**

4.1.3 Mercury

No personnel will be allowed to enter the crawlspace during soil removal unless the air is demonstrated to be below the PEL or PPE is used and the project health and safety officer is present and has verified the air sample results. The PPE for the mercury abatement will be Level C. This includes as a minimum saranex, booties, hoods, and possibly respiratory protection. Respiratory protection will be at a minimum full-face with Mersorb-H or equivalent cartridges. The PEL for Mercury is .05 mg/m³ per 8-hour time weighted average.

4.1.4 Fall Protection

It is anticipated that fall hazards will be encountered during the course of scheduled tasks. Worker protection requirements will be followed as outlined within Occupational Safety and Health Act of 1970 (OSHA) 29 *CFR* 1926.104, "Safety Belts, Lifelines, and Lanyards;" and 29 *CFR* 1926.451, "Scaffolding." Any time there is the possibility for injury due to falls, such as work above 6 ft, a solid rail or tether system shall be present to provide maximum protection for workers. There will also be a scaffolding in place to minimize the fall hazard. The scaffolding will be placed inside the hot cell for easy access to the walls which are contaminated. All scaffolding will include hand rails, kick plates, and locking joints.

4.1.5 Personnel Exposure to Ionizing Radiation

The whole body dose rates from the material in the cell is the primary radiation concern. Dose rates are relatively low with maximum identified dose rates of up to 5 mrem/hour on some surfaces of the hot cell wall. Workers are responsible to minimize their dose by using the time of exposure, distance from the source, and shielding of the source as efficiently as practical to keep doses "as low as reasonably achievable" (ALARA).

The maximum dose expected to any worker at the job site is less than 100 mrem. This is based on exposure to the maximum whole body dose rate in the cell of 5 mrem/hour times 20 hours, and estimate of the duration of decontamination of higher level activity surfaces.

4.1.6 Radiation Work Permit

The RWP for work at the site will state the personal protective clothing that is to be required to be worn while working in specific project activities. This RWP will be provided by Energy Systems with its content subject to approval of the ATG Health Physicist. The contents of the RWP will be considered to be the minimum requirements for the task.

4.1.7 Carcinogen Identification

This section provides the construction requirements for controlling carcinogenic materials on a project. Using or working with carcinogenic materials shall be in accordance with 29 *CFR* 1910, Subpart Z and additional requirements stated in this section.

The carcinogenic materials in question in this section are polychlorinated biphenyls (PCBs) which are in the sludge in the hot cell.

The carcinogenic or suspect carcinogenic material expected to be encountered on the project have been identified as PCBs and asbestos. If existing carcinogenic or suspect carcinogenic material, not

previously identified, is encountered during renovations or demolition activities, ATG will immediately notify Energy Systems. Within ten days, ATG will be given further instructions.

4.1.7.1 Equipment

- All vacuum cleaners shall each be equipped with a HEPA filter.
- All signs shall be in accordance with 29 *CFR* 1910, Subpart Z and legible from 20ft away.
- As a minimum, all carcinogen warning signs shall have the following information:

**CANCER-SUSPECT AGENT
AUTHORIZED PERSONNEL ONLY**

4.1.7.2 General Requirements

- Immediately notify Energy Systems of spills involving carcinogenic materials.
- Eating, drinking, smoking, chewing gum or tobacco, applying cosmetics, taking medication, and storing food is not permitted in regulated areas.
- Hand washing shall be made available to the workers after handling carcinogen material. These facilities are available to workers at the site.
- ATG will furnish an emergency eye wash which will be located near each controlled work area when handling carcinogenic material or suspected carcinogenic material.

4.1.8 Respiratory Protection Summary

This section provides respiratory requirements for construction personnel. All ATG personnel will be medically qualified to wear a respirator, fit tested, and trained through Energy Systems in the proper use of respiratory protection. Description: perform work in accordance with Standard 29 *CFR* 1926.103 and requirements stated herein.

4.1.8.1 Respirators may be required for the following work

- Welding or cutting existing structures or pipes
- Lead abatement work
- Asbestos abatement
- Scabbling/concrete cutting
- As specified on the RWP

4.1.8.2 Respirators may additionally be required for the following work

- Confined space entry and work
- Handling carcinogen or suspected carcinogenic material
- Dust creating activities not adequately controlled

4.1.9 Electrical

This section covers PPE, training, and tool requirements for working with electrical components. All ATG personnel will receive documented Lockout/Tagout training prior to working on-site. All electrical services will be de-energized by Energy Systems prior to work on the Waste Evaporator Facility as stated in Section 3 of the ATG *Project Work Plan*.

Appropriate PPE and insulated tools will be utilized by ATG each time any electrical circuit (including those verified as de-energized) is to be cut.

4.1.9.1 Personal Protective Equipment

Rubber insulating gloves, hard hats, rubber matting, and safety glasses. Rubber insulated gloves shall meet the provisions of American National Standards Institute (ANSI)/American Society for Testing and Materials (ASTM), D 120-1984.

4.1.9.2 Tools

- Metal or conductive ladders shall not be used near energized electrical lines or equipment.
- Tools used for cutting electrical circuits shall be insulated.
- Electric tools shall either be equipped with a three-wire cord having the ground wire permanently connected to the tool frame and appropriate female receptors/connectors or shall be double-insulated and permanently labeled "Double-Insulated," or shall be connected to the power supply by means of an isolating transformer or other isolated power supply.
- Hydraulic and pneumatic tools used on or around energized lines or equipment shall have nonconductive hoses.
- A ground fault interrupter will be present in all electrical circuits.

4.1.10 Summary

This section provides on-site safety requirements for cutting, hot work, and incidental welding.

4.1.10.1 Execution

- On-site incidental welding.
- Before welding, burning, or cutting on-site, request and receive an approved Hotwork/Welding Permit. This permit is valid only for the duration noted. Attach the permit to the welding equipment. The oxygen and acetylene tanks will be properly stored in the portable cart and chained to prevent the tanks from tipping over.
- Perform welding, burning, and hotwork in accordance with 29 *CFR* 1926, Subpart J and ANSI Z 49.1.
- Visual inspection of the welds is sufficient.

4.1.10.2 Protection

Provide continuous fire watch during on-site cutting, welding, burning, and hot-work operation. Maintain fire watch during work breaks, lunch breaks, and 30 minutes after completion of work or after quitting time. Fire watch personnel shall not perform other tasks during the fire watch period. Instruct

fire watch personnel in accordance with National Fire Protection Association Standard 51B. Provide verification of instructions to Energy Systems. A fire extinguisher will be at each fire hazard area and employees will be notified of daily locations of the work sites.

4.1.10.3 Personal Protective Equipment

Tyvek, steel-toed boots, double rubber gloves, work gloves, leather apron, respirators, and welding goggles.

4.2 PERSONNEL MONITORING

Occupational exposure hazard(s) will be continually monitored for all personnel on this project. Thermoluminescent dosimeters (TLDs) will be supplied by Energy Systems. ATG will supply direct and passive monitoring which will be used to identify the hazards. This includes the monitoring of lead, mercury, asbestos, and PCBs. When needed there will also be personnel air monitoring for airborne contaminants. The direct and passive monitoring equipment will be calibrated before use, after repair and/or by the manufacturer, as required.

A baseline blood test will be taken to establish a lead monitoring program. All confined spaces will be monitored for oxygen, explosive level, and toxic gases. All sampling will be reported on ATG surveillance forms.

4.2.1 Occupational Radiation Exposure Guides

ATG Administrative Control Levels per calendar year:

- Whole Body—1.0 Rem
- Extremities—9.0 Rem
- Skin—3.0 Rem

The ATG Health Physicist and ORNL Radiation Protection shall approve any authorization for exposure above the control levels. These levels are in agreement with Energy Systems and DOE restrictions for personnel exposures.

4.2.2 Site Registration Form

All personnel assigned to work on the project or visitors to the project must complete a Site Registration Form, ATG Form 109, prior to starting work. Completed Site Registration Forms will be retained with the personnel exposure files. ATG will immediately inform the Energy Systems Project Manager in the case of any skin or clothing contamination. Any appropriate Energy Systems forms may replace ATG forms if all required information is present. Sample forms appear in Appendix A of this *ATG Project Health and Safety Plan*.

4.2.3 Occupational Radiation Exposure History

Before an ATG individual will be permitted to work in a radiologically controlled area, a U.S. Nuclear Regulatory Commission (NRC) Form 4 must be completed and reviewed by the Project Manager or Site Coordinator. Exposure results shall be listed on the NRC Form 4 on a quarterly basis.

4.2.4 Thermoluminescent Dosimetry

TLDs shall be the permanent record of an individual's occupational radiation exposure. The TLDs used by ATG on this job will be provided by Energy Systems. All personnel assigned to the project will be issued a TLD for the job or on a monthly basis as the work requires.

In the event of a lost TLD, immediate notification to the Radiation Safety Officer (RSO) or Supervisor is required. A lost TLD report will be completed and filed in the individual's exposure file to ensure proper identification of the dose received when the person was in the area exposed to radiation without monitoring. Notification of the Energy Systems Radiation Protection Section is required upon discovery of loss and for replacement of TLDs.

4.2.5 Radiation Work Permits

All personnel working in the work area must be assigned to a specific RWP applicable to the job being performed. All personnel assigned to a job requiring an RWP shall sign the RWP Sign-In Sheet prior to starting work, indicating time in and starting pocket ionization chamber (PIC) dose. Upon completion of the work or at the end of the shift, personnel shall sign out and record the time out and the current PIC dose.

4.3 TRAINING

Individuals assigned to this project will be trained and qualified radiation workers. Training records will be filed as part of the *Project Quality Assurance Report*. Training specific to the project will be performed prior to the start of work by the Project Supervisor and recorded on the Training Attendance Record (ATG Form 027) (see sample forms in Appendix A of this plan). Requirements of the *Project Work Plan*, *Project Quality Assurance Plan* and the *Project Health and Safety Plan* will be covered in the on-site training. Sample forms appear in Appendix A of this ATG *Project Health and Safety Plan*.

4.4 DECONTAMINATION

All personnel, tools, and equipment will be properly decontaminated prior to leaving the work area. Proper decontamination will minimize exposure to employees and prevent contamination into clean areas. Personnel will remove any disposable PPE and place it in the provided containers prior to leaving the contamination reduction zone.

Containment control barriers will be established and PPE will be required to minimize the potential for areas or personnel to become contaminated. In the event that personnel contamination is detected, the following procedure will be used to remove or contain the contamination.

4.4.1 Explanation

This procedure is a follow-up to the Radiation Survey Procedure which describes how a radiation worker detects personal contamination. Once detected, this procedure will explain where and how to decontaminate to acceptable levels. It further provides for ongoing documentation to assure adequate review and improvement of existing procedures.

4.4.2 Decontamination Methods

4.4.2.1 Personnel Decontamination

When contamination is found on the worker, the worker shall immediately notify the Radiation Protection Technician and inform him that he has become contaminated. The worker will indicate where he/she believes the contamination occurred, and the route taken to where the surface contamination was detected. This information will assist the Radiation Protection Technician in determining which areas to survey to avoid the contamination of other personnel. After notifying the Radiation Protection Technician, the individual who is contaminated shall, if possible, isolate the contaminated item or items by the use of clean plastic bags and remain in the personnel survey area. Any method of decontamination used will require monitoring and documentation of the results for each step in the procedure. All liquids used for decontamination purposes, will be considered contaminated and handled as radioactive waste. A spray solution of soap and water should be used as the primary agent to remove skin contamination. A soap and water foam will be sprayed on the contaminated area, allowed to soak for a few minutes, then wiped clean. Radiation surveys will be performed between each wash.

NOTE: Under no circumstances will any individual's skin be abraded without the presence of a medical doctor. Notify the ATG Corporate Health Physicist, the Director of Decontamination and Decommissioning, or the Vice President of Operations immediately, should this in the opinion of the doctor, become necessary.

ATG will immediately inform the Energy Systems Project Manager if there is any skin or clothing contamination, as this is a reportable occurrence.

4.4.2.2 Clothing Decontamination

When contamination is found on clothing, the worker shall immediately notify the Radiation Protection Technician and inform him of the situation, including where the worker believes the contamination occurred and the route taken to where the contamination was detected. This information will assist the Radiation Protection Technician in determining which areas to survey to avoid the contamination of other personnel. The contaminated clothing shall be removed, taking special care not to further contaminate additional clothing or personnel. The item(s) shall be surveyed to determine the degree of contamination. Depending on the source of contamination, decontamination methods such as using tape to adhere the contamination to or scraping a shoe with a knife may be used. If the contaminated item cannot be easily decontaminated without using soap and water methods, the item shall be disposed of as radioactive waste.

In order to fully assess the degree of contamination, the skin dose to personnel and to critique the incidents to improve future procedures, documentation is necessary. Documentation of the event should start and continue from the initial detection of contamination to the final release. Personnel contamination will be classified in two categories, skin and clothing. A separate form shall be used for each, along with a Contamination Report Index, (ATG Form 116) to chronologically categorize all personnel contamination. A Personnel Contamination Report, (ATG Form 117), and a Clothing Contamination Report, (ATG Form 118) shall be completed by the individual performing the decontamination and submitted to the Project Manager for evaluation and filing. The Contamination Report Index shall be maintained by the Project RSO. The contamination reports shall be maintained in the individual's exposure file (see sample forms in Appendix A of this ATG *Project Health and Safety Plan*).

5. CONFINED SPACE

A confined space is defined as any enclosed area having limited means of egress and not intended for human occupancy where ventilation is not adequate to remove toxic or flammable atmosphere or oxygen deficiency which may exist. Examples of confined spaces are but not limited to: tanks, vessels, bins, boilers, ducts, sewers, underground utility vaults, manholes, pits, tubes, vaults, or vessels. The crawlspace of the gallery and the hot cell will require confined space controls. This will be considered Low Risk Confined Space Entry which is defined as: entry into a confined space which is found to have acceptable safety and health conditions (i.e., the atmosphere is not considered toxic, flammable, oxygen deficient, oxygen enriched, and there is no other unacceptable safety or health hazards); and there must be an extremely low probability of occurrence for a potential hazard, especially one that could be life threatening. Activities that are to be conducted in the space shall be reviewed to determine their impact on the classification of the space.

5.1 DESCRIPTION

This section provides construction requirements to control access into and work within all confined spaces. Work shall be in accordance with ANSI "Safety Requirements for Confined Space Standards" Z117.1-1989, OSHA Standards 29 *CFR* 1926, 29 *CFR* 1910.146, and additional confined space regulations.

5.1.1 Existing Confined Spaces

- Low Risk
 - Cell Area
 - Gallery Crawlspace

5.1.2 Confined Space Identification and Permit

Before entry or potential entry into a confined space(s), ATG shall complete the first portion of the "Permit Attachment for Confined Space Entry" and submit it to Energy Systems. ATG shall identify all potential confined spaces created by construction activities and submit a permit. All excavations over 4ft in depth shall be considered a potential confined space and require the submittal of a permit.

Before entry into a confined space all applicable monitoring shall be conducted, which includes oxygen, flammability, and toxic gases.

5.2 EQUIPMENT

5.2.1 Lighting

- Use explosive-proof lighting when the potential of flammable vapors or combustible dusts exists. This includes low-voltage lighting.
- Provide a ground-fault circuit interrupter for all 110-V cord-connected lighting.

5.2.2 Tools

- Power tools shall be either pneumatic or electric.
- Electrical power hand tools shall be protected by a ground-fault circuit interrupter.
- All tools (power or manual) used when the potential for flammable vapors or combustible dusts exists shall be spark proof.

6. EXCAVATION

Excavation will be necessary on this project, but it will be very limited. The major extent of the excavation will take place during the removal of soil in the crawlspace. All excavations on this project will conform to the specific guidelines established by Energy Systems protocol.

7. HAZARD COMMUNICATION PROGRAM

7.1 PURPOSE

The purpose of this written Hazard Communication Program is to comply with the requirements of the *CFR*, Title 29, Part 1910.1200, "Hazard Communication." This program is site specific.

7.2 POLICY

ATG is an employer engaged in a business within the Standard Industrial Classification Codes 8744, 3829, 1629, and 1799 where chemicals or hazardous materials are either used or are produced for use. This program will assure that the hazards of all chemicals found in the work place will be evaluated and that information concerning their hazard will be transmitted to all affected employees.

The known hazards that will be handled on this project will be lead, mercury, PCBs, asbestos, and radioactive material. The hazards have been evaluated in the *ATG Project Health and Safety Plan*. Communication to the employees will be handled in the project training and verified through the *ATG Project Quality Assurance Plan*. Identification of the hazards are required by posting the appropriate signs and labeling containers or items that contain hazardous materials and/or wastes or radioactive material in accordance with 29 *CFR* 1910, and 10 *CFR* 20.

Any currently unknown hazards will be handled in the same manner when they are encountered. Material Safety Data Sheets will be distributed and the material will be properly labeled. The Project Health and Safety Manager will be responsible for conducting the evaluation, communication and identification.

All visitors to the site must report to the Project Manager and the Health and Safety Manager. A visitor's log will be maintained in the site log book. The site log book will be kept on-site during operating hours.

7.3 KEY ATG PERSONNEL

POSITION	NAME	PHONE	PAGER
Program Director	Bill Haney	482-3275	800/719-4431
Project Manager	Tom O'Dou	482-3275 pin 44054	800/230-0243
Health & Safety Manager	Chad Becker	482-3275	local 417-8766

7.4 KEY FACILITY PERSONNEL

POSITION	NAME	PHONE
Project Manager	G. J. Mandry	576-5557
Construction Manager	R. L. Collins	574-3257
Health & Safety Manager	B. E. Copeland	576-6447

7.5 OTHER KEY PERSONNEL

POSITION	NAME	PHONE
QA Manager	W. E. Palmer	576-4075
Business Manager	P. R. Sanders	241-2033
Environmental Manager	A. D. Reynolds	241-3715

7.6 PROJECT ROLES AND RESPONSIBILITIES

7.6.1 ATG Project Director

The Project Director is responsible for the overall project. He is to assure the project meets the objectives and contracted commitments. He has the direct management responsibility and authority for cost, schedule, quality and technical performances of all activities in support of the project. He is ultimately responsible for the implementation of all quality related activities. The Radioactive Waste Remediation Assistant Vice President will serve as Project Director for this project and shall be referred to as such in all documents from this point forward.

7.6.2 ATG Project Manager

The ATG Project Manager will have overall responsibility for ATG's on-site conduct of the project and will report to the Project Director for oversight and management control. He will be the primary point of contact with the Energy Systems Project Manager. He is responsible for implementing and monitoring compliance with the operations plan and implementing corrective actions. Other responsibilities include; selecting project staff and assigning duties, reporting to the Project Director project budgets and schedules, and identifying and resolving project specific problems. The Project Manager will assure the tasks are completed in a professional, efficient, and safe manner.

7.6.3 ATG Health and Safety Manager

The Health and Safety Manager is specialized in Industrial Hygiene and Occupational Health and Safety. The Health and Safety Manager has responsibility for ensuring project activities are conducted according to corporate health and safety policies. He oversees the preparation of project activities and monitors the project to ensure the *ATG Project Health and Safety Plan* is implemented. He will provide expert advice to project staff when dealing with unexpected health and safety issues encountered during the project. He is the primary on-site contact for safety and health during field activities. The Health and Safety Manager oversees the on-site execution of all field activities regarding safety and health procedures. He has the authority to stop all work if conditions are judged to be hazardous to on-site personnel, to the public, or to the environment. The Health and Safety Manager will remain at the project site at all times while workers are performing site activities. Other specific responsibilities are as follows:

1. Ensures that all on-site project personnel meet the required level of training, medical requirements including respirator fit test (as required), attend a pre-entry briefing on project and potential site hazards, and review the *ATG Project Work Plan* and *Project Health and Safety Plan*. Maintains copies of documentation of the above at the project site and ensures documentation is available for on-site review. Note: the ORNL Special Access Training Badge may be used as verification of training.
2. Require personnel to obtain immediate medical attention in the case of a work-related injury or illness.

3. Deny access to all or any portion of the work area as warranted.
4. Order work to cease, evacuation of the work area by all personnel, and reestablish safe working conditions, as needed. Contact the Laboratory Shift Superintendent's (LSS) Office when stop work conditions exist due to suspected health and safety hazard(s).
5. Control access to the site by visitors and unauthorized personnel. Advise visitors and unauthorized personnel of their responsibilities, and ensure they meet access requirements before entry into the contamination reduction zone or exclusion zone is allowed.
6. Ensure the correct field execution of the *ATG Project Work Plan* and *Project Health and Safety Plan*.
7. Ensure this *ATG Project Work Plan* and *Project Health and Safety Plan* are revised and approved if there are changes in site conditions or tasks.
8. Advise emergency response personnel in an emergency.
9. Coordinate with the Safety and Health Evaluation and Support Team (SHEST) and Radiation Protection (RP) to establish site work zones, and the level of required personnel protection, monitoring, and other controls.
10. Coordinate and minimize the number of personnel and amount of equipment in the work zones.
11. Coordinate accident prevention by oversight of field activities and being aware of all site operations.
12. Ensure that needed work permits are obtained and made available on site.
13. Ensure that the Hazardous Waste Operations and Emergency Response (HAZWOPER) Program Coordinator (HPC), SHEST, and RP are contacted prior to commencement of site work to: (1) notify of intent to begin work, and (2) schedule monitoring support, as needed.
14. Conduct daily inspection of the work site.
15. Provide the HPC a list of personnel participating in site activities to determine the need for inclusion in the hazardous waste worker medical surveillance program.
16. Ensures that appropriate fall protection measures are in place, as warranted.
17. Ensures that an approved hoisting and rigging plan is available, as warranted.
18. Ensure that appropriate measure have been taken to prevent spills.

7.6.4 ATG Field Personnel

ATG Field Personnel will take all reasonable precautions to prevent injury to themselves and to their fellow workers by remaining alert to potential harmful situations. All tasks must be performed in accordance with the *ATG Project Work Plan* and the *Project Health and Safety Plan*. Any unsafe conditions must be reported immediately to the Project Manager and/or the Health and Safety Manager. Personnel must report any medical conditions that may be affected by the work environment. All injuries

must be reported—no matter how minor. The Field Personnel must read and comply with all postings and rules at the work site. Spilling and splashing of materials must be kept to a minimum. Good housekeeping must be maintained within and around the work area.

7.7 SPILL PREVENTION CONTROL

Spill prevention control shall be as follows:

- Secondary runoff will be controlled as described in Section 3.11 of the Resources Conservation and Recovery Act (RCRA) *Facilities Closure Work Plan*.
- Decontamination pads (if required) will be constructed to contain all free liquids as described in Section 3.6 of the RCRA *Facilities Closure Work Plan*.
- All work on site will proceed according to the ORNL *Spill Prevention Control and Countermeasures Plan*.

7.8 SITE CONTROL

Work zones will be established to prevent unauthorized entry and to prevent any contamination outside the work site. Three zones will be established to determine work areas and control the flow of personnel into these areas. The zones will consist of an exclusion zone, contamination reduction zone, and a support zone. The zones will be clearly marked and will change periodically as the project progresses. The barriers will be properly posted for any radiological, hazardous material, or industrial hazards.

Entrance and exit areas will be clearly marked. Periodic monitoring of the zones will be performed to ensure postings and barriers are in place.

Visitors to the work areas must be cleared by the Project Manager and fill in a "Visitor Sign-In Sheet." Before entry into the work areas, visitors must be provided with the proper PPE and worn to the approval of the Health and Safety Manager.

Personnel in the work area will be required to use the buddy system. Personnel will maintain internal communication, line-of-sight with other workers, and work party monitoring. A two-way radio will be maintained in the support zone for emergency communications.

8. EMERGENCY

8.1 SAFETY SIGNALS

Vehicle, tractor, and portable gas-operated horns are used for safety signals as follows:

One Long Blast—WARNING ALARM—Prepare for Emergency Response.

8.2 EMERGENCY INFORMATION

The responsibility of day-to-day implementation of this information primarily lies with the Health and Safety Manager. During an actual emergency response situation, the Health and Safety Manager will serve as the Emergency Coordinator until the LSS or emergency response team arrives.

Medical assistance will be provided by either the Health Division with a doctor and nurse, or the Protective Services Organization with Emergency Medical Technicians. The LSS will provide emergency response personnel and coordinate emergency assistance. The radio number for the LSS is Station 103. The telephone number for the LSS is 574-6606. In the event that the LSS is not available, emergency services may be reached at the telephones numbers listed on the following page.

The Health and Safety Manager will perform the following pre-emergency response with the LSS:

1. Locate nearest telephone and alarm station.
2. Confirm and post emergency telephone numbers.
3. Post site map of work areas marked with evacuation routes.
4. Inventory and check out on-site emergency equipment and supplies, as warranted.

In the event of an emergency that requires evacuation of the site, a verbal instruction will be given by the Health and Safety Manager that will account for all personnel, ascertain information about the emergency, and advise further instructions to the on-site personnel. In all situations that require evacuation, personnel shall not reenter the work area until the conditions causing the emergency have been corrected, the hazard reassessed, the *ATG Project Work Plan* and *Project Health and Safety Plan* revised, approved, and reviewed with on-site personnel, and instructions given for reentry. Reentry will not be allowed until approved by the LSS, who serves as the Laboratory Emergency Director.

The Health and Safety Manager will brief workers on emergency response procedures and the evacuation route in the pre-entry briefing.

EMERGENCY PHONE NUMBERS

Emergency Personnel	Phone #	Radio #
ORNL Emergency Response	911	294
Laboratory Shift Superintendent	574-6606	294
Fire Department	574-5678	294
Medical Center	574-7431	294
Security	574-6646	294
SHEST	574-6447	231
Radiation Protection		
Environmental Compliance	574-8770	216

The nearest hospital is Methodist Medical Center, which is 12 miles northeast of the site on Highway 95.

9. TRAFFIC CONTROL PLAN

The decontamination and decommissioning of Building 3506 will require a traffic control plan designed to describe the rerouting of traffic due to work. The work at Building 3506 may cause temporary closing of Third Street at the work site. This will only be temporary for movement of heavy equipment and shipment of wastes. The closing of this will follow standard Tennessee Department of Transportation closing procedures. These procedures will be modified to accommodate Energy Systems operations with minimal closure time. There will not be any closure of pedestrian walkways under noted circumstances for vehicular traffic.

9.1 ROAD CLOSING

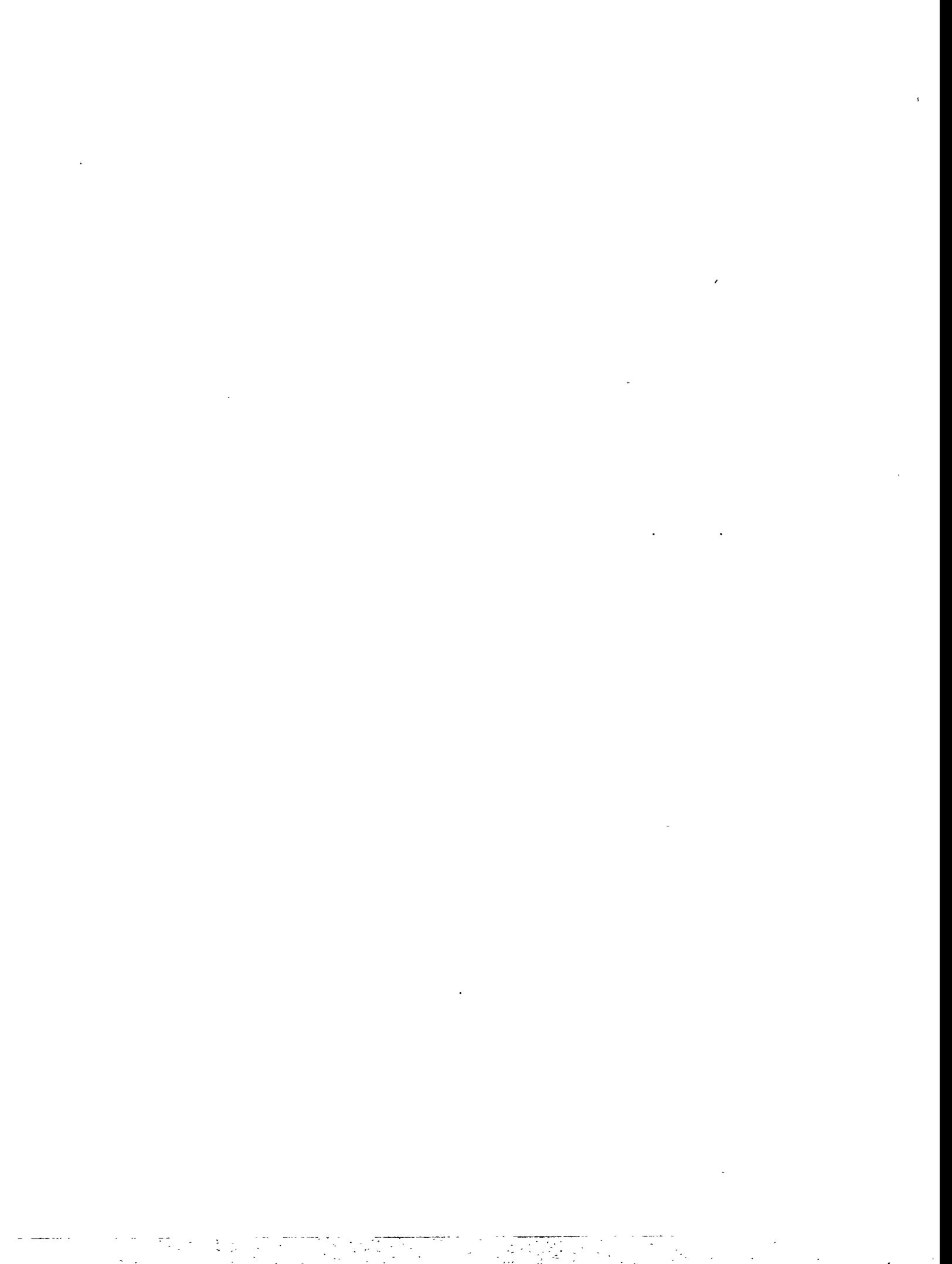
Closing of Third Street will be done by placing highly visible markers and barrels or cones across the street. An alternate route will be posted when needed. This alternate route will move traffic to Fourth Street temporarily to facilitate movement of vehicles around the site at Building 3506.

9.2 NOTIFICATION

The Energy Systems Construction Engineer will be notified within twenty-four hours of any pending road closures pertaining to Building 3506 prior to actual closing of the road. All rerouting of traffic will be coordinated with Energy Systems to minimize delays of operations.



Appendix
SAMPLE FORMS



**SITE REGISTRATION FORM
ALLIED TECHNOLOGY GROUP, INC.**

PERSONAL INFORMATION

Name:		Date:
Social Security:	Date of Birth:	Project Name:
Permanent Address:		
City:	State:	Zip:

EMPLOYER INFORMATION

Employer's Name:	
Employer's Address:	
Name of Emergency Contact:	
Address of Emergency Contact:	
Emergency Contact Phone:	
Signature:	

MEDICAL HISTORY

List any condition or ailment that may affect your ability to perform your job:

Indicate if you are epileptic or diabetic:

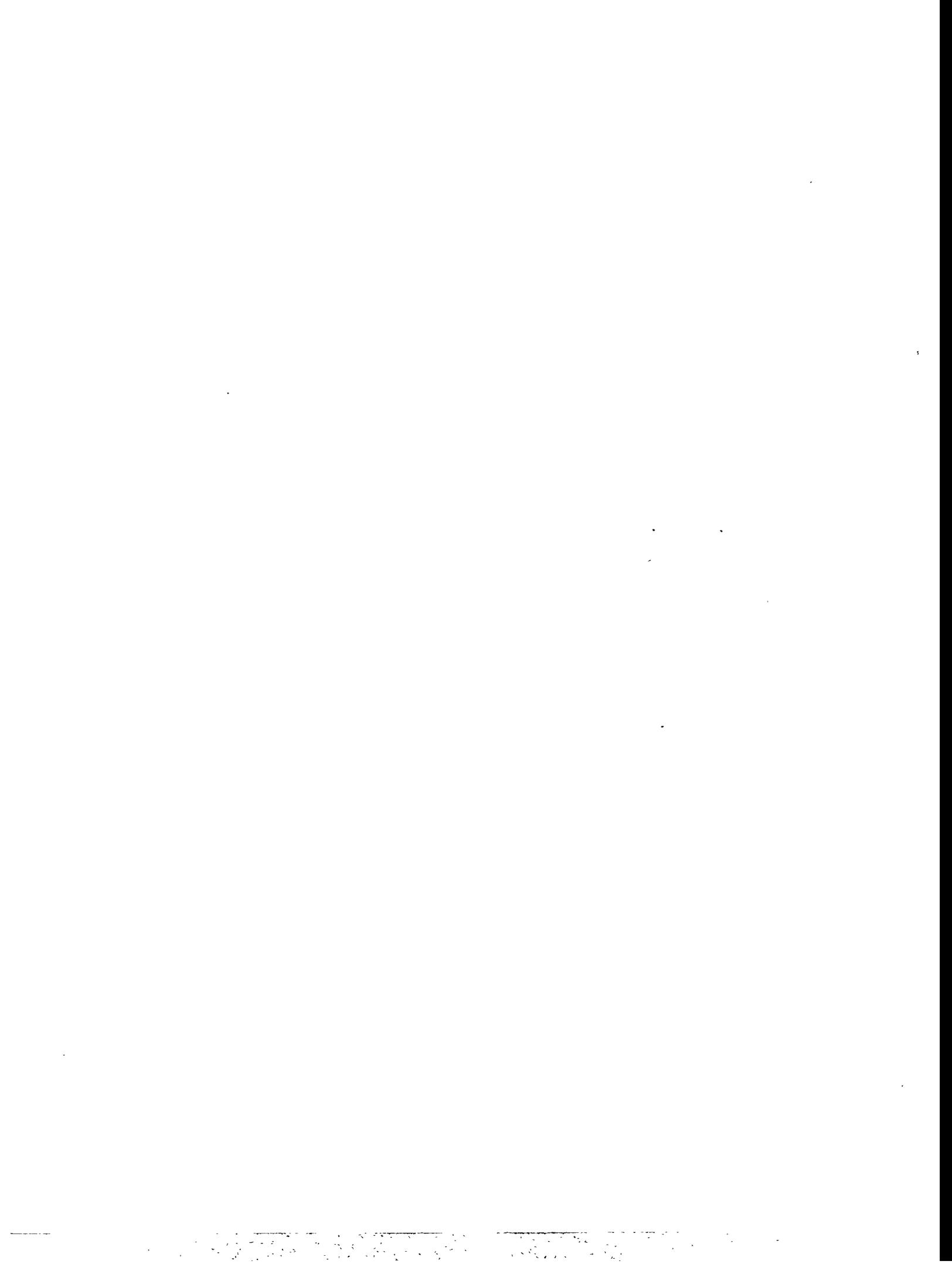
List any allergies you have:

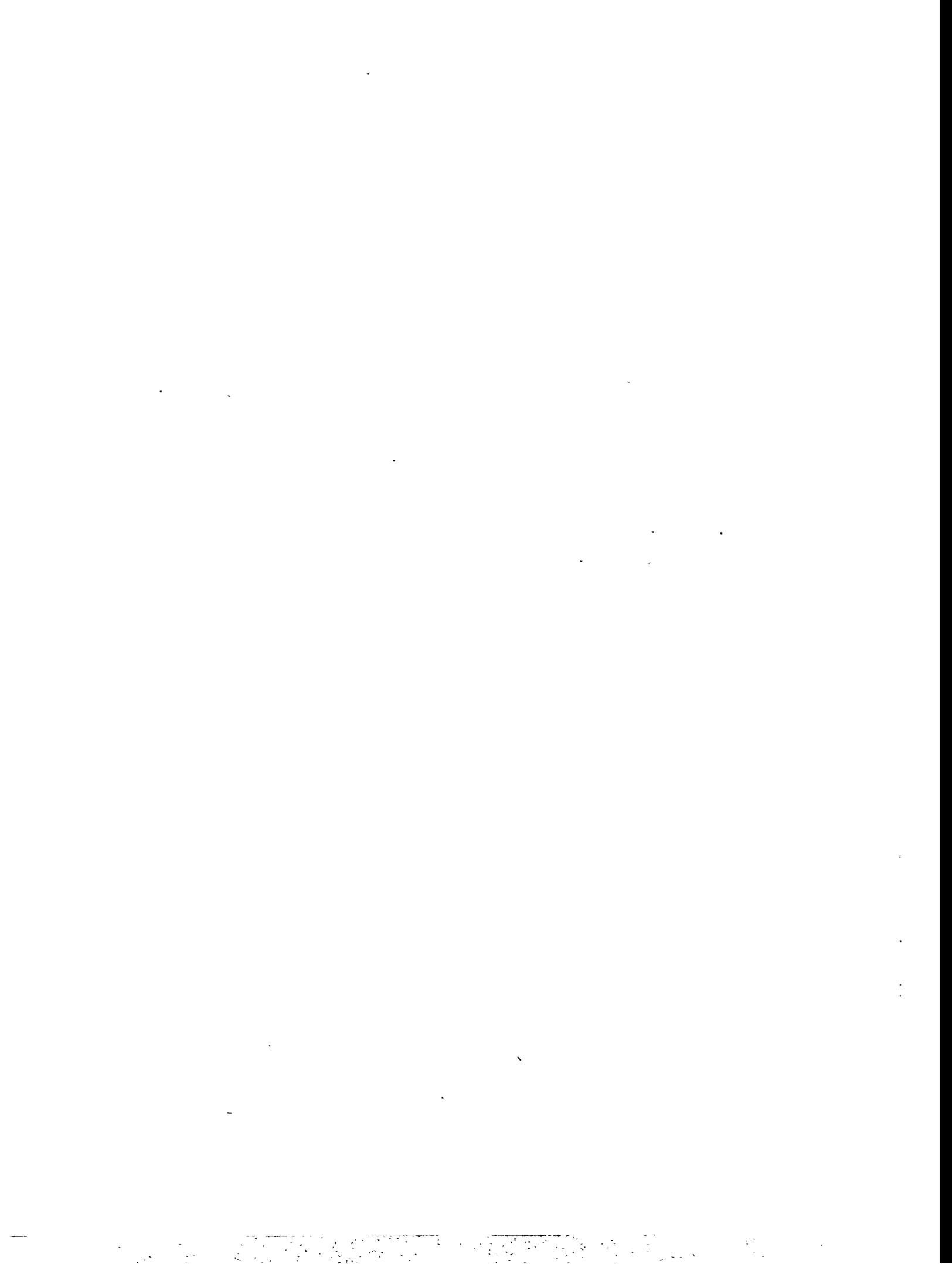
List any medications you are now taking:

Last Tetanus Shot date:	Date of Last Physical:
Signature:	
Date:	

FINAL PAYCHECK ADDRESS

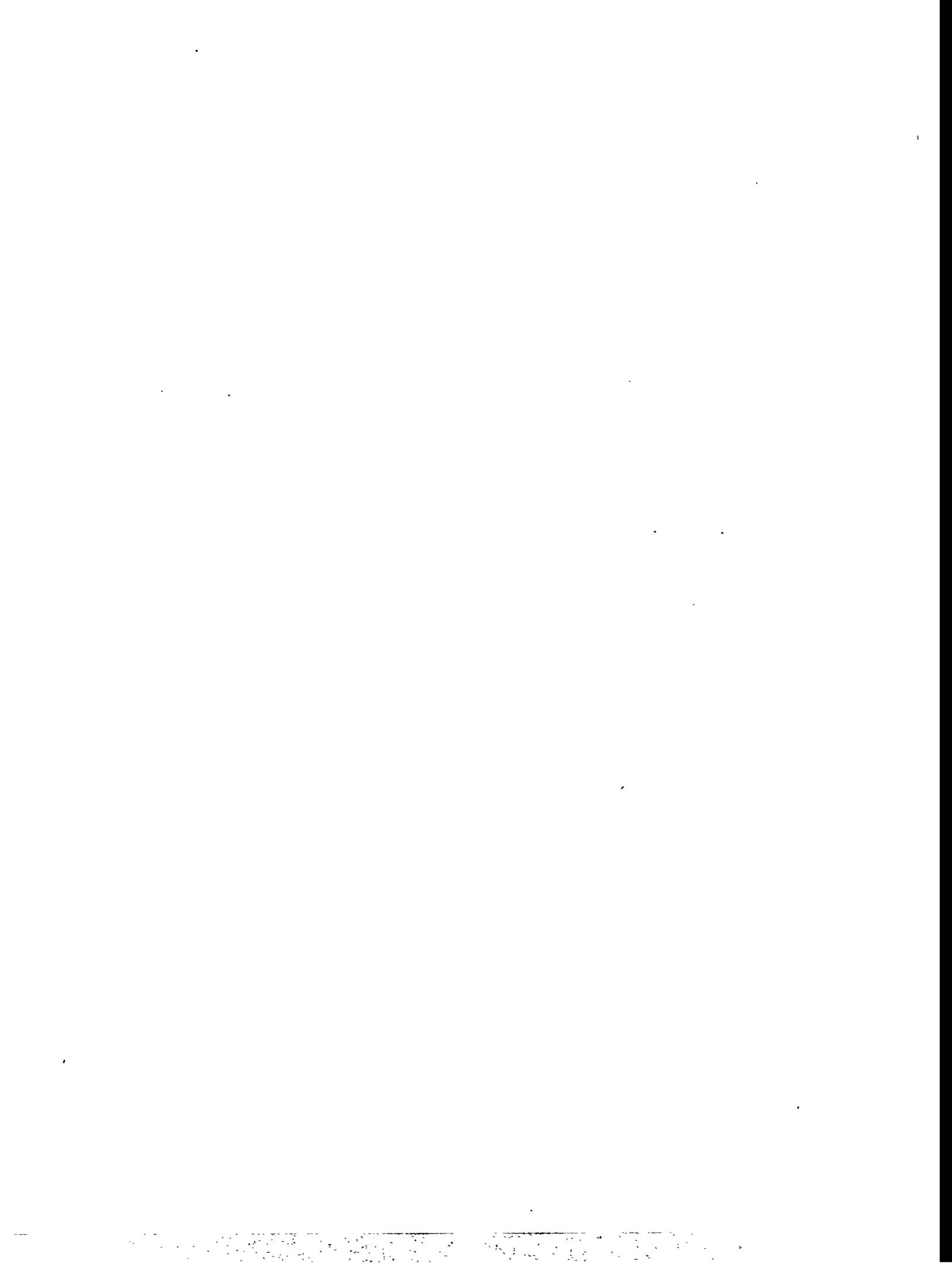
Address:	
City:	
Phone:	
FedEx: <input type="checkbox"/>	Check box at left if you want your check Federal Expressed to you. \$10.00 fee is deducted from your final pay for this service. If not checked, paycheck will be sent regular mail.





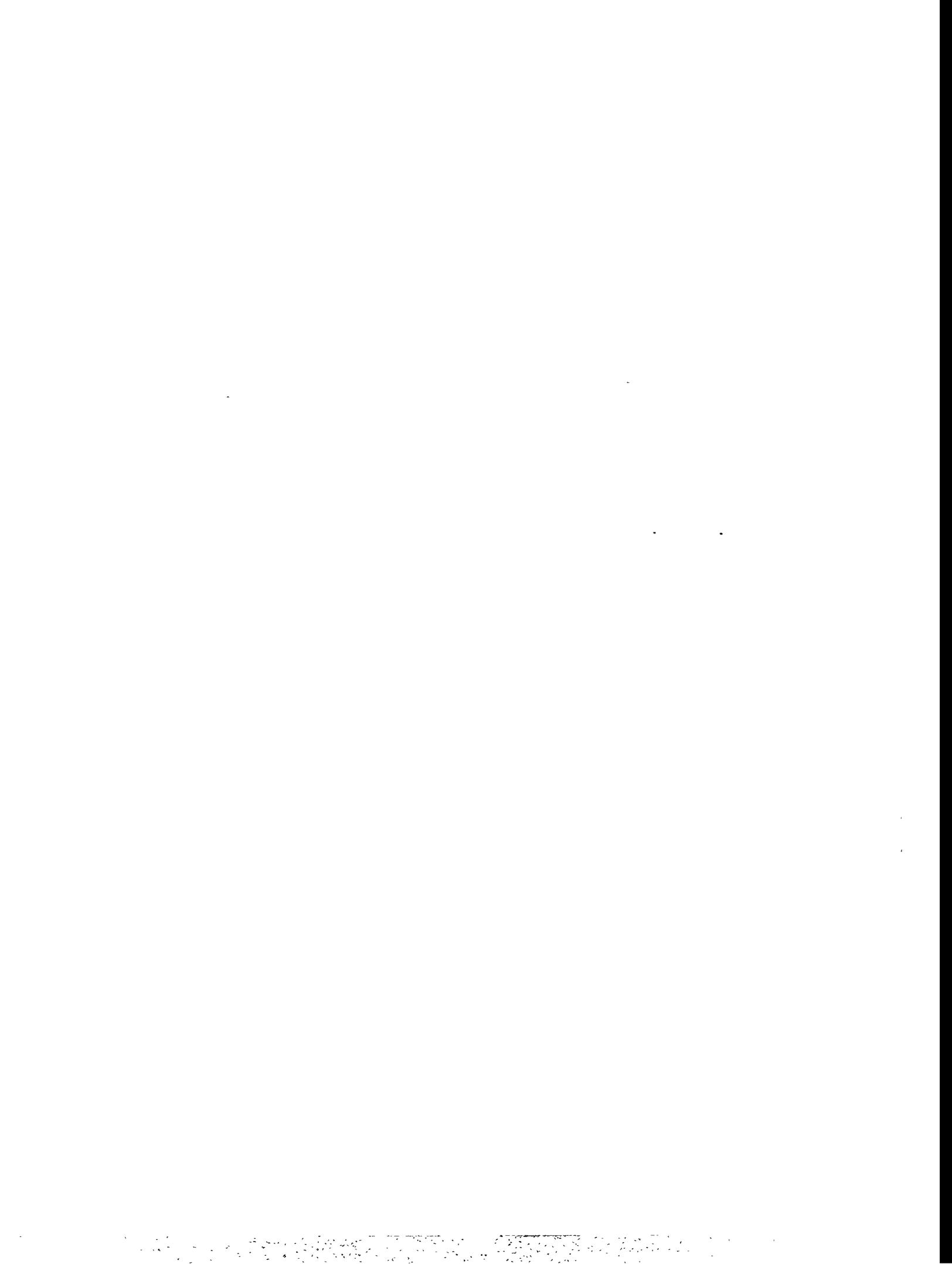
PERSONNEL CONTAMINATION REPORT

NAME	DATE
LOCATION WHERE CONTAMINATION OCCURRED:	RWP#
EXTENT OF CONTAMINATION:	
A. INITIAL SURVEY RESULTS:	
B. SURVEY RESULTS AFTER DECONTAMINATION:	
C. RELEASE SURVEY RESULTS:	
SKIN DOSE EVALUATION:	
<p>A. Maximum contamination level conversion from dpm to mrad/hr maximum skin dose rate _____ dpm (4,000 dpm/mrad/hr) = _____ mrad/hr.</p> <p>B. Maximum skin dose rate Total time skin contaminated Total maximum skin dose _____ mrad/hr x _____ hr* = _____ mrad**.</p> <p>* If skin contamination cannot be removed, assume a residence time of 48 hours. Contact the Radiation Safety Officer in all cases where skin contamination cannot be reduced below 1000 dpm.</p> <p>** If 75 mrad, contact the Radiation Safety Officer. (75 mrad is equivalent to 75000 cpm on the skin for 4 hours.)</p>	
RADIATION SAFETY OFFICER COMMENTS:	
SIGNATURE (TECHNICIAN)	DATE
SIGNATURE (INDIVIDUAL)	DATE
SIGNATURE (SUPERVISOR)	DATE



CLOTHING CONTAMINATION REPORT

NAME:	BADGE NO.:
WORK AREA:	
DATE OF OCCURRENCE:	TIME OF OCCURRENCE:
LOCATION WHERE CONTAMINATION OCCURRED:	
JOB BEING PERFORMED:	
WAS WORK COVERED BY RWP? <input type="checkbox"/> YES OR <input type="checkbox"/> NO	IF YES, RWP#
ANTI-C's WORN? <input type="checkbox"/> YES OR <input type="checkbox"/> NO	
DESCRIBE:	
EXTENT OF CONTAMINATION, INCLUDING APPROXIMATE AREA:	
CAUSE OF CONTAMINATION:	
METHOD OF DECONTAMINATION:	
RADIATION PROTECTION COMMENTS:	
SURVEY SECTION:	
A. INITIAL SURVEY RESULTS:	
B. AFTER DECONTAMINATION:	
C. RELEASE SURVEY RESULTS:	
HEALTH AND SAFETY OFFICER	DATE
INDIVIDUAL'S SIGNATURE	DATE



REFERENCES

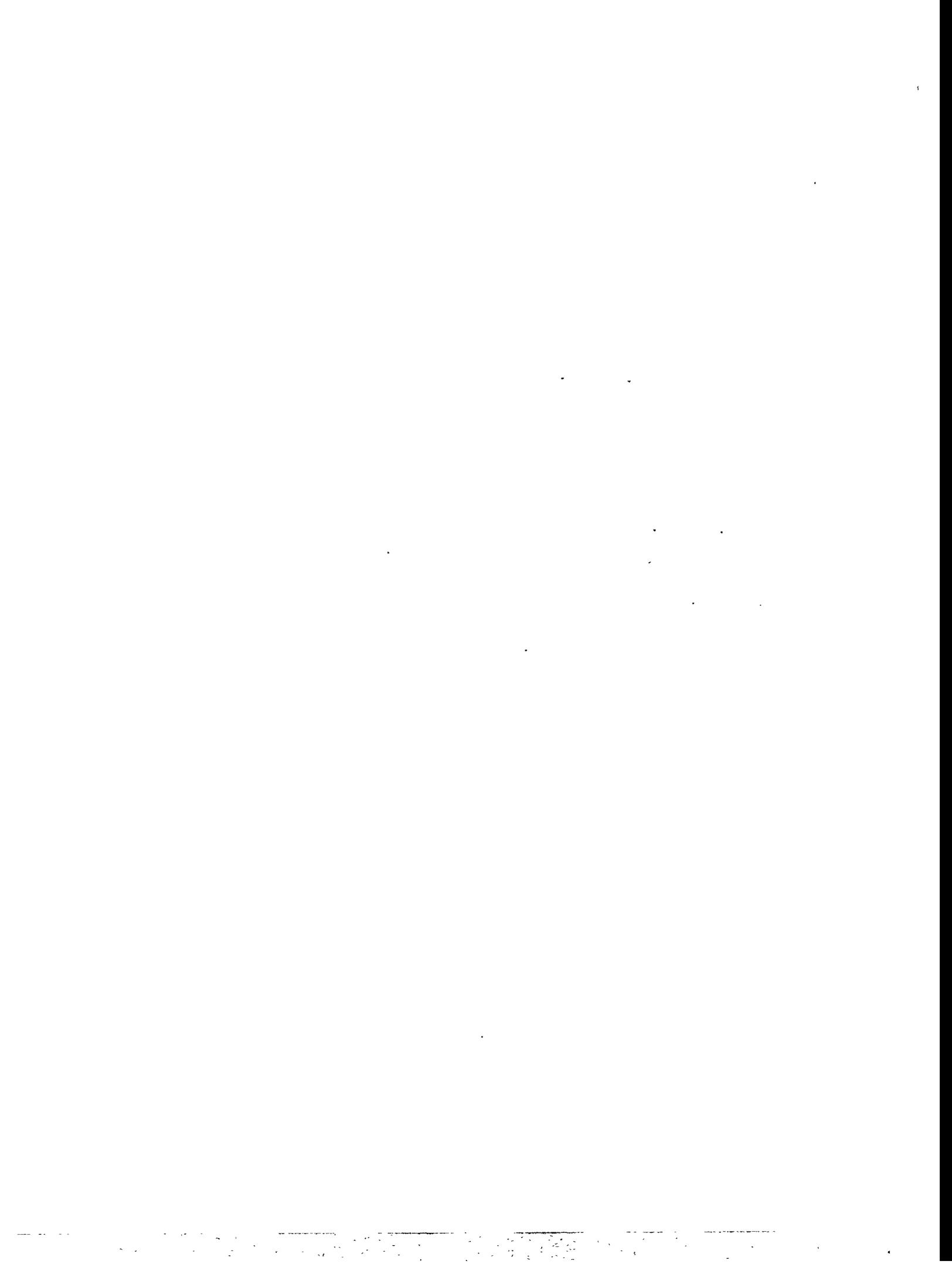
(Bechtel 1994). Bechtel National, Inc. *Site Characterization Report for Building 3506 at Oak Ridge National Laboratory, Oak Ridge, Tennessee.* (ORNL/ER/Sub/87-99053/72). July 1994.

(Energy Systems 1995a). Lockheed Martin Energy Systems, Inc. *Service Contract Specifications for Decontamination and Demolition of Building 3506.* Project Order No. 9440020.01, "Decontamination and Demolition of Building 3506 at Oak Ridge National Laboratory." August 1, 1995.

(Energy Systems 1995b). Lockheed Martin Energy Systems, Inc. "Request for Proposal" No. KEP03-18. August 8, 1995.

(DOE). U.S. Department of Energy. Table IV-1, "Surface Contamination Limits" Order 5400.5.

(Energy Systems). *Health, Safety, and Environmental Protection Procedure for Excavation Operations, M-116, "Radiological Soil Handling Criteria."*



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