

0050439

DOE/RL-98-22

Rev. 0

Surveillance and Maintenance Plan for the Uranium Trioxide (UO₃) Facility



United States
Department of Energy

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.
Available in paper copy and microfiche.

Available to the U.S. Department of Energy
and its contractors from
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(423) 576-8401

Available to the public from the U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

Printed in the United States of America

DISCLM-5.CHP (8-91)

Surveillance and Maintenance Plan for the Uranium Trioxide (UO_3) Facility

January 1999



United States Department of Energy

P.O. Box 550, Richland, Washington 99352

**THIS PAGE INTENTIONALLY
LEFT BLANK**

CONTENTS

1.0	INTRODUCTION	1-1
2.0	FACILITY DESCRIPTION	2-1
2.1	FACILITY HISTORY	2-1
	2.1.1 Introduction.....	2-1
2.2	FACILITY OVERVIEW	2-3
2.3	SURVEILLANCE AND MAINTENANCE ACTIVITIES	2-4
	2.3.1 Surveillance.....	2-4
	2.3.2 Maintenance.....	2-5
3.0	WASTE MANAGEMENT AND ENVIRONMENTAL COMPLIANCE REQUIREMENTS.....	3-1
3.1	WASTE MANAGEMENT STANDARDS	3-1
	3.1.1 Dangerous/Hazardous Waste Standards	3-2
	3.1.2 Radioactive Waste Standards.....	3-3
	3.1.3 Asbestos Standards	3-4
	3.1.4 Polychlorinated Biphenyl Standards.....	3-4
3.2	ENVIRONMENTAL PROTECTION STANDARDS	3-4
	3.2.1 Air Emission Standards.....	3-5
3.3	REPORTING STANDARDS	3-5
	3.3.1 Reporting Requirements for Nonroutine Releases or Abnormal Conditions.....	3-5
	3.3.2 Reporting Requirements for Routine Releases	3-6
4.0	RADIOLOGICAL CONTROLS	4-1
5.0	QUALITY ASSURANCE.....	5-1
6.0	HEALTH AND SAFETY/EMERGENCY PREPAREDNESS.....	6-1
6.1	HAZARDS.....	6-1
6.2	EMERGENCY PREPAREDNESS	6-1
	6.2.1 Emergency Preparedness (Training of Personnel).....	6-1
	6.2.2 Emergency Planning (Development of the Emergency Action Plan.....	6-2
	6.2.3 Emergency Response (Evacuation)	6-2
	6.2.4 Emergency Prevention.....	6-2
	6.2.5 Incident Responses.....	6-2

CONTENTS (cont.)

7.0	HAZARDOUS SUBSTANCE INVENTORY, MANAGEMENT, AND PROTECTION	7-1
8.0	SAFEGUARDS AND SECURITY	8-1
9.0	COST AND SCHEDULE	9-1
10.0	REFERENCES	10-1

FIGURES

2-1.	UO ₃ Site Map	2-2
------	--------------------------------	-----

ACRONYMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
BHI	Bechtel Hanford, Inc.
CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
DOH	Washington State Department of Health
DOP	diocetyl phthalate
Ecology	Washington State Department of Ecology
EM	Office of Environmental Management
ERC	Environmental Restoration Contractor
HVAC	heating, ventilation, and air conditioning
OEMP	operational environmental monitoring program
PCB	polychlorinated biphenyl
PHMC	Project Hanford Management Contractor
ppm	parts per million
PUREX	plutonium uranium
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RCT	Radiological Control technician
REDOX	reduction oxidation
S&M	surveillance and maintenance
SAA	satellite accumulation area
SSWMI	site-specific waste management instruction
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
TSD	treatment, storage, and disposal
UNH	uranyl nitrate hexahydrate
UO ₃	uranium trioxide
WAC	<i>Washington Administrative Code</i>
WHC	Westinghouse Hanford Company

**THIS PAGE INTENTIONALLY
LEFT BLANK**

Metric Conversion Chart

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into Metric Units			Out of Metric Units		
<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>	<i>If You Know</i>	<i>Multiply By</i>	<i>To Get</i>
Length			Length		
inches	25.4	millimeters	Millimeters	0.039	inches
inches	2.54	centimeters	Centimeters	0.394	inches
feet	0.305	meters	Meters	3.281	feet
yards	0.914	meters	Meters	1.094	yards
miles	1.609	kilometers	Kilometers	0.621	miles
Area			Area		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.0836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	Hectares	2.47	acres
Mass (weight)			Mass (weight)		
Ounces	28.35	grams	Grams	0.035	ounces
Pounds	0.454	kilograms	Kilograms	2.205	pounds
Ton	0.907	metric ton	Metric ton	1.102	ton
Volume			Volume		
teaspoons	5	milliliters	Milliliters	0.033	fluid ounces
tablespoons	15	milliliters			
fluid ounces	30	milliliters			
cups	0.24	liters			
pints	0.47	liters	Liters	2.1	pints
quarts	0.95	liters	Liters	1.057	quarts
gallons	3.8	liters	Liters	0.264	gallons
cubic feet	0.028	cubic meters	Cubic meters	35.315	cubic feet
cubic yards	0.765	cubic meters	Cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	Multiply by 9/5, then add 32	Fahrenheit
Radioactivity			Radioactivity		
curies	3.7×10^{10}	Becquerel	becquerel	2.7×10^{11}	curies

**THIS PAGE INTENTIONALLY
LEFT BLANK**

1.0 INTRODUCTION

This document provides a plan for implementing surveillance and maintenance (S&M) activities to ensure the Uranium Oxide (UO₃) Facility is maintained in a safe, environmentally secure, and cost effective manner until subsequent closure during the final disposition phase of decommissioning. This plan has been prepared in accordance with the guidelines provided in the U.S. Department of Energy (DOE) Office of Environmental Management (EM) *Decommissioning Resource Manual* (DOE 1995), and Section 8.6 of Change Form P-08-97-011 to the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology, et al. 1996). Specific objectives of the S&M program are as follows:

- To ensure adequate confinement of hazardous substances.
- To provide physical safety and security controls.
- To maintain the facilities in a manner that will minimize potential hazards to the public and workers.
- To provide adequate frequency of inspections to identify potential hazards.
- To maintain selected systems or equipment that will be essential for decommissioning activities in a shutdown but standby or operational mode, if economically justified.
- To provide a mechanism for the identification and compliance with applicable environmental, safety and health, and safeguard and security requirements.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

2.0 FACILITY DESCRIPTION

This chapter provides a description of the UO_3 Facility. In addition to supplying an overall understanding of the facility, this section identifies S&M activities.

The UO_3 Facility is shown in Figure 2-1, and for the purpose of this S&M plan, is defined as follows:

- The 224-U Building, 272-U Building, 2715-UA, 2716-U, 203-U, 203-UX, UNH truck load, the waste shed, six 100,000 gallon tanks in the 211-U tank farm, 211-U 307 pump pit, 211-U acid loading station, the 207-U retention basin, 207-U sample shack, and the 2714-U Building, which is currently empty.

The T hopper storage pad, which was originally part of the UO_3 Facility when it operated, will not be transferred to the EM-40 program until later since the UO_3 powder from previous campaigns is still stored in T hoppers on the pad. This area, which currently belongs to the Fuel Supply Shutdown project, will be deactivated and transferred to EM-40 at a later date.

2.1 FACILITY HISTORY

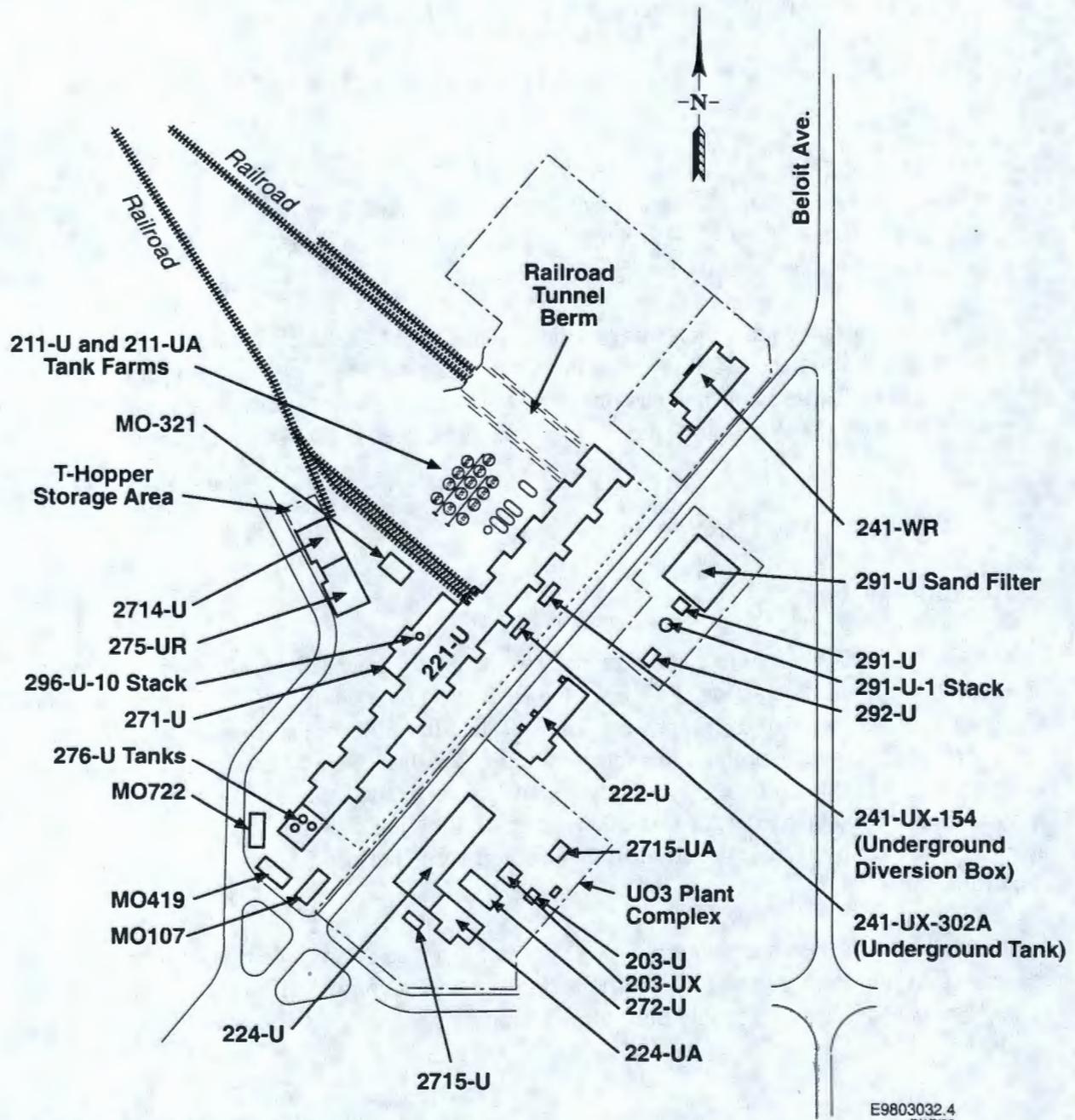
2.1.1 Introduction

The UO_3 Facility was used to convert uranyl nitrate hexahydrate (UNH) solution from the Plutonium Uranium Extraction (PUREX), the Reduction Oxidation (REDOX), and originally the 221-U facilities into a solid UO_3 power. The UO_3 Facility processing schedule was determined by the PUREX uranium product inventory buildup. The last operating campaign was completed in June 1993. Deactivation of the facility began as soon as the campaign was finished in preparation for transfer from the EM-60 program. Following deactivation, S&M responsibilities for the UO_3 Facility were transferred from Westinghouse Hanford Company (WHC) to Bechtel Hanford, Inc. (BHI).

The purpose of the deactivation project was to establish a passively safe and environmentally secure configuration for the UO_3 Facility, and preserve that configuration for a 10-year horizon. The plant is fully deactivated and unoccupied, empty of portable equipment and furniture, and locked.

A hazard classification evaluation was done for the UO_3 Facility in a deactivated state. The evaluation determined that the facility could be reclassified from a nuclear facility to an "other industrial facility" with no hazardous waste activities after deactivation. The determination was based on the fact that nearly all radioactive material and hazardous materials have been removed.

Figure 2-1. UO₃ Plant Facility and Nearby Structures.



* Note: Buildings and structure addressed by the SAR include 221-U, 271-U, 276-U, 211-U, 211-UA, 291-U, 292-U, 275-UR, MO-321, and 241-WR

E9803032.4
7/17/98

Ref: Dwg. H-2-44511
Sh. 67, 68, 76

The hazards classification evaluation was done per DOE-EM-STD-5502-94, *Hazard Baseline Documentation* (DOE 1994), and reported in WHC-SD-CP-HC-004, *UO₃ Building Hazard Classification - Deactivated State* (Dodd 1994).

The *UO₃ Plant Safety Analysis Report*, WHC-SD-CP-SAR-002 (WHC 1993), has been archived since a final safety analysis report is needed only for nuclear facilities. The UO₃ Facility is classified as industrial.

2.2 FACILITY OVERVIEW

During deactivation, the UO₃ Facility was stabilized so that when it was transferred to the EM-40 program in 1993, only a minimal effort would be required for S&M activities. All process equipment, instrumentation, and heating, ventilation and air conditioning (HVAC) systems in the UO₃ Facility were shut down. During S&M, the buildings will be unoccupied. The building doors and gates in the perimeter fence will be locked to limit access. The facility will be entered only for quarterly surveillances or to correct deficiencies identified during the surveillance entries.

The following activities have been completed to isolate source material and mitigate contamination migration:

- Process ventilation stacks were isolated (capped or blanked).
- All water sources have been isolated to the individual buildings. The main underground headers will be blanked after facility transfer to ensure no in-leakage occurs. (This isolation has been added to the Post-Transition Punchlist.)
- HVAC has been sealed to reduce the potential migration of contamination, and to keep water and small animals out.
- Miscellaneous wall penetrations were sealed.
- Electrical power was disconnected, and in the case of 224-U and 224-UA, lighting was installed or modified to allow safe performance of the surveillances.
- All drains to the sanitary sewer were sealed thus isolating the buildings from the sanitary sewer.
- The main incoming steam to the UO₃ Facility has been shut off and the main isolation valve has been removed.
- All sumps and floor drains were sealed and either plugged or grouted.

- The trench that runs from 224-UA to 224-U (C-cell) was tied into the 207-U retention basin pipe for routing of storm water buildup from the backside contamination zone areas to the 207-U basins for solar evaporation.
- All sinks and toilets were removed and sealed.
- Blind flanges and blanks were used to isolate pipes containing UO_3 powder from the process system.
- The cover plates on the 203-U enclosure trench were replaced with grating to assist in evaporation of storm water.
- All "no access" doors and large roll up type doors were sealed using an expansion foam.
- Door sweeps were repaired and/or verified to be in good condition to minimize potential vermin infestation.

2.3 SURVEILLANCE AND MAINTENANCE ACTIVITIES

2.3.1 Surveillance

Surveillance activities at the UO_3 Facility are conducted in accordance with BHI-FS-01, *Field Support Administration*, Section 3.1, "Surveillance and Maintenance."

All operating equipment inside the UO_3 Facility perimeter fence has been shut down. Facility operations will be limited to the following activities:

- Environmental monitoring of the 207-U Basins area.
- Quarterly entries into the yard areas and the 224-U and 224-UA Buildings for surveillance.
- General housekeeping activities.

The 207-U basins collect run-off from the roofs of the 224-U and 224-UA buildings and adjacent concrete pads. The outlets from the basins have been isolated and the accumulated water will be allowed to evaporate. The Operational Environmental Monitoring Program (OEMP) will continue to monitor the air and soil in the vicinity of the basins. This is done to show compliance with the National Emission Standards for Hazardous Air Pollutants requirements for monitoring and estimation of emissions from diffuse and fugitive sources. The OEMP is done using existing equipment, and is funded separately from the Surveillance/Maintenance and Transition (S/M&T) Project budgets.

The quarterly surveillance entries of the UO₃ Facility will consist of a walk-through of the yard areas, Building 224-U, and Building 224-UA to check for any indication of structural defects, roof deterioration, posting deficiencies, water intrusion, animal or insect intrusion, hazardous conditions or unlabeled containers. Entries into the process cells will require a minimum of two people as the buddy system requires. Radiation Control Technicians (RCT) perform air sampling and take smears prior to surveillance activities. S&M procedures will provide direction for the surveillance entries and include data sheets to document observations.

General housekeeping activities, including tumbleweed removal and sand cleanup from outdoor contamination areas, are performed during the S&M period.

2.3.2 Maintenance

Since the deactivated UO₃ Facility has been reclassified from a nuclear facility to an industrial facility, a Maintenance Implementation Plan is not required. The maintenance program described in BHI-FS-01, Section 3.1, will cover maintenance activities.

Since there is no operating process equipment or HVAC system at the UO₃ Facility, very little routine maintenance is required. The only electrical equipment that is maintained is the lighting circuits in the 224-U and 224-UA buildings. The power to the lighting circuits is only switched on for surveillance entries. Defective light bulbs are replaced during surveillance entries. Repairs to the lighting circuitry will be made when necessary.

Periodic inspections for roof and structural integrity is the most frequent maintenance activity.

A structural assessments senior engineer inspected the roofs of the 224-U, 224-UA, and 272-U buildings on September 9, 1994. The following actions were recommended:

1. Re-inspect the 224-U roof at an interval of four years.
2. Re-inspect the 224-UA roof at an interval of one year.
3. Re-inspect the 272-U roof at an interval of two years.
4. Seal the roofs of the 224-UA and 272-U buildings with an elastomer protective barrier to prevent in-leakage.
5. Perform an annual membrane inspection on the 224-U Building.
6. Provide additional sealing material to all the pitch pans on the 224-U Building roof to prevent in-leakage.

Items 1, 2, 3, and 5 are included in the S&M procedure. The roofs of the 272-U and 224-UA buildings have been sealed with an elastomer protective barrier as recommended in Item 4. Item 6 was completed as part of deactivation.

In addition to the roof inspections, structural assessments are performed on the 224-U, 224-UA, and 272-U buildings every five years (first due in 1999) as recommended by the structural assessments senior engineer.

Roof repairs or replacement approximately every 20 years is the largest maintenance activity anticipated. Building demolition will be evaluated as an alternative to roof repairs.

3.0 WASTE MANAGEMENT AND ENVIRONMENTAL COMPLIANCE REQUIREMENTS

Waste management requirements during S&M activities at the UO₃ Facility may apply to management and disposal of small quantities of various types of materials generated from routine S&M activities. Routine activities include handling and disposition of waste generated from small-scale cleanup, spill cleanup, and housekeeping activities. There are no routine waste streams resulting from UO₃ Facility activities.

Environmental protection requirements directly related to the S&M scope of work include reporting of routine and non-routine releases and conditions. Requirements appropriate for monitoring and control of radiological conditions in the UO₃ Facility are presented in section 4.0, and are not addressed here.

3.1 WASTE MANAGEMENT STANDARDS

The UO₃ Facility is a deactivated surplus facility with the majority of hazardous materials consisting of fairly adherent films and residues in deactivated equipment and systems. Various nondestructive assay and sampling techniques are used for identification and characterization of potentially hazardous materials encountered or anticipated during S&M activities. Materials and determination methods are developed on a job-specific basis. The S&M activities involve handling and disposition of small quantities of waste generated from small-scale cleanup, spill cleanup, and housekeeping activities. The potential regulated wastes involve the following:

- Heavy metals (e.g., lead, mercury)
- Light bulbs
- Radioactively-contaminated rain water
- Contaminated oils
- Fuels
- Batteries
- Miscellaneous chemicals
- Miscellaneous liquids
- Asbestos
- Polychlorinated biphenyl (PCB)

Waste management requirements for hazardous (Washington State dangerous) and radioactive mixed wastes are primarily derived from *Washington Administrative Code (WAC) 173-303* and *40 Code of Federal Regulations (CFR) 260 through 268*. Since there are no *Resource Conservation and Recovery Act of 1976 (RCRA)* treatment, storage, or disposal (TSD) units at

UO₃, federal and state regulations pertaining to RCRA TSD units do not apply to materials residing within the UO₃ complex until such time as the accumulated materials are physically disturbed (e.g., removed from the facility or treated or repackaged within the facility).

DOE Order 5820.2A, *Radioactive Waste Management*, is used as the applicable standard for radioactive and mixed waste under the provisions of the *Atomic Energy Act of 1954*. Federal standards under the *Clean Air Act of 1955* and *Toxic Substances Control Act of 1976* are the primary standards applicable to the management of asbestos waste and PCBs, respectively.

Detailed information regarding waste management requirements applicable to UO₃ S&M activities are presented below.

3.1.1 Dangerous/Hazardous Waste Standards

3.1.1.1 Generator Standards. Dangerous waste generator standards would apply to any regulated dangerous waste resulting from S&M activities. WAC 173-303-070 requires that a generator determine whether a waste is subject to regulation as a dangerous waste. Sampling and testing methods to be used in making dangerous waste determinations are specified in WAC 173-303-110. 40 CFR 262.11 requires that the generator also determine the status of any RCRA regulated waste with respect to the land disposal restriction standards of 40 CFR 268. Waste designation is performed in accordance with BHI-EE-10, *Waste Management Plan*.

Dangerous waste generated by S&M activities at the UO₃ facility would most likely be managed in containers. Container management standards are specified in WAC 173-303-630, and include provisions for container integrity, labeling, compatibility, separation and segregation, inspections, and provision of secondary containment. WAC 173-303-160 establishes requirements for determining whether a container may be considered "empty" and therefore exempt from dangerous waste management standards.

Since there are no permitted container storage areas at the UO₃ facility, containerized dangerous waste from S&M activities would be subject to the accumulation standards of WAC 173-303-200. With the exception of satellite accumulation areas (SAA), a 90-day accumulation limit is applicable and specified personnel training, preparedness and prevention, contingency planning and emergency preparedness, and general inspection requirements would be imposed. Requirements for SAAs (specified in WAC 173-303-200(2)) are somewhat less stringent. There is no specified time limit for SAAs; however, quantities are limited to 55 gallons of dangerous waste or one quart of acutely hazardous waste per waste stream. Generators of RCRA regulated wastes would also be subject to a variety of generator responsibilities established in the land disposal restriction regulations of 40 CFR 268. When SAA limits are reached, the waste container is transferred to a less than 90-day accumulation area for interim storage prior to final transport to a permitted TSD

All waste generated at the UO₃ Facility is managed per the directives of a site-specific waste management instruction (SSWMI) in accordance with BHI-EE-10. The SSWMI provides waste stream specific management requirements including designation, separation and segregation, waste minimization, packaging, marking and labeling, storage, inspection, transportation tracking, and traceability.

3.1.2 Radioactive Waste Standards

Chapter III of DOE Order 5820.2A establishes a variety of requirements that are applicable to S&M activities at UO₃, involving the generation of low-level radioactive or mixed waste. These include the following:

- Per item 3(c)(1) of the Order, technical and administrative controls are required to ensure reduction in the gross volume of waste generated and/or the amount of radioactivity requiring disposal.
- Per 3(c)(2), auditable programs must be in place to assure that the amount of low-level waste generated or shipped for disposal is minimized.
- Per 3(d), low-level waste must be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. Characterization must ensure that the actual physical and chemical characteristics and major radionuclides are recorded and known during all phases of waste management. Characterization records must be maintained.
- Per item 3(e)(1), waste generators must ensure that low-level waste shipped to another facility is done in accordance with the receiving facility requirements.
- Per 3(e)(3), generators shall implement a waste certification program to provide assurance that the receiving facility waste acceptance criteria are met.
- Per 3(f)(1), low-level waste must be treated by an appropriate method to ensure disposal can be done in a manner that is protective of public health and safety.
- Per 3(g)(4), each low-level waste package must be labeled to show the type of waste contained.

In addition to these DOE Order requirements pertaining to the generation of low-level waste, Chapter III item 3(k)(2) requires monitoring of non-operational low-level waste treatment, storage, and disposal facilities in order to allow for measure to prevent migration of radionuclides. This requirement is applicable to areas of UO₃ where low-level waste exists.

3.1.3 Asbestos Standards

The UO₃ S&M activities include the cleanup of small amounts of asbestos. Asbestos cleanup activities are done in accordance with 40 CFR 61.150. Per this standard, asbestos cleanup must be done in a manner that prevents any visible emissions to the outside air. Asbestos-containing waste must be adequately wetted then sealed in leak-tight containers or wrapping. Containers or wrapped materials must be labeled. Disposal at an appropriate waste disposal site must occur as soon as practical.

3.1.4 Polychlorinated Biphenyl Standards

Spills or discharges of materials containing greater than 50 parts per million (ppm) of PCB (measured prior to the spill or discharge) are subject to PCB regulations of 40 CFR 761. Specific PCB testing methods are identified in 40 CFR 761.60(g). Regulations at 40 CFR 761.125 establish requirements for PCB spill cleanup. Included are provisions for reporting, cleanup methodology and decontamination requirements, disposal of cleanup debris and materials, and recordkeeping. Cleanup actions must be completed within 48 hours of discovery of the spill for low-concentration spills involving less than 1 pound of PCB. Cleanup actions for high-concentration spills or spills involving more than 1 pound of low-concentration PCBs must be completed within 24 hours. Post-cleanup sampling is required in accordance with 40 CFR 761.130. 40 CFR 761.65(c) establishes standards for temporary storage of PCB cleanup wastes in specified containers for a period of up to 30 days. Containers in temporary storage must be properly dated, inspected, and labeled; PCB storage records must be maintained. After 30 days, the containers must be moved to an approved PCB disposal or storage-for-disposal facility. Washington State regulates PCBs as dangerous waste (W001) in concentrations between 2 to 50 ppm (WAC 173-303-9904). Exclusions to this regulation are provided in WAC 173-303-071(3)(k).

3.2 ENVIRONMENTAL PROTECTION STANDARDS

In addition to waste management standards described in section 3.1, environmental protection requirements address releases to air and soil, emergency/contingency planning, and environmental reporting requirements.

Standards for surface water discharges and underground injection of rainwater are not applicable to the UO₃ Facility because all drains have been plugged as part of deactivation. However, the potential exists for external discharge of contaminated rainwater through cracks and joints in the floor. Because the piping systems were drained as part of transition, significant quantities of liquids are not likely to remain. Therefore, any spills are expected to be fully contained within the building. A variety of release reporting requirements may apply if a release to the environment were to occur. In addition to spill and release reporting requirements, routine reporting requirements apply to S&M activities at the UO₃ Facility.

Standards contained in WAC 246-247 are applicable to S&M activities undertaken at the UO₃ Facility if such activities have the potential to emit any airborne radionuclides.

Detailed information regarding environmental protection requirements applicable to UO₃ Plant S&M activities are presented below.

3.2.1 Air Emission Standards

In accordance with 40 CFR 61, Subpart H, and WAC 246-247, radionuclide airborne emissions from all combined operations at the Hanford site may not exceed 10 mrem/yr effective dose equivalent to the hypothetical offsite maximally exposed individual. WAC 246-247 requires verification of compliance, typically through periodic confirmatory air sampling.

There are no exhaust stacks at the UO₃ Facility that would be subject to routine radionuclide emissions monitoring requirements. Radionuclide emission standards would apply to S&M activities undertaken at the UO₃ Facility if such activities could result in fugitive, diffuse, or point-source air emissions of radionuclides. If the potential exists for any non-zero radioactive emissions, "best available radionuclide control technology" would be required pursuant to WAC 246-247. If S&M activities could result in an increase of non-radioactive toxic air pollutants to the atmosphere above the small quantity emission rates, implementation of "best available control technology for toxics" would be required in accordance with WAC 173-460.

3.3 REPORTING STANDARDS

3.3.1 Reporting Requirements for Nonroutine Releases or Abnormal Conditions

3.3.1.1. Federal Hazardous Substance. 40 CFR 302 requires immediate notification to the National Response Center upon discovery of a release of a hazardous substance into the environment in excess of a reportable quantity.

40 CFR 355 requires immediate notification to the community emergency coordinator for the local emergency planning committee and to the State emergency response commission for a release of a reportable quantity of an extremely hazardous substance or a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* hazardous substance.

3.3.1.2 Dangerous Waste/State Hazardous Substance. WAC 173-303-145 requires immediate notification for any release of a dangerous waste or a state hazardous substance such that human health or the environment is threatened, regardless of the quantity. Notifications must be made to the Washington State Department of Ecology (Ecology) as well as to local authorities in accordance with the local emergency plan.

WAC 173-303-360 requires immediate notification to Ecology in the event of a release, fire, or explosion at a dangerous waste TSD facility or from a less-than-90-day accumulation area if the event represents an emergency that could threaten human health or the environment. In addition, immediate notification to local authorities is required if the facility emergency coordinator determines that evacuation of local areas may be advisable. A written report on any incident that requires implementation of the facility contingency plan must be submitted to Ecology within 15 days in accordance with WAC 173-303-360(2)(k).

3.3.1.3 Air Emission System Failure. WAC 246-247-080(5) requires notification to the Washington State Department of Health (DOH) within 24 hours of any shutdown, or of any transient abnormal condition lasting more than four hours, or other change in facility operations which, if allowed to persist, would result in emissions of radionuclides in excess of applicable standards. If requested by DOH, a written report must be submitted within 10 days.

3.3.1.4 Polychlorinated Biphenyl Spills. 40 CFR 761.125 requires notification in the shortest time possible after discovery (but no later than 24 hours) to the Pesticides and Toxics Substances Branch of the U.S. Environmental Protection Agency regional office for PCB spills in excess of 10 pounds.

3.3.2 Reporting Requirements for Routine Releases

3.3.2.1 Dangerous Waste Reports. WAC 173-303-220 requires an annual report from generators of dangerous waste. This provision would apply to any S&M activities undertaken at UO₃ resulting in the generation of a dangerous waste.

The Tri-Party Agreement (Ecology, et al. 1996) requires an annual report pertaining to any land disposal restricted mixed waste generated, treated, stored, or disposed at Hanford. S&M activities at the UO₃ Facility involving land disposal restricted mixed waste would need to be included in this report.

The Project Hanford Management Contractor (PHMC) coordinates preparation and compiles the dangerous waste reports. The UO₃ S&M program will need to provide applicable information to the PHMC to support development of these reports.

4.0 RADIOLOGICAL CONTROLS

Radiological conditions for facilities within S/M&T Project have been assessed to ensure adequate radiological controls have been implemented to perform S&M activities safely. The radiological control activities implemented for the facilities to demonstrate compliance with DOE Order 5480.1, *Radiation Protection for Occupational Workers*, are described in the following:

- 10 CFR 835, *Occupational Radiation Protection*
- HSRCM-1 *Hanford Site Radiological Control Program*,
- BHI-SH-01, *Hanford ERC Environmental, Safety, and Health Program*, Section 10.2, "Radiological Controls,"
- BHI-SH-02, Volume 1, Section 1.0, General Procedures,
- BHI-SH-02, Volume 2, Section 2.0, Radiological Control Implementing Procedures, and
- BHI-SH-04, *Radiological Control Work Instructions*.

Prior to the performance of surveillance or maintenance activities, the proposed activity is discussed with the Radiological Controls organization to determine the scope of the activity and radiological survey requirements needed. Technical assessment documentation may be issued by the Radiological Control organization to provide direction concerning the isotopes of concern, any specific survey and/or air sampling requirements. Additionally, dependent upon work scope and expected radiological conditions, an as low as reasonably achievable (ALARA) review may be performed. RCTs assess radiological conditions of the work/surveillance area in accordance with BHI procedures and issued technical assessments, document survey results, and ensure correct radiological postings/boundaries of the area.

Based upon the results of the radiological survey, a Radiation Work Permit is issued describing the appropriate personnel protective clothing, dosimeter requirements, respiratory protection and RCT coverage requirements.

The UO₃ Facility areas, which are accessed for routine S&M, are either Radiological Buffer Areas or Contamination Areas. Surveys and entry requirements for these areas are in accordance with BHI procedures and the Radiological Protection Program. The major isotope of concern for the UO₃ Facility is uranium-238.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

5.0 QUALITY ASSURANCE

The Environmental Restoration Contractor (ERC) Quality Program as documented in BHI-QA-01, *ERC Quality Program*, satisfies the requirements of both DOE Order 5700.6C, *Quality Assurance*, and 10 CFR 830.120, "Quality Assurance Requirements."

**THIS PAGE INTENTIONALLY
LEFT BLANK**

6.0 HEALTH AND SAFETY/EMERGENCY PREPAREDNESS

6.1 HAZARDS

Hazard analyses are conducted for S&M activities in accordance with the work control process. The team examines available facility data and proposed activities and processes for hazards, and develops controls for hazards that may pose a threat to workers, the public, or the environment. BHI-SH-02, Procedure 1.7, "Project Safety Planning and Documentation," in concert with the BHI-FS-01, Procedure 2.1, "Work Control," ensures that the appropriate level of safety documentation is implemented for all S&M work activities.

6.2 EMERGENCY PREPAREDNESS

Administration (preparedness and planning) of the emergency management program for the 224-U (UO₃) Facility is found in BHI-SH-03, *Emergency Management Program*, Volume 2, Section 3.0, "Emergency Action Plan 200 Area S/M&T." BHI-SH-03 meets the requirements of DOE/RL-94-02, *Hanford Emergency Response Plan* (DOE-RL 1996), and the applicable emergency management DOE Orders and state and federal regulations.

If an emergency occurs at the UO₃ Facility, the response to mitigate would not be part of the S&M, rather would fall under the ERC Emergency Management Program as outlined in BHI-SH-03, which implements the applicable DOE Emergency Implementing Procedures (DOE-RL 1998).

NOTE: UO₃ cannot create a DOE Emergency (i.e., Alert, Site Area, or General Emergency).

The following documents the Emergency Management measures taken at the UO₃ Facility during S&M.

6.2.1 Emergency Preparedness (Training of Personnel)

The UO₃ Plant Facility is locked and unoccupied. S&M personnel make entries into the facility during monthly routine and quarterly surveillances. Therefore, no permanent emergency equipment, communications equipment, warning systems, personal protective equipment, spill control, and containment supplies are located within the facility.

Prior to routine and quarterly entries, personnel will review the appropriate procedures and attend pre-job safety meetings. The procedures, emergency plan, and meetings dictate the appropriate emergency equipment to be taken into the work area(s), will identify the facility specific hazards, and the appropriate evacuation routes and notifications if an incident occurs.

6.2.2 Emergency Planning (Development of the Emergency Action Plan)

Emergency Plan (emergency action plan [BHI-SH-03, Volume 2, Section 3.0) has been written to ensure proper response(s) of employees if an emergency occurs. Facility-specific hazards have been outlined in BHI-00066, *Hanford Surplus Facilities Hazards Identification Document* (Egge 1997) and/or 0221U-SSHS-G0001, "U Plant and UO₃ Site-Specific Health and Safety Plan (200 West Area) (BHI 1998 _). Primary and alternate Building Warden (BW) and appropriate evacuation routes are included in the emergency plan. The emergency plan for the UO₃ Facility is an Emergency Evacuation Information Board posted just inside the 224-U Building entrance, which contains the emergency evacuation information and evacuation routes for employees to review prior to conducting S&M.

6.2.3 Emergency Response (Evacuation)

If an emergency or abnormal incident occurs during S&M activities, personnel will evacuate the facility and communicate the abnormal condition information to the Patrol Operations Center on 911 (if using a cellular phone, 373-3800), their supervisor, and the Facility Administrator.

6.2.4 Emergency Prevention

Performance of post-deactivation S&M activities and personnel training mitigates contamination migration and/or minimizes the potential for unplanned sudden radiological or hazardous releases.

6.2.5 Incident Response

The initial response to any emergency is to immediately protect the health and safety of individuals in the immediate area and to initiate a request for emergency response.

7.0 HAZARDOUS SUBSTANCE INVENTORY, MANAGEMENT, AND PROTECTION

The following hazardous substances will be managed in accordance with ALARA considerations and applicable requirements provided in section 3.0 above. Compliance with hazardous material protection requirements are ensured as described in BHI-SH-01, BHI-SH-02, Volumes 1 and 4, and BHI-SH-05, *Industrial Hygiene Work Instructions*.

All hazardous waste was removed from the UO₃ Facility during deactivation or will be removed within 90 days following generation and staging on the 90-day pad. The following hazardous materials will remain at the UO₃ Facility during the S&M period:

- Mercury switches and lead/silver solder that are part of instrumentation in the control room, switchgear room and other locations. All visible mercury switches have been removed, but others may remain inside equipment.
- Solidified UNH in the drain lines from the ED-6 concentrator and TK-X-19 (nor more than 15 gallons).
- Dioctyl phthalate (DOP) contamination in the high efficiency particulate air filters left in the 224-UA loadout room, and on the 224-UA roof.
- Approximately 2 liters of solidified UNH in the concrete-lined 203-U riser pit (30 ft below grade).
- Potential PCB or DOP bearing ballasts in the remaining light fixtures.
- Asbestos insulation on piping and vessels.

The abandoned 270-W tank located under the 2715-UA Building will remain as is. The tank contents, if any, are unknown at this time. The WHC Tank Waste Remediation organization has taken responsibility for this tank, and will perform a safety investigation and assessment in the future. Tank Waste Remediation Support (WHC) and EM-40 will need a separate agreement for access and work control associated with investigation of the 270-W tank contents.

The hazardous materials described above will remain in the UO₃ Facility through the S&M period. The wastes will be identified in BHI-00066 (Egge 1997) and/or 0221U-SSHS-G0001 (BHI 1998). During the quarterly surveillance entry, personnel will check for friable asbestos, unidentified/unlabeled containers, and suspect hazardous materials.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

8.0 SAFEGUARDS AND SECURITY

Since the deactivated UO_3 Facility has been reclassified from a nuclear facility to the "Other Industrial Facilities" category, DOE Order 5632.2A, *Physical Protection of Special Nuclear Material and Vital Equipment*, and DOE Order 5480.5, *Safety of Nuclear Facilities*, do not apply to the UO_3 Facility during S&M. However, access to the facility will be controlled to prevent radiation exposure or injury to personnel.

The BHI S/M&T Project controls access to the fenced areas and building of the UO_3 Facility and possesses the security keys to unlock gates and doors. Access will be limited to personnel who have current training, or are escorted by trained personnel. Access control for the UO_3 Facility and other surplus facilities, is described in BHI-FS-01, Section 1.1, "Surplus Facilities Access Control."

Physical access control to the 224-U, 224-UA, and 272-U building; nearby smaller buildings, and the adjacent yard area at the UO_3 Facility is provided by a 8-ft high chain link fence topped by three strands of barbed wire. Vehicle access gates are located in the southwest and northeast sides of the perimeter fence. A pedestrian gate is located near the west corner. All of the gates in the perimeter fence will be locked when the UO_3 Facility deactivation is completed. The doors to all the buildings inside the fence will also be locked or sealed to provide additional access control.

The 211-U tank farm and 207-U retention basins are cordoned off with magenta and yellow chain, with applicable radiological status postings, but are not fenced. There are no intrusion alarms at any of the UO_3 Facilities.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

9.0 COST AND SCHEDULE

A brief description and work breakdown structure of the UO₃ Facility S&M activities are given below. The air and soil monitoring around the 207-U basins is not included in the cost breakdown because it is not funded out of S/M&T Project budget, but rather a sitewide ongoing program. The Post-Transition Punchlist (Stefanski 1994) activities that will be finished after facility deactivation is completed also are not included since those activities are part of the PUREX/UO₃ Deactivation Project. That work will be funded by the deactivation project except for the steam valve removal that is part of a planned steam valve replacement funded by a separate utility project.

Four surveillance entries will be made each year on a quarterly basis beginning in May 1995.

Quarterly surveillance	\$30K
Maintenance	50K

Activities described in Section 2.3 are scheduled throughout the year in accordance with the applicable fiscal year work plan and the field support work package system described in BHI-FS-01.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

10.0 REFERENCES

10 CFR 830.120, "Quality Assurance Requirements," *Code of Federal Regulations*, as amended.

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.

40 CFR 61, "National Emissions Standards in Hazardous Air Pollutants," *Code of Federal Regulations*, as amended.

40 CFR 260, "Hazardous Waste Management System: General," *Code of Federal Regulations*, as amended.

40 CFR 261, "Identification and Listing of Hazardous Waste," *Code of Federal Regulations*, as amended.

40 CFR 262, "Standards Applicable to Transporters of Hazardous Waste," *Code of Federal Regulations*, as amended.

40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste," *Code of Federal Regulations*, as amended.

40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, as amended.

40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, as amended.

40 CFR 266, "Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities," *Code of Federal Regulations*, as amended.

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.

40 CFR 302, "Designation, Reportable Quantities, and Notification," *Code of Federal Regulations*, as amended.

40 CFR 355, "Emergency Planning and Notification," *Code of Federal Regulations*, as amended.

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing Distribution in Commence, and Use Prohibitions," *Code of Federal Regulations*, as amended.

Atomic Energy Act of 1954, 42 U.S.C. 2011, et seq., as amended.

BHI, 1998, "U Plant and UO₃ Site Specific Health and Safety Plan (200 West Area)."
0221U-SSHS-G0001, Bechtel Hanford, Inc., Richland, Washington.

BHI-EE-10, *Waste Management Plan, Bechtel Hanford, Inc., Richland, Washington.*

BHI-FS-01, *Field Support Administration, Bechtel Hanford, Inc., Richland, Washington.*

BHI-QA-01, *ERC Quality Manual, Bechtel Hanford, Inc., Richland, Washington.*

BHI-SH-01, *Hanford ERC Environmental, Safety, and Health Program, Bechtel Hanford, Inc.,
Richland, Washington.*

BHI-SH-02, Volumes 1, 2, and 4, *Safety and Health Procedures, Bechtel Hanford, Inc.,
Richland, Washington.*

BHI-SH-03, *Emergency Management Program, Volume 2, Bechtel Hanford, Inc.,
Richland, Washington.*

BHI-SH-04, *Radiological Control Work Instructions, Bechtel Hanford, Inc.,
Richland, Washington.*

BHI-SH-05, *Industrial Hygiene Desk Instructions, Bechtel Hanford, Inc., Richland, Washington.*

Clean Air Act of 1955, 42 U.S.C. 7401, et seq., as amended.

*Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C.
9601, et seq., as amended.*

Dodd, E. N. III, 1994, *UO₃ Building Hazard Classification – Deactivated State,*
WHC-SD-CP-HC-004, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

DOE, 1994, *Hazard Baseline Documentation, DOE-EM-STD-5502-94, U.S. Department of
Energy, Washington, D.C.*

DOE, 1995, *Decommissioning Resource Manual, DOE/EM-0246, U.S. Department of Energy,
Office of Environmental Management, Washington, D.C.*

DOE Order 5480.1, *Radiation Protection for Occupational Workers, as amended,
U.S. Department of Energy, Washington, D.C.*

DOE Order 5480.5, *Safety of Nuclear Facilities, U.S. Department of Energy, Washington, D.C.*

DOE Order 5632.2A, *Physical Protection of Special Nuclear Material and Vital Equipment*, U.S. Department of Energy, Washington, D.C.

DOE Order 5700.6C, *Quality Assurance*, U.S. Department of Energy, Washington, D.C.

DOE Order 5820.2A, *Radioactive Waste Management*, U.S. Department of Energy, Washington, D.C.

DOE-RL, 1996, *Hanford Emergency Response Plan*, DOE/RL-94-02, Release 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1998, *Emergency Plan Implementing Procedures*, DOE-0223, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1996, *Hanford Federal Facility Agreement and Consent Order*, 6th Amendment, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Egge, R. G., 1997, *Hanford Surplus Facilities Hazards Identification Document*, BHI-00066, Rev. 4, Bechtel Hanford, Inc., Richland, Washington.

HSRCM-1, *Hanford Site Radiological Control Manual*, as amended, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq., as amended.

Toxics Substances Control Act of 1976, 15 U.S.C. 2601, et seq., as amended.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-460, "Controls for New Source of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

WAC 246-247, "Radiation Protection—Air Emissions," *Washington Administrative Code*, as amended.

WHC, 1993, *UO₃ Plant Safety Analysis Report*, WHC-SD-CP-SAR-002, Rev. 6G, Westinghouse Hanford Company, Richland, Washington.

**THIS PAGE INTENTIONALLY
LEFT BLANK**

DISTRIBUTION**ONSITE (20 copies)**

U.S. Department of Energy
Richland Operations Office

C. A. Ashley	Uncontrolled	H0-12
J. P. Sands	Uncontrolled	H0-12
DOE-RL Reading Room	Uncontrolled	H2-53

State of Washington
Department of Ecology

S. Mohan	Uncontrolled	B5-18
----------	--------------	-------

ERC Team

R. G. Egge	Uncontrolled	S3-21
G. L. Funnell	Controlled	T7-05
R. P. Henckel	Uncontrolled	S3-21
C. J. Kemp	Uncontrolled	S3-20
J. J. McGuire	Uncontrolled	S3-20
J. D. Showman	Controlled	T7-05
R. G. Shuck	Uncontrolled	T7-05
P. J. Woods	Uncontrolled	S3-20

200 W Library 271U (R. G. Shuck)	Controlled	T7-05
200 E Library MO970 (C. M. Jones)	Controlled	S3-20
S/M&T Project Files	Uncontrolled	S3-20
Document and Information Services (3)	Uncontrolled	H0-09
ERC Training (M. G. Wininger)	Controlled	H0-08
Hanford Technical Library	Controlled	P8-55

W
 JEW
 1/26/99

**THIS PAGE INTENTIONALLY
LEFT BLANK**