

0051907

DOE/RL-99-24
Revision 0



Surveillance and Maintenance Plan for the 221-B Facility (B Plant)



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)

DOE/RL-99-24
Revision 0

Surveillance and Maintenance Plan for the 221-B Facility (B Plant)

April 1999



United States Department of Energy

P.O. Box 550, Richland, Washington 99352

CONTENTS

1.0	INTRODUCTION	1-1
2.0	FACILITY ACTIVITIES	2-1
2.1	HISTORICAL BACKGROUND.....	2-1
2.2	FACILITY DESCRIPTION	2-1
2.2.1	Inactive Waste Sites.....	2-2
2.2.2	Operational Systems Description.....	2-2
2.3	SURVEILLANCE ACTIVITIES	2-9
2.3.1	Environmental Monitoring of the Canyon Ventilation System Stack.....	2-9
2.3.2	Quarterly Surveillance	2-9
2.3.3	Routine Surveillance.....	2-10
3.0	MAINTENANCE IMPLEMENTATION PLAN	3-1
3.1	MAINTENANCE ORGANIZATION AND ADMINISTRATION	3-1
3.2	TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL....	3-1
3.2.1	On-the-Job Training.....	3-1
3.2.2	Training in Root-Cause Analysis.....	3-1
3.3	MAINTENANCE FACILITIES, EQUIPMENT, AND TOOLS	3-2
3.4	TYPES OF MAINTENANCE.....	3-2
3.4.1	Types of Maintenance and Frequency	3-2
3.5	MAINTENANCE PROCEDURES	3-3
3.6	PLANNING, SCHEDULING, AND COORDINATION OF MAINTENANCE	3-3
3.7	CONTROL OF MAINTENANCE ACTIVITIES	3-4
3.8	POST-MAINTENANCE TESTING	3-4
3.9	PROCUREMENT OF PARTS, MATERIALS, AND SERVICES.....	3-4
3.10	MATERIAL RECEIPT, INSPECTION, HANDLING, STORAGE, RETRIEVAL, AND ISSUANCE.....	3-4
3.11	CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT	3-4
3.12	MAINTENANCE TOOLS AND EQUIPMENT CONTROL	3-4
3.13	FACILITY CONDITION INSPECTION.....	3-5
3.14	MANAGEMENT INVOLVEMENT.....	3-5
3.15	MAINTENANCE HISTORY.....	3-5
3.16	ANALYSIS OF MAINTENANCE PROBLEMS	3-6
3.17	MODIFICATION WORK.....	3-6
3.17.1	Maintenance Program Interface with Modifications	3-6
3.18	SEASONAL FACILITY PRESERVATION REQUIREMENTS.....	3-6
4.0	QUALITY ASSURANCE	4-1
5.0	TRAINING AND QUALIFICATIONS	5-1

CONTENTS (continued)

6.0	ENVIRONMENTAL COMPLIANCE / PROTECTION.....	6-1
6.1	B PLANT FACILITY AIR PERMITTING.....	6-1
6.2	REGULATORY FILES / DOCUMENTATION.....	6-1
6.3	HAZARD MATERIAL PROTECTION	6-6
7.0	RADIOLOGICAL CONTROLS	7-1
8.0	EMERGENCY MANAGEMENT.....	8-1
8.1	EMERGENCY PREPAREDNESS	8-1
8.2	EMERGENCY PLANNING (Development of the Emergency Action Plan)....	8-1
8.3	EMERGENCY RESPONSE (Evacuation).....	8-1
8.4	EMERGENCY PREVENTION.....	8-2
8.5	INCIDENT RESPONSE.....	8-2
9.0	HEALTH AND SAFETY.....	9-1
9.1	FIRE HAZARD ANALYSIS	9-1
9.2	OCCUPATIONAL SAFETY AND HEALTH.....	9-1
10.0	SECURITY.....	10-1
11.0	COST AND SCHEDULE.....	11-1
11.1	COST	11-1
11.2	SCHEDULE.....	11-1
12.0	REFERENCES	12-1

APPENDICES

A	Hazardous Material Remaining at the B Plant Facility.....	A-i
---	-----------------------------------------------------------	-----

CONTENTS (continued)**FIGURES**

2-1.	B Plant Facility Boundaries and Buildings.....	2-11
2-2.	B Plant Facility Fenced Area	2-12
2-3.	221-B/271-B Surveillance Routes (Basement and First Floor Levels)	2-13
2-4.	221-B/271-B Surveillance Routes (Second and Third Floor Levels).....	2-14
2-5.	212-B Surveillance Route	2-15
2-6.	222-B Surveillance Route	2-16
2-7.	Quarterly Surveillance of B Plant Building (221-B) Data Sheet.....	2-17

TABLES

2-1.	B Plant Facility Structures and Components	2-3
6-1.	B Plant Regulatory Compliance during Surveillance and Maintenance.....	6-2
11-1.	Surveillance and Maintenance Cost Estimate.....	11-1

THIS PAGE INTENTIONALLY
LEFT BLANK

ACRONYMS

ALARA	as low as reasonably achievable
ARA	airborne radioactivity area
BED	building emergency director
BHI	Bechtel Hanford, Inc.
CA	contamination area
CEDAC	central data acquisition and control
CFR	<i>Code of Federal Regulations</i>
Cs	cesium
DIS	Document and Information Services
DOE	U.S. Department of Energy
EM	Office of Environmental Management
EP	Environmental Protection
ERC	Environmental Restoration Contractor
FCA	fixed contamination area
FHA	fire hazard analysis
HCA	high contamination area
HEPA	high efficiency particulate air
HRA	high radiation area
HVAC	heating, ventilating, and air conditioning
LLW	low level waste
MOA	memorandum of agreement
MSDS	material safety data sheets
NDA	nondestructive analysis
NESHAP	National Emissions Standards in Hazardous Air Pollutants
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
PLC	programmable logic controller
PM	preventive maintenance
PMII	Project Manager's implementing instructions
RBA	radiological buffer area
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RCT	Radiological Control technician
RL	U.S. Department of Energy, Richland Operations Office
RWP	radiation work permit
S&M	surveillance and maintenance
S/M&T	Surveillance/Maintenance and Transition
Sr	strontium
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
TSD	treatment, storage, and/or disposal
WAC	<i>Washington Administration Code</i>
WDOH	Washington State Department of Health
WESF	Waste Encapsulation and Storage Facility

1.0 INTRODUCTION

This document provides a plan for implementing surveillance and maintenance (S&M) activities to ensure the B Plant 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/EM-0246) (DOE 1995), and Section 8.6 of TPA change form P-08-97-01 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:

- Ensure adequate containment of remaining radioactive and hazardous material.
- Provide security control for access into the facility and physical safety to surveillance personnel.
- Maintain the facility in a manner that will minimize potential hazards to the public, the environment, and surveillance personnel.
- Provide a plan for the identification and compliance with applicable environmental, safety, health, and security requirements.

2.0 FACILITY ACTIVITIES

2.1 HISTORICAL BACKGROUND

The B Plant Complex at the DOE Hanford Site is located in the south central region of the state of Washington. B Plant was constructed between 1943 and 1945 to process spent nuclear fuels in support of the Manhattan Project. After its original mission was completed, the plant was modified between 1961 and 1967 for the recovery, separation, and purification of strontium (Sr) and cesium (Cs) contained in the mixed fission product waste stream generated during prior fuel reprocessing operations. The recovered, purified, and concentrated Sr and Cs solutions were then transferred to the newly constructed (1974) Waste Encapsulation and Storage Facility (WESF) for conversion, encapsulation, and storage. These Sr and Cs separation campaigns were conducted at B Plant from 1968 to 1985.

In May 1991, the DOE, Richland Operations Office (RL) eliminated B Plant from any future processing missions due to the difficulties of bringing a 46 year-old plant up to current environmental standards. Between 1991 and 1995, B Plant was maintained to ensure safe storage and management of substantial radioactive contamination and residual inventory from past operations, as well as supporting safe storage of approximately 150 mega-curies of encapsulated Sr and Cs in WESF.

In September 1995, the Office of Waste Management (EM-30) and the Office of Nuclear Material and Facility Stabilization (EM-60) signed a Memorandum of Agreement (MOA) to place B Plant in transition. Included in the MOA is the decoupling of B Plant from WESF, which will continue its mission of providing safe storage and management of Hanford's Sr and Cs capsule inventory.

In September 1996, transition activities were initiated to isolate the facility, mitigate contamination migration, and achieve facility stability through the removal, stabilization, disposal, or excess of major radioactive sources, hazardous materials, and dangerous chemicals and waste. These activities were also in preparation for the transfer from the Office of Nuclear Materials and Facility Stabilization (EM-60) to the Office of Environmental Restoration (EM-40). End point criteria for deactivation activities for B Plant were defined in HNF-SD-WM-TPP-054, *B Plant End Point Document* (FDH 1995). Completion of these activities has established a safe and environmentally secure configuration suitable for a long-term S&M program.

2.2 FACILITY DESCRIPTION

The S&M of the B Plant Facility includes surveillance and monitoring of the 221-B Building, ancillary buildings, and their associated equipment within the B Plant perimeter fence.

The boundary of the B Plant S&M Project, as shown in Figure 2-1, encompasses approximately 44 buildings and 17 waste sites. As shown, this boundary excludes the 225-B Building (WESF), approximately 20 active WESF support facilities, and the 224-B Facility. The project boundary encompasses all facilities and waste sites included in the B Plant transition work scope.

Table 2-1 lists and describes the B Plant buildings and structures that are included in the S&M program and the location of each building/facility is shown graphically in Figure 2-1. (Facilities and waste sites outside of this work scope are not shown in Figure 2-1, unless for reference or information purposes.) The physical location and extent of the B Plant fence is shown in Figure 2-2.

For the purpose of deactivation, the facility is comprised of spaces and systems that were classified, in terms of their intended deactivated condition, into six (6) cases, as follows:

- Case 1:** Internal spaces for which routine access will be required for S&M
- Case 2:** Internal spaces for which access is not expected for S&M
- Case 3:** External spaces including building exterior envelopes
- Case 4:** Systems/equipment which must be kept operational
- Case 5:** Systems/equipment to be mothballed (i.e., suitable for later refurbishment and operation)
- Case 6:** Systems/equipment to be abandoned in place.

2.2.1 Inactive Waste Sites

The scope of the S&M program is limited to the facilities described in Section 8 of the Tri-Party Agreement (Ecology, et al. 1996); therefore, waste sites are not addressed in this document.

2.2.2 Operational Systems Description

The Canyon Ventilation System, Canyon Liquid Level (TK 10-1) Monitoring, Surveillance Lighting System, and Instrumentation, and Monitoring and Control System are the only systems operating during the B Plant S&M phase. Implementation of 0000X-PMII-G0001, *Surveillance/Maintenance and Transition (S/M&T) Project Manager's Implementing Instructions (PMII)* (BHI 1999b), ensures a high level of performance with no significant environmental, safety, and/or health impacts from the remaining facility activities. The PMII translates the DOE and the Environmental Restoration Contractor (ERC) Conduct of Operations principles, guidelines, and procedures into performance requirements for all S/M&T Project personnel involved with the facilities S&M program. These instructions are based on a graded approach to DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*, and are applied in the performance and maintenance of the following operating systems and surveillance activities.

2.2.2.1 Electrical. The original electrical distribution system to B Plant is isolated and disconnected. No other equipment, systems, or areas within the B Plant deactivation complex will require electrical power except the Canyon Ventilation System, the liquid level monitoring, and the two surveillance lighting systems.

Table 2-1. B Plant Facility Structures and Components.
(sheet 1 of 5)

Identification #	Building Description / Components
207-BA*	CBC Sampling Building
211-B*	Chemical Tank Farm Area
211-BB	MCC Building for 211-A Area
212-B*	Cask Transfer Station
217-B*	Demineralized Water Building
221-B	B Plant Canyon Building <ul style="list-style-type: none"> • Canyon and Process Cells • Electrical Gallery* • Pipe Gallery* • Operating Gallery* • SWP Change Room • Railroad Tunnel
221-BA*	15-in. Cooling Water Monitor Building
221-BB*	Condensate Building for Low Level Waste (LLW) Concentrator
221-BC	SWP Change Building
221-BD	Laundry Storage Building
221-BF*	BCP Diversion Pit Building
221-BG*	24-in. Cooling Water Monitor Building
221-BK	Canyon Exhaust System Instrumentation Building and Canyon Exhaust System <ul style="list-style-type: none"> • Duct • Filters • Fans
222-B	Office Building

Table 2-1. B Plant Facility Structures and Components.
(sheet 2 of 5)

Identification #	Building Description / Components
271-B	B Plant Support Building <ul style="list-style-type: none"> • Basement • First Floor* • Second Floor • Third Floor*
271-BA	Laundry Storage Building
2711-B	Breathing Air Compressor Building
2715-B*	Paint and Oil Storage Building
2716-B	Storage Building – Railroad Cut
276-B*	Paint Shop
276-BA	ISO Tank Area
291-B*	Exhaust Fans Control / Turbine Building
291-BA*	Exhaust Air Sample Building
291-BB*	Instrument Building – A and B Filters
291-BC*	C Filter Building
291-BD*	C Filter Instrument Building
291-BF*	D Filter Instrument Building
291-BG*	E Filter Instrument Building
291-BJ*	F Filter Instrument Building
291-BK*	E Filter Monitoring Building
292-B*	Stack Monitoring Station
291-B-1	Retired Canyon Ventilation Stack
296-B-1	Canyon Ventilation Stack
296-B-2	Filter Vault Passive Vent Stack
296-B-5	Retired 221-BB Stack
296-B-13	Retired 221-BF Stack
296-B-21	Retired Pipe Gallery Exhauster

Table 2-1. B Plant Facility Structures and Components.
(sheet 3 of 5)

Identification #	Building Description / Components
296-B-22	Retired Pipe Gallery Exhauster
296-B-23	Retired Pipe Gallery Exhauster
296-B-24	Retired Pipe Gallery Exhauster
296-B-25	Retired Pipe Gallery Exhauster
296-B-26	Retired Pipe Gallery Exhauster
296-B-27	Retired Pipe Gallery Exhauster
C8-S49	Main B Plant Substation (221-B / 271-B)
C8-S77	B Plant 291-B Area Substation
A-F Filters	A-F Filter Vaults
Yard	Total Area inside the Fence
B Plant Unplanned Release Sites	
Unplanned Release Sites*	<ul style="list-style-type: none"> • UPR-200-E-1 • UPR-200-E-2 • UPR-200-E-3 • UPR-200-E-7 • UPR-200-E-32 • UPR-200-E-41 • UPR-200-E-44 • UPR-200-E-52 • UPR-200-E-64 • UPR-200-E-69 • UPR-200-E-80 • UPR-200-E-85 • UPR-200-E-90 • UPR-200-E-95 • UPR-200-E-103 • UPR-200-E-112 • UPR-200-E-140

Table 2-1. B Plant Complex Facilities and Waste Sites.
(sheet 4 of 5)

B Plant Waste Sites	
200-E-6	Septic Tank
200-E-16	LLW Concentrator (in Canyon)
200-E-25	Miscellaneous Waste Stream #659
200-E-28	221-B Steam Condensate Release
200-E-30	291-B Sand Filter
200-E-55	Miscellaneous Stream #322
200-E-88	Miscellaneous Stream #3
200-E-89	Miscellaneous Stream #4
200-E-90	Miscellaneous Stream #5
200-E-91	Miscellaneous Stream #6
200-E-92	Miscellaneous Stream #7
200-E-93	Miscellaneous Stream #8
200-E-94	Miscellaneous Stream #9
200-E-95	Miscellaneous Stream #308
200-E-97	Miscellaneous Stream #470
200-E-98	Miscellaneous Stream #490
200-E-99	Miscellaneous Stream #570 / #1 (Duplicate)
200-E-100	Miscellaneous Stream #571 / #2 (Duplicate)
207-B*	Cooling Water Retention Basin
216-B-4*	Dry Well
216-B-13*	Crib
216-B-59*	Trench
216-B-59B	Retention Basin
216-B-64*	Retention Basin
217-B NU	217-B Building Emergency Neutralization Unit

Table 2-1. B Plant Complex Facilities and Waste Sites.
(sheet 5 of 5)

B Plant Waste Sites	
221-B-26-1	221-B-TK-26-1 Radioactive Organic Waste Solvent Tank 1
221-B-27-2	Tank TK-27-2
221-B-27-3	221-B-TK-27-3 Radioactive Organic Solvent Tank 2
221-B-27-4	221-B-TK-27-4 Radioactive Organic Waste Solvent Tank 3
221-B-28-3	221-B-TK-28-3 Radioactive Organic Solvent Tank 4
221-B-28-4	221-B-TK-28-4 Radioactive Organic Solvent Tank 5
221-B-29-4	221-B-TK-29-4 Radioactive Organic Solvent Tank 7
221-B-30-3	221-B-TK-30-3 Radioactive Organic Solvent Tank 6
221-B NANU	221-B Nitric Acid Neutralization Unit
221-B SDT	221-B Plant Settle and Secant Tank
221-B SHNU	221-B Sodium Hydroxide Elementary Neutralization Unit
221-B-WS-1	B Plant Storage
221-B-WS-2	B Plant Waste Pile
270-E-1*	Condensate Collection Tank
2607-E3	Septic Tank
2607-E4	Septic Tank
B Plant Filter	F-34-4 Filter

NOTE: "*" denotes materials or units within the facility which are regulated or potentially regulated, as designated in HNF-EP-0895.

There are two new power sources supplying power for the surveillance lighting system; one provides power to 221-B/271-B and the other to 212-B. The surveillance lighting systems illuminate the surveillance routes that are designated Case 1. Both lighting systems have disconnect switches external to the buildings for energizing the lighting systems prior to entry of the buildings, and the systems are only utilized when performing surveillance activities.

Power for the canyon ventilation exhaust fans, supporting control system, Cell 10 liquid level surveillance monitoring systems, and the retired filters monitoring system is supplied from an Electric Utility 480 volt overhead power pole.

2.2.2.2 Canyon Ventilation System. The 221-B canyon is maintained at a negative pressure with respect to atmosphere for contamination control purposes. The airflow has been rerouted from the original configuration to allow isolation of the previous high efficiency particulate air (HEPA) filtration system. Infiltration air enters the canyon through the galleries, air locks, 212-B, and 224-B. The filtration system is made up of two parallel air cleanup trains each rated at approximately 50% capacity of the normal canyon airflow rate. Two parallel exhaust fans operate in a run-standby configuration and discharge through a stack. Each fan is designed for 100% airflow. The exhaust stack is attached to the south wall of the canyon.

2.2.2.3 Instrumentation, Monitoring, and Control System. A programmable logic controller (PLC) located in the 221-BK Building, which services the canyon ventilation system, serves as the data acquisition center for monitoring data. It monitors and/or controls the following:

- Provides on/off control of the ventilation system exhaust fans.
- Takes temperature measurements for the canyon ventilation system exhaust fans bearings, exhaust air and heat detection signals.
- Takes differential pressure measurements of canyon to atmosphere and HEPA filter bank.
- Records stack flow and sampling.
- Takes filter radiation levels.

Data acquired by the PLC unit is transmitted to a central data acquisition and control station (CEDAC) located at the 271-U Facility in the 200 West Area. The CEDAC station receives the flow of data and provides monitoring, alarm, and control functions.

2.2.2.4 Retired Filters Ventilation and Monitoring System. Due to high radioactive inventory levels in the original plant HEPA filtration system (the 291-B filters), the filters were isolated from the canyon exhaust air stream. An upstream isolation barrier was installed in the wind tunnel between the canyon and the 291-B filters at a manhole access port and downstream isolation barriers were installed at the inlets to the three original exhaust fans. The 291-B passive ventilation system consists of two HEPA filters and a manifold to the different filter vaults. Emissions are monitored from the 291-B filters by periodic nondestructive analysis

(NDA) of the second HEPA filter bank. The monitoring of the emissions will be conducted in accordance with the Notice of Construction (DOE-RL 1997) for the modification of the B Plant ventilation system. Additionally, liquid level indicators in each of the filter vaults will alert personnel so water levels do not accumulate above unacceptable levels.

2.2.2.5 Canyon Liquid Level (TK 10-1) Monitoring and Removal. Any liquid in-leakage to the B Plant canyon is monitored in Cell 10 and the level of liquid in TK 10-1 is transmitted via the canyon ventilation instrumentation and control system to the 271-U CEDAC station. If liquid is detected at the 25% level indicator, RL will be notified immediately in order to make proper notification to the Washington Department of Ecology (Ecology). RL will notify the Ecology office (Kennewick) within three (3) working days by email, facsimile, or by phone. Disposition of the tank contents will be decided based upon subsequent discussions with Ecology and RL. If a subsequent decision is made for removal of the liquid from Tank 10-1, it is accomplished by utilizing a portable submersible pump inserted through an access hole provided in the Cell 10 cover block. Pumping TK 10-1 will be a very infrequent operation that is planned, engineered, and executed separate from the ongoing S&M work scope.

2.3 SURVEILLANCE ACTIVITIES

2.3.1 Environmental Monitoring of the Canyon Ventilation System Stack

The 296-B-1 Canyon Ventilation System Stack has been designated as a major stack using the National Emissions Standards in Hazards Air Pollutants (NESHAP) criteria, 40 *Code of Federal Regulations* (CFR) 61 Subpart H. This designation is due to the stack's potential to discharge sufficient radionuclides into the air, resulting in an offsite effective dose equivalent in excess of 0.1 mrem per year. However, since these emissions from the new ventilation system are not expected during S&M, monitoring activities have been reduced to a minimum, yet still meet the U.S. Environmental Protection Agency's requirements (see BHI-SH-05, *Industrial Hygiene Desk Instructions*) and the requirements of WAC 246-247. Environmental sampling currently planned for the B Plant main ventilation stack during the B Plant S&M phase consists of continuous stack particulate sampling, designed to provide an accurate release record for the stack.

The passive vent connecting the retired A through F HEPA filter and housing has been designated as a major stack by using the NESHAPs criteria, 40 CFR 61 Subpart H. This designation is due to its potential to discharge sufficient radionuclides into the air, resulting in an offsite effective dose equivalent in excess of 0.1 mrem per year. Because of potential hydrogen generation, the vent for the isolated filter housing was provided. Sampling of emissions from the retired HEPA filter building will be accomplished by performing NDA surveys on the final vent filter as described in the Notice of Construction (DOE/RL 1997).

2.3.2 Quarterly and Annual Surveillance

Quarterly surveillance of the B Plant facilities is necessary to ensure unfavorable conditions or trends are identified and evaluated in time to initiate appropriate action. These surveillances

consist of internal and external surveillance of selected portions of the 221-B Building and its ancillary facilities.

Quarterly surveillance of B Plant consists of a walk through of the Case 1 spaces (routine access) and Case 3 spaces (external areas), described in HNF-SD-WM-TPP-054, *B Plant End Point Document* (FDH 1995), and includes parts of the 221-B, 222-B, 271-B, 212-B, and outdoor areas. In addition, a roof inspection will be conducted beginning in fiscal year 2000 and conducted yearly until the new roof covering is installed. A physical walk-down of the roof will be performed in order to inspect the flashing and expansion joints to look for areas of potential water leakage into the canyon that may reach Tank 10-1.

Surveillance involves checking for indications of internal and/or external structural defects, roof deterioration, posting deficiencies, contamination migration, suspect hazardous materials, hazardous conditions, electrical hazards, unidentified friable asbestos, failed lights, doors locked, water leaks, excess combustible materials, excess equipment or material, ground subsidence, housekeeping, occupational hazards, previously unidentified hazards, unidentified or unlabeled containers, and animal or insect intrusion. In addition, routine general housekeeping such as tumbleweed and miscellaneous debris removal is performed throughout the B Plant complex.

Indoor surveillance currently consists of a walk through of the 221-B electrical and piping galleries; 271-B basement, first, second, and third floors; 212-B cask station; and the 222-B Office Building (the surveillance routes are shown in Figures 2-3 through 2-6). A sample S&M checklist is provided in Figure 2-7 as an example of what is reviewed during a typical surveillance.

2.3.3 Routine Surveillance

Routine surveillance governed by operations, maintenance, and radiological work packages are performed in addition to quarterly surveillance to ensure adequate operation. These packages detail the frequency and activities necessary to prevent potential health and safety impacts and equipment failure.

The operations work package(s) describes the required surveillance and frequency for the remaining active equipment. The maintenance work package(s) describe the preventive maintenance (PM) and instrument calibrations to maintain the remaining active equipment. The radiation protection procedures, radiation work permit (RWP), and radiological technical assessments describe the radiological control activities such as posting, access control, work place air monitoring, and radiological surveys.

Figure 2-3. 221-B / 271-B Surveillance Routes
(Basement and First Floor Levels).

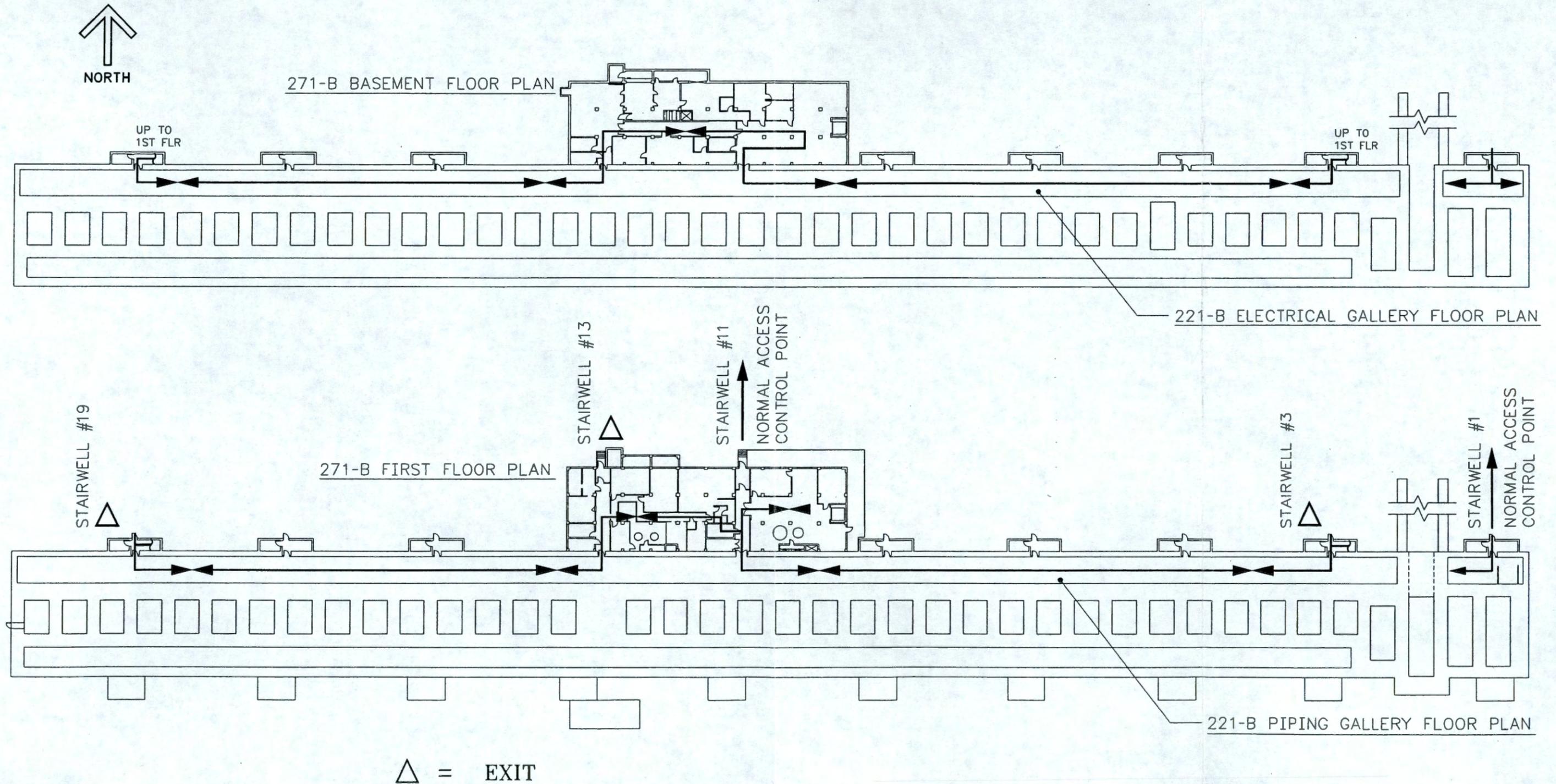
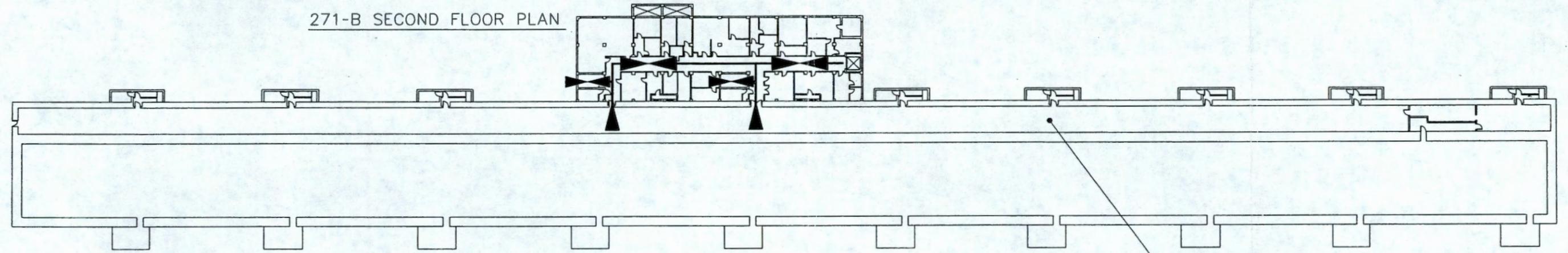


Figure 2-4. 221-B / 271-B Surveillance Routes
(Second and Third Floor Levels).

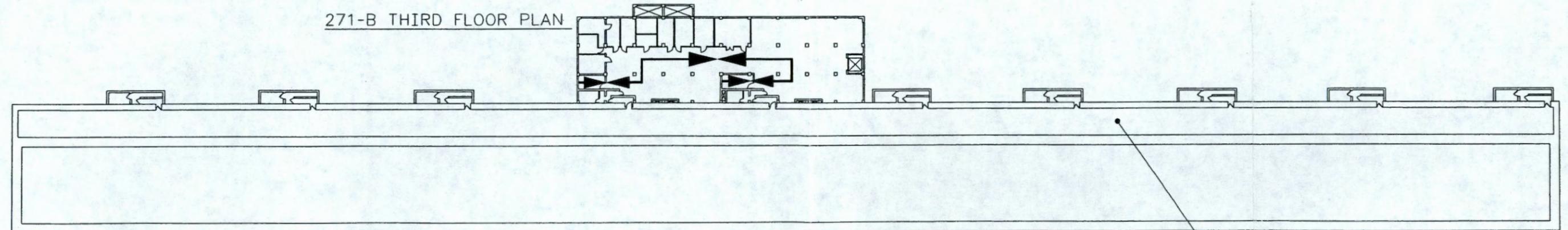


271-B SECOND FLOOR PLAN



221-B OPERATING GALLERY FLOOR PLAN

271-B THIRD FLOOR PLAN



221-B CRANE GALLERY FLOOR PLAN

Figure 2-5. 212-B Surveillance Route.

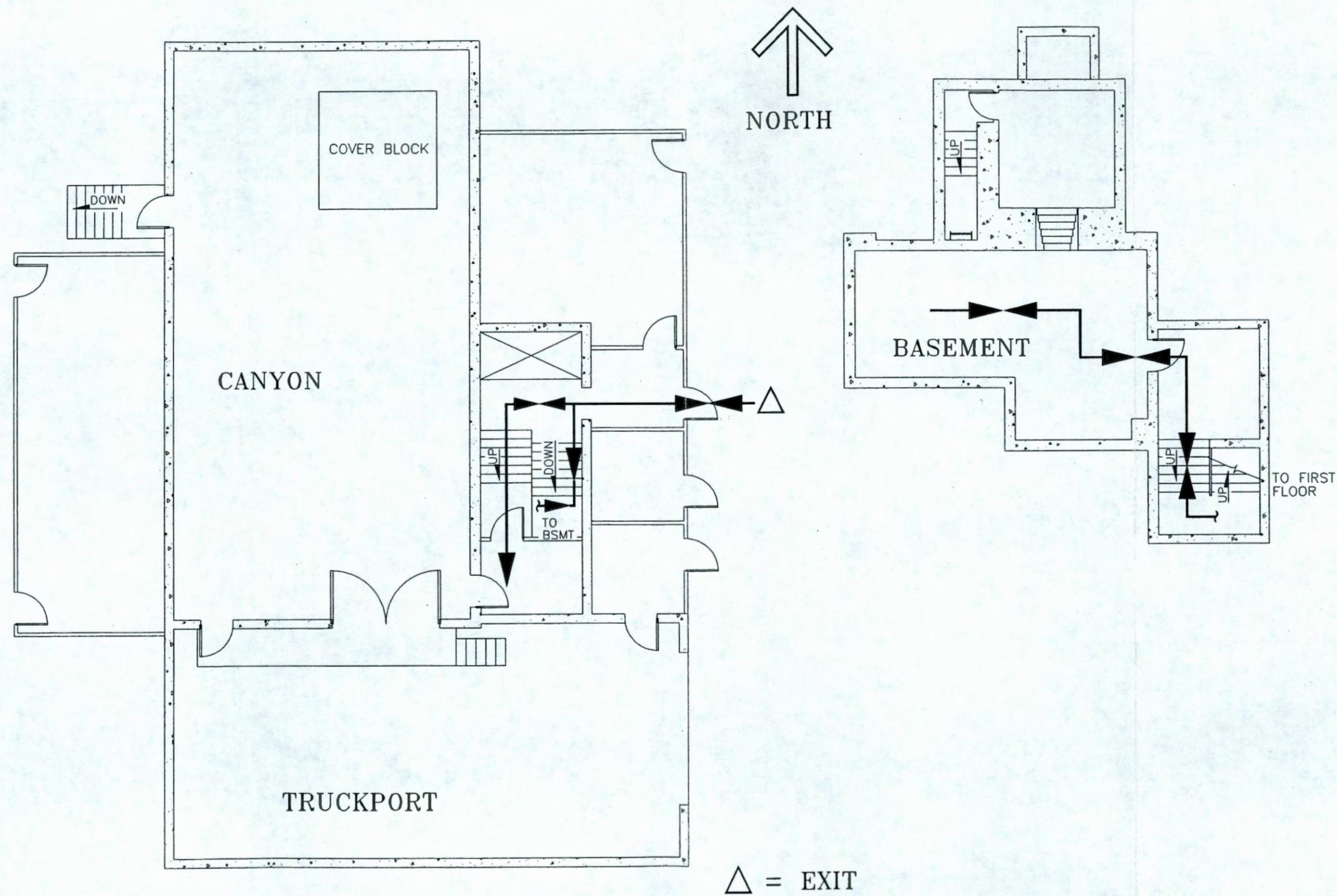


Figure 2-7. Quarterly Surveillance of B Plant Building (221-B) Data Sheet.
(sheet 1 of 2)

**Prerequisite Actions Met
Craft Supervisor**

Signature _____		Date _____
Surveillance		Comments
Animal / Pest Intrusion	(Yes / No)	
Asbestos Concerns	(Yes / No)	
Doors Locked	(Yes / No)	
Electrical Hazards	(Yes / No)	
Excess Combustible Material	(Yes / No)	
Excess Equipment or Material	(Yes / No)	
Housekeeping Needed	(Yes / No)	
Structural Damage	(Yes / No)	
Lighting / Electrical Problems	(Yes / No)	
Occupational Hazards	(Yes / No)	
Signs Missing	(Yes / No)	
Unidentified or Unlabeled Containers	(Yes / No)	
Previously Identified Hazards	(Corrected / Uncorrected)	
Unidentified Hazards	(Yes / No)	
Water Leaks	(Yes / No)	

Surveillance Operator

Signature _____

Date _____

Craft Supervisor / Facility Manager

Signature _____

Date _____

Use page 2 for additional comments.

3.0 MAINTENANCE IMPLEMENTATION PLAN

Maintenance activities are conducted in accordance with BHI-01044, *ERC Maintenance Implementation Plan for Nuclear Facilities* (BHI 1997).

3.1 MAINTENANCE ORGANIZATION AND ADMINISTRATION

The maintenance organization and administration ensures a high level of performance through effective implementation and control of maintenance activities, necessary to maintain the plant in a manner that promotes worker health, environmental protection, equipment preservation, and cost effectiveness.

Maintenance Organization Policies establishing the policies, procedures, and standards for the administration of maintenance activities are contained in BHI-FS-01, *Field Support Administration*, Section 1.0, "Administration."

Maintenance strategies describing the working relationships that exist within all organizations that support maintenance are covered in BHI-FS-01, Procedure 3.2, "Preventative Maintenance."

The program described in BHI-HR-01, *Human Resources Policies and Procedures*, covers staffing resources and personnel accountability. It ensures the maintenance program has a sufficient number of qualified personnel to perform its functions and monitor personnel in the performance of their assigned responsibilities.

3.2 TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL

A maintenance training and qualification program consistent with BHI-MA-02, *ERC Project Procedures*, Procedure 5.2, "ERC Training," is implemented to develop and maintain the knowledge and skills needed by S/M&T Project personnel to effectively perform and manage maintenance activities.

3.2.1 On-the-Job Training

A formal On-the-Job Training program does not exist given the relatively lower hazard level, the expected stable nature of the B Plant Facility, experience level of the maintenance work force, and the type of maintenance.

3.2.2 Training in Root-Cause Analysis

An appropriate number of individuals are trained in principles and methods of root-cause analysis and various approaches to cause and affect analysis as directed in BHI-MA-02, Procedure 2.4, "Root Cause."

3.3 MAINTENANCE FACILITIES, EQUIPMENT, AND TOOLS

Maintenance facilities, equipment, and tools effectively support facility maintenance and maintenance training. Shop, storage, and office facilities are located as stated in the Maintenance Implementation Plan (BHI 1997).

3.4 TYPES OF MAINTENANCE

A proper balance of routine and preventative maintenance is employed to provide a high degree of confidence that facility equipment degradation is identified and corrected. Preventative and routine maintenance is conducted as described in BHI-FS-01, Procedures 2.1, "Work Control," and 3.2.

3.4.1 Types of Maintenance and Frequency

The following maintenance and frequencies are recommended to satisfy code and specification, manufacturer's recommendations, and to ensure optimum equipment operating life during the S&M program.

Canyon Ventilation System

- | | |
|------------------------------------------------------------------------------------------------|----------------------------------|
| • Inspect and lube canyon exhaust fans and bearings EF-1 and -2 | As recommended in procedures |
| • Calibration of equipment controlled by canyon ventilation instrumentation and control system | As recommended in procedures |
| • HEPA / prefilter changeout | As determined from surveillances |
| • HEPA aerosol test | As determined from surveillances |
| • Vent and balance on canyon ventilation HEPA filters | As determined from surveillances |
| • Canyon exhaust fan rotation | Monthly |
| • Replace canyon ventilation HEPA filters | As determined from surveillances |
| • Canyon ventilation stack monitoring system inspections | As recommended in procedures |

Retired Filters Passive Vent System

- | | |
|------------------------------------------------|------------------------------|
| • Retired filters liquid level instrumentation | As recommended in procedures |
| • HEPA filter changeout | As recommended in procedures |
| • HEPA dioctyl phthalate/aerosol testing | As recommended in procedures |
| • Environmental HEPA testing | As recommended in procedures |

Electrical System

- | | |
|-------------------------------------------|-------------------------|
| • Electrical distribution system | Bi-annually to annually |
| • Surveillance lighting system | Bi-annually to annually |
| • Replace surveillance system light bulbs | As required |
| • Exercise circuit breakers | Annually |

Miscellaneous Systems

- | | |
|------------------------------------------------|------------------------------|
| • Cell 10 TK 10-1 liquid level instrumentation | As recommended in procedures |
| • Potential cold weather protection | See Section 3.18 |

3.5 MAINTENANCE PROCEDURES

Maintenance procedures are prepared, reviewed, and used as directed in BHI-FS-01, Procedures 2.1 and 2.3, "Task Instruction Development." They provide appropriate work direction and ensure that maintenance is performed safely and efficiently.

3.6 PLANNING, SCHEDULING, AND COORDINATION OF MAINTENANCE

An effective system for planning, scheduling, and coordinating maintenance activities is implemented as directed in BHI-FS-01, Procedure 2.1. It ensures prompt maintenance, improvement in maintenance efficiency, and reduction in radiation exposure (as low as reasonably achievable [ALARA]).

3.7 CONTROL OF MAINTENANCE ACTIVITIES

Management-directed and –delegated control of maintenance activities ensures that maintenance practices result in safe and reliable facility operation. Control of maintenance activities is conducted per BHI-FS-01, Procedure 2.1.

3.8 POST-MAINTENANCE TESTING

When required, post-maintenance testing is performed per BHI-FS-01, Procedure 2.1, to verify that components fulfill their design function when returned to service after maintenance.

3.9 PROCUREMENT OF PARTS, MATERIALS, AND SERVICES

Any parts, materials, and services used for maintenance activities are of standard industrial practice and commercial quality, and procured per BHI-PR-01, *ERC Procurement Procedures*.

3.10 MATERIAL RECEIPT, INSPECTION, HANDLING, STORAGE, RETRIEVAL, AND ISSUANCE

Procedures and policies for receiving, inspecting, handling, storing, retrieving, and issuing equipment, parts, and materials for maintenance are covered by BHI-FS-01, Section 5.0, "Quality Control," BHI-PR-03, *ERC Warehouse Manual*, and BHI-SH-06, *Quality Services Procedures*, Section 6.0, "Quality Site Services."

3.11 CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT

The program for control and calibration of measuring and test equipment is BHI-FS-01, Procedure 3.15, "Control of Measuring and Teat Equipment," which is consistent with the Quality Assurance requirements of DOE Order 5700.6C, *Quality Assurance*, and ensures the accurate performance of facility instrumentation and equipment for testing, calibration, and repairs.

3.12 MAINTENANCE TOOLS AND EQUIPMENT CONTROL

Implementation of BHI-FS-01, Procedures 5.2, "Material Control," and 5.3, "Control of Deficient Items," provides assurance for storage, issuance, and maintenance of an adequate and readily available supply of tools and equipment.

3.13 FACILITY CONDITION INSPECTION

Quarterly surveillance of the B Plant Facility identify and evaluate unfavorable conditions or trends to promptly initiate appropriate actions to prevent equipment and structural degradation that may result in malfunctions of the remaining operating and monitoring systems.

3.14 MANAGEMENT INVOLVEMENT

BHI-MA-01, *ERC Policies, Organization, and Responsibilities*; BHI-SH-01, *Hanford ERC Environmental, Safety, and Health Program*, Section 4.0, "Management of Environmental, Safety, and Health Program;" and 0000X-PMII-G0001 (BHI 1999b) describe management involvement in ensuring the safety of DOE nuclear facility operations. RL, contractors, and facility managers are sufficiently informed concerning conditions at the B Plant Facility.

3.15 MAINTENANCE HISTORY

There are two maintenance work methods used by the ERC to maintain the equipment and facilities (reference BHI-FS-01, Procedure 2.1). They are as follows:

1. Demand Work: i.e., repairs, modification, installations, etc.
2. PM/Surveillance Work: i.e., calibrations, adjustments, inspection, etc.

Both methods of performing work on equipment, facilities, or structures are accomplished by the use of a work package. A work package identification number is assigned to each work package and is loaded into a software database for tracking, control, and cycling (PM/Surveillance) during the work process. After the work is completed in each package, the package is closed and the hard copy (original) is filed for retention with Bechtel Hanford, Inc. (BHI) Document and Information Services (DIS). The completed work package is also electronically closed and is filed in a Demand History File or a PM/Surveillance History File, depending on the type of work performed.

The maintenance history of work performed on equipment, facilities, or structures can then be retrieved from the History Data Files and the hard copies can be retrieved from DIS.

A maintenance and trending program is not necessary during S&M. Operating equipment and maintenance is limited to heating, ventilation, and air-conditioning (HVAC); lighting; electrical; and the instrument and monitoring system as described in the operating procedures. The quarterly surveillance data sheets permit documentation of observations, findings, and corrective actions associated with the remaining operating equipment. These reports, compliance with operating procedures, the operating equipment list, and vendor information for operating units provide sufficient information for maintenance planning.

3.16 ANALYSIS OF MAINTENANCE PROBLEMS

Maintenance problems are analyzed as part of the work control process described in BHI-FS-01, Procedure 2.1. Other management systems for analyzing and resolving failures or deficiencies in equipment include BHI-FS-01, Procedure 5.3, and BHI-MA-02, Procedures 2.6, "Occurrence Investigation and Reporting," and 2.8, "Nonconformance Control."

3.17 MODIFICATION WORK

Facility modification work, including temporary modifications, is accomplished under the same basic administrative controls as those applied to facility maintenance activities. This minimizes risk to facility equipment, environment, and/or personnel. Facility modification work will be conducted per BHI-DE-01, *Design Engineering Procedures*, and BHI-FS-01, Procedure 2.1.

3.17.1 Maintenance Program Interface with Modifications

Modifications are performed in accordance with requirements and limitations of applicable procedures, codes, standards, specifications, etc.

3.18 SEASONAL FACILITY PRESERVATION REQUIREMENTS

A program is in place to prevent equipment and building damage due to cold weather that may be at risk. This program, BHI-FS-01, Procedure 3.5, "Cold Weather Protection," includes properly approved procedures for the implementation and suspension of extreme weather protective actions. The program directs that all appropriate measures be taken to prevent damage or degradation to systems as a result of extreme weather conditions.

During cold weather, special attention should be given to the following:

- Vents for frost at inlet areas.
- PLC unit instrumentation temperature conditions.
- Water effect on HEPA filters.

4.0 QUALITY ASSURANCE

The 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." For the B Plant complex, BHI-QA-01 is augmented by BHI-QA-03, *Quality Assurance Program Plan*, Plan No. 3.2, "Quality Assurance Program Plan for Surveillance and Maintenance of Nuclear Facilities," and Plan No. 6.1, "Quality Assurance Original Plan for Radiological Air Emissions Monitoring."

5.0 TRAINING AND QUALIFICATION

Training requirements for ERC personnel performing and/or supporting activities in nuclear facilities are documented in BHI-01230, *Training Implementation Matrix for ERC Managed Nuclear Facilities*, Appendix G, "B Plant Facility" (BHI 1999d), which contains the training requirements specific to B Plant. Training requirements for ERC personnel performing and/or supporting activities in RCRA facilities, to meet the standards of WAC 173-303-330, will be documented in 0000X-TP-G0001, *Surveillance/Maintenance and Transition Project Treatment, Storage, and/or Disposal Training Plan* (BHI 1999c).

6.0 ENVIRONMENTAL COMPLIANCE / PROTECTION

An Environmental Protection (EP) program assures environmental and DOE requirements, controls, and standards are complied with in the safe operation of a facility. During post-deactivation surveillance, EP is implemented in the B Plant S&M activities identified in Section 2.0, "Facility Activities," as described below.

During the B Plant deactivation, major radioactive sources and/or dangerous chemicals and wastes were removed, stabilized, excessed, or disposed to meet the criteria identified in HNF-SD-WM-TPP-054, *B Plant End Point Document* (FDH 1995). This included removal of dangerous waste constituents to a minimum pumpable heel from tanks and vessels identified as treatment, storage, and/or disposal (TSD) units in the B Plant *Resource Conservation and Recovery Act of 1976* (RCRA) Part A Permit Application. The Hazardous Substances and Dangerous Waste Inventory (Appendix A) within the B Plant complex identifies and describes the material, location, and quantity. Hazards associated with these materials are minimal due to their remote locations and existing form.

Dangerous waste generation and disposal is not expected during S&M. However, waste generated from routine maintenance activities will be handled in compliance with the applicable regulatory requirements, BHI-EE-02, *Environmental Requirements*, and BHI-EE-10, *Waste Management Plan*. Compliance with the RCRA requirements found in *Washington Administrative Code* (WAC) 173-303 and with the Hanford Facility Dangerous Waste Permit Application (DOE-RL 1997) during the S&M phase are addressed in Table 6-1.

6.1 B PLANT FACILITY AIR PERMITTING

Under the State of Washington Department of Health (WDOH) Radioactive Air Emissions Permit FF-01, the Hanford Site is permitted for airborne radioactive emissions. Consequently, under FF-01, B Plant is also permitted for airborne radioactive emissions. Any changes or updates to this permit will not be necessary during S&M unless modifications with a potential impact to the conditions and limitations set forth in the permit are deemed necessary.

6.2 REGULATORY FILES / DOCUMENTATION

The identification and location of regulatory documentation generated during the B Plant Facility's operation are listed on the B Plant Regulatory File Checklist. All other historical records and documents are retained at the Records Holding Area. Access to any of these files is possible by contacting the current Records Holding Organization.

Table 6-1. B Plant Regulatory Compliance during Surveillance and Maintenance.
(sheet 1 of 3)

DANGEROUS WASTE REGULATIONS	S&M COMPLIANCE APPLICABILITY
Introductory Regulations WAC 173-303-010 to WAC 173-303-060	Dangerous waste generation and disposal is not expected during the B Plant surveillance and maintenance (S&M) phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
Dangerous Waste Designation WAC 173-303-070 to WAC 173-303-110	Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
General Recycling Requirements WAC 173-303-120	N/A: No recycling, reclaimed, or recovered dangerous waste exists during the B Plant S&M phase.
Prohibitions and Restrictions WAC 173-303-140 to WAC 173-303-141/40 CFR 268	N/A: No land disposal will occur during the B Plant S&M phase. However, the Annual Report on Hanford Site Land Disposal Restrictions for Mixed Waste is updated as necessary annually.
Spills & Discharge Into the Environment WAC 173-303-145 and 40 CFR 302	Notifications and responses for spills and discharges of dangerous waste or hazardous substances into the environment during the B Plant S&M phase are addressed in BHI-EE-02.
Division, Dilution, & Accumulation WAC 173-303-150	Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
Containers WAC 173-303-160 to WAC 173-303-161	Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, containers used as a result of waste generated from routine maintenance activities are handled in compliance with BHI-EE-02 and BHI-EE-10.
Generator Requirements WAC 173-303-170 to WAC 173-303-230	Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
Transporter Requirements WAC 173-303-240 to WAC 173-303-270	Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
Notice of Intent WAC 173-303-280 Siting Criteria WAC 173-303-282	Not applicable during the B Plant S&M phase.

Table 6-1. B Plant Regulatory Compliance during Surveillance and Maintenance.
(sheet 2 of 3)

DANGEROUS WASTE REGULATIONS	S&M COMPLIANCE APPLICABILITY
Performance Standards WAC 173-303-283	This section requires identification of performance standards for maintaining dangerous waste facilities to the maximum extent practical given the limits of technology to prevent endangerment to people and the environment, as specified. Compliance will be met through adherence to this S&M plan.
Required Notices WAC 173-303-290	N/A: No waste sources outside the Hanford site are received by the B Plant facility.
General Waste Analysis WAC 173-303-300	The purpose of this section is to confirm knowledge about dangerous waste before treatment, storage, and/or disposal. Appendix A lists the hazardous material remaining at the facility. Dangerous waste generation and disposal is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities is handled in compliance with BHI-EE-02 and BHI-EE-10.
Security WAC 173-303-310	Addressed in Safeguards & Security section of this S&M plan.
General Inspection WAC 173-303-320	Quarterly surveillances are performed as identified in this S&M plan.
Personnel Training WAC 173-303-330	Appropriate training is provided as identified in Section 5.0 of this S&M plan.
Construction Quality Assurance Program WAC 173-303-335	Not applicable during S&M.
Preparedness and Prevention WAC 173-303-340	Addressed in Section 8.0, Emergency Management, of this S&M plan.
Contingency Plan/Emergency Procedures WAC 173-303-350	Addressed in Section 8.0, Emergency Management, of this S&M plan.
Manifest System WAC 173-303-370	Dangerous waste will not be received from offsite sources during S&M.
Facility Record Keeping WAC 173-303-380	Dangerous waste generation is not expected during S&M. However, operating records for waste generated or managed at the facility are compliant with BHI-EE-02 and BHI-EE-10.
Other General Requirements WAC 173-303-395	Generation and disposal of ignitable, reactive, or incompatible waste during S&M is not expected. However, waste generated will be handled in compliance with BHI-EE-02 and BHI-EE-10.
Facility Reporting WAC 173-303-390	Dangerous waste from an offsite source is not expected during S&M. Therefore, unmanifested waste reports will not be applicable. Supporting information for the Hanford Site Annual Dangerous Waste, Hanford Site Land Disposal Restrictions for Mixed Waste Report, and any applicable reports will be prepared and submitted as required by the department.

Table 6-1. B Plant Regulatory Compliance during Surveillance and Maintenance.
(sheet 3 of 3)

DANGEROUS WASTE REGULATIONS	S&M COMPLIANCE APPLICABILITY
<p>Interim Status Treatment, Storage, and Disposal Facility Standards WAC 173-303-400/ 40 CFR 265.1101(c)(4)/ 40 CFR 255 Subpart J</p>	<p><u>Tank Systems</u> During the B Plant deactivation, treatment, storage, and/or disposal (TSD) tanks and vessels identified in the B Plant Part A Permit Application were emptied to the practical and reasonable extent possible with existing plant systems. The solutions in the 221-B canyon tanks and vessels were characterized in accordance with the <i>Sample and Analysis Plan for B Plant Solutions</i>, and transferred to the tank farms Double Shell Tanks for long term storage. Solutions in the Organic Solvent Waste storage tanks located outside of the 221-B building were sent off-site as part of the B Plant deactivation. Removal of the dangerous waste solutions ensured that the vessels will be left in a state of minimum surveillance and maintenance until subsequent closure. Therefore, during the B Plant S&M phase, no surveillance of the dangerous waste units or ancillary equipment will be performed.</p> <p><u>Cell 4 Container Storage</u> The B Plant 221-B canyon Cell 4 will continue to store dangerous waste in containers per the B Plant Part A Permit Application during the S&M phase. Because the waste does not contain any free liquids, and because the access to the containers is remote and the canyon crane will be unavailable, no surveillance of the Cell 4 containers will be performed. During the S&M phase, no additional containers will be placed in storage in Cell 4.</p> <p><u>Containment Building</u> The B Plant Containment Building - 221-B canyon and process cells, will continue to store dangerous waste per the B Plant Part A Permit Application during the S&M phase. Monitoring the differential pressure of the canyon during S&M will satisfy the 40 CFR 265.1101(c)(4) requirement to maintain the containment building's integrity. No additional surveillance of the dangerous waste or ancillary equipment will be performed to satisfy this requirement.</p>
<p>Permits WAC 173-303-800 to WAC 173-303-840</p>	<p>The B Plant Facility containment building, cell 4 container storage, and tank systems are currently and will remain under interim status until closure. No further permitting will be pursued.</p>
<p>Polychlorinated Biphenyls (PCB) 40 CFR 761 Subparts D and G</p>	<p>PCBs may exist in transformers, ballast, and lubricants/oils once used in the plant. PCB waste generation is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities will be handled in compliance with the applicable requirements.</p>
<p>Asbestos 40 CFR 61.150</p>	<p>Undetermined quantities of asbestos exist throughout the plant as a solid component. Asbestos waste generation is not expected during the B Plant S&M phase. However, waste generated from routine maintenance activities will be handled in compliance with the applicable requirements.</p>

Documentation assembled as a means of documenting completion of endpoints are located in the end point files at the 271-U Building. These records include the following:

- Canyon cell arrangement drawings.
- Certified vendor information of operating and mothballed system
- B Plant Facility Hazardous Substances and Dangerous Wastes Inventory.
- Pre-Closure Work Plan.
- Description of conditions or limitations applicable to criticality prevention.
- Deactivation work plans.
- Descriptions/photos of Case 2 spaces, internal/no access expected.
- Electrical distribution drawings of new operational systems.
- Index identifying drawings and corresponding titles of essential and downgraded facility drawings.
- Final radiological surveys and maps.
- Fire Hazard Analysis.
- Radiological control surveillances and data of current postings
- Confined space program.
- Resolution of remaining outstanding Tri-Party Agreement and regulatory commitments.
- S&M safety evaluations documentation.
- S&M phase updated Facility Environmental Monitoring Plan.
- S&M phase updated Building Emergency Plan
- S&M phase updated Safety Equipment List.
- S&M phase updated Final Safety Analysis/Safety Authorization Basis documentation.
- Special nuclear material inventory
- Structural and roof evaluations.
- S&M procedures.
- Unusual occurrence reports considered relevant and informative for S&M.
- B Plant Dangerous Waste Part A Permit Application.
- WDOH Radioactive Air Emissions Permit, FF-01.
- Waste characterization data for egress waste, historical radiation survey data, and other radiological records.
- An administrative record was established for the B Plant Facility as described on Table 9-3 of the Tri-Party Agreement (Ecology, et al. 1996). The administrative record for B Plant contains the following documents:
 - B Plant RCRA Analytical Data for B Plant's TSDs.
 - Pre-Closure Work Plan.

6.3 HAZARD MATERIAL PROTECTION

During the S&M program, the B Plant Facility complies with the applicable requirements and ALARA considerations for control of potential personnel exposures to hazardous materials.

Compliance with hazardous material protection requirements, per WAC 173-303-330, are ensured as described in BHI-SH-01, BHI-SH-02, Volume 1 and 4, *Safety and Health Procedures*, and BHI-SH-05, *Industrial Hygiene Work Instructions*.

7.0 RADIOLOGICAL CONTROLS

Radiological conditions for facilities within S/M&T Projects have been assessed to ensure adequate radiological controls have been implemented to perform S&M activities. 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; Final Rule*,
- HSRCM-1 *Hanford Site Radiological Control Manual*,
- BHI-SH-01, *ERC Environmental Safety and Health Program*, Section 12, "Radiological Controls,"
- BHI-SH-02, Volume 1, *General Procedures*,
- BHI-SH-02, Volume 2, *Safety and Health 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 and any specific survey and/or air sampling requirements. Additionally, dependent upon work scope and expected radiological conditions, an ALARA review may be performed. Radiological Control Technicians (RCT) 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 RWP is issued describing the appropriate personnel protective clothing, dosimeter requirements, respiratory protection, and RCT coverage requirements.

Current conditions for some specific areas are outlined below. If conditions change, the appropriate radiological controls and postings will be implemented in accordance with approved BHI procedures. The areas include the following:

- Radiological Buffer Areas (RBA),
- Fixed Contamination Areas (FCA),
- Contamination Areas (CA),
- High Contamination Areas (HCA),
- Radiation Areas (RA),

- High Radiation Areas (HRA), and
- Airborne Radioactivity Areas (ARA).

The areas of the building most frequently entered for S&M activities consists of clean areas, FCAs, RBAs, and CAs. These are surveyed and controlled in accordance with BHI procedures and the Radiation Protection Program.

The canyon area of the B Plant Facility is posted as ARA, HCA, and HRA. Entry into this area requires at a minimum a RWP, Level 1 ALARA Review, technical assessments for air sampling and survey requirements, a HRA Access Plan, and a current survey of the area.

8.0 EMERGENCY MANAGEMENT

Administration (preparedness and planning) of the emergency management program for the B Plant Facility is found in BHI-SH-03, Vol. 1, *Emergency Management Program*. BHI-SH-03 Vol. 1 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 B Plant Facility, the response to mitigate would not be part of the S&M, but would fall under the ERC Emergency Management Program as outlined in BHI-SH-03 which implements the facility specific emergency action plan and the Hanford Emergency Response Plan (DOE-RL 1996).

The following documents the Emergency Management measures taken at the B Plant Facility during the S&M phase to meet requirements of WAC 173-303-340, -350, and -360.

8.1 EMERGENCY PREPAREDNESS

The B Plant Facility is locked and unoccupied. Surveillance personnel during routine surveillance make entries into the compound. Therefore, no permanent emergency equipment, communications equipment, warning systems, personal protective equipment, and spill control and containment supplies are located within the facility.

Prior to routine entries, personnel will review 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) and will identify the facility specific hazards and the appropriate evacuation routes and notifications if an accident occurs.

8.2 EMERGENCY PLANNING (Development of the Emergency Action Plan)

The Emergency Plan (emergency action plan) has been written to ensure proper response(s) of employees if an emergency occurs. Facility-specific hazards have been outlined in the hazards identification document (BHI 1999a). Primary and Alternate Building Emergency Directors (BED) and appropriate evacuation routes have been identified.

8.3 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 BED.

8.4 EMERGENCY PREVENTION

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

8.5 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. In all cases, whether an operational emergency, natural phenomena, or security emergency, personnel are to respond using the SWIM acronym:

- **Stop** what you are doing, place equipment in a safe configuration
- **Warn** others, which include the following:
 - Warning all personnel in the vicinity
 - Calling 911 (or 373-3800 from a cellular telephone)
 - Informing the BED
- **Isolate** the area, so others do not wander in.
- **Minimize** exposure by moving upwind and away from the incident (particularly where there is a release from the building).

9.0 HEALTH AND SAFETY

9.1 FIRE HAZARD ANALYSIS

A B Plant Fire Hazards Analysis (FHA), HNF-3756 (FDH 1999), was completed per DOE Order 5480.7A, *Fire Protection*, to assess the fire risks envisioned to remain at the facility and confirm there are no undue fire hazards to site personnel and the public.

9.2 OCCUPATIONAL SAFETY AND HEALTH

The Occupational Safety and Health Administration (OSHA) regulations in 29 CFR 1910, "Occupational Safety and Health Standards," and 1926, "Safety and Health Regulations for Construction," apply contractually at all Hanford Government-Owned, Contractor-Operated facilities and to DOE contractor and subcontractor employees. These OSHA requirements are mandated by DOE Order 440.1, *Worker Protection Management*, and DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards*, and are considered the minimum acceptable standards for implementation.

The OSHA standards pertinent to the S&M phase are 29CFR 1910 and 29 CFR 1926. The requirements of 29 CFR 1910 are applicable to the routine S&M activities conducted by B Plant personnel, while 29 CFR 1926 requirements are applied to work that is subject to the Davis-Bacon Act.

Prior to routine and quarterly entries, personnel review appropriate procedures and attend pre-job safety meetings. The procedures and meetings note any potential hazards or precautions to be taken at the work area(s).

Compliance with occupational safety and health standards and statutory requirements are conducted in accordance with the following:

- DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards*,
- DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities*,
- DOE Order 5480.1B, *Environment, Safety, and Health Program for DOE Operations*.

10.0 SECURITY

During the post-deactivation surveillance of the B Plant Facility, the 221-B/271-B Building and ancillary buildings are unoccupied, locked and/or sealed. A chain-linked perimeter fence deters physical access. Entry into the B Plant Facility fenced areas and buildings is limited to personnel with proper training or individuals accompanied by trained personnel. Signs are posted accordingly throughout the facility identifying restricted access. The facility is entered only for routine and quarterly surveillances, as described in Section 2.0, "Facility Activities," of this document. Access control for the B Plant Facility and other surplus facilities is described in BHI-FS-01, Procedure 1.1, "Access Control and Administration for ERC Facilities."

There are no intrusion alarms or routine security patrols within the perimeter fence of the B Plant Facility. Hanford Patrol continues to provide routine security patrols in the vicinity as part of their patrols throughout the 200 East Area.

11.0 COST AND SCHEDULE

11.1 COST

A cost estimate (Table 11-1) for performance of the S&M program at the B Plant Facility is outlined below.

Table 11-1. Surveillance And Maintenance Cost Estimate.

DESCRIPTION	TOTAL
FY 1999 TOTAL COST	\$ 1,625,000
FY 2000 TOTAL COST	\$ 750,000
FY 2001 TOTAL COST	\$ 750,000
FY 2002 TOTAL COST	\$ 750,000
FY 2003 TOTAL COST	\$ 750,000
TOTAL	\$ 4,625,000

Note: The above dollars do not include major maintenance or repairs of the facilities.

11.2 SCHEDULE

At a minimum, four surveillance entries are made each year on a quarterly basis commencing the spring of 1999. The frequency of routine surveillances and preventive maintenance are identified in Sections 2.3 and 3.4 of this plan are identified in the appropriate work packages.

12.0 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.
- 29 CFR 1910, "Occupational Safety and Health Standards," *Code of Federal Regulations*, as amended.
- 29 CFR 1926, "Occupational Safety and Health Standards for the Construction Industry," *Code of Federal Regulations*, as amended.
- 40 CFR 61, "National Emissions Standards in Hazardous Air Pollutants," Subpart H, 'National Emissions Standards for Emissions of Radionuclide Other Than Radon from Department of Energy Facilities,' *Code of Federal Regulations*, as amended.
- 40 CFR 255, "Identification of Regions and Agencies for Solid Waste Management," *Code of Federal Regulations*, as amended.
- 40 CFR 265, "Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," *Code of Federal Regulations*, as amended.
- 40 CFR 268, "Land Disposal Restriction," *Code of Federal Regulations*, as amended.
- 40 CFR 302, "Designation Reportable Quantities, and Notifications," *Code of Federal Regulations*, as amended.
- 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibition," *Code of Federal Regulations*, as amended.
- BHI, 1997, *ERC Maintenance Implementation Plan for Nuclear Facilities*, BHI-01044, as amended, Bechtel Hanford, Inc., Richland, Washington.
- BHI, 1999a, *B Plant Site-Specific Health and Safety Plan*, 0221B-SSHS-G0001, as amended, Bechtel Hanford, Inc., Richland, Washington.
- BHI, 1999b, *Surveillance/Maintenance and Transition Project Manager's Implementation Instructions (PMII)*, 0000X-PMII-G0001, as amended, Bechtel Hanford, Inc., Richland, Washington.
- BHI, 1999c, *Surveillance/Maintenance and Transition Project Treatment, Storage, and Disposal Training Plan*, 0000X-TP-G0001, as amended, Bechtel Hanford, Inc., Richland, Washington.

- BHI, 1999d, *Training Implementation Matrix for ERC Managed Nuclear Facilities*, BHI-01230, as amended, Bechtel Hanford, Inc., Richland, Washington.
- BHI-DE-01, *Design Engineering Procedures Manual*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-EE-02, *Environmental Requirements*, 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-HR-01, *Human Resource Policies and Procedures*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-MA-01, *ERC Policies, Organization, and Responsibilities*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-MA-02, *ERC Project Procedures*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-PR-01, *ERC Procurement Procedures*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-PR-03, *ERC Warehouse Manual*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-QA-01, *ERC Quality Program*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-QA-03, *ERC Quality Assurance Program Plans*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-01, *Hanford ERC Environmental, Safety, and Health Program*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-02, *Safety and Health Procedures*, Volumes 1, 2 and 4, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-03, *Emergency Management Program*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-04, *Radiological Control Work Instructions*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-05, *Industrial Hygiene Work Instructions*, Bechtel Hanford, Inc., Richland, Washington.
- BHI-SH-06, *Quality Services Procedures*, Bechtel Hanford, Inc., Richland, Washington.
- DOE, 1995, *Decommissioning Resource Manual*, DOE/EM-0246, U.S. Department of Energy, Washington, D.C.

- DOE Order 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5480.1, *Radiation Protection for Occupational Workers*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5480.1B, *Environmental, Safety, and Health Program for DOE Operations*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5480.7A, *Fire Protection*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5480.19, *Conduct of Operations Requirements For DOE Facilities*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 5700.6C, *Quality Assurance*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE Order 6430.1A, *General Design Criteria*, as amended, U.S. Department of Energy, Washington, D.C.
- DOE-RL, 1996, *Hanford Emergency Response Plan*, DOE/RL-94-02, as amended, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE-RL, 1997, *Hanford Facility Dangerous Waste Permit Application, General Information Portion*, DOE/RL-91-28, as amended, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE-RL, 1997, *Radioactive Air Emissions Notice of Construction for Modification of the Ventilation System for B Plant Complex, 221-B Canyon Building (Project W-059)*, DOE/RL-97-17, as amended, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE RLID 5480.7, *Fire Protection*, as amended, 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 (EPA), U.S. Department of Energy, Olympia, Washington.

FDH, 1995, *B Plant End Points Document*, HNF-SD-WM-TPP-054, as amended, Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1998, *Documentation of Remaining Hazardous Substances/Dangerous Waste in B Plant*, HNF-3208, as amended, Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 199__, HNF-EP-0898, as amended, Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1999, *B Plant Fire Hazard Analysis*, HNF-3756, as amended, Fluor Daniel 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.

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

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

APPENDIX A

HAZARDOUS MATERIAL REMAINING AT THE B PLANT FACILITY

This appendix was taken directly from the submittal to document closure of End Point 00.00.26, "Remaining Hazardous Substances / Dangerous Waste Documentation," per the B Plant End Points Document (HNF-SD-WM-TPP-054). It summarizes the results in HNF-3208, *Documentation of Remaining Hazardous Substances/Dangerous Waste in B Plant* (FDH 1998).

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
GENERAL		<p>This General section addresses hazardous substances/ dangerous wastes that may not have been specifically addressed in the deactivation process. Traces of the following materials, which are expected to remain stable during surveillance and maintenance (S&M), may exist in unknown quantities throughout the facility, as noted below:</p> <ul style="list-style-type: none"> • Asbestos abandoned throughout the plant as a solid component such as transite siding, utility line insulation, floor tiles, and gasket material. Refer to individual Space/Systems in this document for additional descriptions of asbestos remaining at the facility. • Lead as a solid component, such as paint, light bulb contacts, washers affixing transite, solder in electrical and plumbing system, sanitary water line joints packed with lead mesh; steam, air and water safety relief valve seals; components of control panels-all abandoned in-place and stable during S&M. • Mercury in thermostats and in electronic switches (i.e., electronic switches) throughout the facility. Mercury vapor lights were also used for exterior lighting. • Remaining smoke detectors may contain radioactive sources. • Polychlorinated biphenyls (PCB) may exist in ballasts and lubricants/gear oil once used throughout the plant. • Organic in liquid films, greases, and solid residues in bearings and gearboxes throughout the plant. • Silver and lead contacts are used in the electrical system. Lead and zinc were used as soldering in the electrical systems. 	

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
211-B Chemical Tank Farm System	01.02.09	<ul style="list-style-type: none"> *Nitric Acid (Material Safety Data Sheet [MSDS] #39255) *Hydroxy Acetic Acid (MSDS #37906) *Ammonium Carbonate (MSDS #44107) *Sodium Hydroxide (MSDS #44107) *Demineralizer regeneration effluent consisting of salt cake from sodium hydroxide and sulfuric acid (MSDS #44214 and #40658) Lead (MSDS #055668) 	<ul style="list-style-type: none"> In tanks TK-SA-101, -102, and -103 (found dry) In tank TK-SF-120 (found dry) 127.5 lbs in tank TK-MNB-173 112.5 lbs in tank TK-SQ-141 675 lbs in tank TK-SQ-142 2025 lbs in tank TK-SQ-143 2250 lbs in TK-SK-161 <p>NOTE: Asterisked items may be present in solid or liquid form as residual heels or attached to internal surfaces in the abandoned in-place tanks, associated valves and piping and pumps.</p> <ul style="list-style-type: none"> Trace amounts may be found in paint on stairs and catwalk 68 lbs total contained in the drip pans for Tanks 141, 142, 143, and 161 Counterweights may contain solid metal lead bullet. (Ref: Letter 16F00-96-099-RAW and 16F00-98-RAW-35)
211-B Chemical Tank Farm	01.01.14	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Possible lead paint (Ref: Letter 16F00-96-100-RAW)
217-B Demineralizer Building and System	01.10.03 01.10.11 01.12.07	<ul style="list-style-type: none"> Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) Sodium Hydroxide (MSDS #34249) NSP 122 Epoxy-Phenolic Floor Coating, Resin and Hardener (MSDS #48614A and #48642) 	<ul style="list-style-type: none"> 4 pints total (one pint each) to seal 2 floor drains Not more than 17.5 lbs in TK-DW-112 7 gal total used to seal and coat cement floor (Ref: Letter 16F00-98-RAW-025 and 96-071)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
276-B Organic Makeup / Paint Storage Building System	01.16.05	<ul style="list-style-type: none"> Di (2-ethyhexyl) phosphoric acid (MSDS #42193) Tributyl Phosphate (MSDS #47042) Diluent – Kerosene (MSDS #36275) Chevron NL Gear Compound 320 (MSDS #14518) NSP 700 Block / Concrete Filler, Part A (MSDS #700002) and Part B (MSDS #700003) 	<ul style="list-style-type: none"> Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in tank agitator for TK-154 4 pints total used to seal drains (Ref: Letter 16F00-98-RAW-025 and 96-071)
276-B Organic Makeup / Paint Storage Building	01.14.11 01.14.02	<ul style="list-style-type: none"> Di (2-ethyhexyl) phosphoric acid (MSDS #42193) Tributyl Phosphate (MSDS #47042) Diluent – Kerosene (MSDS #36275) Chevron NL Gear Compound 320 (MSDS #14518) NSP 700 Block / Concrete Filler, Part A (MSDS #700002) and Part B (MSDS #700003) 	<ul style="list-style-type: none"> Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in tank agitator for TK-154 4 pints total used to seal drains (Ref: Letter 16F00-98-RAW-025 and 96-071)
276-B Organic Makeup/Paint Storage Building Exterior	01.15.10	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> 700 ft² contained in roof felt (Ref: Letters 16F00-96-RAW-072 and 98-024)
217-B Demineralizer Building Exterior	01.11.15 01.11.03	<ul style="list-style-type: none"> Asbestos (MSDS #11068) Lead (MSDS #55778) 	<ul style="list-style-type: none"> 530 ft² corrugated asbestos transite siding Used to cap the bolts on exterior of the building that attaches the transite siding to the building. Lead-based paint found on the doors and window encasements. (Ref: Letter 16F00-97-RAW-223)
212-B Hot Cell System	02.05.05	<ul style="list-style-type: none"> Lead (MSDS #055668) Devcon 2-ton Clear Epoxy Resin (MSDS #175830) and Hardener (MSDS #17565) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> Approximately 180 lbs left in place in the 226 Strontium Loadout line used for shielding purposes. (Ref: Letter 16F00-97-RAW-157) Approximately 5 to 10 lbs used for shielding around associated piping inside hot cell (Ref: Letters 16F00-98-RAW-016 and 97-140) Approximately 18 gal total used for fixing contamination in metal catch tray located on east side of cell 21 oz used for sealing around outside entrance of hot cell (Ref: Letters 16F00-98-RAW-016 and 97-140)

A-4

DOE/RL-99-24
Revision 0

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
212-B Crane	02.03.09	<ul style="list-style-type: none"> • Shell Alvania EP Grease 2 (MSDS #25047B) • Texaco Regal R&O (MSDS #13818) 	<ul style="list-style-type: none"> • 140 oz total found in the following: <ul style="list-style-type: none"> + Bridge drive shaft bearings (14 oz) + Bridge wheel bearings (56 oz) + Hoist Drum bearings (14 oz) + Trolley wheel bearings (56 oz) • 10 gal hoist drum gears 1 gal hoist drum brake gears 3 gal trolley primary reduction gears (Ref: Letters 16F00-97-RAW-139 and 98-015)
212-B Change Room	02.02.11 02.02.02	<ul style="list-style-type: none"> • Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) • Asbestos 	<ul style="list-style-type: none"> • Approximately 2 pints total used to seal the floor drain • All pipe insulation inside and outside contains asbestos material. Floor tiles and linoleum contains asbestos. Roofing materials have possible asbestos-containing material (PACM). Building walls have sprayed-on asbestos-containing materials z(ACM). (Ref: Letters 16F00-97-RAW-081 and 98-023)
212-B Canyon	02.01.14 02.01.03	<ul style="list-style-type: none"> • Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) • Nitric Acid (MSDS #39255) • Sodium Hydroxide (MSDS #42214) • Lead (MSDS #55778) • Shell Alvania EP Greasse 2 (MSDS #25047B) • Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> • 2 pints total used to plug the floor drain • Possible trace amounts in tanks TK-CS-1 and TK-CS-2 and associated piping and valves • Possible trace amounts in associated piping and valves • Approximately 7 lbs lead flashing around sewer vents 1015 lbs lead cover block port covers • Approximately 2 qts: 1 in tank agitator motor and 1 in motor used in power door opener on south end of canyon • 150 linear ft insulation in canyon and 162 linear ft insulation on steam piping (Ref: Letter 16F00-97-RAW-149)
212-B Heating, Ventilating, and Air Conditioning (HVAC) System	02.07.08	<ul style="list-style-type: none"> • Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> • Approximately 472 ft² around the heating and cooling unit and attached to ventilation duct work (Ref: Letter 16F00-97-RAW-148)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
212-B Facility Exterior	02.04.03	<ul style="list-style-type: none"> Lead Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> Found in paint on building exterior (Ref: Letter 16F00-97-RAW-157) 5673 ft² of ACM is present on the exterior walls (asbestos material over the metal sheeting) 3544 ft² of ACM on roof (Ref: Letters 16F00-97-RAW-147 and 98-RAW-018)
212-B Operating Gallery	02.08.11 02.08.02	<ul style="list-style-type: none"> Asbestos (MSDS #042831) RTV Silicone Sealant (MSDS #12133) Lead Wool (MSDS #40244) Lead Glass 	<ul style="list-style-type: none"> 1325 ft² in floor tiles 10 oz used to seal around the two sheet metal plates directly above hot cell window Approximately 20 lbs used as in-place shielding around hot cell window and operating gallery window Approximately 9,000 lbs used in hot cell window for in-place shielding (Ref: Letters 16F00-98-RAW-012, 97-121)
212-B Truck Port	02.09.10	<ul style="list-style-type: none"> Downing Corning 732 Multi-Purpose Sealant – Aluminum (MSDS #25158) Hilti CF 128 Filler Foam (MSDS #54336) 	<ul style="list-style-type: none"> 5 lbs used for sealing wall penetrations 10 lbs used to seal building penetrations (Ref: Letters 16F00-98-RAW-011 and 16F00-97-RAW-120)
212-B HVAC Building	02.06.15 02.06.03	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Hilti Foam (MSDS #33924) Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> 300 ft², east wall / coating over metal Approximately 5 lbs used for sealing penetrations 2 pints total used for sealing drain (Ref: Letter 16F00-98-NLS)
221-B Electrical Gallery System	03.02.06	<ul style="list-style-type: none"> Lead (MSDS #055668) 	<ul style="list-style-type: none"> Approximately 154 lbs shielding for gamma detector at tank 900, east end of gallery (Ref: Letter 16F00-98-NLS-051)

A-6

DOE/RL-99-24
Revision 0

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-B Electrical Gallery	03.01.03 03.01.16	<ul style="list-style-type: none"> Asbestos (MSDS #011068) Lead (MSDS #055778) Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> 850 linear ft on 225 lb steam line Unknown quantity on steam valves/flanges Lead paint throughout, quantity unknown. Approximately 2450 lbs lead shielding in seven wall penetrations (radiation monitors) cells 18, 27, 28, 30, and 38 (2). Approximately 250 lbs shielding, tank 900 gamma detector 6 qts total on 3-in. pipe across from cells 12, 29, 31, 33, 35, and 37 (Ref: Letters 16F00-98-NLS-081 and 075)
221-B Canyon Crane	04.03.12 04.01.12	<ul style="list-style-type: none"> Asbestos Lead Refrigerant oil (MSDS #027947) Freon-12 	<ul style="list-style-type: none"> Unknown quantity brake shoes, PACM Unknown quantity lead paint throughout. Approximately 22,000 lbs lead shielding, cab walls and top, 110 lbs lead shielding, beta cam 1.5 quart, air conditioner (Ref: Letter 16F00-98-NLS-086) Estimated 64 oz. left in crane air conditioning unit (Ref: Letter 16D00-98-SEK-052)
221-B Canyon	04.01.02 04.01.20	<ul style="list-style-type: none"> Following vessels contain heavy metals: E-5-2, TK-9-1, TK-10-1, E-20-2, TK-22-1, TK-23-1, E-23-3, TK-24-1, TK-26-1, TK-27-2, TK-27-4, T-28-1, TK-28-2, TK-29-2, T-30-1, TK-30-3, TK-32-1, TK-34-1, TK-34-2, TK-35-2 (Simmons 1998). Lead in the form on shielding, counterweights,, covers, blankets, bricks, paint and cask (Simmons 1998). 	<ul style="list-style-type: none"> Barium 35.05 kg Cadmium 0.42 kg Chromium 18.64 kg Lead 210.2 kg Silver 145 g Lead: + Shielding 74,342 lbs + Counterweights 8,920 lbs + Blankets 16,506 lbs + Cask 17,500 lbs
221B-SMP-R/Inactive Utility Pit	04.41.02 04.41.13	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> Approximately 25 linear ft insulation on the pipe that runs north/south in pit. Also asbestos insulation mixed in dirt on floor of pit. 41 oz used to seal diamond plate pit covers (Ref: Letter 16F00-97-RAW-205)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-B Cell 40	04.47.03	<ul style="list-style-type: none"> Chlorine 36 (used as a detector source) Lead Sheets (MSDS #055778) Lead Bricks (MSDS #055778) Lead Shielding (MSDS #055778) Lead Counterweights (MSDS #055778) Lead Glass Window (MSDS #055778) 	<ul style="list-style-type: none"> Less than 2 micro curies in the Victoreen 856 system 3,776 lbs (16 at 236 lbs each) in pipe chase 936 lbs (36 at 26 lbs each) in pipe chase 110 lbs (2 at 65 lbs each) manipulator cover 240 lbs, manipulator arm Approximately 9,000 lbs (59% lead) cell window (Ref: Letter 16F00-98-NLS-066)
Vessel Vent System in 221-B-FP-F-22-9A and -B	04.45.05	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> 31 linear ft pipe insulation on 221B-9B filter pit and associated systems There is a possibility of ACM in wall penetrations of 221B-9A filter pit. However, no positive identification of asbestos material was made. (Ref: Letters 16F00-98-RAW-005 and 006)
221-B SWP Change Room Lobby	04.39.13 04.39.02	<ul style="list-style-type: none"> Asbestos 	<ul style="list-style-type: none"> Unknown quantity asbestos on steam valves and flanges (Ref: Letter 16F00-98-NLS-082)
221-B Railroad Tunnel	04.38.15 04.38.02	<ul style="list-style-type: none"> Lead Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> Lead-based paint throughout, unknown quantity (no flaking) 2 qts total (2 floor drains) south end of tunnel (Ref: Letter 16F00-98-NLS-080)
221B-FP-F-22-9/A Vessel Vent Filter Pit	04.40.13 04.40.02	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> PACM in wall penetrations (Ref: Letter 16F00-98-RAW-005)
221-B Facility Exterior	04.37.19	<ul style="list-style-type: none"> Asbestos (MSDS #011068) Lead (MSDS #055778) 	<ul style="list-style-type: none"> 36 ft² transite on door #1 Unknown quantity Insulkote covering on fiberglass insulation and duct work located on SF-1 and SF-2. Unknown quantity in roofing materials. Approximately 225 lbs lead shielding 1/8-in. sheets near door 3, covers two pipe protrusions (Ref: Letter 16F00-98-NLS-077)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221BB-VP-01/Never Used Steam Condensate Pit	04.42.14 04.42.03	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> ACM possible in the steam condensate piping valve gaskets and packing (Ref: Letters 16F00-98-RAW-014 and 97-134)
221BC-VP-01/Inactive Utility Pit	04.43.14 04.43.03	<ul style="list-style-type: none"> Asbestos (#042831) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> PACMs in wall penetrations 4.5 lbs used to seal the diamond plate covers to the pit (Ref: Letter 16F090-97-RAW-206)
221BC-VP-02/Inactive Utility Pit	04.44.14 04.44.03	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> 35 linear ft on 3-in. and 4-in. pipe 8 lbs used to seal the metal lid (Ref: Letter 16F00-97-RAW-209)
221B-FP-F-22-9/B Vessel Vent Filter Pit	04.49.13 04.49.02	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> 31 linear ft used in pipe insulation (Ref: Letter 16F00-98-RAW-006)
221B-FP-F-22-9/C Vessel Vent Filter Pit	04.51.13 04.51.02	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> Approximately 20 linear ft PACM in the tar insulation on piping 4.5 lbs used to seal meal cover over the filter pit (Ref: Letters 16F00-97-RAW-208 and 98-007)
221-B Operating Gallery Systems	05.04.06	<ul style="list-style-type: none"> Asbestos 	<ul style="list-style-type: none"> Unknown quantity in valves and flange gaskets (Ref: Letter 16F00-98-NLS-0083)
221-B Operating Gallery	05.01.02 05.01.13	<ul style="list-style-type: none"> Asbestos Lead Devcon 2-ton Clear Epoxy Hardener (MSDS #017565) and Resin (MSDS #017583) 	<ul style="list-style-type: none"> PACM may be located in gaskets on steam valves, flanges, and tanks Unknown quantity lead paint throughout Approximately 50 quarts total, throughout 50 floor drains (Ref: Letters 16F00-98-NLS-076 and 0083)

A-9

DOE/RL-99-24
Revision 0

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-B Pipe Gallery	06.01.02 06.01.13	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Devcon 2-ton Clear Epoxy Hardener (MSDS #017565) and Resin (MSDS #017583) Lead 	<ul style="list-style-type: none"> Approximately 4 linear ft asbestos insulation on a 1½-in. diameter pipe in cell 39. Total 4.172 ft³ in gaskets on steam valves and flanges in pipe chases (Ref: Letter 16F00-98-NLS-077) 26 qts total, 25 floor drains throughout Unknown quantity lead paint throughout. Approximately 1353 lbs lead shielding sheets, north wall/east end of gallery (most is painted) (Ref: Letter 16F00-98-NLS-084)
221-B Pipe Gallery System	06.02.18	<ul style="list-style-type: none"> Asbestos Lead 	<ul style="list-style-type: none"> Unknown quantity in piping system gaskets Lead-based paint throughout (Ref: Letter 16F00-98-NLS-084)
221-B Stairwells System	07.04.05	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Lead-based paint located throughout (Ref: Letter 16F00-98-NLS-063)
221-B Stairwells 1, 3, 11, 13, and 19	07.02.12	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) Devcon 2-ton Clear Epoxy Hardener (MSDS #017565) and Resin (MSDS #017583) 	<ul style="list-style-type: none"> 20 ft² in restroom 117 and 119 Lead-based paint throughout and Lead pipe packing, estimate 1.5 lbs per joint in sewer drain lines 6 quarts total used to seal drains (Ref: Letter 16F00-98-NLS-063)
221-B Electric and Pipe Galleries off of Stairwell #1	07.01.14	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) 	<ul style="list-style-type: none"> 308 ft² wallboard Lead-based paint on ceiling and walls Lead pipe packing on sewer drain lines – estimated 1.2 to 1.5 lbs per joint (Ref: Letter 16F00-98-NLS-054)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-BB Steam Condensate (BCS) Building Exterior	08.02.11	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Dow Corning 732 Multi-Purpose Sealant – Aluminum (MSDS #25158) Hilti cr 128 Filler Foam (MSDS #54336) 	<ul style="list-style-type: none"> 20 linear ft insulation on piping of steam supply to 221-BB and lines into the pits. 5 linear ft on northside of 221-BB and on vessel vent #3 on southside of building (Ref: Letter 16F00-97-RAW-101) 4 lbs used for sealing building wall penetrations 8 lbs used to seal openings into the building (Ref: Letter 16F00-98-RAW-010)
221-BB Steam Condensate (BCS) Building Sytem	08.03.11	<ul style="list-style-type: none"> Mobilux EP 1 (MSDS #21539) Mobilux EP 2 (MSDS #11582A) Potassium Permanganate (MSDS #44343) WEDAC (MSDS #13365) 	<ul style="list-style-type: none"> Trace amount in fan motor bearings Trace amount in fan motor bearings Trace amounts in liquid or solid form as residual heels or attached to internal surfaces in piping associated with the two tanks in north corner of the cold side of 221-BB Trace amounts in liquid or solid form as residual heels or attached to internal surfaces in piping associated with the two tanks in north corner of the cold side of 221-BB (Ref: Letter 16F00-97-RAW-103)
221-BB Steam Condensate (BCS) Building	08.01.14	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> Found in piping gaskets (Ref: Letter 16F00-97-RAW-106)
221-BB-MVP-01/ 221B North Condensate Pit	08.08.03 08.06.15	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Dow Corning 732 Multi-Purpose Sealant – Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> Approximately 20 linear ft insulation on steam supply system 22 oz. used for sealing penetrations (Ref: Letters 16F00-98-RAW-013 and 97-129)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-BC Change Room Building 221-BC Change Room Building Exterior 221-BC Change Room Building System	09.01.13 09.02.14 09.03.04	<ul style="list-style-type: none"> • Lead (MSDS #055778) • Asbestos (MSDS #042831) • Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) • Texaco Regal R & O (MSDS #13818) 	<ul style="list-style-type: none"> • Lead paint on all doors and outside building trim Approximately 10 lb lead pipe packing around penetration through the roof • PACM in the coating of ventilation ductwork and on the roofing material • 12 pints total used for sealing drains • Less than 1 oz remaining in the gear box for the dumbwaiter (Ref: Letter 16F00-98-RAW-009)
221-BF Process Condensate (BCP) Storage Building System	10.03.10	<ul style="list-style-type: none"> • Citric Acid (MSDS #40201) • Nitric Acid (MSDS #39255) • Sodium Hydroxide (MSDS #42214) 	<ul style="list-style-type: none"> • Tanks in 221-BF were flushed to minimum heels in December 1995. Resource Conservation and Recovery Act (RCRA) listed materials may be present in liquid or residual heels or attached to internal surfaces in the abandoned in-place tanks, associated valves, piping, and pumps. (Ref: Letter 16F00-97-029-RAW)
271-B Elevator	11.03.11	<ul style="list-style-type: none"> • Asbestos 	<ul style="list-style-type: none"> • Unknown quantity, brake shoes, PACM (Ref: Letter 16F00-98-NLS-090)
271-B Basement Shops and System	11.01.14 11.01.03 11.02.05	<ul style="list-style-type: none"> • Asbestos (MSDS #042831) • Lead • Mercury (MSDS #41394) • Devcon 2-ton Clear Epoxy Resins (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> • 108 ft² floor tiles in Instrument Supply Office • 240 ft² floor tiles in Instrument Lunchroom • 40 ft² floor tiles in Instrument Storage Office • Approximately 11,000 ft² transite duct in Instrument Shop and main basement area • Approximately 123 linear ft insulation on piping • All paint, especially on doors and door frames, is potentially lead-based paint. • A visual inspection of the 271-B basement reviewed no evidence of mercury metal contamination in the work area. Wipe sampling in areas likely to have some mercury contamination, revealed several areas of minimal surface contamination in the Instrument Tech Shop. The residual contamination, presumably a by-product of historical work practice, is equivalent to residual contamination found after mercury spill cleanup. There also exists a possibility of finding mercury in P-traps and drains. • 12 pints total, 1 pint per floor drain (Ref: Letter 16F00-98-RAW-030)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
271-B First Floor	11.04.13	<ul style="list-style-type: none"> Asbestos (MSDS #011068A) Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) Lead Sodium Hydroxide 	<ul style="list-style-type: none"> 2076 ft² transite throughout Unknown quantity asbestos piping system gaskets throughout 240 ft² asbestos wall board, office walls 6570 ft² asbestos floor tile, entryways, offices and restrooms 14 qts total, 14 floor drains throughout Lead-based paint throughout piping system Unknown quantity sewer line packing Estimate 1.5 lbs spilled white material in confined space #101 and #102 (Ref: Letter 16F00-98-NLS-085)
271-B Second Floor	11.06.13	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) Acidic residue (pH is about "4") Devcon 2-ton Clear Epoxy Resins (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> 4114 ft² ventilation ductwork throughout 7908 ft² asbestos floor tiles throughout Less than 2 ft³ packing/insulation in pipe chase 614 ft² asbestos wall panels in office walls Lead-based paint throughout Approximately 1.5 lbs lead pipe packing per joint throughout Residue throughout sewer lines (Ref: Letter 16F00-98-NLS-043) 1.5 quart total used to seal drains (Ref: Letter 16F00-98-NLS-094)
271-B Third Floor AMU	11.09.16 11.09.04	<ul style="list-style-type: none"> Lead (MSDS #055778) NaOH (MSDS #034249) Asbestos (MSDS #042831) Devcon 2-ton Clear Epoxy Resins (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> Approximately 1.5 lbs per joint in drain pipe packing 61.25 lbs in TK-H-310 3412 ft² ductwork in ventilation system 1080 ft² asbestos floor tiles Less than 2 ft³ packing in pipe chases (Ref: Letter 16F00-98-NLS-044) 6 quarts total used to seal drains (Ref: Letter 16F00-98-NLS-094)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
291-B Stack / Steam Turbine Building System	12.03.06	<ul style="list-style-type: none"> Asbestos Thermal System Insulation (MSDS #042831) Glycerin (MSDS #42442) 	<ul style="list-style-type: none"> Approximately 100 linear ft located on 1-in. and 2-in. steam system piping Approximately ½ pint in each gauge, used in 2 pressure gauges located on the steam turbine fan motors (Ref: Letter 16F00-97-RAW-216)
291-B Stack / Steam Turbine Building	12.01.12 12.01.02	<ul style="list-style-type: none"> Lead Asbestos (MSDS #042831) Devcon 2-ton Clear Epoxy Resins (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> Lead-based paint on the floor coating 50 linear ft on 1-in. and 2-in. steam pipe 4 pints total to seal floor drains (Ref: Letter 16F00-98-RAW-011)
291-BB A and B Filter Instrument Building and System	12.04.10 12.06.08	<ul style="list-style-type: none"> Lead Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> Lead paint on interior of entrance door 20 linear ft on vent line 3 ft of ¾-in. rope in the wall-mounted heaters (Ref: Letter 16F00-98-RAW-012)
291-BD C Filter Instrument Building and System	12.09.09 12.11.07	<ul style="list-style-type: none"> Lead Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> Lead paint on interior of entrance door PACM in gaskets and packing (Ref: Letter 16F00-98-RAW-013)
291-B Stack / Steam Turbine Building Exterior	12.02.18	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead 	<ul style="list-style-type: none"> PACM on the roof felt and associated roofing material Lead paint on exterior of the entrance door (Ref: Letter 16F00-98-RAW-001)
291-BF D Filter Instrument Building and System	12.12.08 12.14.06	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Lead-based paint on interior of entrance door (Ref: Letter 16F00-98-RAW-014)
291-BG E Filter Instrument Building and System	12.15.08 12.17.07	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Lead-based paint on interior of entrance door (Ref: Letter 16F00-98-RAW-015)
291-BD C Filter Instrument Building Exterior	12.10.15	<ul style="list-style-type: none"> Lead Zinc chromate 	<ul style="list-style-type: none"> Lead paint on door to the building Contained in building exterior paint (Ref: Letter 16F00-98-RAW-002)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
291-BF D Filter Instrument Building Exterior	12.13.15	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Lead paint on door to the building (Ref: Letter 16F00-98-RAW-003)
291-BG E Filter Instrument Building Exterior	12.16.12	<ul style="list-style-type: none"> Lead 	<ul style="list-style-type: none"> Lead paint on door to the building (Ref: Letter 16F00-98-RAW-004)
291-B Exhaust Fans	12.24.06	<ul style="list-style-type: none"> Grease packing (MSDS #10622A) 	<ul style="list-style-type: none"> Residual packing for the bearings. Material has not been added and allowed to run dry. No reservoir or drain plug on the fans. (Ref: Letter 16F00-98-AW-016)
292-B Stack Monitoring Building and System	12.30.02 12.30.10 12.32.04	<ul style="list-style-type: none"> Lead Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> Lead-based paint on interior sides of doors. 8 pints total to seal drains (Ref: Letter 16F00-98-RAW-020)
291-A/B/C/D/E Sump / Seal pits	12.23.16 12.23.03	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) 	<ul style="list-style-type: none"> Potential asbestos gaskets on steam valves and flanges. Approximately 7 linear ft on 2-in. steam line, pit A/B Approximately 24 linear ft on C filter pit steam line Approximately 470 lbs lead blankets in 291B-VP-A, B, in-place for shielding. Approximately 41,890 lbs lead shot in 291B-VP-A, B in-place for shielding Approximately 200 lbs lead shot in C filter Approximately 1,695 lbs lead blankets in C filter Approximately 25 lbs lead seal across lid and valve steam for 291-VP-A, B (Ref: Letter 16F00-98-RAW-006)
292-B Stack Monitoring Building Exterior	12.31.03 12.31.10	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead 	<ul style="list-style-type: none"> 1-in. pipe is fully enclosed, underground 1-in pipes, length unknown Lead paint on the wood entrance door and on the fascia boards, and on wooden bottle rack. (Ref: 16F00-98-RAW-005)
291-B Yard	12.27.21 12.27.03	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) 	<ul style="list-style-type: none"> 552 linear ft insulation on steam lines 2158 lbs, various lead sheeting, blankets, and aprons used as in-place necessary shielding. (Ref: Letter 16F00-98-RAW-019)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
Steam B22	14.06.07	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> 35 linear ft insulation material on a 3-in. steam pipe located on the line north of main valve HDR-700-46. Possible asbestos material on all piping elbows that enter the 291-B Steam Turbine Building from the main steam line. (Ref: Letter 16F00-98-RAW-028)
Process and Instrument Air System	14.03.11	<ul style="list-style-type: none"> Asbestos Compressor oil (MSDS #036809) 	<ul style="list-style-type: none"> 75 linear ft piping insulation, west wall of compressor room Residual inside air tanks and lines (Ref: Letter 16F00-98-NLS-088)
Fire Protection B26	14.02.22	<ul style="list-style-type: none"> Asbestos Lead 	<ul style="list-style-type: none"> Unknown quantity in gaskets throughout building Unknown quantity in paint throughout building. (Ref: Letter 16F00-98-NLS-089)
207-BA CBC Sampling Building	15.03.10	<ul style="list-style-type: none"> Hilti CF 124 Filler Foam (MSDS #33924) Devcon 2-ton Clear Epoxy Resin (MSDS #175830 and Hardener (MSDS #17565) Glycerin (MSDS # 42442) Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> 2 lbs used on building exterior for vermin control Approximately 2 quart total used to seal floor drains Approximately 1 pint contained in pump pressure gauge P1-207BA-2 Doors were sealed with 10.3 oz material (Ref: Letters 16F00-97-RAW-158, 165 and 98-019 and 98-021)
221-BA Cooling Water Monitor Sample Building System	15.10.05	<ul style="list-style-type: none"> Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) Hilti CF 124 Filler Foam (MSDS #33924) Glycerin (MSDS #42442) Lead (MSDS #55778) 	<ul style="list-style-type: none"> Doors were sealed with 10.3 oz material (Ref: Letters 16F00-98-RAW-021, 97-165) 5 lbs used for vermin proofing building penetrations Approximately 1 pint used in pressure gauge P1-221-BA-900-2 25 lbs, lead plug used for shielding inside the small raw water riser, a lead seal, approximately 18 in. diameter, used for shielding of the large raw water riser. (Ref: Letters 16-F00-98-RAW-020, 97-159)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
221-BA Cooling Water Monitor Sample Building	15.09.13	<ul style="list-style-type: none"> Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) Hilti CF 124 Filler Foam (MSDS #33924) Glycerin (MSDS #42442) Lead (MSDS # 55778) 	<ul style="list-style-type: none"> Doors were sealed with 10.3 oz material (Ref: Letters 16F00-98-RAW-021, 97-165) 5 lbs used for vermin proofing building penetrations Approximately 1 pint used in pressure gauge P1-221BA-900-2 25 lbs, lead plug used for shielding inside the small raw water riser, a lead seal, approximately 18 in. diameter, used for shielding of the large raw water riser (Ref: Letters 16F00-98-RAW-020, 97-159)
221-BG Cooling Water Monitor Sample Building, Exterior and System	15.11.12 15.12.08 15.13.08	<ul style="list-style-type: none"> Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) Hilti CF 124 Filler Foam (MSDS 33924) Lead (MSDS #55778) Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) Glycerin (MSDS #42442) Alvina EPLF2 Gear Grease (MSDS #25047B) 	<ul style="list-style-type: none"> Doors were sealed with 10.3 oz material (Ref: Letters 16F00-98-RAW-021, 97-165) Used for sealing penetrations in building Used for shielding in the 24-in. raw water header seal Approximately 2 qt total used to seal floor drain Approximately 1 pint in each pressure gauge Approximately 1 qt found in pump motor on north wall of building (Ref: Letter 16F00-97-RAW-160)
222-B Office Building	17.02.11	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #055778) Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) 	<ul style="list-style-type: none"> 142 linear ft insulation on 4-in. line above ceiling Approximately 24 linear ft insulation on 2-in. line 1380 ft² asbestos ceiling tiles, west end 441 ft² asbestos wall panels, throughout 1.5 lbs lead sewer drain pipe packing per joint (Ref: Letter 16F00-98-NLS-053) 12 quarts total used to seal drains (Ref: Letter 16F00-98-NLS-094)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
2711-B Annex Building	17.05.10	<ul style="list-style-type: none"> Devcon 2-ton Clear Epoxy Resin (MSDS #17583) and Hardener (MSDS #17565) Hilti CF 124 Filler Foam Asbestos (MSDS #042831) Lead 	<ul style="list-style-type: none"> 10 pints total to seal floor drains 8 lbs used to seal wall penetrations 112 ft² used on roofing material All structural steel in painted with one coat of red lead primer. Two coats of light gray enamel (nonlead-based) covers the primer. (Ref: Letter 16F00-98-RAW-026)
2715-B Paint Storage Building and Exterior	17.06.10 17.07.03 17.07.13	<ul style="list-style-type: none"> Asbestos (MSDS #042831) Lead (MSDS #55778) 	<ul style="list-style-type: none"> 288 ft² transite roofing material 40 lead-headed bolts used to secure transite roofing material (Ref: Letter 16F00-98-RAW-029)
Organic Storage Tanks	18.05.11	<ul style="list-style-type: none"> 70%NPH 20% D2EHPA 10%TBP 	<ul style="list-style-type: none"> Estimate less than 2 gal material in the heel of tank #WHCU 0081753 (Ref: Letters 16F00-98-RAW-023 and 16D00-98-SEK-065)
276-B Organic Makeup/Paint Storage Building	01.14.11 01.14.02	<ul style="list-style-type: none"> Di (2-ethyhexyl) phosphoric acid (MSDS #421930) Tributyl Phosphate (MSDS #47042) Diluent – Kerosene (MSDS #36275) Chevron NL Gear Compound 320 (MSDS #14518) NSP 700 Block/Concrete Filler, Part A (MSDS #700002) and Part B (MSDS #700003) 	<ul style="list-style-type: none"> Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in TK-154 Trace amounts in tank agitator for TK-154 4 pints total used to seal drains (Ref: Letters 16F00-98-RAW-025 and 96-071)
276-B Organic Makeup/Paint Storage Building Exterior	01.15.10	<ul style="list-style-type: none"> Asbestos (MSDS #042831) 	<ul style="list-style-type: none"> 700 ft² contained in roof felt (Ref: Letters 16F00-96-RAW-072 and d98-024)
217-B Demineralizer Building Exterior	01.11.15 01.11.03	<ul style="list-style-type: none"> Asbestos (MSDS #11068) Lead (MSDS #55778) 	<ul style="list-style-type: none"> 530 ft² corrugated asbestos transite siding Used to cap the bolts on exterior of the building that attaches the transite siding to the building. Lead-based paint found on the doors and window encasements. (Ref: Letter 16F00-97-RAW-223)

LOCATION	EP#(s)	MATERIAL DESCRIPTION	QUANTITY / STATE
212-B Hot Cell System	02.05.05	<ul style="list-style-type: none"> • Lead (MSDS # 055668) • Devcon 2-ton Clear Epoxy Resin (MSDS #175830) and Hardener (MSDS #17565) • Dow Corning 732, Multi-Purpose Sealant, Aluminum (MSDS #25158) 	<ul style="list-style-type: none"> • Approximately 180 lbs left in place in the 226 Strontium Loadout line used for shielding purposes. (Ref: Letter 16F00-98-RAW-016 and 97-140) Approximately 5 to 10 lbs used for shielding around associated piping inside hot cell (Ref: Letters 16F00-98-RAW-016 and 97-140) • Approximately 18 gal total used for fixing contamination in metal catch tray located on east side of cell • 21 oz used for sealing around outside entrance of hot cell (Ref: Letters 16F00-98-RAW-016 and 97-140)
212-B Crane	02.03.09	<ul style="list-style-type: none"> • Shell Alvania EP Grease 2 (MSDS #25047B) • Texaco Regal R&O (MSDS #13818) 	<ul style="list-style-type: none"> • 140 oz total found in the following: + Bridge drive shaft bearings (14 oz) + Bridge wheel bearings (56 oz) + Hoist drum bearings (14 oz) + Trolley wheel bearings (56 oz) • 10 gal hoist drum gears 1 gal hoist drum brake gears 3 gal trolley primary reduction gears (Ref: Letters 16F00-97-RAW-139 and 98-015)

DISTRIBUTION

ONSITE (xx copies)

**U.S. Department of Energy
Richland Operations Office**

C. A. Ashley (RL)	H0-12
T. W. Ferns	H0-12
C. H. Gunion	H0-12
P. M. Pak	H0-12
L. E. Rogers	R3-79

B&W Hanford Company

R. W. Bailey	S4-49
L. C. Zinsli	S6-15

ERC Team

D. R. Byers	S3-21
V. G. Edens	H0-15
T. A. Edwards	S3-20
R. G. Egge	S3-21
G. L. Funnell	T7-05
R. P. Henckel	S3-21
C. J. Kemp	S3-20
N. R. Kerr	S3-21
R. J. Land	H0-02
J. J. McGuire	S3-20
R. G. Shuck	T7-05
S. R. Turney	S3-21
P. J. Woods	S3-20
J. C. Work	S3-20
S/M&T Project Files	S3-20
Document Information Services (3)	H0-09
DOE-RL Reading Room	H2-53
Hanford Technical Library	P8-55

Attachment 2

072374

DOE/RL-99-24

**SURVEILLANCE AND MAINTENANCE PLAN FOR THE
221-B FACILITY (B PLANT)**

APPROVAL:

Thomas Ferns 9/13/99
T. W. Ferns, Project Manager
Restoration Projects Division
U.S. Department of Energy
Richland Operations Office

L. E. Rogers 9/13/99
L. E. Rogers, B Plant Program Manager
Transition Program Division
U.S. Department of Energy
Richland Operations Office

T. A. Wooley, B Plant Project Manager
Nuclear Waste Program
State of Washington
Department of Ecology