1243829
00715144

DOE/RL-2004-45
Rev. 0

# Sampling and Analysis Plan for the B Plant Construction Laydown Yard

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management


**United States Department of Energy**
P.O. Box 550
Richland, Washington 99352

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200



RECEIVED
APR 19 2017
EDMC


Approved for Public Release
(Upon receipt of Clearance approval)
Further Dissemination Unlimited

200-CB-1

65

DOE/RL-2004-45
Rev. 0

# Sampling and Analysis Plan for the B Plant Construction Laydown Yard

CR Haas, Fluor Hanford

June 2004

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

**United States Department of Energy**
**P.O. Box 550**
**Richland, Washington 99352**

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

| | | |
|---|---|---|
| L. Aardal | 6-24-2004 | N/A |
| Clearance Approval | Date | Release Approval (stamp) |

Approved for Public Release
(Upon receipt of Clearance approval)
Further Dissemination Unlimited

DOE/RL-2004-45
Rev. 0

| For use with Technical Documents (when appropriate) | |
|---|---|
| EDC- | FMP- |
| EDT- | ECN- |
| Project No.: | Division: CP |
| Document Type: RPT | Page Count: 65 |

| For use with Speeches, Articles, or Presentations (when appropriate) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Abstract | | Summary | | Full Paper | | Visual Aid | |
| Conference Name: | | | | | | | |
| Conference Date: | | | | | | | |
| Conference Location: | | | | | | | |
| Conference Sponsor: | | | | | | | |
| Published In: | | | | | | | |
| Publication Date: | | | | | | | |

**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.

Scientific or technical information is available to U.S. Government and U.S. Government contractor personnel through the Office of Scientific and Technical Information (OSTI). It is available to others through the National Technical Information Service (NTIS).

This report has been reproduced from the best available copy.

Printed in the United States of America

# EXECUTIVE SUMMARY

## Document Overview

This sampling and analysis plan (SAP) provides information and instructions to be used for sampling and analysis activities in the B Plant Construction Laydown Yard. The SAP consists of three parts – the data quality objectives, the quality assurance project plan, and the field sampling plan.

The Data Quality Objectives (DQO) summary report (Sections 1.0 through 7.0) describes the planning approach for defining the data collection design criteria for data obtained through sampling and analysis, visual inspection, and direct-reading radiological surveys.

The Quality Assurance Project Plan (QAPjP) (Section 8.0) presents the objectives, functional activities, methods, and quality assurance/quality control procedures associated with the B Plant Construction Laydown Yard decontamination and demolition (D&D) sample collection, laboratory analyses, visual inspection, and radiological surveys. The QAPjP follows U.S. Environmental Protection Agency (EPA) guidelines contained in *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (EPA 2001) and *EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans* (EPA 2001a).

The Field Sampling Plan (FSP) (Section 9.0) provides the strategy for sample collection, laboratory analyses, visual inspections, and radiological surveys during characterization activities at the B Plant Construction Laydown Yard. Data collection from sampling and analysis, process knowledge, and/or existing characterization, will be used to identify the chemical, hazardous, and radiological contamination of the facility structure and internal components and the wastes resulting from the D&D activities and will support the preparation of the waste profile summaries to determine the appropriate waste disposition in accordance with *Washington Administrative Code* 173-303, "Dangerous Waste Regulations"; *Hanford Site Solid Waste Acceptance Criteria* (FH 2003); and *Environmental Restoration Disposal Facility Waste Acceptance Criteria* (BHI 2002).

## Quality Assurance

The activities described in this SAP meet the quality assurance (QA) requirements for data quality found in *EPA QA/G-4, Guidance for the Data Quality Objectives Process* (EPA 1994). The QAPjP covers the sampling and analysis activities that are required to support the D&D of the B Plant Construction Laydown Yard. The QAPjP was prepared using the guidance provided in *EPA QA/G-5, EPA Guidance for Quality Assurance Project Plans* (EPA 1998).

Two laboratories have been identified to provide analytical services: the Waste Sampling and Characterization Facility (WSCF) and the 222-S Laboratory. The WSCF Quality Assurance Plan is specified in HNF-SD-CP-QAPP-017, *Waste Sampling and Characterization Facility Quality Assurance Plan* and the 222-S Quality Assurance Plan is specified in HNF-SD-CP-QAPP-016, *222-S Laboratory Quality Assurance Plan*. These laboratory Quality Assurance Plans implement the applicable requirements of the Hanford Analytical Services Quality Assurance Requirements Document (HASQARD), Volume 4 (DOE-RL 1998). Further details regarding QA are included in Section 8.0 of this report.

This page intentionally left blank.

# CONTENTS

EXECUTIVE SUMMARY ..... ES-1

ACRONYMS ..... vii

1.0 DATA QUALITY OBJECTIVES ..... 1
1.1 PURPOSE ..... 1
1.2 SCOPE ..... 1
1.3 EXISTING REFERENCES ..... 1
1.4 AREA HISTORY AND DESCRIPTION ..... 2
1.4.1 Historical Description ..... 2
1.4.2 Physical Description ..... 7
1.5 LIST OF CONTAMINANTS OF POTENTIAL CONCERN ..... 12
1.6 CONTAMINANT OF POTENTIAL CONCERN EXCLUSIONS ..... 12
1.7 FINAL LIST OF COCS ..... 13

2.0 STATEMENT OF THE PROBLEM ..... 14

3.0 IDENTIFY THE DECISION ..... 14

4.0 IDENTIFY INPUTS TO THE DECISION ..... 16
4.1 INFORMATION REQUIRED TO RESOLVE DECISION STATEMENTS ..... 16
4.2 ANALYTICAL PERFORMANCE REQUIREMENTS ..... 17

5.0 DECISION RULES ..... 19

6.0 FINAL ACTION LEVELS ..... 19

7.0 SAMPLING DESIGN ..... 21
7.1 FOCUSED SAMPLE DESIGN ..... 21
7.2 SPECIFIC MEDIA SAMPLING ..... 21
7.3 WASTE DISPOSITION OPTIONS ..... 21

8.0 QUALITY ASSURANCE PROJECT PLAN ..... 22
8.1 SCOPE AND PURPOSE ..... 22
8.2 PROJECT MANAGEMENT ..... 22
8.2.1 Project Organization ..... 22
8.3 PROBLEM DEFINITION/BACKGROUND ..... 22
8.3.1 Project Description and Schedule ..... 22
8.3.2 Quality Objectives and Criteria ..... 22
8.4 DATA QUALITY OBJECTIVES ..... 23
8.4.1 Data Quality Indicators ..... 23
8.4.2 Special Training Requirements/Certification ..... 24
8.4.3 Documentation and Records ..... 24
8.5 MEASUREMENT/DATA ACQUISITION ..... 24
8.5.1 Sampling Process Design ..... 24
8.5.2 Sampling Methods Requirements ..... 24
8.5.3 Sample Handling and Custody Requirements ..... 25
8.5.4 Analytical Methods Requirements ..... 25

## CONTENTS (cont)

8.5.5 Quality Control Requirements ..... 25
8.5.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements ..... 25
8.5.7 Instrument Calibration and Frequency ..... 26
8.5.8 Inspection/Acceptance Requirements for Supplies and Consumables ..... 26
8.5.9 Data Management ..... 26
8.6 ASSESSMENT/OVERSIGHT ..... 27
8.6.1 Assessments and Response Actions ..... 27
8.6.2 Reports to Management ..... 27
8.7 DATA VALIDATION AND USABILITY ..... 27
8.7.1 Data Review, Validation, and Verification Requirements ..... 27
8.7.2 Validation and Verification Methods ..... 27
8.7.3 Reconciliation with Data Quality Objectives ..... 27

9.0 FIELD SAMPLING PLAN ..... 28
9.1 SAMPLING OBJECTIVES ..... 28
9.2 SAMPLING LOCATIONS ..... 28
9.2.1 DOE and EPA Involvement with Specific Sample Events, Sampling Location, and Disposal ..... 28
9.3 LABORATORY ANALYSIS ..... 29
9.4 ARCHIVE SAMPLES AND SPLITS ..... 29
9.5 RADIOLOGICAL SURVEYS ..... 29
9.5.1 Routine Radiological Surveys ..... 29
9.5.2 Material Release Surveys for Reuse ..... 29
9.5.3 Soil and Slab Visual and Radiological Surveys ..... 30
9.6 SAMPLING PROCEDURES ..... 30
9.7 SAMPLE AND WASTE MANAGEMENT ..... 30
9.7.1 Waste Profiling ..... 31
9.8 HEALTH AND SAFETY ..... 31
9.9 ANAMOLOUS WASTE MATERIALS ..... 31

10.0 REFERENCES ..... 34

## APPENDIX

A B PLANT CONSTRUCTION LAYDOWN YARD SAMPLE LOGBOOK ..... APP A-i

B B PLANT CONSTRUCTION LAYDOWN YARD PHOTOS ..... APP B-i

## FIGURES

Figure 1-1. Hanford Site 200 East Area. ..... 4
Figure 1-2. B Plant Radiological Buffer Area. ..... 5
Figure 1-3. Location of 241-ER-152 Diversion Box. ..... 6
Figure 1-4. Location of Structures Within the Yard. ..... 11

# TABLES

Table 1-1. Existing References. 1
Table 1-2. Laydown Yard Structures. 7
Table 1-3. Contaminants of Potential Concern. 12
Table 1-4. Rationale for COPC Exclusion. 12
Table 1-5. Final List of COCs. 13
Table 3-1. Summary of DQO Problem Statement Information. 14
Table 4-1, DSs Where Data Do Not Exist or Are of Insufficient Quality to Resolve the DSs. 16
Table 4-2. Analytical Performance Requirements for Solid/Other Materials. 17
Table 5-1. Decision Rules. 19
Table 6-1. Concentration Limits – Environmental Restoration Disposal Facility (BHI 2001, 2002). 20
Table 6-2. Action Limits – Recycling Requirements for Used Oil. 20
Table 6-3. Action Levels – PHMC Radiological Control Manual Radiological Release Limits. 21
Table 9-1. Specific Media Sampling. 32

This page intentionally left blank.

# ACRONYMS

| | |
|---|---|
| ACM | asbestos-containing material |
| AM | action memorandum |
| CCRC | Hanford's Centralized Consolidation/Recycling Center |
| CERCLA | *Comprehensive Environmental Response, Compensation and Liability Act of 1980* |
| CFR | *Code of Federal Regulations* |
| CWC | Central Waste Complex |
| D&D | decontamination and demolition |
| DOE | U.S. Department of Energy |
| DQO | data quality objectives |
| Ecology | State of Washington Department of Ecology |
| EE/CA | engineering evaluation/cost analysis |
| EPA | U.S. Environmental Protection Agency |
| ERDF | Environmental Restoration Disposal Facility |
| ETF | 200 Areas Effluent Treatment Facility |
| FH | Fluor Hanford, Inc. |
| GEA | gamma energy analysis |
| GM | Geiger-Mueller counter |
| JCS | Job Control System |
| HASQARD | Hanford Analytical Services Quality Assurance Requirements Document |
| LLW | low-level waste |
| PCB | polychlorinated biphenyls |
| PHMC | Project Hanford Management Contract |
| PLM | polarized light microscopy |
| QAPjP | quality assurance project plan |
| RCRA | *Resource Conservation and Recovery Act of 1976* |
| RDL | required detection limit |
| RPD | relative percent difference |
| SAP | sampling and analysis plan |
| TOX | total organic halides |
| TSCA | *Toxic Substances Control Act of 1976* |
| TSD | treatment, storage, and/or disposal |
| WAC | *Washington Administrative Code* |
| WSCF | Waste Sampling and Characterization Facility |

This page intentionally left blank.

# 1.0 DATA QUALITY OBJECTIVES

## 1.1 PURPOSE

The purpose of the B Plant Construction Laydown Yard Data Quality Objectives (DQO) summary report (FH 2004) was to develop a defensible sampling approach for use in dispositioning waste material generated from the cleanup of equipment and materials, as well as demolition of trailers and other miscellaneous structures, within the B Plant Construction Laydown Yard. The types of waste that are expected to be generated include building and trailer demolition debris, contaminated equipment and materials, and soil. Sections 1.0 through 7.0 of this SAP present the data quality objectives process for the B Plant Construction Laydown Yard decontamination and demolition (D&D) project.

## 1.2 SCOPE

The field activities in the scope of work covered by the B Plant Construction Laydown Yard DQO summary report are (1) sampling and analysis for waste characterization purposes, (2) radiological survey and disposal or recycle of equipment and materials, (3) demolition of structures and mobile offices, and (4) radiological survey and visual inspection of areas below structures, and removal of contaminated soil. This DQO summary report addresses the disposition of waste resulting from demolition of structures and mobile offices, as well as cleanup of contaminated equipment and materials from the B Plant Construction Laydown Yard.

## 1.3 EXISTING REFERENCES

The documents identified in Table 1-1 were used to support the description, process history, deactivation activities and previous sampling/analysis of points in the facility addressed in this DQO process.

Table 1-1. Existing References.

| Reference | Summary |
|---|---|
| *Engineering Evaluation/Cost Analysis for the 224-B Plutonium Concentration Facility*, DOE/RL-2000-06 Rev. 2 (DOE/RL-2003) | Provides the basis for the CERCLA removal action in the B Plant Construction Laydown Yard. |
| *Waste Encapsulation and Storage Facility (WESF) Radiological Characterization Study*, HNF-3956, Rev. 0, (B&W 1999) | Provides radiological characterization data for contamination associated with the fruit fly waste. |
| *SWITS Report Shipment 30953 From Dyncorp (D Poor) to WMP TSD Unit LLBG*, (DYN 1998) | Provides radiological data for contamination associated with the fruit fly waste. |
| *Fall 1998 200 East Area Biological Vector Contamination Report*, HNF-3628, Rev. 0 (FH 1999) | Provides historical information regarding the construction laydown yard and the source of the radiological contamination. |

Table 1-1. Existing References.

| Reference | Summary |
|---|---|
| *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Rev. 4 (BHI 2002) | Provides land disposal restriction limits and the chemical and radiological concentration limits in the wastes to be disposed at ERDF. |
| *Hanford Site Solid Waste Acceptance Criteria*, HNF-EP-0063, Rev. 8 (FH 2003) | Provides waste acceptance criteria for disposal at the low level burial grounds. |

## 1.4 AREA HISTORY AND DESCRIPTION

### 1.4.1 Historical Description

The B Plant Construction Laydown Yard is located south of the 221-B Building in the 200E Area (Figure 1-1) of the Hanford Site. The laydown yard was last managed by the Fluor Federal Services Construction Forces and has since been vacated. The laydown yard contains radiologically contaminated materials, equipment, mobile offices, and miscellaneous structures.

From late September through early November 1998, an approximately 2.5 hectare (6.2 acre) area (Figure 1-2) at the Hanford Site's 200 East Area came under intense scrutiny to determine the source of an unexpectedly high number of radioactive contamination discoveries. The area is immediately southwest of B Plant and contains facilities that were, at one time, under the supervision of five different Hanford Site contractors.

Biota-related transport of radioactive contamination had been observed and tracked in this area since at least 1982. Past monitoring records indicate that Russian Thistle (*Salsola kali*), also known as tumbleweed, harvester ants (*Pogonomyrmex salinas*), and deer mice (*Peromyscus maniculatus*) had been observed to be frequent contributors to contamination transport (i.e., vectors), often with significant loss of equipment and the need for expensive cleanup actions. The most recent (summer 1998) significant contamination spreads had been caused by deer mice at the 241-ER-151 Diversion Pit and at B Plant's K-3 Filter Pit Encapsulation Facility. Discovery of additional contamination at the nearby MO-967 Mobile Office, used as a lunchroom, was first thought to be related to these incidents.

Increased surveys found contamination in places not typical of mouse or ant caused contamination. The contamination was found to be associated with discarded food and food containers in places such as refuse cans, on walls, and in dumpsters. A radiological control technician (RCT) conducting a radiation survey at the lunchroom observed contamination 'flying away', alerting environmental monitoring personnel that a new vector for contamination spread had to be considered and new methods for survey had to be adopted. Fruit flies of the genus *Drosophila* were observed to be prevalent in the lunch trailer and throughout the area. Flying insect traps baited with fruit were placed at each facility in the immediate area and near the 200 East Area quickly collected contaminated fruit flies, while those at the 200 West Area or at other 200 East Area locations did not. Only one contaminated fruit fly was discovered outside the immediate 2.5 hectare (6.2 acre) area.

The contamination was spread from a radioactive waste transfer piping diversion pit to nearby mobile offices and structures. It is believed that fruit flies were attracted to a sucrose-based contamination fixative applied to the inside of a contaminated concrete diversion pit to control smearable radiological contamination before work was initiated inside the pit. After eggs were laid in the sweet mixture by the

insects, they hatched, matured, and spread contamination in the pit to the nearby B Plant Construction Laydown Yard.

As referenced in FH 1999, the source of contamination that lead to the 1998 fruit fly contamination event was presumed to be the 241-ER-152 Diversion Box (Figure 1-3) located in the B Plant Construction Laydown Yard. Trailers and materials/equipment in the vicinity of this diversion box were, at that time, placed within a Radiological Buffer Area (RBA) (Figure 1-2) until such a time that they could be dispositioned.

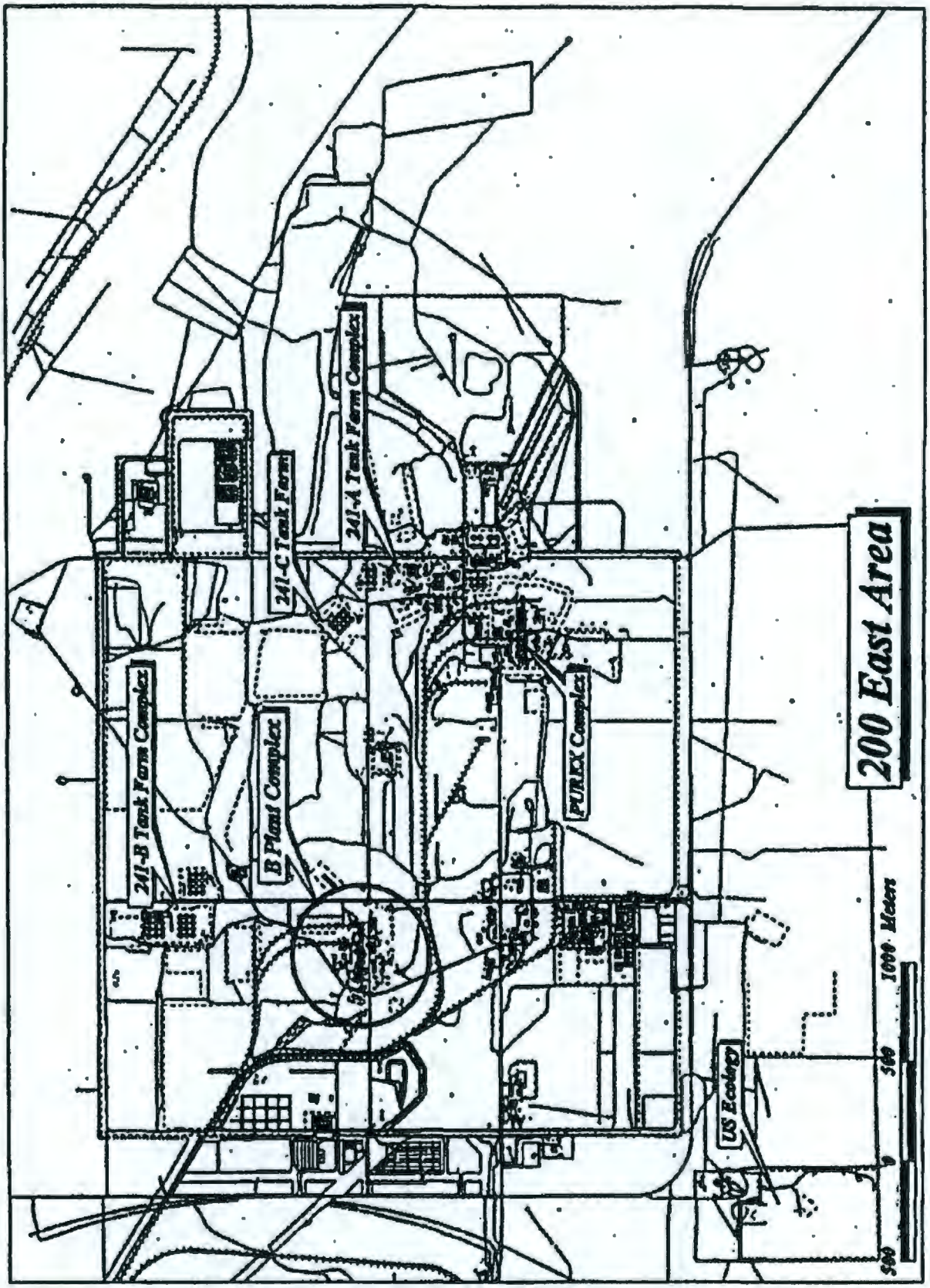



Figure 1-1. Hanford Site 200 East Area.

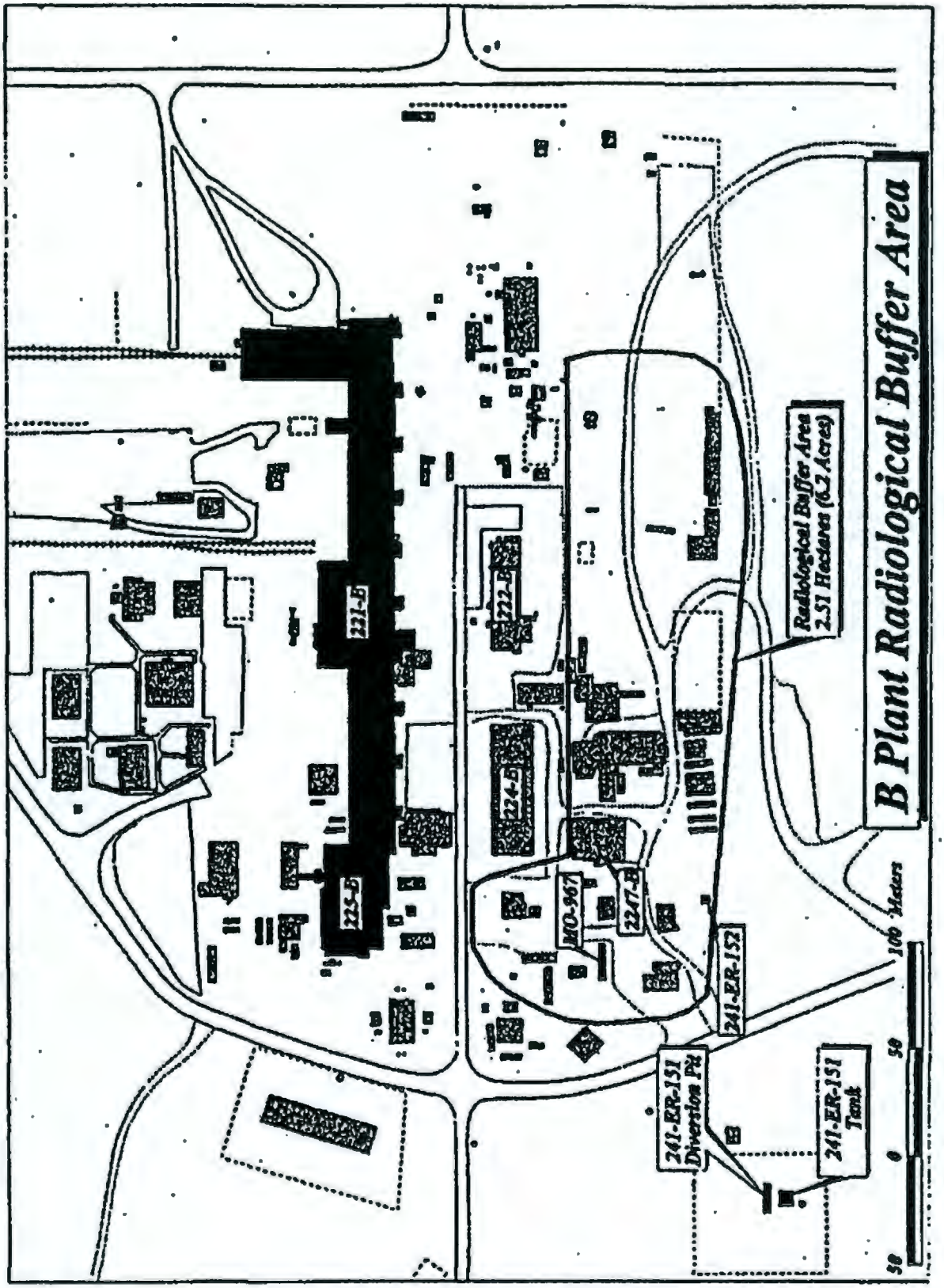



Figure 1-2. B Plant Radiological Buffer Area.

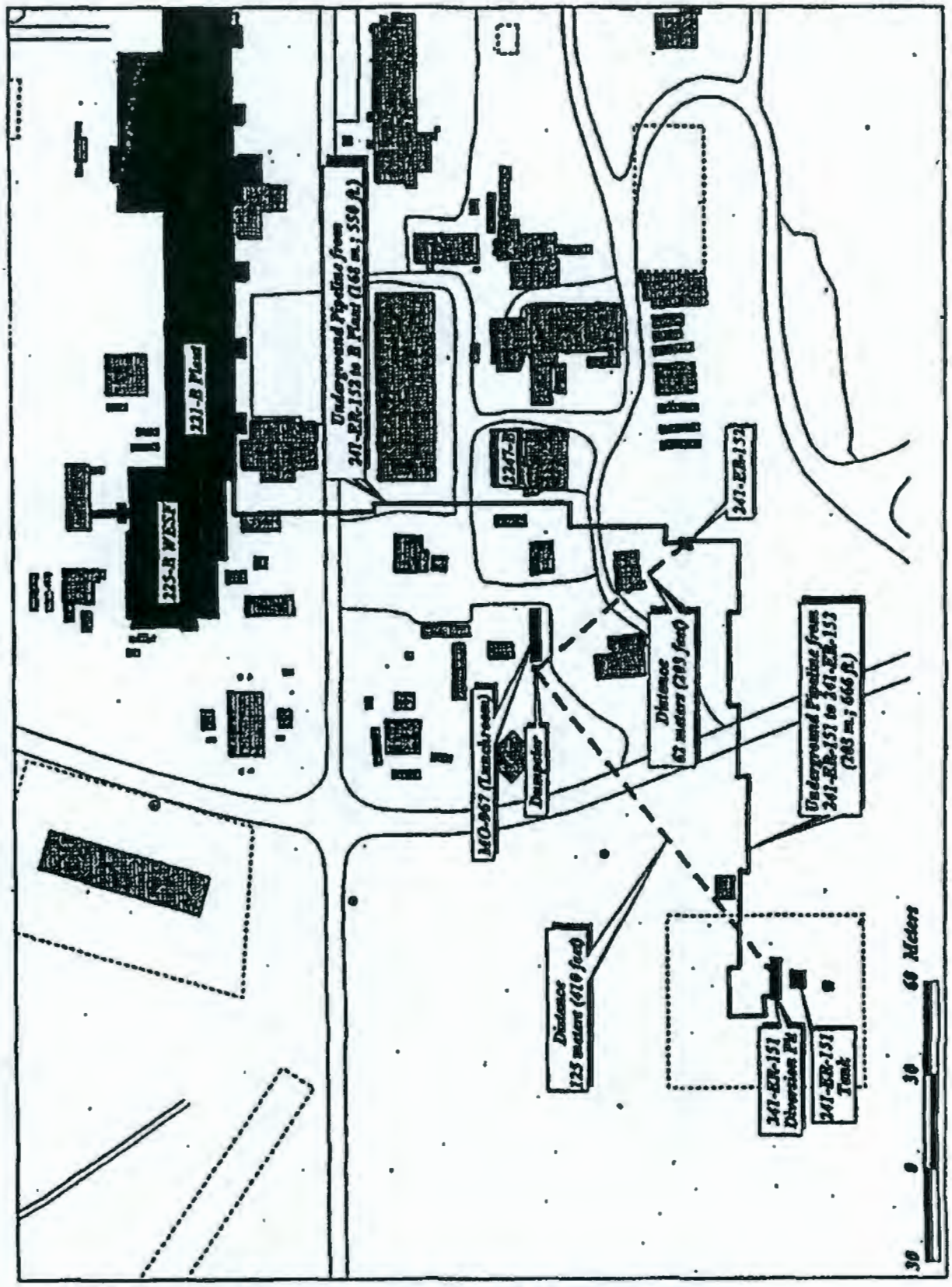



Figure 1-3. Location of 241-ER-152 Diversion Box.

### 1.4.2 Physical Description

The B Plant Construction Laydown Yard is located south of the 221-B Building in the 200 East Area (Figure 1-1) of the Hanford Site. The laydown yard consists of contaminated mobile office trailers, and miscellaneous structures (Figure 1-4) which housed materials and equipment used by construction forces. In addition, the laydown yard contains contaminated equipment and materials, scrap metal, obsolete machinery, and wood. Table 1-2 lists the contaminated structures and office trailers that are contained within the laydown yard, as well as potential waste streams and contaminants of potential concern that are expected to be encountered.

Table 1-2. Laydown Yard Structures.

| Structure No. | Type | Primary Material | Potential Waste Streams | COPCs |
|---|---|---|---|---|
| MO-958 | Mobile Trailer | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| MO-964 | Mobile Trailer | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| MO-967 | Mobile Trailer | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| MO-959 | Mobile Trailer | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| MO-965 | Mobile Trailer | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils, Transformers | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |

Table 1-2. Laydown Yard Structures.

| Structure No. | Type | Primary Material | Potential Waste Streams | COPCs |
|---|---|---|---|---|
| 2238E | Skid Mount Shack | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, selenium, silver, iron, tin |
| 2240E | Trailer Skid | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2251E | Trailer Skid | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils, Incandescent Light Bulbs | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2254E | Building | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils, Incandescent Light Bulbs | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2253E | Trailer Skid | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils, Incandescent Light Bulbs | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2241B | Building | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2239E | Trailer Skid | Metal and Wood | Building Debris, Asbestos containing material, Light Ballasts, Paint, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |

Table 1-2. Laydown Yard Structures.

| Structure No. | Type | Primary Material | Potential Waste Streams | COPCs |
|---|---|---|---|---|
| 272BC | Trailer Skid | Metal and Wood | Building Debris, Light Ballasts, Paint | Radiological Contamination, PCBs, barium, lead, arsenic, cadmium, chromium, mercury, selenium, silver, iron, tin |
| 2201B | Building | Metal and Wood | Building Debris, Light Ballasts, Paint, Thermostats/Thermometer, Asbestos containing material, Oils | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2244B | Building | Metal and Wood | Building Debris, Light Ballasts, Fuses, Transformers, Thermometers, Emergency Light Batteries, Incandescent Light Bulbs, Asbestos containing material, Oils, Paint | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, sulfuric acid, selenium, silver, iron, tin |
| 2245B | Building | Metal and Wood | Building Debris, Light Ballasts, Fuses, Asbestos containing material, Incandescent Light Bulbs, Oils, Thermometer, Paint, Batteries | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, nickel, selenium, silver, iron, tin |
| 2247B | Building | Metal and Wood | Asbestos containing material, Building Debris, Light Ballasts, Fuses, Transformers, Thermostats, Oils, Paint | Asbestos, Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2252E | 2 Conexes<br>1 Building | Metal and Wood | Building Debris, Light Ballasts, Paint, Thermostat | Radiological Contamination, PCBs, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2200B | Building | Metal and Wood | Building Debris, Light Ballasts, Thermometer, Oils, Paint | Radiological Contamination, PCBs, TOX, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |
| 2255EA | Building | Metal and Wood | Building Debris, Transformers, Paint, Light Ballasts, Containerized Low Level Waste from the Fruit Fly Incident | Radiological Contamination, PCBs, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, iron, tin |

Table 1-2. Laydown Yard Structures.

| Structure No. | Type | Primary Material | Potential Waste Streams | COPCs |
|---|---|---|---|---|
| 2257E | Building | Metal and Wood | Building Debris, Paint, Light Ballasts, Exit Signs | Radiological Contamination, PCBs, lead, cadmium, arsenic, barium, chromium, mercury, selenium, silver, tritium, iron, tin |
| 2255E | Building | Metal and Wood | Building Debris, Paint | Radiological Contamination, lead, cadmium, arsenic, barium, chromium, mercury, selenium, silver, iron, tin |
| 2256E | Building | Metal and Wood | Building Debris, Paint | Radiological Contamination, lead, cadmium, arsenic, barium, chromium, mercury, selenium, silver, iron, tin |

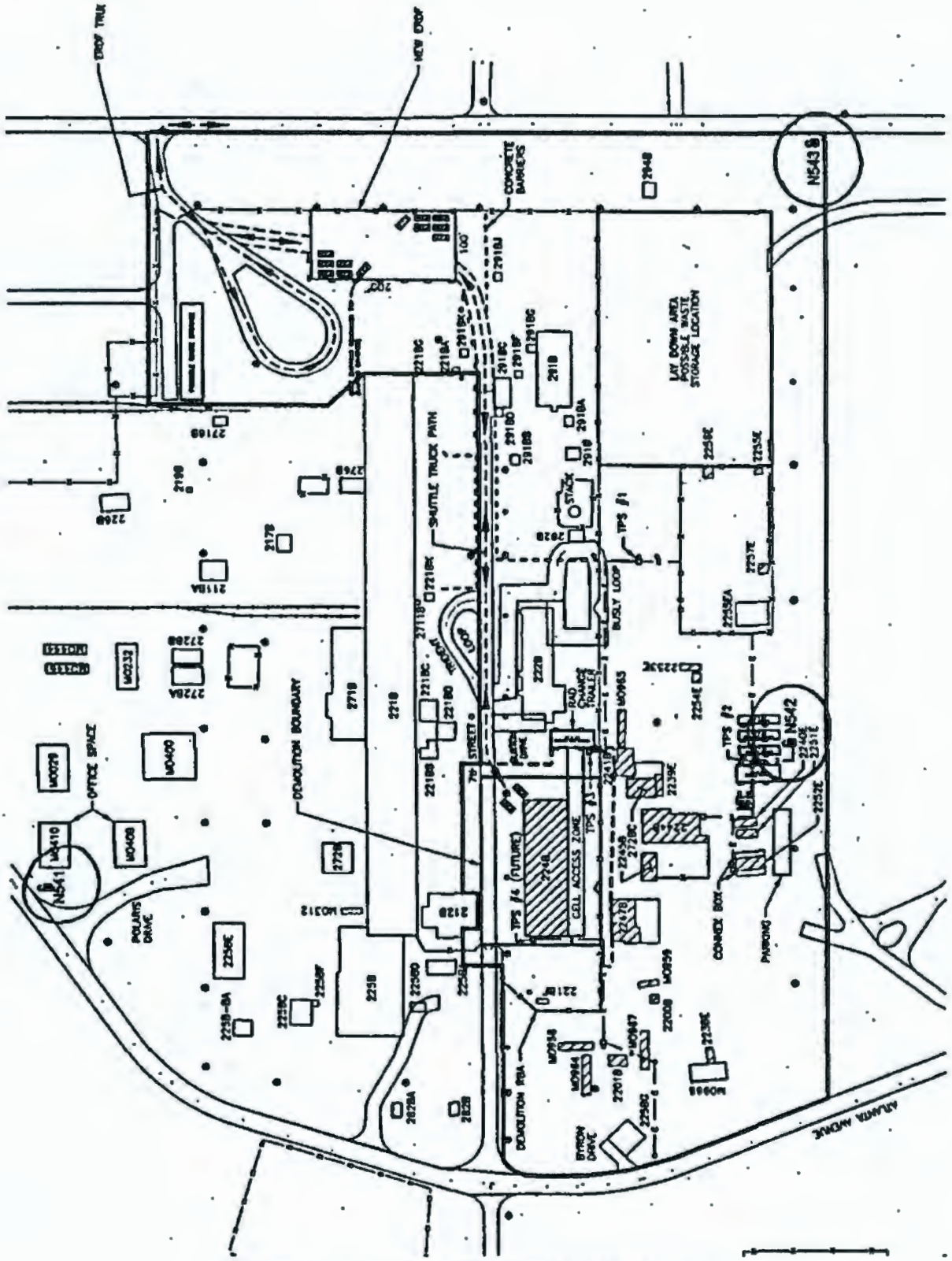



Figure 1-4. Location of Structures Within the Yard.

## 1.5 LIST OF CONTAMINANTS OF POTENTIAL CONCERN

Table 1-3 summarizes the radiological and chemical COPCs described in the various waste streams. These COPCs are based on process knowledge, historical data, and DQO team pre-demolition walkdowns.

Table 1-3. Contaminants of Potential Concern.

| |
|---|
| Sr90 - Y90 |
| Cs137 - Ba137 |
| Plutonium Isotopes |
| Asbestos |
| Lead |
| Sulfuric Acid |
| PCBs |
| Mercury |
| Tritium |
| Barium |
| Arsenic |
| TOX |
| Cadmium |
| Nickel |
| Iron |
| Tin |
| Selenium |
| Silver |
| Chromium |
| Petroleum products |

## 1.6 CONTAMINANT OF POTENTIAL CONCERN EXCLUSIONS

Table 1-4 presents a list of the COPCs to be excluded from the investigation. These exclusions are based on physical laws, process knowledge, task focus, and/or historical data. Table 1-4 also provides the specific rationale for the exclusion of each of the identified COPCs.

Table 1-4. Rationale for COPC Exclusion.

| COPC Excluded | Rationale For Exclusion |
|---|---|
| Iron | Excluded as a solid material; not a Washington State toxic or persistent waste and not a UHC as defined in 40 CFR 268.2. |
| Tin | Excluded as a solid material; not a Washington State toxic or persistent waste and not a UHC as defined in 40 CFR 268.2. |
| Plutonium Isotopes | Not expected to be present per FH 1999. |

UHC = underlying hazardous constituent

## 1.7 FINAL LIST OF COCS

Table 1-5 presents the final list of contaminants of concern (COCs) that will be carried through the remainder of the DQO process. In addition, Table 1-5 lists the final list of waste streams that are expected to be encountered during D&D activities.

Table 1-5. Final List of COCs.

| Waste Stream No. | Waste Streams | COCs |
|---|---|---|
| 1 | Bulk demolition debris includes but is not limited to:<br>• poured concrete<br>• concrete block<br>• sheetrock<br>• wooden doors<br>• non-asbestos containing roofing materials<br>• machinery & miscellaneous equipment<br>• steel siding<br>• tin roofing<br>• steel (scrap, I-beams) | Sr-90<br>Cs-137 |
| 2 | Asbestos-containing material | Asbestos Fibers, Sr-90, Cs-137 |
| 3 | Incandescent Light Bulbs | Lead, Sr-90, Cs-137 |
| 4 | Fluorescent Light Ballasts and Tubes | PCBs (ballasts only), Sr-90, Cs-137 |
| 5 | Lead Fuses | Lead, Sr-90, Cs-137 |
| 6 | Thermostats and Thermometers | Mercury, Sr-90, Cs-137 |
| 7 | Emergency light batteries | Lead, Sulfuric Acid, Sr-90, Cs-137 |
| 8 | Exit signs | Tritium, Sr-90, Cs-137 |
| 9 | Lubrication grease, oil, hydraulic oils (includes door actuators and transformer oil) | PCBs, arsenic, barium, cadmium, chromium, lead, mercury, TOX, Sr-90, Cs-137 |
| 10 | Paints | Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, PCBs, Sr-90, Cs-137 |
| 11 | Batteries | Nickel, Cadmium, Sr-90, Cs-137 |
| 12 | Electrical Transformers | PCBs, Sr-90, Cs-137 |
| 13 | Step off pad soft waste | Sr-90, Cs-137 |
| 14 | Stained or discolored soil | Sr-90, Cs-137, (These isotopes are only COCs for those areas that are currently posted as radiologically contaminated) PCBs, arsenic, barium, cadmium, chromium, lead, mercury, TOX, petroleum. |

## 2.0 STATEMENT OF THE PROBLEM

Demolition and cleanup of the B Plant Construction Laydown Yard will generate radiologically and non-radiologically contaminated waste material. This waste will have to be disposed and, therefore, must be properly designated to ensure that the receiving facilities' waste acceptance criterion are met.

## 3.0 IDENTIFY THE DECISION

To address the problem statement, a series of principal study questions (PSQs) must be answered. Table 3-1 presents these PSQs and the alternative actions (AAs) that will be taken after each PSQ has been answered. Each AA has the possibility of being an incorrect choice. Table 3-1 discusses the consequences of incorrectly choosing each AA and provides a qualitative assessment of the severity of the consequences of incorrectly choosing each AA. Finally, the PSQs and AAs are combined into decision statements (DSs).

Table 3-1. Summary of DQO Problem Statement Information.

| PSQ-AA# | Alternative Action | Description of Consequences of Implementing the Wrong Alternative Action | Severity of Consequences (Low/Moderate/Severe) |
|---|---|---|---|
| *PSQ #1 – Does the waste material exceed the radiological criteria for the disposal facility?* | | | |
| 1-1 | The affected media exceeds the waste acceptance criteria for radionuclides. | Waste is improperly managed and disposed at an inappropriate facility. | Severe |
| 1-2 | The affected media does not exceed the waste acceptance criteria for radionuclides. | Additional project cost incurred as a result of using alternative disposal facilities. | Moderate |
| DS #1 – Determine if the radionuclides present in the waste material exceed the disposal facility's waste acceptance criteria. | | | |
| *PSQ #2 – Do the chemical and/or physical properties of the waste material exceed the disposal facility's waste acceptance criteria limits?* | | | |
| 2-1 | The chemical and/or physical properties of the waste material exceed the disposal facility's waste acceptance criteria limits. | Waste is managed as a nonhazardous waste and improperly disposed. | Severe |
| 2-2 | The chemical and/or physical properties do not exceed the disposal facility's waste acceptance criteria limits. | Waste is unnecessarily managed as a hazardous waste. Additional project cost is incurred. | Low |
| DS #2 – Determine if the chemical and/or physical properties of the waste material exceed the disposal facility's waste acceptance criteria limits. | | | |
| *PSQ #3 – Is the waste material a listed dangerous waste?* | | | |
| 3-1 | The waste material is a listed dangerous waste and receives a listed waste code. | Waste is managed as a non-listed dangerous waste and improperly disposed. | Severe |
| 3-2 | The waste material is not a listed dangerous waste and is not regulated as such. | Waste is managed as a listed dangerous waste and improperly disposed. Additional project costs incurred. | Low |
| DS #3 – Determine if the waste material is regulated as listed dangerous waste. | | | |

Table 3-1. Summary of DQO Problem Statement Information.

| PSQ-A A# | Alternative Action | Description of Consequences of Implementing the Wrong Alternative Action | Severity of Consequences (Low/Moderate/ Severe) |
|---|---|---|---|
| *PSQ #4 – Is the waste material a characteristic dangerous waste (e.g., ignitable, corrosive, reactive, or toxic)?* | | | |
| 4-1 | The waste material is a characteristic dangerous waste (e.g., corrosive, ignitable, reactive, and/or toxic) and receives a characteristic waste code. | Waste is managed as a noncharacteristic dangerous waste and improperly disposed. | Severe |
| 4-2 | The waste material is not a characteristic dangerous waste (e.g., corrosive, ignitable, reactive, and/or toxic) and is not regulated as such. | Waste is managed as a characteristic dangerous waste and improperly disposed. Additional project costs incurred. | Low |
| DS #4 – Determine if the characteristic dangerous waste codes (e.g., corrosivity, ignitability, reactivity, and toxicity) apply to the waste material. | | | |
| *PSQ #5 – Is the waste material a toxic dangerous waste per Washington State criteria?* | | | |
| 5-1 | The waste material is a toxic dangerous waste per Washington State criteria and receives a toxic dangerous waste code. | Waste is managed as a non-toxic dangerous waste and improperly disposed. | Severe |
| 5-2 | The waste material is not a toxic dangerous waste per Washington State criteria and is not regulated as such. | Waste is managed as a toxic dangerous waste and improperly disposed. Additional project costs incurred. | Low |
| DS #5 – Determine if the waste material meets the definition of a toxic dangerous waste in accordance with Washington State criteria. | | | |
| *PSQ #6 – Is the waste material a persistent dangerous waste in accordance with Washington State criteria?* | | | |
| 6-1 | The waste material meets the definition of a persistent dangerous waste in accordance with Washington State criteria. | Waste is managed as a non-persistent dangerous waste and improperly disposed. | Severe |
| 6-2 | The waste material does not meet the definition of a persistent dangerous waste in accordance with Washington State criteria. | Waste is managed as a persistent dangerous waste and improperly disposed. Additional project cost incurred. | Low |
| DS #6 – Determine if the waste material meets the definition of a persistent dangerous waste in accordance with Washington State criteria | | | |
| *PSQ #7 – Is the waste material a PCB waste?* | | | |
| 7-1 | The waste material is regulated due to PCB concentrations. | Waste is managed as a non-PCB regulated waste and improperly disposed. | Severe |
| 7-2 | The waste material is not regulated due to PCB concentrations | Waste is managed as a PCB regulated waste and improperly disposed. | Low |
| DS #7 – Determine if the waste material is regulated due to PCB concentrations. | | | |
| *PSQ #8 – Is the waste material ACM?* | | | |
| 8-1 | The waste material is regulated due to asbestos content. | Waste is managed as non-ACM and improperly disposed. | Severe |
| 8-2 | The waste material is not regulated due to asbestos content. | Waste is managed, as an ACM and improperly disposed. Additional project cost incurred. | Low |
| DS #8 – Determine if the waste material is regulated due to asbestos content. | | | |
| *PSQ #9 – Is the waste material subject to the Land Disposal Restrictions ?* | | | |
| 9-1 | The waste material is land disposal restricted. Treatment is imposed on the debris prior to disposal. | Waste is managed and disposed as non-land disposal restricted waste when it should have been treated. | Severe |
| 9-2 | The waste material is not land disposal restricted. Treatment is not required for the debris prior to disposal. The debris will be disposed in an onsite facility without treatment. | Waste is managed and disposed as land disposal restricted waste. Additional project costs incurred. | Low |
| DS #9 – Determine if Land Disposal Restrictions impose treatment for waste material. | | | |

Table 3-1. Summary of DQO Problem Statement Information.

| PSQ-A A# | Alternative Action | Description of Consequences of Implementing the Wrong Alternative Action | Severity of Consequences (Low/Moderate/ Severe) |
|---|---|---|---|
| *PSQ #10 – Does the material meet the requirements for recycling?* | | | |
| 10-1 | The affected media meets the requirements for recycling. | Waste is disposed when it should have been recycled. Additional project costs incurred. | Low |
| 10-2 | The affected media does not meet the requirements for recycling and must be managed as a waste material. | Waste is improperly recycled when it should have been disposed. | Severe |
| DS #10 – Determine if the affected media meets the recycling requirements. | | | |

[a] The definition of dangerous waste also includes hazardous waste.

# 4.0 IDENTIFY INPUTS TO THE DECISION

The purpose of Table 4-1 is to identify the type of information needed to resolve each of the DSs identified in Table 3-1. The information may already exist or may be derived from computational or surveying/sampling and analysis methods. Analytical performance requirements (e.g., practical quantitation limit [PQL], precision, and accuracy) are also provided in this step for any new data that need to be collected.

## 4.1 INFORMATION REQUIRED TO RESOLVE DECISION STATEMENTS

Table 4-1 identifies the DSs where data do not exist or are of insufficient quality to resolve the DSs.

Table 4-1, DSs Where Data Do Not Exist or Are of Insufficient Quality to Resolve the DSs.

| DS# | Information Needed | Available Data | Is Information Sufficient? |
|---|---|---|---|
| 1 | Information on radiological composition of waste | DYN 1998, FH 1999, B&W 1999 | No for WS#14 (Only areas currently posted for radiological contamination) |
| 2 | Information on chemical and/or physical properties of waste | DYN 1998, FH 1999 | No for WS#14 |
| 3 | Listed waste code status | DYN 1998, FH 1999 | Yes |
| 4 | Characteristic waste code status | Process knowledge | No for WS# 9, 14 |
| 5 | Toxic waste code status | Process knowledge | No for WS# 9, 10 |
| 6 | Persistent waste code status | DYN 1998, FH 1999 | Yes |
| 7 | PCB concentrations | Process knowledge | No for WS# 10, 12, 14 |
| 8 | Information on asbestos containing materials (ACM) | Good faith estimate by certified asbestos handler | No for WS# 2 |
| 9 | Information regarding land disposal restricted materials | Process knowledge | Yes |
| 10 | Information on recyclable materials | FH 1999 | Yes |

## 4.2 ANALYTICAL PERFORMANCE REQUIREMENTS

Table 4-2 identifies the analytical performance requirements and action levels.

Table 4-2. Analytical Performance Requirements for Solid/Other Materials.

| COCs | Analytical Method | Action Level[e,f] | RDL Requirement | Accuracy[b] (% Recovery)[b] | Precision[b] (% RPD)[b] |
|---|---|---|---|---|---|
| Radiological Constituents | | | | | |
| Cesium-137 | GEA | 10 pCi/g | 0.1 pCi/g | 70-130[a] | ±30[a] |
| Total Strontium | Rad-Sr | 10 pCi/g | 1 pCi/g | 70-130[a] | ±30[a] |
| Nonradiological Constituents – Metals | | | | | |
| Arsenic | EPA Method 6010/200.8 | 100 mg/kg | 10 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 5.0 mg/L[d] | 0.5 mg/L | 70-130[b] | ±30[b] |
| Barium | EPA Method 6010/200.8 | 2,000 mg/kg | 2 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 100 mg/L[d] | 10 mg/L | 70-130[b] | ±30[b] |
| Cadmium | EPA Method 6010/200.8 | 20 mg/kg | 0.5 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 1.0 mg/L[d] | 0.1 mg/L | 70-130[b] | ±30[b] |
| Chromium | EPA Method 6010/200.8 | 100 mg/kg | 10 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 5.0 mg/L[d] | 0.5 mg/L | 70-130[b] | ±30[b] |
| Lead | EPA Method 6010/200.8 | 100 mg/kg | 5 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 5.0 mg/L[d] | 0.5 mg/L | 70-130[b] | ±30[b] |
| Mercury | EPA Method 200.8 | 4.0 mg/kg | 0.2 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/200.8 | 0.2 mg/L[d] | 0.02 mg/L | 70-130[b] | ±30[b] |
| Selenium | EPA Method 6010/200.8 | 20 mg/kg | 10 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 1.0 mg/L[d] | 0.1 mg/L | 70-130[b] | ±30[b] |
| Silver | EPA Method 6010/200.8 | 100 mg/kg | 1 mg/kg | 70-130[b] | ±30[b] |
| | EPA Method 1311/6010 | 5.0 mg/L[d] | 0.5 mg/L | 70-130[b] | ±30[b] |
| Nonradiological Constituents – General Inorganics | | | | | |
| Asbestos | PLM | 1 wt%[g] | <1 wt%[g] | N/A | N/A |
| Organic Compounds | | | | | |
| PCBs | EPA Method 8082 | 2 mg/kg | 0.017 mg/kg | 70-130[c] | ±30[c] |
| *Waste Characteristics* | | | | | |
| Gross beta | Proportional counting | 10 pCi/g | 15 pCi/g | 70-130[a] | ±30[a] |
| TOX | EPA Method 9020 | 1,000 mg/kg | 0.5 mg/kg | 70-130[c] | ±30[c] |

Table 4-2. Analytical Performance Requirements for Solid/Other Materials.

| COCs | Analytical Method | Action Level[c,f] | RDL Requirement | Accuracy[a] (% Recovery)[b] | Precision[a] (% RPD)[b] |
|---|---|---|---|---|---|

[a] Accuracy criteria for associated batch laboratory control sample percent recoveries. With the exception of GEA, additional analysis-specific evaluations also performed for matrix spikes, tracers, and carriers, as appropriate to the method. Precision criteria for batch laboratory replicate sample analyses.

[b] The accuracy criteria specified is for calculated percent recoveries for associated analytical batch matrix spike samples. Additional accuracy evaluation based on statistical control limits for analytical batch laboratory control samples is also performed. The precision criteria specified is for calculated relative percent differences (RPDs) for batch laboratory replicate matrix spike analyses or replicate sample analyses.

[c] Accuracy criteria are the minimum for associated batch laboratory control sample percent recoveries. Laboratories must meet statistically based control if more stringent. Additional analyte-specific evaluations also performed for matrix spikes and surrogates as appropriate to the method. Precision criteria for batch laboratory replicate matrix sample analyses.

[d] Lower action level may be needed to determine land disposal treatment requirements.

[e] The 222-S Laboratory may be used for sample analyses due to high dose rates. Laboratory procedures based on EPA SW-846 methods will be used. This approach has been accepted by Washington State Department of Ecology due to the ALARA concerns with the samples and how they must be handled in the 222-S Lab.

[f] MDLs for the 222-S laboratory are orders of magnitude higher than these values and will be acceptable since only the very high content samples will be sent to 222-S for radionuclide quantification. The 222-S lab will not be used for any kind of clearance sampling that could require these low MDLs.

[g] Asbestos concentrations in soil samples will be reported by one of the following phrases, rather than weight percent:

1.) None: No asbestos fibers found.

2.) Trace detectable: with extensive searching, a few asbestos fibers were found; concentration very low, well below 1%.

3.) Obvious presence: Asbestos fibers easily found but overall concentration still low.

4.) Significant presence: Asbestos fibers readily found; overall concentration may approach or exceed 1% level.

EPA = EPA's *Test Methods for Evaluating Solid Waste: Physical and Chemical Methods* (SW-846 [EPA 1997]), except for Methods 300.0 and 418.1 (from EPA's *Methods for Chemical Analysis of Water and Wastes* [EPA 1983]).

GEA = gamma energy analysis

N/A = not applicable

PLM = polarized light microscopy

RPD = relative percent difference

TOX = total organic halides

[h] DOE-RL, 1998, *Hanford Analytical Services Quality Assurance Requirements Document*, DOE/RL-98-68, Vol. 4.

# 5.0 DECISION RULES

Table 5-1 presents the decision rules (DRs) that correspond to each DS identified in Table 4-1.

Table 5-1. Decision Rules.

| DR No. | Decision Rule |
|---|---|
| 1 | If process knowledge or existing data for contaminated materials exceed the final action levels in Table 6-1, then the materials will be evaluated for storage at the CWC in accordance with DR #2 through DR #8, as applicable.<br><br>If process knowledge or existing data for contaminated materials do not exceed the final action levels in Table 6-1, then the materials will be evaluated for disposal at a solid waste landfill, the ERDF, or an offsite TSD unit in accordance with DR #2 through DR #8, as applicable. |
| 2 – 8 | If process knowledge or existing data for contaminated materials indicate that the materials are to be designated as listed, characteristic, toxic, persistent, PCB, or asbestos containing material waste, then materials will be evaluated for treatment or disposal at the ERDF or storage at the CWC in accordance with DR #9.<br><br>If process knowledge or existing data for contaminated materials indicate that the materials are not to be designated as listed, characteristic, toxic, persistent, PCB, or asbestos containing material waste, then materials will be evaluated for being sent to a solid waste landfill in accordance with DR #9. |
| 9 | If process knowledge or existing data dictate land disposal restriction-imposed treatment, then the materials will be treated and disposed at the ERDF or stored at the CWC.<br><br>If process knowledge or existing data do not dictate land disposal restriction-imposed treatment of the materials, then the materials will be disposed at the ERDF. |
| 10 | If process knowledge or existing data for materials indicate that the materials are likely to be reused or recycled, then the materials will be surveyed per Section 7.3 or analyzed per Table 6-2.<br><br>If process knowledge or existing data for materials indicate that the materials are not likely to be reused or recycled, then the materials will be disposed in accordance with DR #1 through DR #9. |

Because waste designation will be based largely on process knowledge, and existing data from waste shipping records associated with the fruit fly contamination incident, statistical sampling designs are not applicable to the DQO process. Therefore, discussions on statistical approaches have been omitted. Instead, sampling and analysis will focus on those waste matrices for which existing data is limited or not available. For example, stained soil, and paint on the structures within the B Plant Construction Laydown Yard are waste matrices that do not have existing characterization data.

# 6.0 FINAL ACTION LEVELS

The concentration or action levels for disposal/recycling/reuse options are described in Tables 6-1 through 6-3. The most restrictive concentration limits or action levels for the disposal/recycling/reuse

options are used for the materials included in the DQO summary report. By meeting the analytical requirements for the most restrictive disposal/recycling/reuse options, the data will be adequate for other less restrictive options. These tables also reflect analysis that may be associated with the anomalous media that may be found during D&D activities and must meet ERDF analytical criteria.

Table 6-1. Concentration Limits – Environmental Restoration Disposal Facility (BHI 2001, 2002)

| COCs | Concentration Limits |
|---|---|
| *PCBs*[a] | |
| PCBs | 500 mg/kg |
| *Metals*[a] | |
| Arsenic | 3,000 mg/kg |
| Barium | 940,000 mg/kg |
| Cadmium | 39,000 mg/kg |
| Chromium (total) | 59,000 mg/kg |
| Selenium | 400,000 mg/kg |
| Silver | 350,000 mg/kg |
| *Radionuclides*[b] | |
| Cesium-137 | 32 $Ci/m^3$ [c] |
| Strontium-90 | 7,000 $Ci/m^3$ [d] |
| Tritium | Unlimited |
| *Waste Characteristics* | |
| Moisture content | Fail |

[a] Public exposure is limiting (DOE-RL 1994).
[b] Radioactive waste Class C limits also apply (10 CFR 61).
[c] *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility* (DOE-RL 1994).
[d] Class C limit in accordance with 10 CFR 61.

Table 6-2. Action Limits – Recycling Requirements for Used Oil.

| COCs | Preliminary Action Levels |
|---|---|
| PCBs | 2 mg/kg |
| TOX | 1,000 mg/kg |
| Chemical constituents and characteristics | See Table 4-2 |
| Radiological constituents | See Table 4-2 |

Table 6-3. Action Levels – PHMC Radiological Control Manual Radiological Release Limits.

| Waste Stream No. | COCs | Action Levels for Solids |
|---|---|---|
| All | Gross beta | 10 pCi/g |
| | Cesium-137 | 10 pCi/g |
| | Strontium-90 | 10 pCi/g |
| | Tritium | 400 pCi/g |
| | Removable beta-gamma | 1,000 (dpm/100 $cm^2$) |
| | Total (fixed + removable) beta-gamma | 5,000 (dpm/100 $cm^2$) |

# 7.0 SAMPLING DESIGN

The objective of the sampling design is to present data collection designs that meet the minimum data quality requirements specified in DQO Sections 1.0 through 7.0.

## 7.1 FOCUSED SAMPLE DESIGN

A focused sampling design is suited to provide waste characterization information that will meet the DSs for all of the waste streams identified in this project. The sample design will incorporate historical information, process knowledge, visual inspections, and radiological surveys and discrete samples of selected waste materials, to determine the historical maximum values of each COC in each waste stream.

## 7.2 SPECIFIC MEDIA SAMPLING

As needed, discrete samples of specific media will be collected from biased locations from those waste streams that have been identified as needing additional sampling/analytical data for final disposition. The laboratory data will be used to confirm contamination levels in each of the materials and to establish the waste profile. This sampling and analysis process will occur prior to and during demolition and cleanup activities.

Table 9-1 identifies the specific media sample design for all of the waste streams identified in the DQO process to resolve the DS for each waste stream. In some cases, existing data, including radiological surveys, and process knowledge will be used to resolve the DS and provide adequate characterization information.

## 7.3 WASTE DISPOSITION OPTIONS

The primary disposal option for the waste streams described in the DQO summary report is the ERDF. The ERDF waste acceptance criteria addresses the radiological, chemical, and physical forms of waste. Those waste streams that are not acceptable to the ERDF will be evaluated for disposition in an alternate disposal location. If these waste streams are encountered, regulatory approval will be sought to ship the waste off site. Waste shipped to the CWC or to a TSD off the Hanford Site must meet the acceptance and packaging criteria outlined in HNF-EP-0063, *Hanford Site Solid Waste Acceptance Criteria* (FH 2003).

The project will evaluate salvageable materials that may have the potential for reuse. At this time, the only items that will be considered for release for reuse will be those items that are not radiologically contaminated. It is recognized that lubricants (i.e., grease and oils) have the potential for volumetric contamination; however, these items will be evaluated for recycling using established criteria.

# 8.0 QUALITY ASSURANCE PROJECT PLAN

## 8.1 SCOPE AND PURPOSE

This Quality Assurance Project Plan (QAPjP) covers the sampling and analysis activities (including field radiological surveys) that are required to support the decontamination and demolition (D&D) of the B Plant Construction Laydown Yard, as described in Section 1.0 of this Sampling and Analysis Plan (SAP). This QAPjP was prepared using the guidance provided in *EPA Guidance for Quality Assurance Project Plans* (EPA 1998) to meet the *EPA Requirements for Quality Assurance Project Plans* (EPA 2001) and *EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans* (EPA 2001a).

This QAPjP defines the Quality Assurance (QA) and Quality Control (QC) activities to be applied to the project to assure the data obtained from the sampling and analysis activities are of the type and quality needed and expected, based on the established Data Quality Objectives (DQOs) described in this SAP.

## 8.2 PROJECT MANAGEMENT

### 8.2.1 Project Organization

The project organization and responsibilities are described in the Decontamination and Demolition Project Execution Plan and in the B Plant Construction Laydown Yard Project Specific Implementation Plan. Detailed responsibilities of those involved in all aspects of the sampling and analysis, from sample collection to disposition, including data generation and acquisition, assessment and oversight, and data validation and usability, are described in applicable implementing procedures.

## 8.3 PROBLEM DEFINITION/BACKGROUND

The problem definition and background are described in Sections 1.0 and 2.0 of this SAP.

### 8.3.1 Project Description and Schedule

The project description and schedules are described in the B Plant Construction Laydown Yard Removal Action Work Plan.

### 8.3.2 Quality Objectives and Criteria

The overall objective of this QAPjP is to provide assurance that the DQOs are achieved. Achievement of the DQOs is assured by implementing the QA and QC activities which are defined in this QAPjP.

## 8.4 DATA QUALITY OBJECTIVES

The DQOs were established using the guidance provided in EPA QA/G-4, *Guidance for the Data Quality Objectives Process* (EPA 1994), and are documented in the DQO summary report (FH 2004). The DQOs are summarized in Sections 1.0 through 7.0 of this SAP.

### 8.4.1 Data Quality Indicators

Data Quality Indicators (DQIs) are qualitative and quantitative measurements taken on data which, when interpreted, determine the degree to which the data are acceptable (i.e., satisfy the DQOs). The DQO process determined that the characterization of waste streams identified in the DQOs does not require statistically based sampling because the characterization deals with individual waste components. Therefore, discrete samples of specific media will be collected from biased locations from those waste streams that have been identified as needing additional sampling/analytical data to determine the upper-bounding level of each contaminant of interest. Since the sampling design will not be statistically based, the DQIs applicable to this SAP will be limited to precision, accuracy, and representativeness. For each DQI, a measurement method and acceptance criteria are specified.

#### 8.4.1.1 Precision

Precision is a quantitative measure of agreement among replicate measurements of the same property, under prescribed similar conditions. The Relative Percent Difference (RPD) method is specified in the DQOs for analytical performance.

The calculational tools specified in the *Hanford Analytical Services Quality Assurance Requirements Document* (HASQARD), Volume 4, (DOE-RL 1998) will be used to determine the RPD.

Acceptance criteria for RPD are specified in Table 4-2 for each analyte of concern. These criteria will be used during the Data Quality Assessment (DQA) to verify the DQOs were achieved.

The manufacturer's specifications will be used as the basis for specifying the precision of radiological field survey instruments.

#### 8.4.1.2 Accuracy

Accuracy is a quantitative measure of the closeness of an individual measurement (or the average of a number of measurements) to the true value. The Percent Recovery (%R) method is specified in the DQOs for analytical performance.

The calculational tools specified in the HASQARD, Volume 4, (DOE-RL 1998) will be used to determine the %R.

Acceptance criteria for %R are specified in Table 4-2 for each analyte of concern. These criteria will be used during the DQA to verify that the DQOs were achieved.

The manufacturer's specifications will be used as the basis for specifying the accuracy of radiological field survey instruments.

#### 8.4.1.3 Representativeness

Representativeness is a qualitative measure of the degree to which a sample, or collection of samples from the same media, appropriately reflect the media from which they were taken. Representativeness applies to solid and liquid samples. Factors that influence the representativeness of a sample include when, where, and how the sample was collected; how the sample was packaged, handled, and transported; the time duration between collection and analysis; and the homogeneity of the media from which the sample is taken. These factors are considered in the sampling process design, described in Section 9.0 of this SAP, to assure the samples are representative.

There are no acceptance criteria specified for representativeness in the DQOs. However, during the DQA process, representativeness will be assessed using the factors discussed above.

### 8.4.2 Special Training Requirements/Certification

Training and certification requirements are established in the Project Hanford Management Contract (PHMC) requirements document HNF-RD-11061, *Training Requirements*. These requirements are implemented in accordance with Central Plateau Remediation Project Procedure CP-PRO-013, *Employee Training*. In addition, the B Plant Construction Laydown Yard project site specific health and safety plan, work packages, permits, and job hazards analysis forms will provide additional training requirements. A B Plant Construction Laydown Yard D&D training matrix will be prepared to summarize and reference the specific training requirements for all personnel for each phase of the project.

### 8.4.3 Documentation and Records

Documentation and records are controlled (i.e., specified, prepared, reviewed, approved, issued, used, revised, stored, protected, retrieved, dispositioned, etc.) in accordance with Project Hanford Management System (PHMS) procedures. Documents are controlled in accordance with the requirements specified in HNF-RD-8310, *Document Control Program*, which are implemented in accordance with HNF-PRO-589, *Project Hanford Management System Documents*. Records are controlled in accordance with the requirements specified in HNF-RD-210, *Records Management Program*, which are implemented in accordance with HNF-PRO-10588, *Records Management Process*.

## 8.5 MEASUREMENT/DATA ACQUISITION

### 8.5.1 Sampling Process Design

The sampling process design is presented in Section 9.0 of this SAP.

### 8.5.2 Sampling Methods Requirements

A summary of the sampling methods is presented in Section 9.0 of this SAP. These sampling methods are implemented through approved project technical procedures and/or Job Control System (JCS) work packages. Technical procedures are controlled in accordance with HNF-PRO-589, *Project Hanford Management System Documents*, and JCS work packages are controlled in accordance with HNF-12115, *Work Management*.

### 8.5.3 Sample Handling and Custody Requirements

Samples are collected, labeled, packaged, shipped, stored, and dispositioned in accordance with approved project and analytical laboratory technical procedures and/or JCS work packages. These procedures and work packages ensure that samples are collected, transferred, stored, and analyzed by authorized personnel; that sample integrity is maintained from collection through disposition; and that an accurate record of handling and custody is maintained from collection through disposition.

An unbroken chain of custody is established and documented using the *Central Plateau Chain of Custody/Sample Analysis Request* (Form A-6003-618) or equivalent. All field sampling activities are documented in controlled field logbooks in accordance with project technical procedures. Logbook entries, as a minimum, record the names of those collecting samples, the date and time samples are collected, the locations samples are collected, the sample identification numbers, the sample container type and size, and the description of the sample media.

### 8.5.4 Analytical Methods Requirements

The analytical methods (e.g., Gamma Energy Analysis and Liquid Scintillation) which are applicable to each analyte of interest are specified in the DQOs. The specific analytical methods (e.g., EPA Method 6010B) used to satisfy the DQOs are identified in Table 4-2 of this SAP. These analytical methods are conducted in accordance with approved laboratory procedures which are controlled in accordance with the laboratory's Quality Assurance Plan.

Two laboratories have been identified to provide analytical services: the Waste Sampling and Characterization Facility (WSCF) and the 222-S Laboratory. The WSCF Quality Assurance Plan is specified in HNF-SD-CP-QAPP-017, *Waste Sampling and Characterization Facility Quality Assurance Plan* and the 222-S Quality Assurance Plan is specified in HNF-SD-CP-QAPP-016, *222-S Laboratory Quality Assurance Plan*. These laboratory Quality Assurance Plans implement the applicable requirements of the HASQARD, Volume 4 (DOE-RL 1998).

### 8.5.5 Quality Control Requirements

The QC procedures must be followed in the field and laboratory to ensure that reliable data are obtained. When performing this field sampling effort, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. Deviations shall be controlled and documented in accordance with Appendix A, *B Plant Construction Laydown Yard Sample Logbook.*

Analytical laboratories implement the QC requirements specified in their Quality Assurance Plans. Quality control of radiological surveys is implemented in accordance with HNF-5173, PHMC Radiological Control Manual.

### 8.5.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

All onsite environmental instruments and measuring equipment are tested, inspected, and maintained in accordance with the manufacturers' requirements and in accordance with approved project technical procedures and/or JCS work packages. The results of tests, inspections, and maintenance activities are documented in logbooks and/or JCS work packages.

Analytical laboratory instruments and measuring equipment are tested, inspected, and maintained in accordance with the laboratories' Quality Assurance Plan. Daily response checks for radiological field survey instruments are performed in accordance with FH procedures.

### 8.5.7 Instrument Calibration and Frequency

All onsite environmental instruments and measuring equipment are calibrated in accordance with HNF-PRO-490, *Calibration Management Program*, using approved project technical procedures and/or JCS work packages. The results of calibrations are documented in logbooks and/or JCS work packages.

Analytical laboratory instruments and measuring equipment are calibrated in accordance with the laboratories' Quality Assurance Plan. Calibration of radiological field survey instruments on the Hanford Site is performed under contract by Pacific Northwest National Laboratory (PNNL) on an annual basis, as specified in their program documentation.

### 8.5.8 Inspection/Acceptance Requirements for Supplies and Consumables

Supplies and consumables procured by FH, which are used in support of sampling and analysis activities, are procured in accordance with HNF-RD-10320, *PHMC Acquisition System Requirements* and HNF-PRO-268, *Control of Purchased/Acquired Items and Services*. The procurement process ensures that purchased items and services comply with applicable procurement specifications. Supplies and consumables are checked and accepted by users prior to use.

Supplies and consumables procured by the analytical laboratories are procured, checked, and used in accordance with their Quality Assurance Plan.

### 8.5.9 Data Management

Data resulting from the implementation of the SAP will be managed and stored by the organization in accordance with HNF-RD-210, *Records Management Program.*

All validated reports and supporting analytical data packages shall be subject to final technical review by qualified reviewers before submittal to regulatory agencies or inclusion in reports or technical memoranda, at the direction of the project task lead. Electronic data access, when appropriate, shall be through computerized databases (i.e., the Hanford Environmental Information System). Where electronic data are not available, hard copies will be provided in accordance with Section 9.6 of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1998).

All validated reports and supporting analytical data packages will be retained and dispositioned in accordance with HNF-RD-210, *Records Management Program.* The requirements of HNF-RD-210 are implemented in accordance with HNF-PRO-10588, *Records Management Processes.*

## 8.6 ASSESSMENT/OVERSIGHT

### 8.6.1 Assessments and Response Actions

The Plateau Projects Quality Assurance organization may conduct surveillances in accordance with HNF-PRO-9769, *Surveillance Process* to verify compliance with the requirements outlined in this SAP, project procedures, and project JCS work packages. Deficiencies identified during surveillances are addressed in accordance with HNF-PRO-052, *Corrective Action Management*.

Oversight activities in the analytical laboratories, including corrective action management, are conducted in accordance with the laboratories' Quality Assurance Plan.

### 8.6.2 Reports to Management

The Plateau Projects Quality Assurance organization reports the results of surveillances to responsible management in accordance with HNF-PRO-9769, *Surveillance Process*. The results of oversight activities at the analytical laboratories are reported to management in accordance with the laboratories' Quality Assurance Plan.

## 8.7 DATA VALIDATION AND USABILITY

### 8.7.1 Data Review, Validation, and Verification Requirements

Data verification and validation is performed on analytical data sets, primarily to confirm that sampling and chain-of-custody documentation is complete, sample numbers can be tied to the specific sampling location, samples were analyzed within the required holding times, and analyses met the data quality requirements specified in the field sampling plan, Section 9.0.

### 8.7.2 Validation and Verification Methods

All data verification and validation shall be performed in accordance with EPA QA/G-8, *Guidance on Environmental Data Verification and Data Validation* (EPA 1996). A validation performed in a comparable manner to Level C, as described in the identified procedures, will be performed on onsite laboratory analyses. This allows the review of all QC data, transcription error verification, and holding time review. This level is the middle validation level and does not require review of raw data and recalculation of data. Should problems arise from the Level C review, the project reserves the option to review or recalculate.

### 8.7.3 Reconciliation with Data Quality Objectives

A data quality assessment (DQA) will be performed on the resulting analytical data in accordance with EPA QA/G-9, *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA 1996a). The data quality assessment will determine if the data are the right type, quality, and quantity to support the intended use. The data evaluation for this project entails the following:

- Reviewing analytical data, including data packages and QA reports
- Drawing conclusions from the data
- Interpreting and communicating the test results.

# 9.0 FIELD SAMPLING PLAN

## 9.1 SAMPLING OBJECTIVES

The objective of the field sampling plan (FSP) is to clearly identify the sampling and analysis activities, visual inspection, and radiological surveys needed to resolve the DRs identified in Table 5-1 of the DQO. The FSP takes the sampling design proposed in Section 7.0 of this SAP and presents the parameters to identify sampling locations. Work packages will dictate the total number of samples to be collected, analyses to be performed, and sample bottle requirements.

## 9.2 SAMPLING LOCATIONS

The field sampling will be conducted in accordance with sampling procedures listed in Section 9.7. If an outside sampling organization (i.e., Sampling and Mobile Labs) is used to perform the sampling activities, field sampling activities will be conducted in accordance with that organizations' procedures. Exact sample locations will be confirmed with the D&D Characterization team members, sample personnel, and radiological control technician supervisors. Table 9-1 describes the sample media and sample strategy. Work packages will identify specific locations and sampling methods. If ALARA reasons or field conditions prevent the collection of samples, as identified in Table 9-1, any deviations shall be documented in the field logbook (Appendix A) as they occur.

Throughout the duration of the project, facility conditions will change and/or additional information will become available, which may alter the initial characterization plans. Uncertainties, such as the use of sampling equipment and accessibility, are possible. Therefore, the key to success of this characterization effort lies with the ability to adjust efforts in the field to appropriately react to the uncertainties or changing conditions.

### 9.2.1 DOE and EPA Involvement with Specific Sample Events, Sampling Location, and Disposal

The D&D activities in the B Plant Construction Laydown Yard are planned in a sequence that proceeds from areas of relatively low risk to areas of higher risk. Individual work packages will be used for sequential scopes of work. Sampling and characterization hold points in these work packages will allow for appropriate decision making.

When proposed sample locations have been identified, they will be incorporated into work packages identifying sample points, special sampling equipment, and sample analyte priorities if there is not enough sample volume to run all analyses. Detection limits and precision and accuracy requirements would also be identified if they differ from those identified in Table 4-2. Sample work packages will be shared with DOE and EPA.

The primary disposal option, as identified in the action memorandum for the B Plant Construction Laydown Yard, for each waste stream is the ERDF. EPA approval is required for storage, treatment, or disposal of waste in locations other than the ERDF.

## 9.3 LABORATORY ANALYSIS

The COCs, analytical method, technique, required detection limit, and laboratory detection limits needed to support data for waste designation are summarized in Table 4-2. These analyses will support the identified waste streams, as well as anomalies found during demolition activities. The sample volumes are separated into maximum volumes for full protocol analysis and minimum volumes for quick-turnaround data. Previous radiological survey activities at the B Plant Construction Laydown Yard, process knowledge, and ALARA information indicate that under most circumstances, maximum volume collection may not be achieved. Each sample location will be evaluated on a case-by-case basis to determine if full protocol will be used or if minimum volume collection will be used for quick-turnaround data.

## 9.4 ARCHIVE SAMPLES AND SPLITS

Provided volume allows, a sufficient volume of liquid and solid will be kept in an archive until data have been returned and have been found to meet criteria. The sample archived will be a subset of the homogenized material sent to the laboratory. The samples will be archived at the WSCF lab, contract lab, or on the project site until data validation.

If requested by EPA, sample splits will be provided for data verification.

## 9.5 RADIOLOGICAL SURVEYS

### 9.5.1 Routine Radiological Surveys

Routine radiological surveys will be conducted prior to any major equipment removal activities. The routine radiological surveys will consist of routine surveys of accessible surfaces of the waste media and will be conducted by project radiological control technicians (RCTs). Additional uniformly distributed and/or biased measurements may be taken at the discretion of the project radiological engineer or project characterization lead. Information obtained from the routine radiological surveys will be used to determine the extent of contamination in the area and to support worker health and safety during D&D activities. These surveys will be conducted in accordance with HNF-5713, PHMC Radiological Control Manual (FH 2002) and HNF-IP-1277, D&D Radiation Protection Procedures.

### 9.5.2 Material Release Surveys for Reuse

Salvageable materials that have no potential for volumetric contamination may be surveyed for release. The material release surveys will involve routine radiation surveys of accessible surfaces of the waste materials and will be conducted by project RCTs in accordance with appropriate procedures.

Additional surveys for offsite release will be conducted as needed in accordance with appropriate property release requirements (Table 6-3).

### 9.5.3 Soil and Slab Visual and Radiological Surveys

The intent of soil surveys is to locate and remove radiologically contaminated soil from areas below those structures that are currently posted as having radiological 'contamination areas' underneath. In addition, visual surveys will be performed to locate any discolored soil which may indicate a spill or release of hazardous material. These actions will ensure that areas containing hazardous materials are either cleaned up as part of the removal action, or posted with appropriate signage to allow for future remedial actions. These actions will also allow the mobilization of materials and equipment into the area in support of the 224-B Facility removal action without disturbing those areas that still contain stabilized hazardous materials.

After demolition of contaminated structures, the area immediately below the radiologically posted structures will be radiologically surveyed using standard hand survey instruments (i.e., GM). In the event contamination is encountered, the soil will be removed and packaged for disposal in the ERDF. Assuming contamination continues to be encountered, soil removal will only occur to a depth of 1 meter. If the radiological contamination continues to be detected, the area will be posted and entered into the WIDS database to ensure future remediation. Any contamination detected on building slabs will be fixed in place. The areas will be entered into the WIDS database.

In addition to radiological surveys, the soil will be visually inspected to locate any discolored soil which may indicate a spill of hazardous materials, other than radiological contamination. In the event discolored soil is encountered, the soil will be sampled and analyzed. Depending on the outcome of the analytical data, the soil will be left in place or packaged and shipped to an appropriate facility for disposition. Discolored soil removal will only occur to a depth of 1 meter. If the discolored soil continues to be detected, the area will be posted and entered into the WIDS database to ensure future remediation.

Visual surveys for discolored soil will not be limited to the areas under structure, but rather to the entire B Plant Construction Laydown Yard project area. Radiological Control postings will be placed in those areas that contain fixed or stabilized radiological contamination. In addition, those areas that contain other hazardous materials may be posted as WIDS sites.

## 9.6 SAMPLING PROCEDURES

The sampling procedures to be implemented in the field shall be consistent with the procedures outlined in DOE/RL-96-68, *Hanford Analytical Services Quality Assurance Requirements Document (HASQARD), Volume 2.* The project will utilize the WSCF Sampling and Mobile Labs organization to perform the sample collection at the B Plant Construction Laydown Yard. Sampling and Mobile Labs will perform the sample collection activities in accordance with DTS-SSPM-001, Sampling Services Procedures Manual.

## 9.7 SAMPLE AND WASTE MANAGEMENT

Sample and waste management activities shall be performed in accordance with the following FH procedures:

- CP-WMO-LLW-002, *Packaging And Storage of Low Level Waste (LLW)*
- CP-WMO-MW-003, *Packaging And Storage of Low Level Mixed Waste (MW)*

- CP-WMO-DW-004, *Packaging and Storage of Dangerous Waste (DW)*
- CP-WMO-NRW-005, *Handling, Packaging and Storage of Non-Regulated, Non-Radioactive Waste (NRW)*
- DTS-SSPM-001, *Sampling Services Procedures Manual*

All waste (including unexpected waste) generated by sampling activities will be managed in accordance with HNF-21184, *B Plant Construction Laydown Yard Waste Management Plan.* Unused samples and associated laboratory waste for the analysis will be dispositioned in accordance with the laboratory contract and agreements for return to the project Site. Pursuant to 40 CFR 300.440, EPA Project Manager approval is required before returning unused samples or waste from offsite laboratories.

In addition, EPA Project Manager approval is required before shipping sample waste from Hanford onsite laboratories (e.g., 222-S Analytical Laboratories, or Waste Sampling and Characterization Facility (WSCF) back to the waste site of origination. Approval of this SAP constitutes the DOE Project Manager's approval of this action.

### 9.7.1 Waste Profiling

Process knowledge obtained from previous characterization of the source facility was used to establish the isotopic ratios contained in the waste matrices. That process knowledge combined with historical radiological survey results of the waste materials and survey results obtained during waste structure demolition/sizing operations will be used in conjunction with an appropriate engineering calculation to establish and bound the isotope-specific activities reflected in the waste profile. A small percentage of the waste matrices are expected to contain low levels of detectable radioactivity (biotransport via fruit fly), while a smaller percentage of the waste matrices (e.g. rodent feces, tumbleweeds, fruit flies, etc.) may contain significant levels of radioactivity. Since the waste contributing the highest pCi/g activity (which provides the upper bounding values for the waste profile) is a small percentage of the total waste matrix, the isotopic values for the actual waste shipments to the disposal facility are expected be a fraction of the profiled values, as determined by the project engineer (i.e., the shipment may be determined to be anywhere from 1-100% of the profiled limits).

## 9.8 HEALTH AND SAFETY

All field operations will be performed in accordance with FH health and safety requirements outlined in CP-MD-019, *Central Plateau Remediation Project Safety and Health Policy*. In addition, a work control package will be prepared that will further control site operations. This work package will include an activity hazard analysis and CP-19640, *Site-Specific Health and Safety Plan, 224-B and 224-T Decommissioning Project* and will also reference applicable RWPs.

The sampling procedures and associated activities will take into consideration exposure reduction and contamination control techniques that will minimize the radiation exposure to the sampling team as required by HNF-PRO-1623, *Radiological Work Planning Process.*

## 9.9 ANAMOLOUS WASTE MATERIALS

Anomalous waste materials include any unplanned or unexpected material discovered during D&D operations that will require sampling and analysis to support disposition. The anomalous waste category

is provided to allow field decision making based on "as-found" conditions discovered during demolition. The Waste Management Organization will support the final determination of the sample analysis that is required on a case-by-case basis. The project will evaluate appropriate historical information, process knowledge, and existing analytical data to determine if additional analytical information is needed to facilitate the appropriate disposal pathway. The project will work with RL and EPA to determine the best path forward for these materials.

Table 9-1. Specific Media Sampling.

| WS # | Waste Stream | Media | Sampling Methods | Analytical Requirements |
|---|---|---|---|---|
| 1 | Bulk Demolition Debris | Bulk demolition debris includes but is not limited to:<br>• poured concrete<br>• concrete block<br>• sheetrock<br>• wooden doors<br>• non-asbestos containing roofing materials<br>• machinery & miscellaneous equipment<br>• steel siding<br>• tin roofing<br>• steel (scrap, I-beams) | No sampling required. Debris will be managed as low level radioactive waste, per radiological characterization data found in B&W 1999 (See Section 9.7.1). Debris that has not been located in a radiologically contaminated area may be salvaged for reuse or recycle. | Existing radiological data; Process knowledge* |
| 2 | Asbestos-containing material | AHERA asbestos inspector will perform inspection | Samples for asbestos containing material, if present, will be obtained in accordance with simplified sampling scheme for friable surface materials (EPA 1985) | Asbestos fibers |
| 3 | Incandescent light bulbs | Lead | No sampling required. Bulbs will be managed as dangerous or mixed waste, or recycled. | Process knowledge* |
| 4 | Fluorescent light fixtures | Internal light ballasts and fluorescent tubes | No sampling required. Light ballasts will be managed as PCB or non-PCB waste. Fluorescent light tubes will be managed as dangerous or mixed waste, or recycled. | Process knowledge* |
| 5 | Electrical fuses | Lead | No sampling required. Lead waste will be managed as dangerous or mixed waste, or recycled. | Process knowledge* |
| 6 | Thermostats and Thermometers | Mercury containing switches and thermostats | No sampling required. Mercury waste will be managed as dangerous or mixed waste. | Process knowledge* |
| 7 | Emergency lights | Lead-acid batteries, incandescent bulbs | No sampling required. Waste matrices will be managed as dangerous or mixed waste, or recycled. | Process knowledge* |
| 8 | Exit signs | Tritium | No sampling required. Tritium containing exit signs will be managed as low level radioactive waste. | Process knowledge* |

Table 9-1. Specific Media Sampling.

| WS # | Waste Stream | Media | Sampling Methods | Analytical Requirements |
|---|---|---|---|---|
| 9 | Lubrication grease, oil, hydraulic oils (includes door actuators and oil from miscellaneous machinery) | Nonaqueous liquids | One representative sample per container or batch of the same material from the same source. Waste lubricants will be managed per sample results.<br><br>Lubricants may be recycled if they meet the criteria listed in Table 6-2. | PCBs, arsenic, barium, cadmium, chromium, lead, mercury, TOX<br><br>Spent oils that are determined to be free of radiological contamination will be evaluated against the CCRC acceptance criteria to determine if they can be recycled. |
| 10 | Paint | Paint/coatings on exterior of materials if observed | Scraping paint; minimum of one representative sample from each type paint/coating. | Arsenic, cadmium, chromium, barium, lead, mercury, selenium, silver, PCBs |
| 11 | Flashlight batteries | Ni-Cd Batteries | No sampling required. Batteries will be managed as mixed waste, or recycled. | Process knowledge* |
| 12 | Electrical transformers | Nonaqueous liquids | If no process knowledge exists, one representative sample per container or batch of the same material from the same source. | PCBs |
| 13 | Step off pad soft waste | PPE garments, rags, tape, plastic, gloves, etc. | No sampling required. Soft waste will be managed as low level radioactive waste with the demolition debris. | Process knowledge* |
| 14 | Discolored or stained Soil | Soil | Radiological survey and visual inspection of soil beneath each trailer or structure that is posted with a 'contamination area under structure' sign.<br><br>In addition, the remainder of the B Plant Construction Laydown Yard will be visually surveyed for discolored or stained soil.<br><br>One representative sample per discolored area, if discovered.<br><br>Structures with concrete foundations will also be surveyed and visually inspected. If discovered, the contamination will be fixed in place. | Radiological survey (for those areas posted as radiologically contaminated); RCRA metals, PCBs, and TOX for <u>any</u> discolored areas in the soil identified during visual inspection. |

AHERA = *Asbestos Hazard Emergency Response Act of 1986*
* *Process knowledge includes, but is not limited to, information from Material Safety Data Sheets, personnel interviews, historical documents, existing data, etc.*

# 10.0 REFERENCES

10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Wastes," *Code of Federal Regulations*, as amended.

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

*Asbestos Hazard Emergency Response Act of 1986*, 20 U.S.C. 52, Sec. 4011, et seq.

BHI, 2001, *Safety Analysis for the Environmental Restoration Disposal Facility*, BHI-00370, Rev. 6, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2002, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Rev. 4, Bechtel Hanford, Inc., Richland, Washington.

B&W, 1999, *Waste Encapsulation and Storage Facility (WESF) Radiological Characterization Study*. HNF-3956, Rev. 0, Babcock and Wilcox Hanford Company, Richland, WA.

DOE-RL, 1994, *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility*, DOE/RL-93-99, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1998, *Hanford Analytical Services Quality Assurance Requirements Document*, DOE/RL-96-68, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2003, *Engineering Evaluation/Cost Analysis for the 224-B Plutonium Concentration Facility*, DOE/RL-2000-06 Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DYN, 1998, *SWITS Report Shipment 30953 From Dyncorp (D Poor) to WMP TSD Unit LLBG*, Doc# 30953, October 14, 1998.

Ecology, et al, 1998, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, State of Washington Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Richland, Washington.

EPA, 1983, *Methods for Chemical Analysis of Water and Wastes* (EPA 600/4-79-020) U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1985, *Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials*, EPA 560/5-85-0309, U. S. Environmental Protection Agency, Washington, D.C.

EPA, 1994, *EPA QA/G-4, Guidance for the Data Quality Objectives Process*, September 1994 (EPA/600/R-96/055) U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1996, *EPA QA/G-8, Guidance on Environmental Data Verification and Data Validation*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1996a, EPA QA/G-9, *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1997, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, 3rd ed., as amended, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1998, *EPA QA/G-5, EPA Guidance for Quality Assurance Project Plans*, February 1998 (EPA/600/R-98/018) U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2001, *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2001a, *EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans*, March 2001 U.S. Environmental Protection Agency, Washington, D.C.

EPA, 2002, *EPA QA/G-8, EPA Guidance on Environmental Data Verification and Data Validation*, November 2002 (EPA/240/R-02/004) U.S. Environmental Protection Agency, Washington, D.C.

FH, 1999, *Fall 1998 200 East Area Biological Vector Contamination Report*, HNF-3628, Rev. 0, Fluor Hanford, Inc., Richland, Washington.

FH, 2002, *PHMC Radiological Control Manual*, HNF-5173, Fluor Hanford, Inc., Richland, Washington.

FH, 2003, *Hanford Site Waste Acceptance Criteria*, HNF-EP-0063, as amended, Fluor Hanford, Inc., Richland, Washington.

FH, 2004, *Data Quality Objectives Report for the B Plant Construction Laydown Yard*, HNF-20554, Fluor Hanford, Inc., Richland, Washington.

This page intentionally left blank.

# APPENDIX A

# B PLANT CONSTRUCTION LAYDOWN YARD SAMPLE LOGBOOK

This page intentionally left blank.

# B Plant Construction Laydown Yard Sample Logbook

| Facility Sample # | Sampling Date | Sampler Name | Analytical Lab | Lab ID # | Type of Sample | Date Analysis Returned |
|---|---|---|---|---|---|---|
| | | | | | | |

| Analysis Results | Sample Disposition | Comments |
|---|---|---|
| | | |

| Facility Sample # | Sampling Date | Sampler Name | Analytical Lab | Lab ID # | Type of Sample | Date Analysis Returned |
|---|---|---|---|---|---|---|
| | | | | | | |

| Analysis Results | Sample Disposition | Comments |
|---|---|---|
| | | |

| Facility Sample # | Sampling Date | Sampler Name | Analytical Lab | Lab ID # | Type of Sample | Date Analysis Returned |
|---|---|---|---|---|---|---|
| | | | | | | |

| Analysis Results | Sample Disposition | Comments |
|---|---|---|
| | | |

This page intentionally left blank.

# APPENDIX B

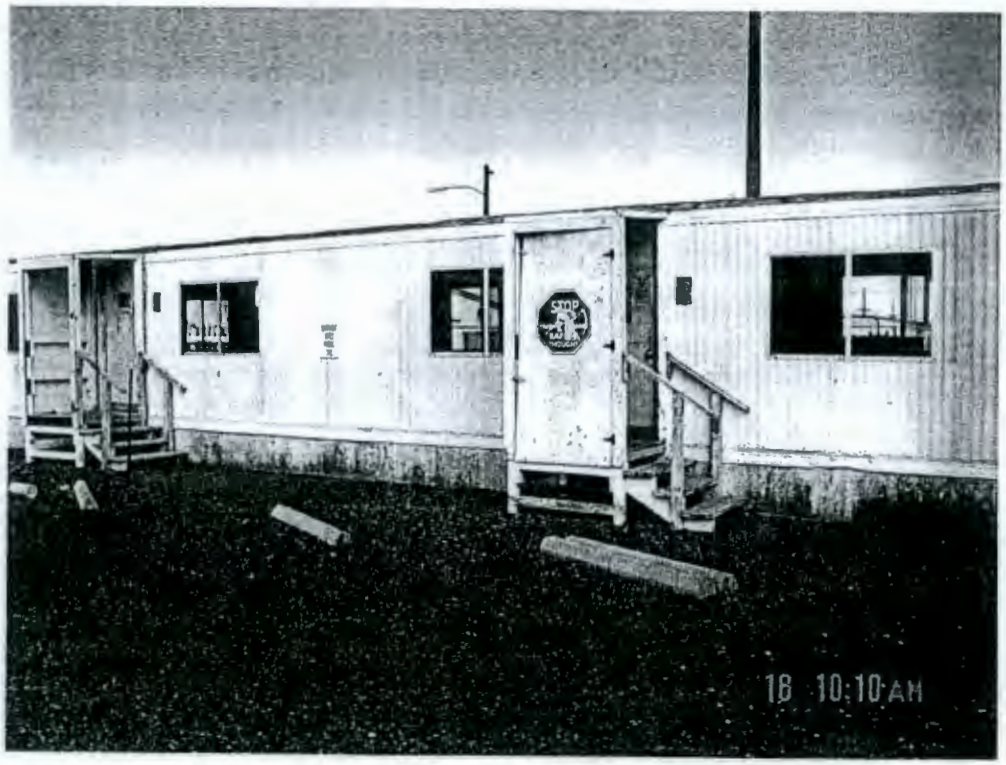
## B PLANT CONSTRUCTION LAYDOWN YARD PHOTOS

This page intentionally left blank.

# B Plant Construction Laydown Yard
# Typical Mobile Offices/Trailers

This page intentionally left blank.

18 8:14 AM


18 10:10 AM

This page intentionally left blank.

# B Plant Construction Laydown Yard
# Typical Structures

This page intentionally left blank.

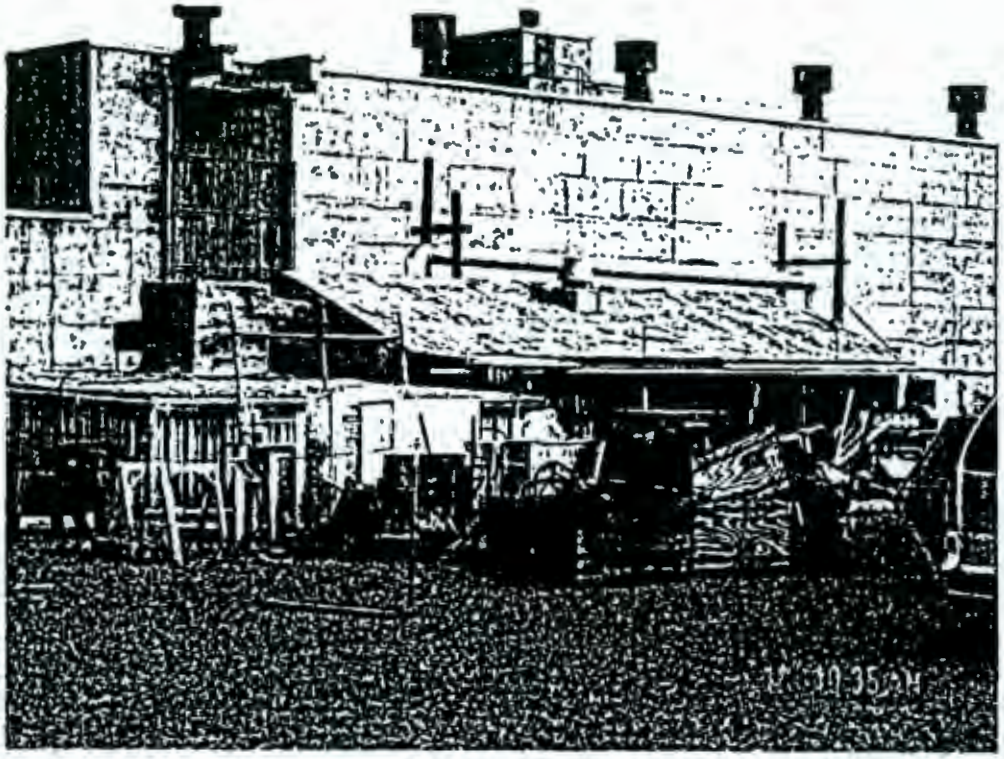
18 10:13 AM

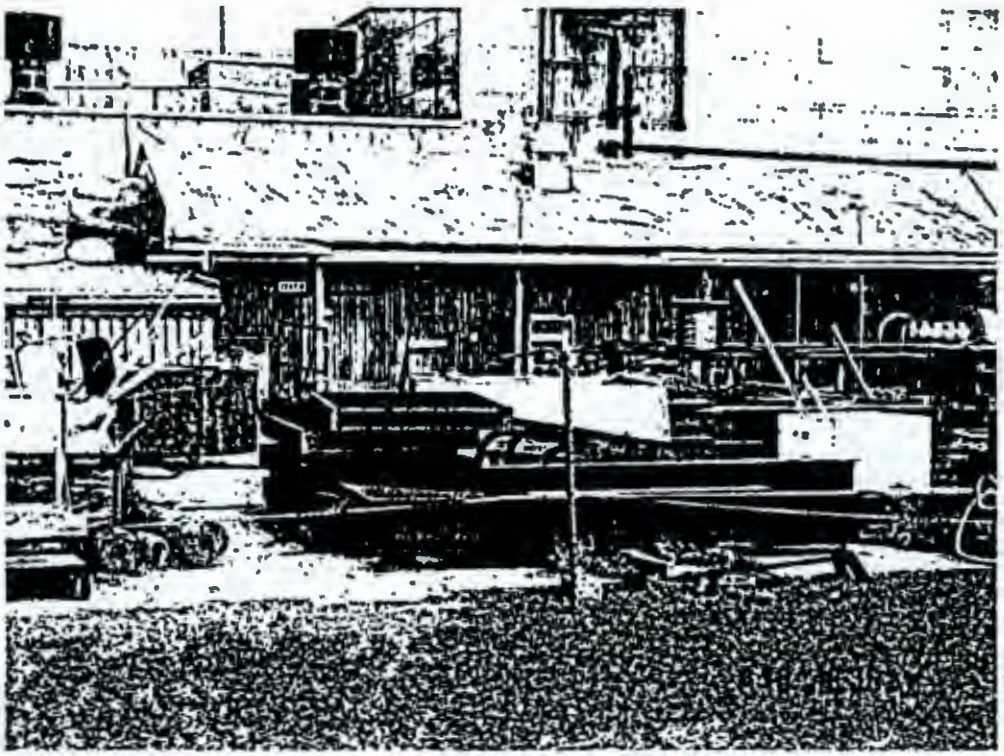
2254E
2253E

This page intentionally left blank.

# B Plant Construction Laydown Yard
# Typical Materials/Equipment

This page intentionally left blank.





## Approvals

DOE/RL-2004-45, *Sampling and Analysis Plan for the B Plant Construction Laydown Yard*, Revision 0.

for

Matt McCormick
Assistant Manager of Central Plateau
U.S. Department of Energy

6-23-04
Date

Craig Cameron

Craig Cameron
B Plant Construction Laydown Yard Project Manager
U.S. Environmental Protection Agency, Region 10

3/24/04
Date