3006 0406160002

CH2M HILL
Mound, Inc.
1 Mound Road
P.O. Box 3030
Miamisburg, OH
45343-3030

CH2MHILL

SM-022/03
April 23, 2003

Mr. Richard B. Provencher, Director
Miamisburg Closure Project
U. S. Department of Energy
P. O. Box 66
Miamisburg, OH 45343-0066

ATTENTION: Robert S. Rothman

SUBJECT: Contract No. DE-AC24-03OH20152
**VARIOUS DOCUMENTS**

REFERENCE: Statement of Work Requirement 055 - Regulator Reports

Dear Mr. Provencher:

Rob Rothman from your office has approved the release of the following final documents:

- Building 94, Closeout Report, Final
- Building 95, Closeout Report, Final

If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact Bob Ransbottom at extension 4220.

Sincerely,

K. L. Kehler
SMPP/TFV Project Manager

KLK/VKD

Enclosures

Approved: 4/23/03
Robert S. Rothman Date
CERCLA Program Manager

cc: Dave Seely, USEPA, (1) w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Frank Schmaltz, DOE/MCP, (1) w/attachments
Randy Tormey, DOE/OH, (1) w/attachments
Terry Tracy, DOE/HQ, (1) w/attachments
Dann Bird, MMCIC, (1) w/attachments
Jim Bonfiglio, MESH, (1) w/attachments
Public Reading Room (4) w/attachments
John Fulton, CH2M Hill, w/o attachments
Bob Ransbottom, CH2M Hill, (1) w/attachments
Val Darnell, CH2M Hill, (1) w/attachments
Kurt Kehler, CH2M Hill, (1) w/attachments
DCC (1) w/attachments

**From:** Val Darnell
**To:** brian.nickel@epa.state.oh.us; INTERNET:Celeste_Lipp@GW.ODH.STATE.OH.US; Rothman, Robert; seely.david@epamail.epa.gov
**Date:** 5/6/03 8:55AM
**Subject:** Buildings 94 and 95 Closeout Reports

Good morning all -

On 4/23/03 I sent out the Final Closeout Reports for Buildings 94 and 95.

Regretably, I neglected to update the cover and footers from "Working Draft" to "Final" prior to having the document printed. In lieu of reprinting and reshipping these documents, we ask that you please correct your copy by striking out "Working Draft" and writing in "Final." I apologize for the inconvenience.

Thank you,
Val Darnell
937-865-3655

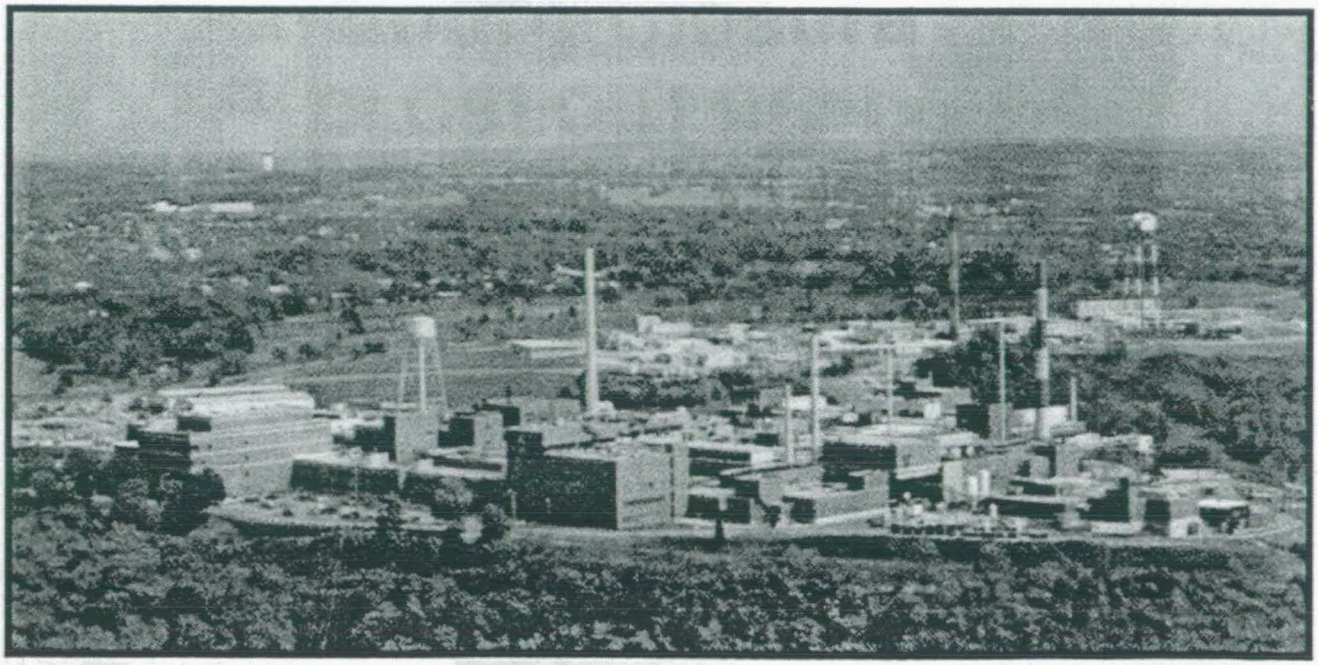
**CC:** Arthur, Karen; Gunckle, Kathy; kathy.fox@epa.state.oh.us; Lewis, Becky; Ransbottom, Robert; Schmaltz, Frank

Environmental
Restoration
Program

# Miamisburg Closure Project
## CLOSEOUT REPORT

# Building 94
(Demolition)

~~Working Draft~~ FINAL
April 2003



# Closeout Report

# Building 94

Prepared for:

United States Department of Energy
Miamisburg Closure Project
P.O. Box 3020
Miamisburg, Ohio 45343-3020

Prepared by:

CH2M Hill Mound, Inc.

# TABLE OF CONTENTS

## Section | Page


1.0 Purpose ..... 1
2.0 Background ..... 1
  2.1 Building 94 ..... 1
  2.2 Potential Release Sites (PRSs) ..... 1
3.0 Actions Taken ..... 2
4.0 Problems Encountered ..... 3
5.0 Resources Committed ..... 3
  5.1 Personnel Organization ..... 3
  5.2 Demolition Cost ..... 4


## Tables


Table 1: PRSs in Proximity to Building 94 ..... 2
Table 2: Materials Disposition ..... 3
Table 3: Personnel Organization for the Demolition ..... 3


## Appendices


Appendix A Figures
  Figure 1: Location of Building 94
  Figure 2: Building 94 and Vicinity
  Figure 4: Building 94 – Before and After Demolition

Appendix B Work Package

Appendix C Post-Demolition Radiological Surveys

## 1.0 PURPOSE

This is the final report documenting completion of the demolition of Building 94 located at the DOE Miamisburg Closure Project (MCP) Site, as shown in the figures provided in Appendix A. The building demolition, including its slab and footers, was accomplished per the Work Package for Building 94 Demolition #SMPP/TFV-33185-00 (13 February 2003), which is provided in Appendix B. The scope of work relating to this building is considered complete.

## 2.0 BACKGROUND

### 2.1 Building 94

Building 94 was constructed in the 1984/85 timeframe in the plant valley area near the western edge of the site boundary. It was a single-story, 1,240 square-foot, pre-fabricated "Butler"-type metal building with a metal roof, constructed on a one-foot thick reinforced concrete slab. The building had four rooms: three larger bays (Bays 1-3) and one smaller mechanical area (Room 4).

Building 94 was built as the "Materials Compatibility Building" to support detonator and explosives program operations. Originally, Bays 1 through 3 were oven rooms, and Room 4 was an equipment room. Subsequently, the building was used for materials aging as described in one report that notes "explosives, pyrotechnics, and explosive components are heated in ovens (aged)." When the material aging processes were discontinued, the ovens were removed from the building. Later, the building was used for soil and water sample storage.

In 1997, the building housed a pilot study to evaluate the effectiveness of extracting plutonium and thorium contamination from soil collected at the site. Because of the process' ineffectiveness at removing thorium and high cost of operation, the program ended in 1999. The equipment was removed from the building and the building was cleaned.

In 2000, the building was turned over to the Test Fire Valley (TFV) project and was used to store Environmental Restoration (ER) project soil and water samples that had been collected at the site, analyzed at offsite laboratories, and returned to the site for disposal. In June 2002, the building was vacated and preparations for demolition were initiated.

### 2.2 Potential Release Sites (PRSs)

Adjacent PRSs are listed in the following table, and their locations shown on Figure 2. None of these are associated with Building 94. PRSs 7 and 41 are being addressed by the ER project. PRSs 54 and 56 will be addressed in the Building 57 BDP.

**Table 1 - PRSs in Proximity to Building 95**

| PRS | CERCLA or Bldg. Related | Binning Status | Comments |
|---|---|---|---|
| 7 | CERCLA | Further Assessment (FA) | Plant Sanitary Outfall Pipeline. |
| 31 | CERCLA | No Further Assessment (NFA) | Underground Sanitary Sewer Line G5. |
| 41 | CERCLA | Removal Action (RA) | Area 3, Thorium Drum Storage and Redrumming Area. Building 94 is located entirely within PRS 41. |
| 54 | Buildings | Unbinned | Building 57 Sand Filters (2 units). |
| 56 | Buildings | Unbinned | Building 57 Chlorine Contact Chamber (Tank 112). |
| 356 | CERCLA | NFA | Elevated Soil Gas Location. |

## 3.0 ACTIONS TAKEN

The Building 94 Building Data Package (BDP) was submitted for simultaneous Core Team and public review on 21 January 2003, and the 30-day public review period concluded on 20 February 2003.

This Closeout Report documents the completion of the demolition and removal of Building 94, slabs, and foundations to three-feet below grade. All preparation and demolition activities were performed in accordance with the detailed Work Plan (Appendix B) to perform demolition and debris removal.

A Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) study of Building 94 was performed prior to demolition. The study report (provided in the Building Data Package) provides details of the survey design and results and indicates that Building 94 met applicable surface release criteria. Post-demolition surveys of the slab and foundation showed no elevated readings (copies are provided in Appendix C).

Building debris was loaded into rolloffs and taken to a local sanitary landfill. Slab and foundation material was taken to the onsite rock crusher for reuse onsite.

The demolition of Building 94 commenced on 6 March 2003 and was completed on 17 March 2003. Site restoration was completed on 20 March 2003. Photographs taken before and after demolition are provided in Appendix A.

**Table 2 - Materials Disposition**

| Building 27 Material | Quantity | Method | Location |
|---|---|---|---|
| Construction Debris (metals) | 210 cubic yards | Landfill | Stoney Hill |
| Clean Hard Fill Debris (concrete) | 133 cubic yards | Reused Onsite | Spoils Area/ Concrete Crusher |

## 4.0 PROBLEMS ENCOUNTERED

Building 94 was successfully demolished per the Work Package, with no variances reported.

## 5.0 RESOURCES COMMITTED

### 5.1 Personnel Organization

Table 3 lists the personnel organization for the demolition.

**Table 3 - Personnel Organization for the Demolition**

| Agency or Party Involved | Contact | Description of Participation |
|---|---|---|
| US EPA (SR-6J)<br>77 W. Jackson<br>Chicago, IL 60604<br>312-886-7058 | David Seely | Federal agency responsible for MCP oversight. |
| Ohio EPA<br>410 E. Fifth Street<br>Dayton, OH 45402-2911<br>937-285-6468 | Brian Nickel | State agency responsible for MCP oversight. |
| DOE/ MCP<br>P.O. Box 66<br>1 Mound Road<br>Miamisburg, OH<br>45343-0066<br>937-865-3620 | Frank Schmaltz | DOE/ MCP, Project Manager responsible for project oversight and success. |
| CH2M Hill Mound, Inc.<br>SMPP-TFV Project<br>P.O. Box 3030<br>1 Mound Road<br>Miamisburg, OH<br>45343-3030<br>937-865-4169 | Kurt Kehler | Provided the DOE/ MCP, Project Manager with technical assistance, administrative support, sampling, decontamination, photo and site documentation, site safety, and report preparation. |

**Table 3 - Personnel Organization for the Demolition**

| Agency or Party Involved | Contact | Description of Participation |
|---|---|---|
| CH2M Hill Mound, Inc.<br>General Superintendent<br>and Equipment Manager<br>P.O. Box 3030<br>1 Mound Road<br>Miamisburg, OH<br>45343-3030<br>937-865-4278 | Max Edington | Provided the equipment necessary for the demolition. |

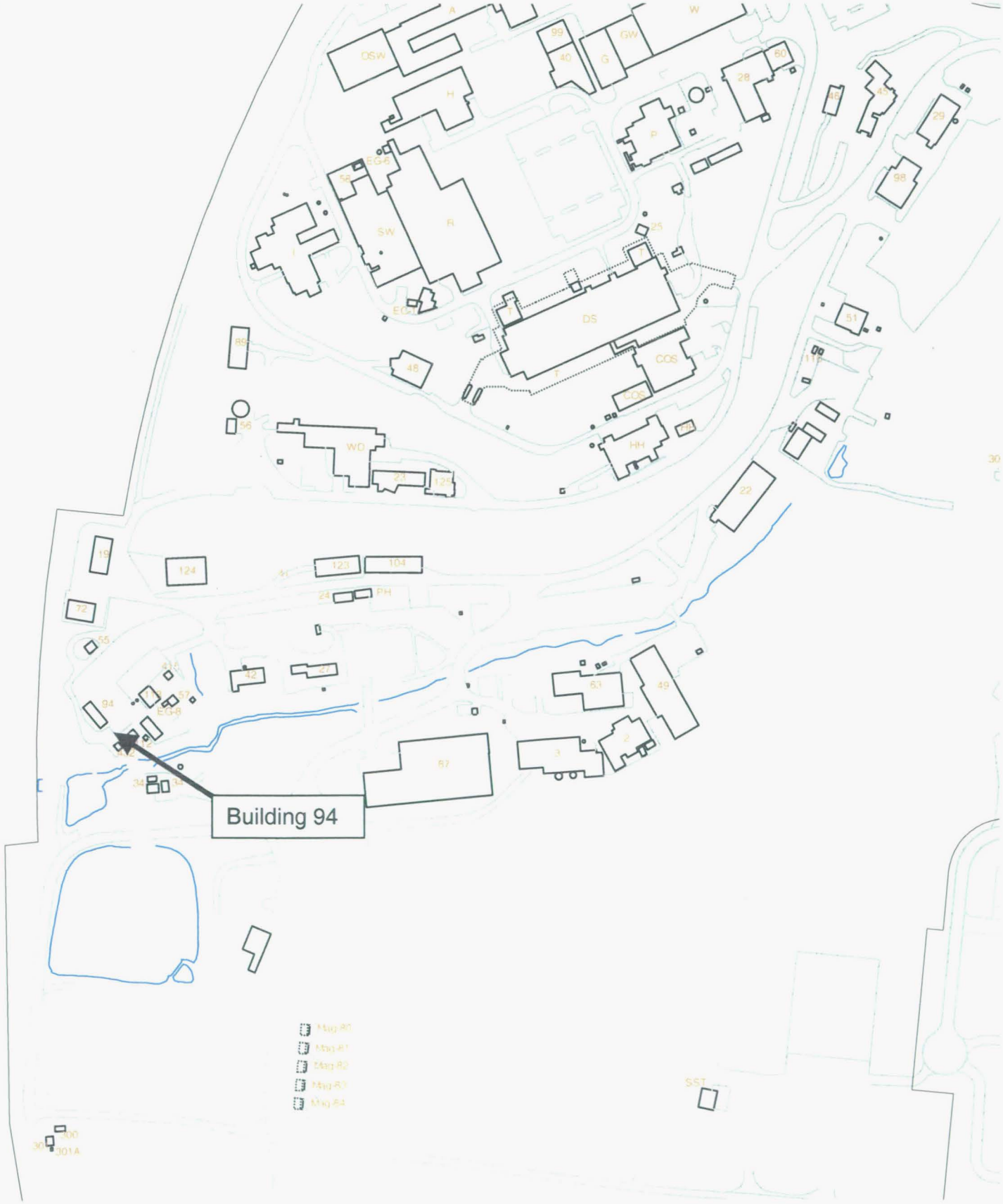
## 5.2 Demolition Cost

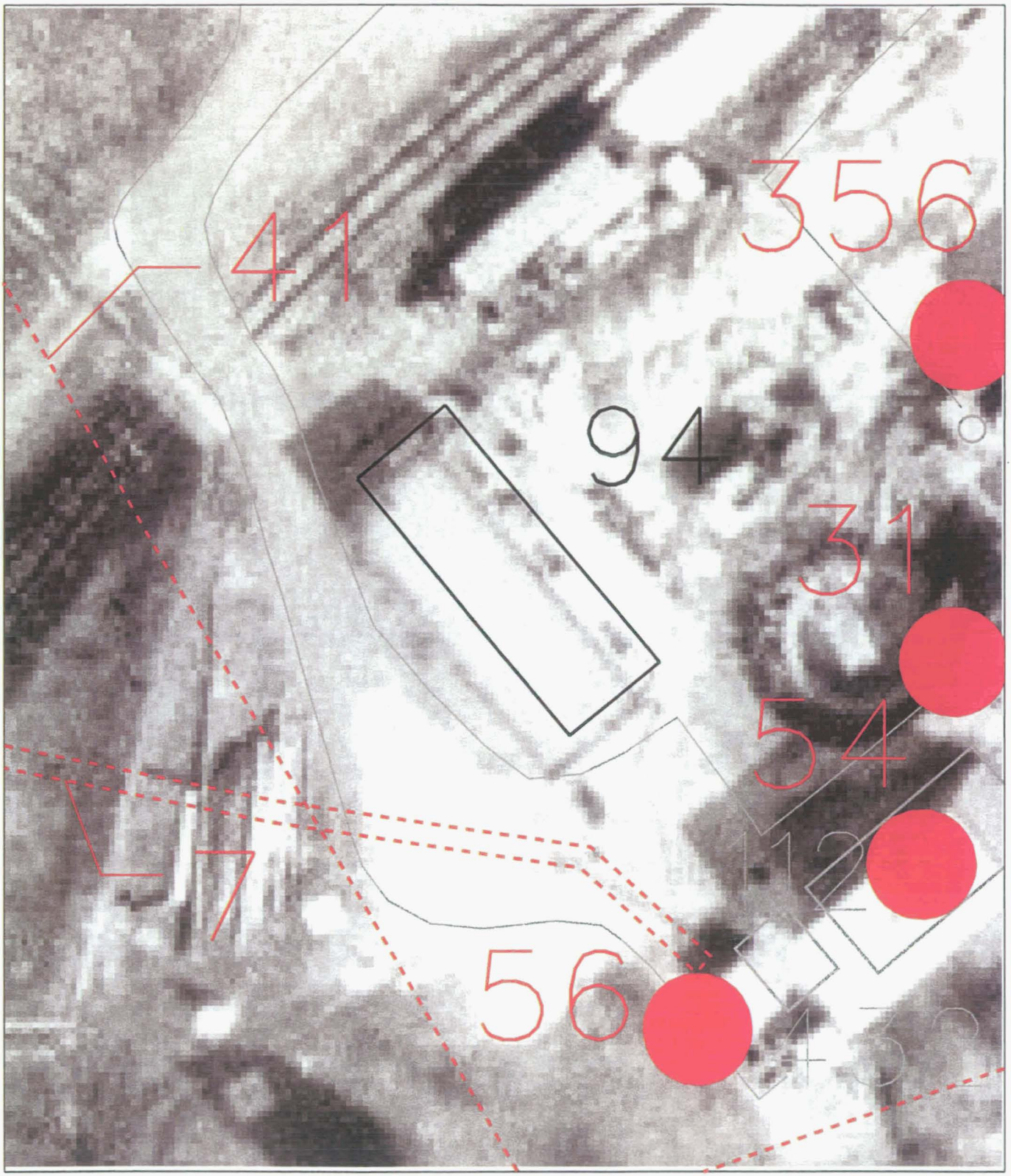
Under the new site contract, CH2M Hill, Inc. has elected to cluster financial data for multiple buildings together. For Building 94, the cluster includes Buildings 49, 94, and 95. As a result, costs for individual building demolitions are not available. When the cluster is completed, the total cost for the cluster will be reported in the Closeout Report for Building 49.

# APPENDIX A

## Figures

# Figure 1 - Location of Building 94






PRS Point
PRS Area
PRS Line

| ISS | DATE | REVISION | BY | CHKR | ENG | LANDEC | APVD | M |
|---|---|---|---|---|---|---|---|---|
| | 04/13/02 | | SSF | | | | | |

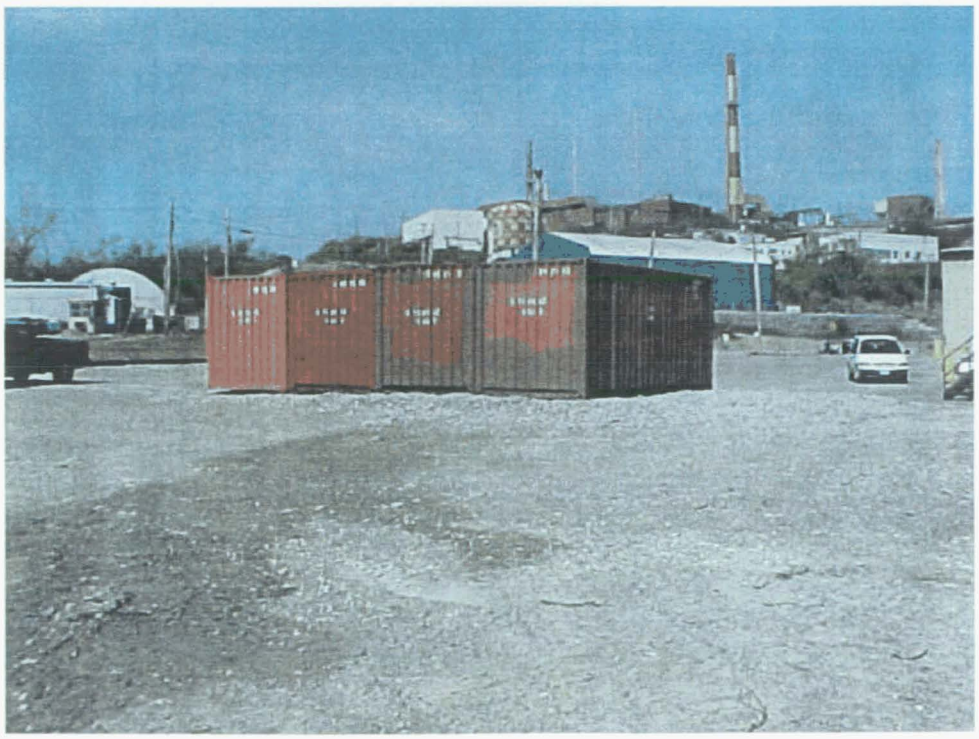
MOUND
Environmental Restoration Geographic Information System

| | |
|---|---|
| SHEET | 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 |
| ISSUE | |
| SHEET | 1 2 3 4 5 6 |
| ISSUE | * |
| PART CLASSIFICATION | |
| DRAWING CLASSIFICATION | UNCLASSIFIED |
| SIZE | |
| DRAWING NUMBER | vicinity.dgn |
| JOB NUMBER | |
| DGN TYPE | STE |
| PROJ | ER-GIS |
| CADEC | |
| SCALE | |
| SHEET 1 OF | |
| STATUS | MD-REL-**/**/** |
| ORIGIN | MSTATION / J |

Figure 2
Building 94
and Vicinity

# Figure 3 - Building Photos

Bldg. 94



Bldg. 94 Area Being Used for Storage After Demolition

# APPENDIX B

## Work Package

WORK PACKAGE / PRELIMINARY HAZARD ANALYSIS

☐~ Office Master Copy (Original Approval Signatures) ☐ ~ Field Working Copy (Original Field Sign -Offs) ☐ ~ Review Copy [Note: Mark this section in color] ☐ ~ Other Copy

*The Project Engineer is responsible for completing Sections 1 through 10. On subcontractor projects, the subcontractor shall complete sections 6, 9, and 10.*

1. WORK PACKAGE TITLE: **Building 94 Demolition**

2. WORK PACKAGE NUMBER. *SMPP/TFV- 33185-00* | REQUESTOR: L. Koehmstedt

8. WORK PACKAGE SCOPE:

The purpose of this effort is to demolish Building 94, see Figure 1.0. Using heavy equipment to demolish the facility, remove and dispose of the debris, provide site restoration grading and provide erosion/restoration protection with seeding and mulch. Safe shutdown activities will have already been completed prior to demolition.

4. WORK PACKAGE PHASES:

1. **Establish Work Zone.**
2. **Demolish structure.**
3. **Demolish slab and foundation.**
4. **Restore area for erosion protection and drainage.**

*Insert the proper sequence of Work Package phases for the job. A phase is a separately definable portion of the project.*

5. WORK LOCATION:

Building #: **94**

Room #: **N/A**

Other: **Spoils Area**

6. SPECIAL MATERIALS AND EQUIPMENT:

1. **Tracked excavator with shear, grapple, hoe ram, concrete cracker/pulverizer, or bucket attachment.**
2. **Rubber tired and tracked front-end loaders.**
3. **Transport equipment for debris as required.**
4. **Other equipment as needed.**

Figure 1.0 Building 94

7. DETAILED WORK STEPS: **See the attached Job Specific Work Plan (JSWP)**

***Insert the activities to be performed during the job. Describe the specific methods of accomplishing these activities. Activities listed must be grouped under the Work Package phases listed in item 4.***

8. *Note: Comments, to identify activities/hazards that are common to multiple phases of the project. Identification of these items will facilitate the option of addressing the items once in the pre-job briefing, as opposed to redundantly listing them in the JSHAs for different phases.*

**COMMENTS:**

*Enter any review comment or issues in this section and/or information generated as a result of completing detailed work steps.*

**9. REVIEW SIGNATURES:**

Written by: _____ Date: 12/10/02 Phone: 3659

Job Foreman: _____ Date: 12/30/02 Phone: 3663

Superintendent/ Constr. Mgr: _____ Date: 12/11/02 Phone: 3866

Project Eng. Mgr: _____ Date: 12/10/02 Phone: 4220

Industrial Safety & Hygiene: _____ Date: [illegible] Phone: [illegible] 3737

Rad. Controls: _____ Date: 12/14/02 Phone: 4235

ES&C: _____ Date: 12/11/02 Phone: 3248

Waste Mgmt: _____ Date: 12/12/02 Phone: x3882

Bldg. Mgr: _____ Date: 01/09/03 Phone: 3241

Craft Review: _____ Trade HD Date: 12/19/02 Phone: 3663

Craft Review: _____ Trade HD Date: 12/19/02 Phone: 3663

Craft Review: _____ Trade HD Date: 12/19/02 Phone: 3663

Craft Review: _____ Trade HD Date: 12/19/02 Phone: 3663

If more sign-off lines are needed see attached pages.

**10. USQ SCREEN / DETERMINATION REQUIRED?** ☐ YES ☒ NO

Brief Explaination This activity has no effect upon a Nuclear Facility

USQ Trained Person: _____ Date: 01/09/03 Phone: 3241

**10. AUTHORIZATION SIGNATURE:**

Project Manager: _____ Date: 01/13/03 Phone:

**11. WORK PACKAGE CLOSURE:**

Job Supervisor: _____ Date: / / Phone:

Project Manager: _____ Date: / / Phone:

**RETURN PHA TO IS&H AT JOB COMPLETION:**

# PRELIMINARY HAZARD ANALYSIS (PHA)
# FOR WORK PACKAGE ACTIVITIES

SECTION A, INDUSTRIAL SAFETY - TO BE COMPLETED BY THE INDUSTRIAL SAFETY AND HEALTH REPRESENTATIVE
*Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.). Including any notations for future Hazard Analyses. Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards, that require protective measures be designed, inspected, or approved by a professional engineer or other competent person.* (Use Section D if additional space is needed.)

| Item | Exist | Work Package Phase | Comments, Controls, Methods of Compliance |
|---|---|---|---|
| Blockage of exits or means of egress | NO | N/A | [EGRESS] |
| Blockages/obstructions (Identify) | NO | N/A | |
| Burning, welding, hot-work (Fire Watch) | YES | Demolition of slab and foundation | [BURN] Possible use of cutting torch during demolition. Administrative Controls. Permit required. Keep fire extinguisher near by during cutting. |
| Chemical compatibility of corrosives/flammables | NO | N/A | |
| Chemical process safety | NO | N/A | |
| Compressed gas cylinders | NO | N/A | |
| Confined space entry | NO | N/A | [CONFINE] |
| Crane operations, overhead or mobile | NO | N/A | |
| Critical lifts (heavy or high value loads) | NO | N/A | [CLIFT] |
| Electrical hazards | NO | N/A | [LIVEL] Electrical Isolation of facility was accomplished during safe shutdown activities. |
| Elevated work/fall protection | NO | N/A | [ELEV] |
| Emergency eyewash/shower available | NO | N/A | [EWASH] |
| Emergency alarms or evacuation plans required | YES | All | [EMERG] Plant Public Address system will be used to announce any plant emergency over the plant radio channel, cell phones will be used also, no specific added hazards exist in the demolition of this building. |
| Explosive/flammable atmosphere | NO | N/A | |
| Explosives | NO | N/A | |
| Fire protection system/equipment outage | YES | Structural Demolition | [FIRE/EFIRE] Fire Alarm System isolation prior to start of structural demolition. |
| Fire Hazards Analysis Required of Demolition | YES | Structural Demolition | [FHA/ADJA] |
| Flammable liquids/gases | YES | Structural Demolition | [FLAM] Possible use of cutting torch during demolition. Administrative Controls. Permit required. Keep fire extinguisher near by during cutting. |
| Forklifts, aerial lifts or material handling equipment | NO | N/A | |
| Grounding of electrical equipment | YES | Structural Demolition | Temp. power to portable equipment. All hand held electrical tools must be equipped with GFCI. |
| Hazards due to condition of facility or terrain (Identify) | NO | N/A | |
| Hoisting and rigging | NO | N/A | [HOIST] |
| Lighting/illumination/adequacy | NO | N/A | [MLITE] |
| Excavation and Soil disturbance | YES | Slab and Foundation Demolition | An excavation and soil disturbing permit is required. |

SECTION A, INDUSTRIAL SAFETY - TO BE COMPLETED BY THE SAFETY AND HEALTH REPRESENTATIVE

*Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.), including any notations for future Job Safety and Health Analysis(JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person.* (Use Section D if additional space is needed.)

| Item | Exist | Work Package Phase | Comments, Controls, Methods of Compliance |
|---|---|---|---|
| Lockout/tagout of hazardous sources: | NO | N/A | [LOTO/ISO] Electrical/Mechanical Isolation of facility was accomplished during safe shutdown activities. |
| • Electrical | NO | N/A | See Above |
| • Mechanical (steam, hydraulic, pneumatic) | NO | N/A | See Above |
| • Interlocks | NO | N/A | [ILOCK] |
| • Chemical | NO | N/A | |
| • Radiological | NO | N/A | |
| Machine guards | NO | N/A | |
| Modification to Fire Wall/Door | NO | N/A | [FIREWAL] |
| Obstruction of fire protection equipment (pull boxes, hydrants, fire department connections, control panels, fire extinguishers, etc.) | NO | N/A | |
| Off-shift work | NO | N/A | |
| Outages of the plant public announcement (PA) system or the emergency notification system | YES | Demolition | [OUTAGE] The plant radio system transmits public announcements, which will be use to monitor for emergencies. |
| Overhead or underground utilities (Identify) | NO | N/A | [UITL] Electrical/Mechanical Isolation of facility was accomplished during safe shutdown activities. |
| Penetrations into walls, floors, etc. | NO | N/A | [PENETR] |
| Plastic sheeting or wood framing/enclosures | NO | N/A | |
| Powder-actuated tools | NO | N/A | |
| Plant utilities (Identify) | NO | N/A | [WATER] Electrical/Mechanical Isolation of facility was accomplished during safe shutdown activities. |
| Repetitive work | NO | N/A | [ERGO] |
| Structural Modification | YES | Demolition | [STRUCT] Building is being demolished. |
| Special Fire Protection Equipment Required | NO | N/A | [FIREQU] |
| Trenching/Shoring | NO | N/A | [DIG] |
| Temporary heating facilities | NO | N/A | |
| Temporary/portable buildings or structures | NO | N/A | [FACIL] |
| Temporary service hook-ups (Identify) | YES | Demolition | Temp. electrical and water service (for dust control). |
| Traffic control/flagman | NO | N/A | [TRAFIC] |
| Work in attics, ceilings, chases, or crawlspaces | NO | N/A | |
| Work impacting adjacent normally occupied areas | YES | N/A | [ADJAC/BMAPP/SIGNS/NOTIF] Waste water treatment plant |
| Work Requiring Scaffolding, construction and inspection | NO | N/A | [SCAFF] |
| Other (Specify) | N/A | N/A | |

**SECTION B, INDUSTRIAL HYGIENE** - TO BE COMPLETED BY INDUSTRIAL HYGIENE REPRESENTATIVE

*Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. lead compliance plans, confined space plans, hearing conservation programs, etc.), including any notations for future Job Safety and Health Analysis (JSHA). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person.* (Use Section D if additional space is needed.)

| Item | Exist | Work Package Phase | Comments, Controls, Methods of Compliance |
|---|---|---|---|
| Abrasive blast (☐ MSDS available)* | NO | N/A | |
| Asbestos | NO | N/A | [ASBEST |
| Beryllium | NO | N/A | |
| Blood-borne pathogens* | NO | N/A | |
| Cadmium | NO | N/A | |
| Carcinogens (☐ MSDS available)* | NO | N/A | [CARC] |
| Chemicals/solvents (☐ MSDS available)* | NO | N/A | [CHEM/MSDS] |
| Chlorofluorocarbon (CFC) | NO | N/A | [CFC] |
| Coal, tar or asphalt products | NO | demolition | |
| Coating/painting (☐ MSDS available)* | NO | N/A | |
| Corrosives/acids/caustics (☐ MSDS available)* | NO | N/A | |
| Dusty operations | YES | demolition | [POWDER ] Potential dust generation controlled via water misting. |
| Hazardous Waste Operations (HAZWOPER)* | NO | N/A | |
| High Pressure systems | NO | N/A | [HIPRES] |
| Insulation/man-made mineral fibers (☐ MSDS available)* | NO | N/A | |
| Lasers | NO | N/A | |
| Lead | YES | N/A | Paint may contain lead, do not torch cut painted surfaces. |
| Foam in Place Operations | NO | N/A | |
| Mercury | NO | demolition | |
| Noise in excess of 85 dBA | YES | demolition | [NOISE] Hearing protection will be used. |
| Polychlorinated biphenyls (PCBs) | NO | N/A | |
| Removal of ceiling tiles* | NO | N/A | |
| Spraying/generation of mists* | YES | demolition | Demolition dust control via water mist. |
| Temperature extremes (heat or cold stress) | Yes | ALL | [CRYRO/COLD/HEAT] Provide heating or cooling for personnel. |
| Ventilation or Air Monitoring requirements | Yes | demolition | [VENTIL/IH] Air monitoring for potential silica during demolition activities will be performed, as needed basis. |
| Welding, brazing, or thermal cutting operations | Yes | demolition | [BURN] Cutting of rebar and etc. will require a permit. |
| Other (specify) | N/A | N/A | |

***NOTE:** Requires a description of the materials involved which present a hazard. Identify the physical location of the MSDS.

**SECTION C. RADIOLOGICAL PROTECTION** - TO BE COMPLETED BY RADIOLOGICAL CONTROLS REPRESENTATIVE

*Identify engineering/administrative controls or PPE as required, keyed to the following checklist items. Insert any required and/or other special actions to be taken because of the particular hazard (i.e. RWP, ALARA Plan, etc.). Additionally, identify any activities which DOE prescribed Occupational Safety and Health standards that require protective measures be designed, inspected, or approved by a professional engineer or other competent person.* (Use Section D if additional space is needed.)

| Item | | Exist | Work Package Phase | Comments, Controls, Methods of Compliance |
|---|---|---|---|---|
| *Location:* | Controlled Area | NO | N/A | |
| | Contamination Area | NO | N/A | [STP] |
| | High Contamination Area | NO | N/A | [STP] |
| | Radioactive Materials Storage Area | NO | N/A | |
| | Airborne Radioactivity Area (STP or OBT) | NO | N/A | |
| | Radiation Area | NO | N/A | |
| | High Radiation Area | NO | N/A | |
| | Very High Radiation Area | NO | N/A | |
| | Other (Specify) | NO | N/A | |
| *Activities:* | Criticality Safety Concerns | NO | N/A | |
| | Digging/Soil Removal | YES | Demolition/slab and foundation | [DIG] Water mist to control potential dust. Air monitoring during demolition. |
| | Surface destruction of radioactively contaminated materials or equipment? | NO | N/A | [SURFAC] |
| | Welding, burning, or grinding? | NO | demolition | [SURFAC] |
| | Hammering, chipping or scraping? | NO | N/A | [SURFAC] |
| | Abrasive blasting? | NO | N/A | [SURFAC] |
| | Dust-collecting equipment or systems? | NO | N/A | |
| | Decontamination and clean-up? | NO | N/A | |
| | Rad Waste Storage and Disposal Required | NO | N/A | [RWSTOR/WASTE/CHAR] |
| | Other (Specify) | N/A | | |
| *Sources:* | X-Ray machine/generator | NO | N/A | [XRAY] |
| | Sealed radioactive sources | NO | N/A | |
| | Unsealed radioactive sources | NO | N/A | |
| *Controls:* | Radiological Work Permit | NO | N/A | [RWP/RWP=JS/RWP=N/R/RPGEN] |
| | ALARA Plan | NO | N/A | [ALARA] |
| | Air Flow Studies | NO | N/A | [AIRFLOW/CAM] |
| | Urinalysis program | NO | N/A | |
| | Preliminary or in-process characterization | NO | N/A | [SURVPS/SURVIP] |
| | Anti-contamination clothing | NO | N/A | |
| | Respiratory protection | NO | N/A | [RESP] |
| | Needs Analysis Evaluation | NO | N/A | |
| | Hazards Analysis | NO | N/A | |
| | Engineering Controls | YES | ALL | Dust control via misting. |
| | Administrative Controls | YES | N/A | Barricades of construction zone |
| | Supplemental dosimetry | NO | N/A | |
| | Shielding | NO | N/A | |
| | Personnel monitoring (frisking) | NO | N/A | |

| SECTION D - OTHER CONDITIONS, CONCERNS, OR SUPPLEMENTAL INFORMATION FROM SECTIONS A THROUGH C |
| --- |
| Identify Assembly Points: Assembly area is north of building 94 on the south side of the railroad track. ***Be aware of threatening weather and take shelter when life-threatening storms are imminent.*** Take shelter area is in building 19, -See Appendix E |

# Work Package Revision Form

| Work Package Revision Form | | | |
|---|---|---|---|
| Work Package No.SMPP/TFV-33185-00 | Revision No. | | |
| Revision Description: (attach page revisions to form) | | | |
| | Name | Signature | Date |
| **PREPARED BY:** | | | |
| Revision Preparer: | | | |
| **REVIEWED BY:** | | | |
| Project Engr. Manager: | | | |
| Project Foreman: | | | |
| Project Superintendent/ Constr. Mgr.: | | | |
| Industrial Safety & Hygiene P o C: | | | |
| Radiological Point of Contact: | | | |
| Environmental Safeguards & Compliance P o C: | | | |
| Waste Management PoC: | | | |
| Building Manager: | | | |
| Other: | | | |
| Other: | | | |
| USQ Trained Person | | | |
| **USQ SCREEN / DETERMINATION REQUIRED?** ☐YES ☐NO<br>Brief Explaination_____ | | | |
| **APPROVED BY:** | | | |
| Project Manager: | | | |

B 8 of 29

## Work Package Revision History Form

| WORK PACKAGE REVISION HISTORY FORM | | | |
|---|---|---|---|
| REV. NO. | REASON | SIGNATURE | DATE |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Job Specific Work Plan
## Table of Contents


1. WORK SCOPE ..... 1
   1.1 Introduction ..... 1
   1.2 Work Package Scope ..... 1
   1.3 Site Information ..... 1
   1.4 Current Uses of Building 94 ..... 1
   1.5 Past Uses of Building 94 ..... 1
   1.6 Summary of Environmental Concerns and Findings – Building 94 ..... 2

2. DRAWINGS AND REFERENCES ..... 3

3. INITIAL CONDITIONS AND PREREQUISITES ..... 3
   3.1 Lessons Learned ..... 3
   3.2 Industrial Safety and Health Requirements ..... 4

4. RADIATION PROTECTION REQUIREMENTS ..... 4

5. ENVIRONMENTAL PROTECTION REQUIREMENTS ..... 5
   5.1 CERCLA ..... 5
   5.2 Review of Building Prints ..... 7
   5.3 National Emissions Standards for Hazardous Air Pollutants (NESHAPs) ..... 7
   5.4 Notification ..... 8
   5.5 Restriction of emission of fugitive dust (OAC 3745-17-08) ..... 8
   5.6 Clean Water Act & Storm Water Pollution Prevention ..... 8
   5.7 National Historic Preservation Act (NHPA) ..... 8
   5.8 Safe Drinking Water Act ..... 9
   5.9 Emergency Spill Response ..... 9

6. CHEMICAL AND WASTE MANAGEMENT REQUIREMENTS ..... 9

7. EMERGENCY PREPAREDNESS ..... 9
   7.1 Site Notification Procedures ..... 9
   7.2 Evacuation Route/Assembly Areas ..... 9
   7.3 Take Shelter Area ..... 10

8. PRE-DEMOLITION SEQUENCE OF WORK ..... 10
   8.1 Site Characterization ..... 10
   8.2 Site Preparation ..... 11
   8.3 Preliminary Activities ..... 11

9. BUILDING DEMOLITION SEQUENCE OF WORK ..... 12
   9.1 Establish Work Zone ..... 12
   9.2 Structural Demolition ..... 13

Job Specific Work Plan

# 1. WORK SCOPE

## 1.1 Introduction

This Job Specific Work Package (JSWP) follows the outline of PP-1059A, Integrated Work Control Program at the Mound Site, Miamisburg, Ohio. Included are a Preliminary Hazard Analysis (PHA) and a Job Safety & Hazard Analysis (JSHA). A Pre-Job Briefing Form (ML-9657) and the Project Manager's Authorization to Commence Work signature will be completed to document that the workers were briefed on the activities covered in this JSWP before work begins.

## 1.2 Work Package Scope

The purpose of this effort is to demolish the superstructure, slab, and foundation, to 3 foot beneath grade of Building 94, remove the debris, and to provide site restoration, grading, seeding and mulching of the area to prevent erosion. This will be accomplished by confirming that all utilities have been isolated during safe shutdown activities, establishing a safe work zone, and the demolition of the building using heavy-duty equipment, and removing of debris as directed by Waste Management.

## 1.3 Site Information

Building 94, the "Materials Compatibility Building," was constructed in 1984 or 85 in the plant valley area near the western edge of the site boundary. It is a single-story, 1,240 square foot, pre-fabricated "Butler"-type metal building with metal roof, on a one-foot thick reinforced concrete slab. The building has four rooms: three larger bays and one smaller mechanical area. The building's north and west walls are contiguous with the current MCP security fence; however, all four building entrances are accessible only from within the current MCP fence-line. The building is serviced with window air conditioner units for cooling and thermostatically controlled electric heaters in each of the three bays. The smaller room has an electric-fin-tube-type radiation heater. There are louver covered exhaust fans as well, with a fan located in each bay. The building has potable water and sanitary services provided by the MCP Plant facility.

## 1.4 Current Uses of Building 94

Building 94 is currently vacant and inactive. Safe shutdown is in process.

## 1.5 Past Uses of Building 94

Building 94 was built as the "Materials Compatibility Building" to support detonator and explosives program operations. Originally, Bays 1 through 3 were oven rooms, and Room 4 was an equipment room. Subsequently, the building was used for materials aging as described in one report that notes "explosives, pyrotechnics, and explosive components are heated in ovens (aged)." When the material aging processes were

discontinued, the ovens were removed from the building. Later, the building was used as a staging area for soil and water sample storage.

In 1997, the building housed a pilot study to evaluate the effectiveness of extracting plutonium and thorium contamination from soil at the MCP site. Because of the process ineffectiveness at removing thorium and high cost of operation, the program ended in 1999, and the equipment was removed from the building and the building cleaned.

In 2000, the building was turned over to the Test Fire Valley (TFV) project and was used to store Environmental Restoration (ER) project soil and water samples that had been collected at the site, analyzed at offsite laboratories, and returned to the site for disposal. In June 2002, the building was vacated and preparations for demolition were initiated.

## 1.6 Summary of Environmental Concerns and Findings – Building 94

**Table 1: Summary of Environmental Concerns and Findings**

| Description | Comment | Resolution |
|---|---|---|
| Lead-Based Paint | No previous lead surveys or sampling data could be found. The paint coatings in a few areas within the building were analyzed in the field using a Niton Model XL-309 XRF lead detector. The sampled paints were found to not contain any amount of lead within the instrument's detection limit.<br>No lead paint hazards currently exist within the building, and no further action is necessary unless any of the untested coatings were to be disturbed by close worker contact. | If lead-based paint were present, there would be no impact to the demolition or disposal of the facility. Close worker disturbance of paint coatings (sanding, grinding, scraping, torching) would be avoided during demolition. If close disturbance is necessary, the point of contact will be tested for lead and appropriate controls and personal protective equipment (PPE) used for disturbance as required. |
| Chemicals | All chemicals have been removed from the building. | N/A |
| Fluorescent Lamps and Polychlorinated Biphenyls (PCBs) | N/A | N/A |
| Air Emissions | N/A | N/A |
| Asbestos | An asbestos survey was conducted in accordance with EPA NESHAP requirements prior to demolition. No asbestos-containing materials were identified. | N/A |
| Drainage Sumps | N/A | N/A |
| Lead | N/A | N/A |
| Mercury | N/A | N/A |

**Table 1: Summary of Environmental Concerns and Findings**

| Description | Comment | Resolution |
|---|---|---|
| Radiological | Radiological surveys of building surfaces showed areas with readings above surface release criteria. | Areas with elevated radiological readings were remediated. All final surveys showed that remediation was successful and all areas meet surface release criteria. |
| Soil Contamination | Of the historic soil samples collected within a 15-foot perimeter of Building 94, one boring location west of the building showed one analytical result (at a depth of 1.5 feet below ground surface) above screening level. | Based on the soil analytical results, no additional protective measures are indicated during building demolition activities.<br>The boring location with the elevated reading will be evaluated as part of the PRS 41 Further Assessment Sampling and Analysis Plan. Any required soil sampling and remediation will be handled by the ER group. |
| Septic System | N/A | N/A |
| Wastewater | Handled by the site wastewater facility. | N/A |
| Stains & Corrosion/HVAC | N/A | N/A |
| Storage Tanks | N/A | N/A |
| Solid Waste Disposal | N/A | N/A |
| Migratory Hazards | N/A | N/A |
| Radon | Within acceptable limits. | N/A |
| Energetic Material | N/A | N/A |

N/A: not applicable

## 2. DRAWINGS AND REFERENCES

PP-1059A, Issue 8, "Integrated Work Control Program"

MD-50000, Issue 11, "Maintenance Work Order and Material Processing"

## 3. INITIAL CONDITIONS AND PREREQUISITES

### 3.1 Lessons Learned

A search of the Lessons Learned Database found the following relevant item:

- Removal of Pier Breaks Underground Water Line

See Appendix F for the full report. The result of the Lessons Learned is that when removing similar piers, or piers of an unknown configuration especially when they are known to be near underground utilities, greater effort in planning the job should be exercised and consideration should be given to excavating the pier rather than simply pulling it out of the ground.

### 3.2 Industrial Safety and Health Requirements

3.2.1 A Job Specific Hazards Analysis (JSHA) is required. The construction zone, as defined in Appendix E, identifies construction boundaries, evacuation routes, the take shelter area, and the assembly area. Debris will be cleared from the immediate construction zone as required to promote safe equipment activity.

3.2.2 Underground electrical utilities will be identified and field located by scanning the area during safe shutdown activities prior to beginning any field demolition activities. Lock-out-tag-out procedures will be followed and electrical energy detection will be performed prior to any electrical demolition activities.

3.2.3 An excavation/soil disturbance permit will be required prior to demolition activities.

3.2.4 Monitoring for fugitive dust will be performed periodically as determined by previous monitoring results and site Safety and Health. Site Safety and Health will be notified before the demolition of concrete begins.

3.2.5 Whole body vibration will be administratively controlled and by reviewing topic at pre-job meeting.

3.2.6 A Hot Work Permit will be required if a torch is used for cutting. Coordinate with site Safety and Health.

3.2.7 Monitoring of noise levels will be performed as determined by previous monitoring results and site Safety and Health. Earplugs (or other hearing protection) will be worn, as appropriate.

## 4. RADIATION PROTECTION REQUIREMENTS

A radiological assessment of Building 94 was performed by reviewing operational history, and radiological survey information. Building 94 was initially placed in service to support detonator and explosives program operations. It then was used to store CERCLA program materials, including aqueous and soil samples collected at Mound, analyzed at offsite laboratories, and returned to Mound for deposit. The building was subsequently used as a site for demonstration of a process for washing radioactively contaminated soils. The most recent use was for Environmental Restoration (ER) sampling support.

Building 94 was classified as impacted because of its history of radioactive material processing and storage. Surveys were performed throughout the building in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Several areas of elevated activity were identified on the floor and remediated. The Final Status surveys demonstrate that remediation was complete and no additional elevated areas were found. The review team has concluded that the building meets radiological surface release criteria established by DOE Order 5400.5 (see Table 2), and no further

radiological surveys are required. Supporting documentation for the information summarized in the following table is contained in the BDP Appendix G.

**Table 2: Radiological Summary**

| TYPE | RSDS (Radiological Survey Data Sheet) | LOCATION | SURVEY RESULTS (dpm/100 cm$^2$) (Note 1) | SURFACE CONTAMINATION GUIDELINES (dpm/100 cm$^2$) (Note 2) |
|---|---|---|---|---|
| Highest Alpha Smearable Activity | 02-TF-1462 | Internal Floor Surface | 8.74 | 20 |
| Highest Alpha Fixed Activity | 02-TF-1461 | Internal Floor Surface | 85 | 100 |
| Highest Beta Smearable Activity | 02-TF-1459 | Internal Wall Surface | 9.59 | 1,000 |
| Highest Beta Fixed Activity | 02-TF-1462 | Internal Floor Surface | 960 | 5,000 |
| Highest Tritium Smearable Activity | 02-TF-1465 | External Wall Surface | 28.62 | 10,000 |

Note 1: Residual radiological activity may be present and not be a concern (within applicable limits). This may result from or be a function of counting statistics, instrument variances, the randomness of decay, radon presence, and/or natural fluctuations in background levels.
Note 2: Guideline values per DOE Order 5400.5, Radiation Protection of the Public and the Environment.

## 5. ENVIRONMENTAL PROTECTION REQUIREMENTS

### 5.1 CERCLA

5.1.1 General/Historical CERCLA Information

Demolition work for this facility will be handled as a non-CERCLA deconstruction . There is no history of spills or releases from this building.

5.1.2 Specific Record Sources for Building 94

5.1.2.1 Occurrence Reports

A search of the occurrence reporting system revealed one report:

- Contaminated Wrench Found in Building 94

5.1.2.2 Spills and Releases

- None

5.1.2.3 Associated PRS Overview

As a result of the investigations and documentation accomplished to comply with the CERCLA cleanup process via the Federal Facilities Agreement (FFA)/DOE Environmental Restoration (ER) Program, DOE and BWXTO have tabulated all the

PRSs identified under the various regulatory programs in effect at the site. Of these 440 PRSs, six are near Building 94 (see Table 2) however none of the PRS are associated with Building 94, other than that Building –94 lies within PRS 41 boundary.

**Table 2: PRSs in Proximity to Building 94**

| PRS | CERCLA or Bldg. Related | Binning Status | Comments |
|---|---|---|---|
| 7 | CERCLA | Further Assessment (FA) | Plant Sanitary Outfall Pipeline. |
| 31 | CERCLA | No Further Assessment (NFA) | Underground Sanitary Sewer Line G5. |
| 41 | CERCLA | FA | Area 3, Thorium Drum Storage and Redrumming Area. |
| 54 | Buildings | Unbinned | Building 57 Sand Filters (2 Units). |
| 56 | Buildings | Unbinned | Building 57 Chlorine Contact Chamber (Tank 112). |
| 356 | CERCLA | NFA | Elevated Soil Gas Location. |

* *PRS 41 is currently undergoing further assessment soil sampling: samples will be taken around the Building 94 footprint. Any required soil sampling and remediation will be handled by the ER group.*

5.1.2.4 Sampling Data

*5.1.2.4.1 Radiological Surveys*

Initial radiological surveys of building surfaces showed some results above screening criteria. Remediation was performed and final surveys showed that the remediation was effective and no additional elevated areas were found. The review team concluded that Building 94 meets radiological surface release criteria established by DOE Order 5400.5

*5.1.2.4.2 Soil Sampling Data*

As shown in Table 3 below, one result from boring location CO115 had a thorium-232 result that exceeded the screening level comparison value. The sample was collected from a depth of 1.5 feet below ground surface. That boring location will be evaluated as part of the PRS 41 Further Assessment. Sampling and Analysis Plan. Any required soil sampling and remediation will be handled by the ER group. Based on the soil analytical results, no additional protective measures are needed indicated during building demolition activities.

**Table 3: Maximum Results Exceeding Screening Levels**

| Analyte | Maximum Result | Background | RBGV* ($10^{-6}$) | Screening Level Comparison |
|---|---|---|---|---|
| Thorium-232 (pCi/g) | 3.56 | 1.4 | 0.07 | 1.47 |

* *RBGV: most stringent of construction and office worker scenarios per Risk-Based Guideline Values, March 1997, Final, as performed using April 2001 HEAST slope factors.*

5.1.2.5 Chemical History

All chemicals have been removed from building. The most recent (March 2002) annual chemical inventory report found no "emergency and hazardous" chemicals located in the building.

5.1.2.6 Lead-Based Paint

No lead surveys or sampling data could be found for Building 94. The paint coatings in a few areas within the building exhibited some damage due to impact damage. Representative samples of the damaged paint were analyzed in the field using a Niton Model XL-309 XRF lead detector. The sampled paints were found to not contain any amount of lead within the instrument's limit of detection. A copy of the Niton's lead sample readout is provided in the BDP. No lead paint hazards currently exist within the building, and no further action would be necessary unless any of the untested coating were to be disturbed by close worker contact (sanding, grinding, scraping, torching).

If lead-based paint were present, it would not impact the demolition or disposal of the facility. Close worker disturbance of paint coatings would be avoided during demolition. If close disturbance is necessary, point of contact will be tested for lead and appropriate controls and personal protective equipment (PPE) used for disturbance as required.

5.1.2.7 Asbestos

An asbestos survey was conducted in accordance with EPA NESHAP requirements prior to demolition. No asbestos-containing materials were identified.

5.1.2.8 Radon

The results of a 1989-90 Mound Indoor Radon study indicated an average radon concentration of 0.5 picoCuries/liter (pCi/L) in Building 94. The USEPA recommended standard for a maximum radon level is 4.0 pCi/L.

## 5.2 Review of Building Prints

This structure has been examined by an Energetic Material Subject Matter Expert (SME) and has been determined to be safe for demolition.

## 5.3 National Emissions Standards for Hazardous Air Pollutants (NESHAPs)

The estimated dose equivalent (EDE) to an offsite individual was calculated to be 3.6 e-6 mrem /yr. Therefore, USEPA approval to begin the project is not necessary.

## 5.4 Notification

A Notification of Demolition and Renovation form must be filed with the Regional Air Pollution Control Agency (RAPCA) at least 10 business days before planned building demolition.

## 5.5 Restriction of emission of fugitive dust (OAC 3745-17-08)

Reasonably available control measures must be employed to prevent fugitive dust from becoming airborne. Visual particulate emissions from any fugitive dust source shall not exceed 20% opacity as a three-minute average. Appropriate activities would include:

Water misting, or other suitable dust suppression, will be used to minimize fugitive dust resulting from demolition activities.

Periodic application of water, or other suitable dust suppression, to adjacent roadways and parking lots will be used to prevent dust from becoming airborne.

Trucks hauling debris to the onsite spoils area should be covered while in transit.

## 5.6 Clean Water Act & Storm Water Pollution Prevention

All inlets to the sanitary and storm systems will be plugged to prevent accidental discharges to the wastewater treatment plant or the environment.

The Site's National Pollutant Discharge Elimination System (NPDES) Permit No. 1IO00005*HD requires the use of control measures to ensure the quality of storm water leaving the site. These control measures and practices are outlined in the site's Storm Water Pollution Prevention Plan OPA980099. Appropriate activities would include, Redirect flow patterns around the project site to prevent stormwater run-on. Provide inlet protection to the storm sewer system by covering catch basins immediately adjacent to the project site and plugging roof drains at ground level until which time the underground pipes can be appropriately abandoned. Exercise good housekeeping techniques by segregating materials in a timely manner, including the prompt disposal of wastes, and sweeping debris from the streets to prevent stormwater pollution. Water that has collected in an open excavation or in sumps, must be monitored prior to discharging to the sanitary or storm sewer systems. Contact Environmental Monitoring at extension 4188 for monitoring and review of these non-routine discharges.

## 5.7 National Historic Preservation Act (NHPA)

Building 94 is not listed as a historic structure with the Ohio Historic Preservation Office (OHPO). No mitigative documentation package is required. However, if any items or artifacts are discovered as this project progresses, the Cultural Resource Representative will be notified at extension 3691. Work will be temporarily suspended until which time the items or artifacts have been recovered.

### 5.8 Safe Drinking Water Act

The potable water supply to Building 94 was turned off and capped to protect the integrity of the water supply to that portion of the plant site.

### 5.9 Emergency Spill Response

Building 94 has been disconnected from all utility services and the lines drained. There should be no regulated component that will be encountered. In the event of a major spill of any regulated substances, or the rupture of a non-isolated utility line (fire, domestic water, ethylene glycol) call 911 if using an onsite phone or 937-865-4040 if using a cell or other outside phone to report it, also see Emergency Preparedness section. All spills must be contained onsite and should be prevented from entering the storm drains if possible. If spills enter the storm drains, all effluent must be retained onsite at the overflow pond.

## 6. CHEMICAL AND WASTE MANAGEMENT REQUIREMENTS

All waste will be managed in accordance with the Waste Management Plan for the Mound Exit Project, MD-10499. The Waste Coordinator will ensure that this is accomplished and summarize in a Job Specific Waste Management Plan See. Appendix G.

Fluorescent tubes and non-PCB containing ballasts will be left in place, and will be demolished with the building. PCB containing ballasts had been in the building; they have been removed during Safe Shutdown activities. Note: The fluorescent tubes have been removed.

## 7. EMERGENCY PREPAREDNESS

### 7.1 Site Notification Procedures

Use **911** for all emergency services onsite. This is the first response for any emergency, spill, or release. If using a cell phone, dial **865-4040**. This number will ring into the plant 911 system.

Any injury, no matter how minor, shall be reported immediately to the Medical Department for evaluation and treatment. The injured employee shall report any injury to the supervisor in charge or designee.

Employees will be notified of emergency or abnormal conditions by the plant paging system or project two-way radios. Additionally, unique sheltering and evacuation signals are available should site-wide protective actions be necessary.

### 7.2 Evacuation Route/Assembly Areas

Assemble area is north of Building 415 on the south side of the railroad track. See map per Appendix E.

### 7.3 Take Shelter Area

**CAUTION**

***Be aware of threatening weather and take shelter when life-threatening storms are imminent.***

The take shelter area is in Building 19. See map per Appendix E.

## 8. PRE-DEMOLITION SEQUENCE OF WORK

### 8.1 Site Characterization

8.1.1 Physical Characterization

A structural engineering survey (see appendix G) was performed and documented for Building 94 to meet the requirements of OSHA 29 CFR 1926.850(a). A walkdown of the structure was used to identify potential hazards as listed in 29 CFR 1926.850(e) through (i). It has been determined the building does not meet the criteria that cause the structure to be historically significant.

8.1.2 Radiological Characterization

A radiological assessment of Building 94 was performed by reviewing operational history, and radiological survey information. Building 94 was initially placed in service to support detonator and explosives program operations. It then was used to store CERCLA program materials, including aqueous and soil samples collected at Mound, analyzed at offsite laboratories, and returned to Mound for deposit. The building was subsequently used as a site for demonstration of a process for washing radioactively contaminated soils. The most recent use was for Environmental Restoration (ER) sampling support. Building 94 was classified as impacted because of its history of radioactive material processing and storage. Surveys were performed throughout the building in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Several areas of elevated activity were identified on the floor and remediated. The Final Status surveys demonstrate that remediation was complete and no additional elevated areas were found. The review team has concluded that the building meets radiological surface release criteria established by DOE Order 5400.5

8.1.3. Chemical and Metals Characterization

All chemicals and metals have been removed from building. The most recent (March 2002) annual chemical inventory report found no "emergency and hazardous" chemicals located in the building.

8.1.4. Asbestos Characterization

An asbestos survey was conducted in accordance with EPA NESHAP requirements prior to demolition. No asbestos-containing materials were identified.

8.1.5. Radon

The results of a 1989-90 Mound Indoor Radon study indicated an average radon concentration of 0.5 pico Curies/liter (pCi/L) in Building 94. The USEPA recommended standard for a maximum radon level is 4.0 pCi/L.

## 8.2 Site Preparation

8.2.1. Site Access Control

The demolition area will be identified utilizing the construction fencing around the building, or at the discretion of the project construction manager/foreman. marked off with barricade tape/fencing.

8.2.2. Temporary Utilities

The only temporary utility that may be required is water and electricity. Coordinate with site Safety and Health. Water will be used to control dust emissions.

8.2.3. Temporary Facilities

This project will use the existing SMPP/TFV project new trailer complex to be located in the existing Mound "C" parking lot.

8.2.4. Temporary Communications

Temporary communications are required (cell phone, radios) due to the difficulty of hearing plant announcements and emergency notifications. At the job site, plant announcements and emergency notifications can be heard on the Plant radio channel.

8.2.5. Staging Areas

The project site is of sufficient size to also be used as a staging area.

## 8.3 Preliminary Activities

Domestic water, firewater, electrical, fire alarm system and communications lines have been disconnected under separate safe shutdown MSR. 30026. An excavation/soil disturbance permit for slab and footing removal will be required prior to excavation activities.

Verify all mercury-containing switches have been removed during safe shutdown. If found, dispose through Waste Management.

Confirm all Freon has been previously removed and recycled from HVAC units inside and outside of the building.

| HAZARD | MITIGATION |
|---|---|
| Fall hazard | Follow requirements of MD-10286 M-14 |

## 9. BUILDING DEMOLITION SEQUENCE OF WORK

### 9.1 Establish Work Zone

Establish work zone boundary using the existing fence and/or with barricade tape as directed by the Project Foreman. Proper signage will be placed at all access points to the site. This zone is not to be entered by anyone not directly involved with the demolition unless they have contacted the Project Manager/Foreman first. Do not begin any demolition activities until the following items are completed.

**All new workers assigned to this project have received a pre-job briefing prior to performing work and a walkdown of the project area. The following must be completed prior to starting work.**

**Review of the *Preliminary Hazard Analysis* for work package activities must be complete.**

9.1.1 The Pre-Job Briefing Record must be completed and signed.

9.1.2 The Job Specific Hazards Analysis (JSHA) must be reviewed.

**NOTE: All workers have Stop Work Authority. Situations where stop work authority is to be exercised are:**

- **To stop unsafe work.**
- **To stop unauthorized work, for example, work outside the scope of this work package.**

9.1.3 Verify Safe Shutdown activities have isolated all the connections to Building 94, including the following systems: electric/communication/fire alarm systems, sewage and potable water systems.

9.1.4 Verify that all pre-demolition notifications have been made and permits are in place.

Install sediment/storm water control fence around designated construction area as necessary. Note: NPDES outfall 601 & waste
water treatment plant are adjacent to the deconstruction site. Exercise extreme care as to not create an upset condition.

Prepare water distribution system for the control of dust.

## 9.2 Structural Demolition

### 9.2.1 Structure Demolition

Demolish the structural steel frame using heavy equipment. Use the existing slab for load out surface for loading debris and placing into appropriate hauling containers or trucks.

**Note: The progression of the building demolition will ultimately be determined in the field.**

| HAZARD | MITIGATION |
|---|---|
| Contact overhead power lines with heavy-duty equipment. | If an part of heavy-duty equipment has the potential to come within 10' of overhead powers, perform LOTO. |
| Struck by flying debris<br>Struck by moving equipment | Establish construction boundary.<br>Wear hardhat safety glasses, safety shoes, and reflective vest inside construction area.<br>Maintain the following distances from operating equipment:<br>Shear – 75 feet<br>Hoe Ram – 50 feet<br>Other heavy duty equipment – 30 feet<br>Bobcat – 15 feet |
| Noise Hazard | Wear hearing protection while running heavy-duty equipment. Follow the requirements of MD-10286 D9. |
| Burns from torch cutting | Obtain and follow Hot Work permit per MD-10286 O2 |
| Heat/Cold Stress | Follow the requirements of MD-10286 D13/D16 |

**Exact sequence of demolition will be left up to the skill of the craft.**

### 9.2.2 Slab and Foundation Demolition

Using heavy equipment, break apart the concrete slab, foundation, and footers in order to eliminate the occurrence structural concrete to 3-feet below grade, torch cut the rebar if required (Hot Work Permit is required if used) to support demolition and downsizing. During the concrete demolition, use heavy equipment to assist radiological control personnel to perform radiological screening of all concrete surfaces. Based on radiological screening results, transport to Mound's spoils area, offsite disposal, or rail spur as directed by Waste Management.

**Note: The progressions of the building demolition will ultimately be determined in the field.**

| HAZARD | MITIGATION |
|---|---|
| Burns/fire | Burn permit, fire protection, and PPE. |
| Strike underground utilities | Obtain Excavation permit and follow its requirements per MD-10286 O5 |

9.2.3 Organize area for future soil remediation

The last step will be to restore the area by grading to drain and seeding. Remove any unnecessary remaining sediment/storm water control fences. Scan equipment for radiological contamination. If contamination is detected or found during radiological surveys only then the equipment will be decontaminate prior to leaving area. Remove dust control water distribution system, temporary power, fencing and any traffic control.

# Appendix A
# JSHA/HASP

Project/Activity: Building 94 Demolition
Name: Lee Koehmstedt

| JSHA CRITERIA CHECKLIST | YES | NO | N/A |
|---|---|---|---|
| 1. Work performed with a 6 ft. or greater fall hazard, excluding portable ladders. See Item 14 for further requirements. | | X | |
| 2. Roof work requiring the use of fall protection (within 6 ft of an unprotected edge) or special fall protection procedures. | | X | |
| 3. Potential hazardous chemical exposure above action levels or permissible exposure limits (PELs), or ACGIH Threshold Limit Values (TLVs). | | X | |
| 4. Work activity in an immediately dangerous to life or health (IDLH) breathing hazard environment. | | X | |
| 5. Fire or explosion hazards. Are fire hazards beyond a Hot Work Permit? (Reference O2, MD-10286) | | X | |
| 6. Work within close proximity of live electrical greater than 50 volts, conductors, and/or work that requires multiple locks, multiple hazard sources, or complicated lockout/tagout circumstances. (Reference MD-10444, *Lockout/Tagout Procedure Manual*, for multiple energy lockout/tagout.) | | X | |
| 7. Any maintenance or repair of equipment under pressure where the pressure cannot be shut off and de-energized. | | X | |
| 8. Work with high or extreme exposure to ionizing or nonionizing radiation (reference MD-80036, Op 10002), noise, or heat or cold stress (reference D9, D13 & D16, MD-10286). | X | | |
| 9. Determined by an appropriate core team, building manager, member of general or executive management, or the IS&H manager to require a JSHA. | X | | |
| 10. Any onsite construction or service project directed to have JSHAs based on this procedure and/or instruction from project personnel or IS&H staff. | X | | |
| 11. Near-miss event with the potential for loss of life or limb or disabling injury/illness if repeated. | | X | |
| 12. Excessive trauma/motion/vibration work situations or manual lifting involving heavy, large, and/or awkward-to-handle objects (reference MD-10407, *Ergonomics Program.* | | X | |
| 13. Unguarded, unmarked close clearance, pinch point, exposed moving machinery parts. | | X | |
| 14. Known potential falling object hazards (e.g., employees working above other employees, potential for dropping tools, falling equipment or material) or working in areas with the potential for flying objects (flying chips, sandblasting, etc.), exposure to sharp or protruding objects (e.g., working inside plenums, air mover ducts, etc.). | X | | |

**MANDATORY JSHA REQUIRED TO ADDRESS ANY/ALL (YES) RESPONSES**

## JOB SAFETY & HEALTH ANALYSIS

**JSHA MASTER DOCUMENT CONTROL NO:** SMPP/TFV – 33185-0

| | | | |
|---|---|---|---|
| **DATE:** 12/10/2002 | _X_ NEW<br>___ REV | **BUILDING:** 94 | **JOB:** Demolish Building 94 |
| **DEPARTMENT/COMPANY:** SMPP/TFV | | | **SECTION:** N/A |

**OCCUPATIONS:** : Heavy Duty Operators, Demo Tech's, Constr. Crafts, Pipefitter/Welders, Electricians, Fab. Mechanics. Supported by Project Personnel e.g.. Supervision, Engineering, RAD Control, Ind. Hygiene, and Safety

**SIGNATURES**

| | |
|---|---|
| ORIGINATOR: Lee Koehmstedt | 12/10/02 |
| REVIEW/REV: Jared Willis/Chris Ahlquist | |
| REVIEW/REV: Bill Wahler/ Jim Harvey | |
| REVIEW/REV: Gary Weidenbach | 01-09-03 |
| APPROVED: C D Thompson | 01-13-03 |

**REQUIRED PERSONAL PROTECTIVE EQUIPMENT:**
Hard Hat, Safety Glasses with side shields, safety shoes, safety vest

**MSDS(s)/CHEMICALS ASSOCIATED WITH THE JOB:**
Insecticide

| BASIC JOB STEPS | POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS | SAFE JOB PROCEDURES |
|---|---|---|
| Break the job down into basic steps that tell what is done first, what is done next, and so on<br><br>Record the job steps in their normal order of occurrence Describe what is done, not the details of how it is done. Usually, three or four words are sufficient to describe each job step. For example, the job of "replacing a light bulb" may break down into basic steps as follows:<br><br>1. Bring and set up ladder<br>2. Ascend ladder<br>3. Remove light globe & bulb<br>4. Replace light bulb<br>5. Replace light globe<br>6. Descend ladder<br>7. Remove and store ladder | Ask yourself for each job what accidents/illnesses could occur to the employee doing the job<br><br>Record potential accidents/illnesses by combining one of the abbreviations below with the agent of contact. For example, "struck by a crane hook" is recorded "SB-crane hook" Number each potential accident<br><br>SB - Struck by<br>CB - Contacted by<br>SA - Struck against<br>CW - Contact with<br>CI - Caught in<br>CO - Caught on<br>IB - Caught between<br>F - Fall<br>SO - Strain-overexertion*<br>E - Exposure (occ illness)<br>*Show ergonomic stresses as SO (repetitive trauma, single event strain, or awkward position) | For each potential accident/illness, ask yourself exactly what the employee should do or not do to avoid the accident/illness.<br><br>Describe specific precautions in detail. Give each precaution the same number given in the potential accident (center column) to which it applies. Avoid generalities such as "Be alert," "Be careful," and "Take caution." Use simple do or don't statements; e g, "Lock out main power switch," "Stand clear of lift before signaling," or "Check wrench grip before exerting full force" If necessary, explain how, as well as what, to do Amount of detail is a matter of judgment<br><br>Describe ergonomic solutions (job redesign, new tools, worker lift assistance, etc ) |
| 1) Establish work zone | **General Safety Note** A wide variety of incidents occur on a regular basis that potentially could result in injury or illness | 1) Be cognizant of your own safe work practices as well as those of your co-workers<br>2) Review any related safety procedures of which you are unsure<br>3) Utilize STOP WORK Authority as necessary |
| 1a) Pre-job meeting with involved personnel to discuss the work plan and safety requirements. | NA | This project engages in Enhanced Work Planning(EWP), a ISM process that evaluates and improves the approach by which work is identified, planned, approved, controlled, and executed. |
| 1b) Area preparation | Standard construction hazards. | A) Demolition preparation is defined by 29CFR1926.850; workers, unfamiliar with construction standards must notify the project supervision and/or project health and safety personnel.<br>B) Once the work area is defined, only authorized personnel are permitted in the construction perimeter.<br>C) Unescorted, Non-project and Non-emergency personnel, must have acceptance of the SMPP/TFV Project Manager for entry. |
| 1c) Utility protection | Running into PIV's, etc. or grates over field drains. | A) Mark PIV's and other utility equipment with visible stakes and/or colored flags, and/or protective barriers as required.<br>B) Cover field grates with steel sheeting to protect. |
| 1d) Emergency egress/access | Blocked access | A) Emergency access to the work zone will be maintained to the extent possible. |

827824 29

# JOB SAFETY AND HEALTH ANALYSIS FORM
## (CONTINUATION SHEET)



| BASIC JOB STEPS | POTENTIAL ACCIDENT/ILLNESSES OR KNOWN HAZARDS | SAFE JOB PROCEDURES |
|---|---|---|
| 1e) Utility isolation | Electrical shock or electrocution | A) Utilities to the building including electrical have been disconnected by project electricians at a point away from the building.<br>B) Identify sources outside the building that may require LOTO to prevent incidental contact by Heavy Duty Equipment. |
| 2/3) Demolition of building and slab | Personnel in proximity with heavy duty equipment | Heavy duty equipment will be used to provide an additional margin of safety vs. putting workers in harms way. -- stay clear of operating equipment. |
| Operation of heavy equipment near electric overhead lines | Electrocution | LOTO all electrical overhead lines. |
| Demolish building, and slab using excavator mounted shear, hoe ram, grapple, loader, and bobcat | Struck by flying debris<br>Struck by moving equipment<br><br>Noise Hazard | Establish construction boundary.<br>Wear hard hat safety glasses, safety shoes, and reflective vest inside construction area. Make eye contact with operator when working around equipment. Use hand signals to communicate intent.<br>Maintain the following distances from operating equipment:<br>Shear – 75 feet<br>Hoe Ram – 50 feet<br>Other heavy duty equipment – 30 feet<br>Bobcat – 15 feet<br>Make sure equipment is in safe working order. Use spotter if operator vision is obstructed. Install traffic control.<br>Wear hearing protection while running heavy duty equipment Follow the requirements of MD-10286 D9 |
| Torch cut rebar or to weaken structural members | Burns, fire<br>Potential lead paint | Obtain and follow Hot Work permit per MD-10286 O2. Wear proper PPE, have fire extinguishers in the construction zone. Test for lead paint; do not torch cut lead paint. |
| Working in excessive heat/cold | Heat Stress/Cold Stress | Follow the requirements of MD-10286 D13/D16 |
| Working outside. | Adverse weather conditions | Be aware of adverse weather conditions, assembly and take shelter areas. |
| Slab removal | Strike underground utilities<br>Silica exposure | Obtain Excavation permit and follow its requirements per MD-10286 O5<br>Monitor for silica, keep area wet for fugitive dust suppression. |
| 4) Restore area | **General Safety Note** A wide variety of incidents occur on a regular basis that potentially could result in injury or illness | 1) Be cognizant of your own safe work practices as well as those of your co-workers<br>2) Review any related safety procedures of which you are unsure |

| | | |
|---|---|---|
| | | 3) Utilize STOP WORK Authority as necessary |
| 4a) Rough grading | Equipment/ personnel mixture | Ground personnel stay clear and in sight of the equipment operator. |
| 4b) Covering ground | Slip -- Trip -- Fall<br>Lifting /twisting strain | Uneven walking and/or working surfaces --use extra caution.<br>Follow accepted practices |
| 4c) Protecting / filtering field drains | Lifting /twisting strain | 2 man rule follow standard practice lifting grates. |
| 4d) Dismantling fence | Slip trips and falls<br>Cuts and abrasions<br>Lifting /twisting strain | 1) Be cognizant of your own safe work practices as well as those of your co-workers<br>2) Review any related safety procedures of which you are unsure<br>3) Utilize STOP WORK Authority as necessary |

# APPENDIX C

## Post-Demolition Radiological Surveys

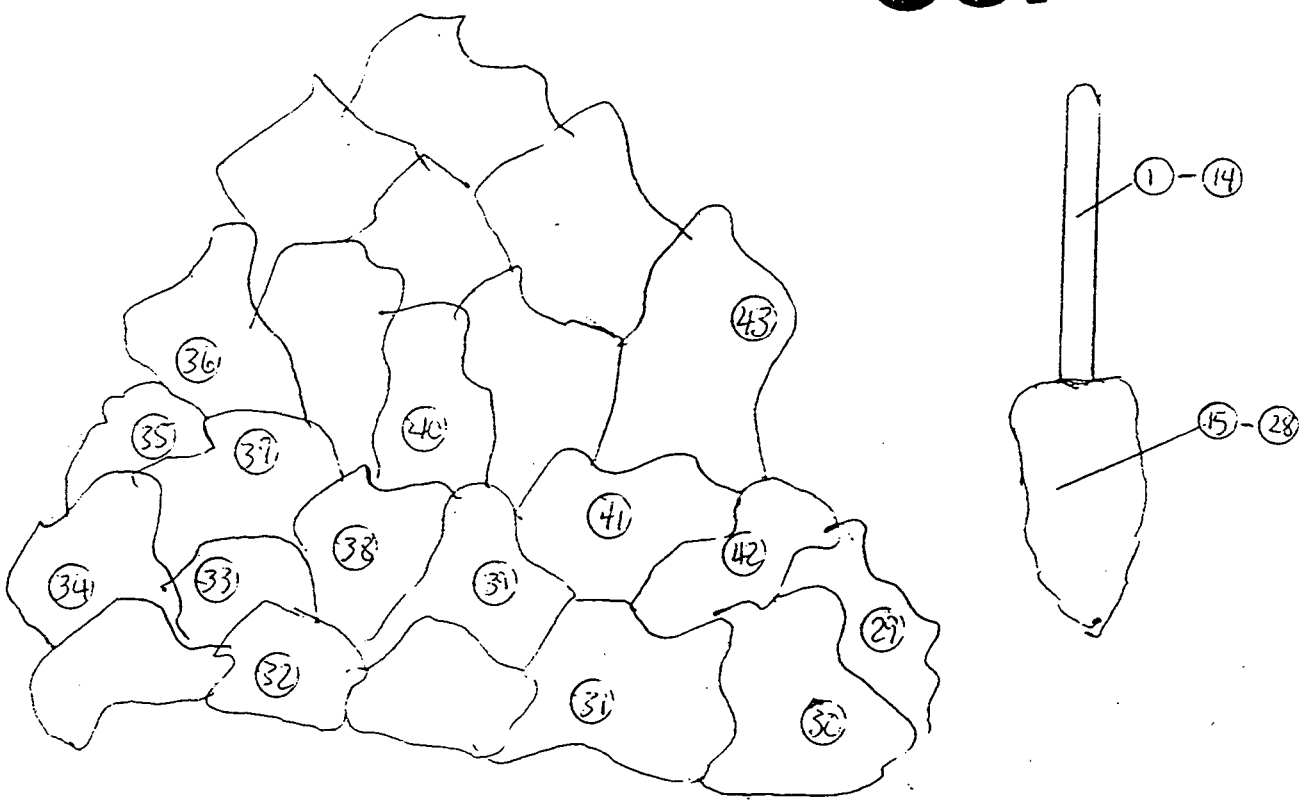
# RADIOLOGICAL SURVEY DATA SHEET



| | |
|---|---|
| LOCATION: (BLDG./AREA/ROOM) 94 CONCRETE | SURVEY NO 03-TF-0066 |
| PURPOSE: RELEASE CONCRETE TO WASTEMANAGEMENT | RWP NO. N/A |
| | DATE: 3-17--2003 |
| | TIME 0900 |

## MAP / DRAWING

COPY




- NOTE: BICRON FIDLER USED FOR INDICATION ONLY. RESULTS WERE NON-DETECTABLE.
- INTEGRATED READING TAKEN IF AUDIBLE ALPHA DETECTED ALL RESULTS: <100 dpm/100cm2 ALPHA AND <5K dpm/100cm2 BETA NO AUDIBLE DETECTED

LEGEND:

# = mrem/hr (γ) whole body

#E = mrem/hr (β+η+γ) extremity on contact

K = factor of 1000

— · — · — = radiological boundary

△# = mrem/hr neutron

(#) = swipe number

[#] = air sample number

(#/α) or /β = direct contamination measurement in dpm/100 cm²

**INSTRUMENTS USED**

| Instrument | Serial Number | Cal. Due Date |
|---|---|---|
| 2360 | 5833/5847 | 3-13-2004 |
| FIDLER | 3815/3846 | 1-22-2004 |
| | N/A | |
| | | |

| | | |
|---|---|---|
| Completed by: (Signature) K. Abercrombie | HP# [redacted] | Date: 3-17--2003 |
| Completed by: (Print Name) DANIEL HARVEY/KEITH ABERCROMBIE | | |
| Counted by: (Signature) RECORD ON FILE | HP# NA | Date: NA |
| Counted by: (Print Name) NA | | |
| Reviewed/Approved by: (Signature) | HP# [redacted] | Date: 03/18/03 |
| Reviewed/Approved by: (Print Name) RM Cablentz | | |

Survey No. 03-TF-0066



# RADIOLOGICAL SURVEY DATA SHEET (cont.)

| Removable Contamination | | | | |
|---|---|---|---|---|
| Swipes (dpm/100cm²) | | | | |
| Sample # | β/γ | Alpha | Tritium | Comments |
| 1 | See Attached | | NA | Poles |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | Poles. |
| 15 | | | | Concrete |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | Concrete |
| 29 | | | | Concrete Pile |
| 30 | | | | |
| 31 | | | | |
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |
| 35 | See Attached | | NA | Concrete Pile |

| Removable Contamination | | | | |
|---|---|---|---|---|
| Swipes (dpm/100cm²) | | | | |
| Sample # | β/γ | Alpha | Tritium | Comments |
| 36 | See Attached | | NA | Concrete Pile |
| 37 | | | | |
| 38 | | | | |
| 39 | | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 43 | See Attached | | NA | Concrete Pile |
| | | NA | | |

COMMENTS: Smears 1-14 on 14 Different Poles. Smears 15-28 on 14 Different Concrete.

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620 (4-98)

Ca 2 of 4

# Alpha/Beta Analysis

| | | | |
|---|---|---|---|
| Batch ID: | Smear Unit 1 - 200303171017 | Count Date: | 3/17/2003 |
| Group: | H | Count Minutes: | 1.5 |
| Serial Number: | 78218-1 | Count Mode: | Simultaneous |
| Batch ID: | 03-TF-0066 HARVEY-43 BSB | Operating Volts: | 1440 |
| Selected Geometry: | Swipe/Smear | Cal Due Dates: | 6/19/2004 |

| Efficiency (%) | | | | Spillover (%) | | | |
|---|---|---|---|---|---|---|---|
| Alpha: | 34.73 | ± | 0.13 | Alpha to Beta: | 11.39 | ± | 0.00 |
| Beta: | 46.13 | ± | 0.13 | Beta to Alpha: | 0.07 | ± | 0.00 |

| Sample ID | Carrier ID | Alpha (dpm) | σ | Beta (dpm) | σ |
|---|---|---|---|---|---|
| 1 | 84 | 0.00 | 0.00 | 2.74 | 2.04 |
| 2 | 34 | 0.00 | 0.00 | 4.11 | 2.50 |
| 3 | 75 | 2.18 | 1.92 | 2.58 | 2.05 |
| 4 | 7 | 0.00 | 0.00 | 1.37 | 1.45 |
| 5 | 60 | 4.37 | 2.72 | 1.06 | 1.46 |
| 6 | 38 | 0.00 | 0.00 | 2.74 | 2.04 |
| 7 | 32 | 0.00 | 0.00 | 4.11 | 2.50 |
| 8 | 73 | 0.00 | 0.00 | 5.48 | 2.89 |
| 9 | 97 | 2.19 | 1.92 | 0.00 | 0.16 |
| 10 | 29 | 0.00 | 0.00 | 2.74 | 2.04 |
| 11 | 75 | 2.19 | 1.92 | 1.21 | 1.45 |
| 12 | 35 | 0.00 | 0.00 | 1.37 | 1.45 |
| 13 | 19 | 2.18 | 1.92 | 5.32 | 2.90 |
| 14 | 46 | 0.00 | 0.00 | 4.11 | 2.50 |
| 15 | 13 | 2.19 | 1.92 | 1.21 | 1.45 |
| 16 | 76 | 4.37 | 2.72 | 1.06 | 1.46 |
| 17 | 34 | 4.37 | 2.72 | 2.43 | 2.06 |
| 18 | 51 | 0.00 | 0.00 | 2.74 | 2.04 |
| 19 | 65 | 0.00 | 0.00 | 4.11 | 2.50 |
| 20 | 9 | 4.37 | 2.72 | 2.43 | 2.06 |
| 21 | 72 | 0.00 | 0.00 | 1.37 | 1.45 |
| 22 | 21 | 0.00 | 0.00 | 2.74 | 2.04 |
| 23 | 69 | 4.37 | 2.72 | 2.43 | 2.06 |
| 24 | 56 | 0.00 | 0.00 | 5.48 | 2.89 |
| 25 | 62 | 0.00 | 0.00 | 4.11 | 2.50 |
| 26 | 43 | 13.11 | 4.70 | 4.54 | 2.92 |
| 27 | 13 | 0.00 | 0.00 | 4.11 | 2.50 |
| 28 | 33 | 2.18 | 1.92 | 5.32 | 2.90 |
| 29 | 44 | 0.00 | 0.00 | 4.11 | 2.50 |
| 30 | 27 | 2.18 | 1.92 | 2.58 | 2.05 |
| 31 | 77 | 0.00 | 0.00 | 6.85 | 3.23 |
| 32 | 65 | 0.00 | 0.00 | 1.37 | 1.45 |
| 33 | 44 | 2.19 | 1.92 | 0.00 | 0.16 |
| 34 | 65 | 4.37 | 2.72 | 0.00 | 0.23 |
| 35 | 6 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 98 | 0.00 | 0.00 | 1.37 | 1.45 |
| 37 | 42 | 4.37 | 2.72 | 3.80 | 2.51 |

B S Brown

KA

~~Page 1 of 2~~

KA
3-17-03

KA

Ca 3 of 4

# Alpha/Beta Analysis

| Efficiency (%) | | | | Spillover (%) | | | |
|---|---|---|---|---|---|---|---|
| Alpha: | 34.73 | ± | 0.13 | Alpha to Beta: | 11.39 | ± | 0.00 |
| Beta: | 46.13 | ± | 0.13 | Beta to Alpha: | 0.07 | ± | 0.00 |

| Sample ID | Carrier ID | Alpha (dpm) | σ | Beta (dpm) | σ |
|---|---|---|---|---|---|
| 38 | 37 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 36 | 2.18 | 1.92 | 2.58 | 2.05 |
| 40 | 59 | 0.00 | 0.00 | 2.74 | 2.04 |
| 41 | 42 | 0.00 | 0.00 | 1.37 | 1.45 |
| 42 | 63 | 4.37 | 2.72 | 0.00 | 0.23 |
| 43 | 57 | 2.18 | 1.92 | 2.58 | 2.05 |

KA KA

**Batch ID:** 03-TF-0066 HARVEY-43 BSB



KA
3-17-03