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OPERABLE UNIT 3

OPERABLE UNIT 4 (OU4) COMPLEX SILO 3 IMPLEMENTATION PLAN FOR ABOVE-GRADE SILO 3 DECONTAMINATION AND DISMANTLEMENT

OCTOBER 2004

FERNALD CLOSURE PROJECT
FERNALD, OHIO

U. S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

FINAL

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RECORD OF ISSUE/REVISION

DATE	REVISION NO.	DESCRIPTION AND AUTHORITY
7/8/04	Rev. 0	Issued Final Implementation Plan
10/14/04	Rev. 0, PCN1	Section 2.2, Paragraph 1 – The last sentence has been changed to read: "Upon availability, the radiological characterization information for Silo 3 and associated structures will be issued with a submittal letter to the regulatory agencies." The following text has been added as the last paragraph to Section 2.3.4: "If debris cannot be dispositioned in the OSDF, either because the OSDF is not open or the debris does not meet the OSDF WAC, the preferred disposition is Envirocare via the WPRAP rail system. If this option is not available, another offsite disposal facility (TBD) will be used." Section 2.3.4, Paragraph 3 – The following two sentences have been added to the end of this paragraph: "At this time, there are no plans to stockpile Silo 3 debris. In the event stockpiling becomes necessary, all site requirements will be met." Section 2.4, Subtitle "Radiological Air Monitoring", Page 11 – The last paragraph has been changed to read: "Supplemental radiological air monitoring will be performed during the Silo 3 and associated structures D&D activities." Note: As a result of this change, reference to several documents has been removed from Page 29. The following text has been added as the last sentence to Section 2.6: "Information relating to any new or innovative technologies incorporated during the decontamination and demolition activities will be issued with a submittal letter to the regulatory agencies." Section 3.2, Subtitle "Surface Decontamination", Page 22 – The following text has been added as the last two sentences: "At the completion of the operations phase, the project will retrieve surrogate material such as flyash or sand to flush out the system. This waste stream will be packaged for disposal. The last sentence of the first paragraph in Appendix B has been changed to identify "three" leading alternatives to onsite disposal.

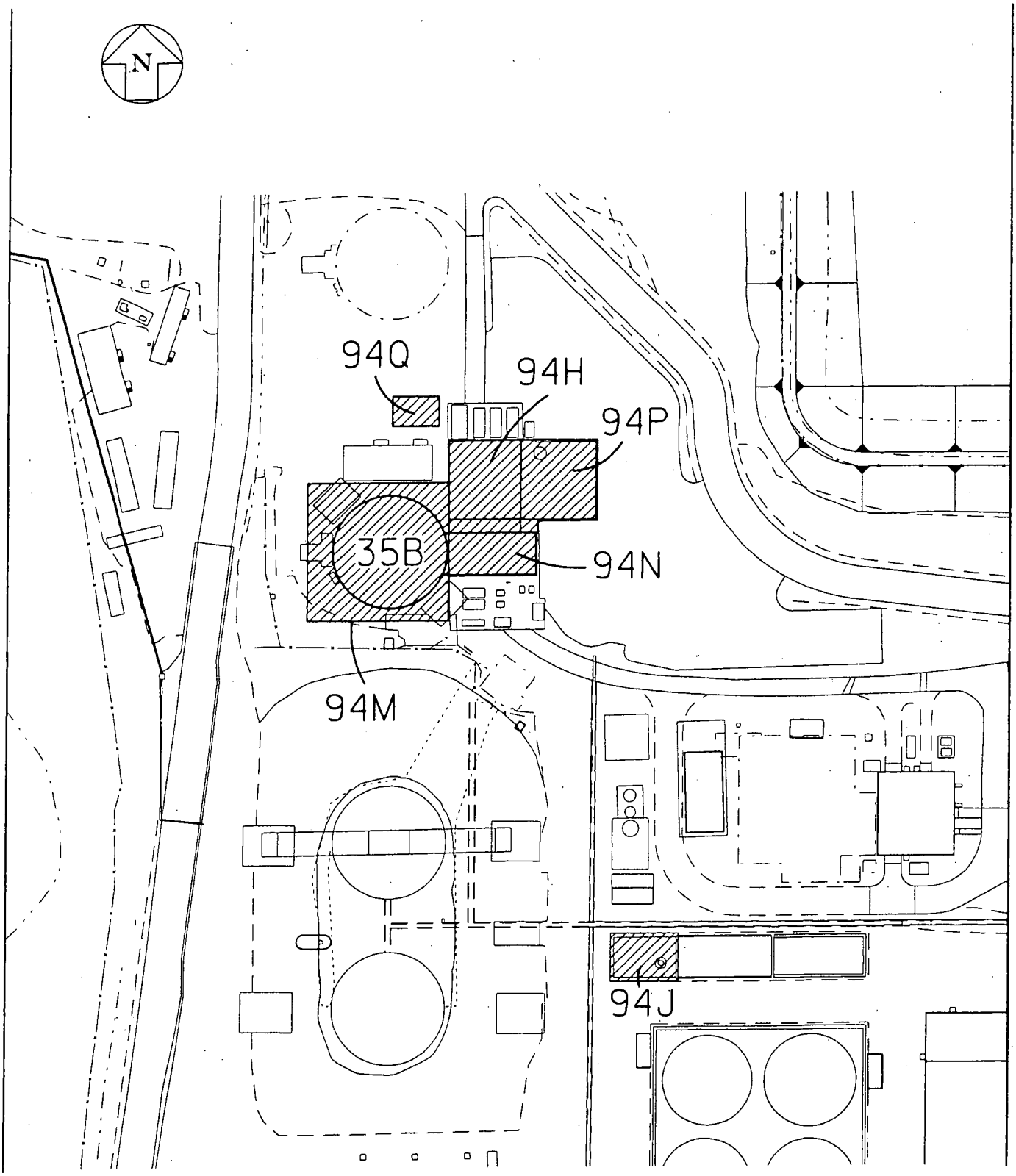

FIGURE 1-1 Silo 3 and Associated Structures

2.0 GENERAL PROJECT REMEDIATION APPROACH

The overall approach to the above-grade D&D of Silo 3 and associated structures is based on the project-specific applications of the programmatic elements and tasks that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. Section 2 of the implementation plan summarizes the project-specific applications of those elements.

2.1 Sequencing of Remediation

The remediation sequence for components in the OU4 Complex Silo 3 D&D project covers the period of: 1) premobilization, which includes the preparation, review and approval of the Fluor Fernald self-perform work control documents, health and safety documents, etc; 2) mobilization, which includes establishing project support facilities and controls; 3) actual D&D field activities for each building/component; and 4) demobilization, which includes securing the area and decontaminating/removing Fluor Fernald self-perform equipment. The actual sequence of building/component D&D will be determined by the Fluor Fernald self-perform project schedule. It is anticipated that the sequence for dismantlement may be the following:

1. Component 35B – Metal Oxide Storage Tank (Silo 3)
2. Building 94M – Silo 3 Enclosure Building
3. Building 94H – Silo 3 Process Building
4. Building 94P – Silo 3 Cargo Container Building
5. Building 94N – Silo 3 Excavator Building
6. Building 94Q – Silo 3 Electrical Equipment Building
7. Building 94J – Silo 3 CEM Building

2.2 Characterization of Silo 3 and Associated Structures

Aside from Silo 3, the buildings are new structures. Just prior to D&D, Silo 3 and associated structures will be surveyed so that debris disposition can be established based on the survey results. Upon availability, the radiological characterization information for Silo 3 and associated structures will be issued with a submittal letter to the regulatory agencies. **PCN1**

D&D debris that has come in direct contact with the Silo 3 material will be evaluated for disposition in accordance with the criteria outlined in Section 3.3.1 of the OU3 Integrated RD/RA Work Plan.

D&D debris that has not come in direct contact with Silo 3 material (ex: structural steel, non-process pipe & equipment and structural concrete) will be evaluated for disposition in accordance with the criteria outlined in Section 3.3.1 of the OU3 Integrated RD/RA Work Plan. It is anticipated that this material will be released for off-site disposal. Changing radiological conditions could alter the waste disposition of this D&D debris.

The most significant radiological concerns are the health and safety of the workers during dismantlement of Silo 3 (Component 35B). The presence of contamination will use standard

storage is a possibility due to the limited number of ROBs at the FCP. Stockpiling of debris, if utilized, will follow the strategies provided under Section 3.3.2.3 of the OU3 Integrated RD/RA Work Plan, which requires best available storage configuration for OU3 Debris Categories A, B, D and E. The strategy for stockpiling also requires removing or encapsulation of contaminants. Specification Section 01517 debris release criteria requires that gross contamination be removed or encapsulated on debris surfaces prior to their removal from a building enclosure or local containment. To the maximum extent practicable, debris will be containerized following sizing when sufficient containers are available. Should the best available storage configuration (i.e., containers with lids or tarps) be temporarily unavailable, stockpiling of debris that meet the release criteria on pads with run-off controls would be performed. Based on current estimates for OSDF debris transfers and the schedules for completion of the Silo 3 and associated structures D&D and start of Area 7 soil excavation, debris stockpiles may remain on the pads of Silo 3 and associated structures for up to six months. At this time, there are no plans to stockpile Silo 3 debris. In the event stockpiling becomes necessary, all site requirements will be met. **PCN1**

Material tracking is performed using the Site-Wide Waste Information, Forecasting and Tracking System/Integrated Information Management System (SWIFTS/IIMS) through the FCP waste acceptance organization. Project-specific reporting on material disposition will be provided by a SWIFTS/IIMS summary in the Project Completion Report. Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. OU3 Debris Categories A, B, D and E debris are classified as OSDF Category 2 material. Therefore, commingled Debris Categories A, B, D and E quantities will be tracked in SWIFTS/IIMS under a discreet Material Evaluation Form that corresponds to Impacted OSDF Category 2 debris in interim storage. Debris Category G (Transite) and Debris Category H (Regulated ACM) are regarded as OSDF Categories 3 and 5, respectively, and will also be handled separately. Since the volume of commingled debris will represent a combination of waste streams, proportions of OU3 debris categories within that total volume will be derived based on original estimates to identify and track waste volumes by OU3 debris category. These derived quantities will be documented in the Project Completion Report for the OU4 Complex. Other than tracking debris specifically for the purpose of OSDF placement, project-specific material tracking and reporting strategies for the OU4 Complex D&D project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the remedial design process.

The disposition strategy for Silo 3 and associated structures material is consistent with the requirements stated in the OU3 Final ROD and strategies presented in the OU3 Integrated RD/RA Work Plan. Table 2-1 identifies that debris generated from this project will be placed in the OSDF. No treatment will be necessary for those materials destined for on-site disposal since all chemical-based waste acceptance criteria are met based on OU3 RI/FS data.

If debris cannot be dispositioned in the OSDF, either because the OSDF is not open or the debris does not meet the OSDF WAC, the preferred disposition is Envirocare via the WPRAP rail system. If this option is not available, another offsite disposal facility (TBD) will be used. **PCN1**

2.3.5 Material Recycling/Reuse

Accessible metals (Category A) from Silo 3 and associated structures have been evaluated for potential recycling options and a detailed summary of that evaluation is available in Appendix B. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), 33.3 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Silo 3 and associated structures were evaluated by comparing the four leading alternatives to on-site disposal. Of the three phases of the Decision Methodology (Threshold Phase, Life Cycle Analysis Phase, and Decision Phase), only the first phase was applied since the comparative evaluation of project costs for each alternative showed that the total costs for each of the recycling options greatly exceed the 25 percent total cost criteria compared to OSDF.

2.4 Environmental Monitoring

Environmental monitoring for the OU4 Complex Silo 3 D&D project will include supplemental radiological environmental air monitoring and wastewater monitoring. Groundwater monitoring is not needed to support this project but would be employed if necessary, as described in Section 3.6.2.3 of the OU3 Integrated RD/RA Work Plan.

Project-specific stormwater management is governed by the FCP Stormwater Pollution Prevention Plan (DOE 1996b) and any monitoring associated with that program is managed by OU5/Aquifer Restoration Project. Project-specific stormwater management includes the diversion of stormwater to appropriate site collection drains surrounding the project.

Surface Water (Wastewater) Monitoring

Section 2.3.2 of this Implementation Plan describes the wastewater management strategies that have been developed for the D&D of Silo 3 and associated structures. The OU3 Integrated RD/RA Work Plan describes the overall strategies to be implemented for project monitoring of wastewater. Listed below are the specific references in the Work Plan:

- Section 3.2.5, Surface Decontamination: Wastewater collection and management strategies.
- Section 3.3.3, Management of Secondary Waste: The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system.
- Section 3.5.2, Management of Contaminated Water: References site procedure to be used for the evaluation and management of contaminated wastewater.
- Sampling and Analysis Plan (SAP)/Section 2, General Sampling and Data Collection Approach: Focuses on wastewater sampling, among other aspects of sampling.

- SAP/Section 3, Specific Sampling Programs: Sampling for disposition of wastes, including wastewater. Determination of hazardous, radiological, and other waste characteristics.

Potential elevated levels of contaminants of concern may be present within Silo 3 and associated structures. Based on an estimated 50,000 gallons of potential washwater, it is anticipated that up to twenty-five samples will be taken to determine isotopic radiological and heavy metals concentrations prior to discharge into the Advanced Wastewater Treatment Facility. Of those twenty-five samples, one will be a duplicate for quality assurance/quality control purposes. The purpose of the sampling is to ensure the adequacy of treatment capacity so that National Pollutant Discharge Elimination System (NPDES) permit requirements are met.

Project-specific reporting for wastewater will be provided in the project completion report. The report will include a summary of the data generated during the project. The report will include a summary of the results from sampling and analysis prior to its discharge into the WWTS.

Radiological Air Monitoring

Occupational monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls. Any potential emissions that could affect the outside environment would be detected first by environmental and occupational monitoring. Section 8.1 of the OU3 RD/RA Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes the occupational air-monitoring program.

Environmental radiological air monitoring during the D&D of Silo 3 and associated structures will consist of the Fernald Site Environmental Monitoring Program described in the site-wide IEMP, and discussed in Sections 3.5.1 and 3.6.2.1 of the OU3 Integrated RD/RA Work Plan. FCP boundary monitors are shown in Figure 2-1.

The supplemental radiological air monitoring program implemented in preparation for operation of the Silo 3 Remediation facility (as outlined in the Silo 3 Remedial Design Package) will be maintained during the Silo 3 and associated structures D&D activities. **PCN1**

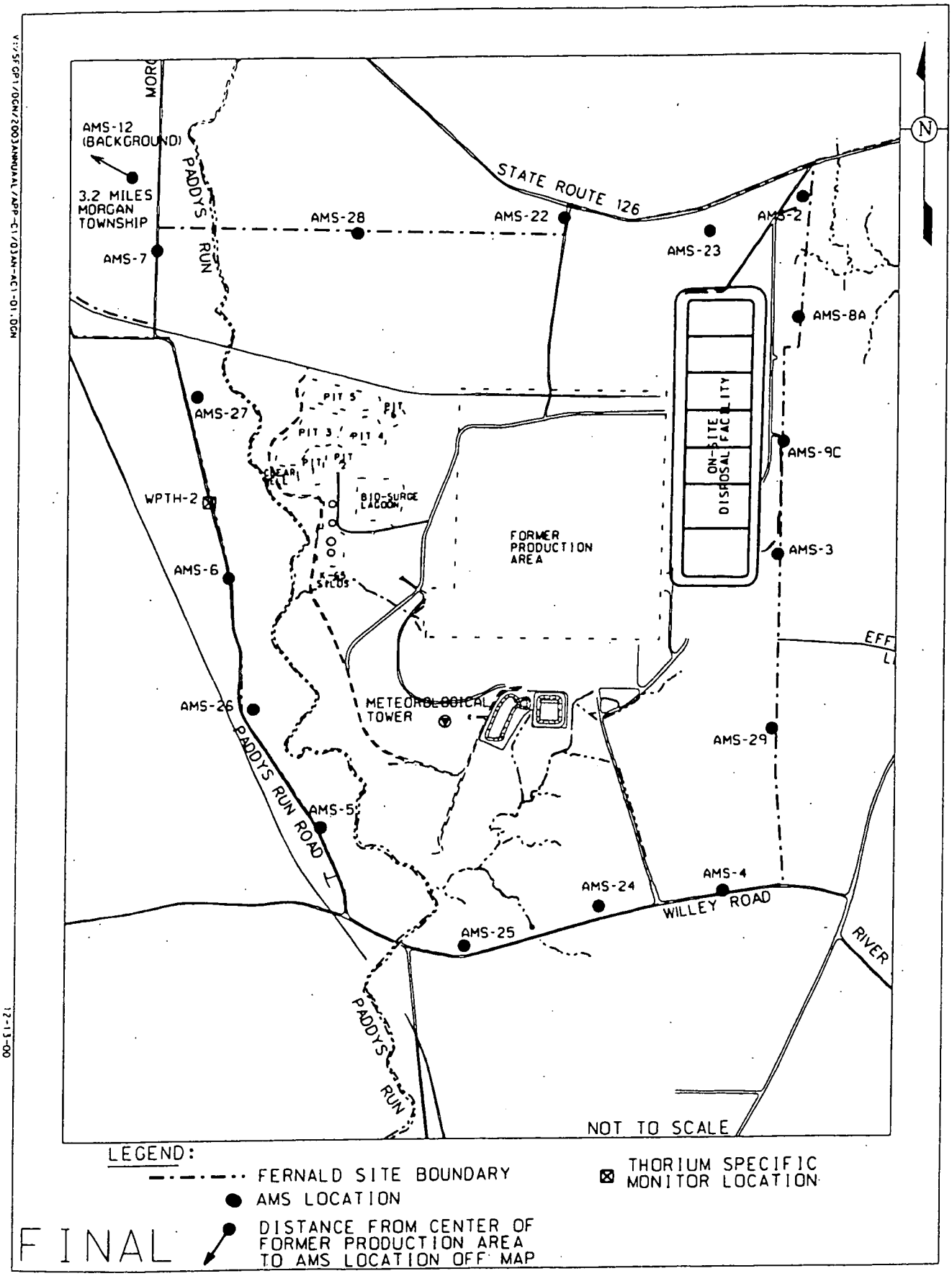

FIGURE 2-1 Air Monitoring Locations

integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer; and

- Plans for personnel tie offs, use of pick boards and walking on or near roof purlins/girders.

Furthermore, Specification Section 05126 requires that the Fluor Fernald self-perform project team apply mechanical means of cutting to remove the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

Concrete Removal

Pursuant to Specification Section 03315, the project team, with oversight by FCP Project Management, prepares work control documents that specify the methods for concrete removal that contains the following information:

- Detailed method and sequence of dismantlement, including equipment to be used;
- Methods for control of contaminants, including control of fugitive emissions;
- Materials, such as non-woven geotextile fabrics and surfactants, to be used;
- Methods of cutting, including equipment to be used;
- Calculations to verify structural adequacy of partially dismantled structure, as applicable; and
- If dismantlement method requires personnel on the roof, Fluor Fernald Engineering shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

The concrete walls will be radiologically surveyed prior to removal to determine the need for engineering controls, such as an enclosure with ventilation or water sprays to minimize fugitive dust, during removal operations. When controls are necessary, best available control technologies will be applied to concrete removal operations.

Specification Section 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, openings in the slab will be filled with granular material or soils and grout to provide a flat uniform surface to minimize the chance for water accumulation & migration and to mitigate potential safety hazards. Wire and cable will be cut away to grade from the conduit embedded in the concrete. Conduit and other slab obstructions will be cut away to grade, plugged, and covered with grout to grade level for positive drainage.

2.6 Use of New Technologies

The performance specifications provide an avenue for FCP Project Management to use new and/or innovative technologies. The use of any new and/or innovative technologies will be identified in the work control documents prepared by the project team with oversight by FCP

Project Management to provide safer, quicker, and/or less expensive remediation. Information relating to any new or innovative technologies incorporated during the decontamination and demolition activities will be issued with a submittal letter to the regulatory agencies. **PCN1**

The Pneumatic Retrieval System (PRS) consists of a Supply HEPA filter, Pneumatic Retrieval Collector Baghouse Filter, Cartridge Filter, Pneumatic Retrieval Collector Discharge Screw, Rotary Airlocks, HEPA/ULPA filter, PRS Blower and vacuum pickup wands. All the equipment in this system will have Silo 3 material in the internals either due to direct transfer of material or particulates in the exhaust air stream. The HEPA/ULPA filter and PRS Blower are located outside either on the south pad or excavator roof.

The Mechanical Retrieval System (MRS) consists of excavator, Retrieval Bin, Double Discharge Screw Feeder, Inclined Conveyor, Transfer Screw Conveyor and Feed Conveyor. Only the upper section of the Inclined Conveyor, Transfer Screw Conveyor and Feed Conveyor are located in the Process Building. All the equipment in his system will have Silo 3 material in the internals due to direct transfer of material.

The Packaging and Container Management System consists of two packaging lines. Each line has: loading frame with load cells, densification table, worker platform & fill chute; package staging conveyor and platform with RF sealer. Only the fill chute will have Silo 3 material in the internals due to transfer of the material. The other equipment is expected to have only surface contamination. Inside the fill chute is a bullet camera and spray nozzle assembly. Another section of conveyor is located inside the airlock.

The Waste Conditioning Additive System is housed in the wastewater tank area. The equipment includes two 1,700-gallon tanks, one used as an additive mix tank. The area contains piping and pumps for filling of tanks with ferrous sulfate and sodium lignosulfonate used for treating the Silo 3 material. Two 120-gallon charge tanks used to supply solution to each of the two Discharge Chute Assemblies in the packaging line are also in this room. The additive tank can also be used as a wastewater holding tank during shut-down operations.

The wastewater tank also in the wastewater tank area will receive water from the floor drains and sumps in the process building and excavator room. Wastewater generated during operations will be sampled prior to transfer to the AWWT or recycled for use in the process. A collection pipe is located outside of the Cargo Bay north wall for transfer to the "supersucker".

The process vent system consists of two baghouses for dust collection and filtration for process vent streams from the material retrieval, transfer and packaging of material. Under each process dust collector is a fines retrieval bin that collects particulates from the bags. A connection to the PRS system allows material to be transferred for packaging. The exhaust air stream is filtered through HEPA/ULPA filters located outside of the process building. All equipment will have internal contamination. The exception will be if the one redundant dust collector remains locked out and not used during operations.

The process building will also contain ductwork for the HVAC supply and exhaust systems that remove airborne contamination. It's anticipated that the three package air conditioning units located on the north pad will not become contaminated during operations. The building

filtration exhaust fans and building HEPA/ULPA Exhaust Modules A&B are located outside on the excavator roof & south pad and will have internal contamination.

The facility also contains piping for plant and instrument air and breathing air stations, process water and domestic water supplied to safety shower/eyewash stations. The air system equipment is located outside north of the process building and is not expected to have internal contamination.

Remedial Tasks

Three remedial tasks are applicable to Building 94H.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Building 94H will include removal of salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94H does not include any particular strategies beyond those already presented in Section 2.5.2. At the completion of the operations phase, the project will retrieve surrogate material such as flyash or sand to flush out the system. This waste stream will be packaged for disposal. **PCN1**

Above-Grade Dismantlement

Building 94H is a steel frame structure with factory insulated wall panels. The roof system is metal deck, insulation and EPDM roof membrane. The building is supported by a mat foundation. It has a two-level roof and several interior platforms for equipment support. The interior walls are metal stud with two layers of drywall on either one side of the stud walls or both sides of the wall. Exterior and interior personnel doors are insulated, 14-gauge and exterior coiling doors are insulated flat metal slats and high-speed doors in airlock are fabric. . Building 94H will be dismantled using a track-hoe mounted, hydraulic shear and backhoe. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of piping & conduit/wire, equipment & systems, doors and structural & miscellaneous steel.

3.3 Building 94J – Silo 3 CEM Building

Background

Building 94J (Silo 3 CEM Building) is a 10' by 15' self-framing, insulated metal building.

Process Area Description

Building 94J houses the controls emissions monitoring (CEM) equipment for stack monitoring. The stack is co-located by the CEM building.

Remedial Tasks
Three remedial tasks are applicable to Building 94J.

Preparatory Action: Facility Shutdown
No facility shutdown activities are required for Building 94J.

Surface Decontamination
Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94J does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement
Building 94J is a self-framing, insulated metal building. The stack is co-located by the CEM building. Building 94J will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of piping & conduit/wire, and structural & miscellaneous steel.

3.4 Building 94M - Silo 3 Enclosure Building

Background
Building 94M (Silo 3 Enclosure Building) is a 100 ft. by 100 ft. frame supported structure. The eave height of the building is 34.75 ft. The fabric membrane is Polyvinyl Chloride (PVC) coated membrane which provides a continuous, uninterrupted weather tight shell over a metal framework. The membrane is self-extinguishing.

Process Area Description
Building 94M is constructed over Silo 3 as a weather enclosure around the silo. The retrieval method is locally contained so surface contamination due to thorium is not expected during normal operation. Contamination due to the radon is expected in the area.

Remedial Tasks
Three remedial tasks are applicable to Building 94M.

Preparatory Action: Facility Shutdown
Facility shutdown activities for Building 94M will include removal of salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination
Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94M does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Building 94M (Silo 3 Enclosure Building) is a frame supported structure. The fabric membrane is a PVC coated membrane. Building 94M will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of PVC, piping & conduit/wire, and structural & miscellaneous steel.

3.5 Building 94N – Silo 3 Excavator Building

Background

Building 94N (Silo 3 Excavator Building) is a cast in place concrete structure. Building 94N measures 61 ft. by 30.5 ft. by 24.25 ft. high. The roof is concrete with tapered insulation and EPDM roof membrane.

Process Area Description

Building 94N houses the mechanical retrieval system. The Mechanical Retrieval System consists of an excavator, retrieval bin, double discharge screw feeder, inclined conveyor, transfer screw conveyor and feed conveyor. Only the retrieval bin, double discharge screw feeder and lower section of the inclined conveyor are located in this area. All the equipment in this system will have Silo 3 material in the internals due to direct transfer of material.

Remedial Tasks

Three remedial tasks are applicable to Building 94N.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Building 94N will include removal of salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94N does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Building 94N is a cast in place concrete structure. Building 94N will be dismantled using a track-hoe mounted, hydraulic shear, backhoe and concrete processor. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of concrete, piping & conduit/wire, and structural & miscellaneous steel.

3.6 Building 94P – Silo 3 Cargo Container Building

Background

Building 94P (Silo 3 Cargo Container Building) is a 53'-8" by 55' pre-engineered metal building. The structure has factory-insulated wall panels attached to a metal girt system. The building roof is a metal standing-seam roof and is sloped with an interior minimum clear height of 32'.

Process Area Description

The container bay houses the off-loading conveyor for the packaging system. There is a bridge crane for bag transfer within the facility. There are operations work platforms located along side of the conveyors.

The northeast corner of the building contains a 4,500-gallon tank for ferrous sulfate additives tanks in a diked area and portable tote for sodium lignosulfonate. The ferrous sulfate is transferred from tanker truck to the tank. These tanks, associated pumps and piping should not have internal contamination.

Remedial Tasks

Three remedial tasks are applicable to Building 94P.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Building 94P will include removal of salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94P does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Building 94P is a pre-engineered metal building. The structure has factory-insulated wall panels attached to a metal girt system. The building roof is a sloped, metal standing-seam roof. Building 94P will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of piping & conduit/wire, equipment & systems and structural & miscellaneous steel.

3.7 Building 94Q – Silo 3 Electrical Equipment Building

Background

Building 94Q (Silo 3 Electrical Equipment Building) is a 33 ft. by 21 ft. pre-engineered, insulated metal building on a concrete floor slab. Building 94Q has a 15 ft. eave height.

Process Area Description

Building 94Q contains the electrical power supply, distribution equipment (motor control centers, lighting panels, etc), uninterruptible power supply system and power lighting centers for system control. This building is northeast of the process building and is not expected to receive contamination due to processing of material. Cable trays to the building are sealed at the building wall penetration.

Remedial Tasks

Three remedial tasks are applicable to Building 94Q.

Preparatory Action: Facility Shutdown

Facility shutdown activities for Building 94Q will include removal of salvageable equipment, general clean-up and disconnection of all utilities.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Building 94Q does not include any particular strategies beyond those already presented in Section 2.5.2.

Above-Grade Dismantlement

Building 94Q will be dismantled using a track-hoe mounted, hydraulic shear. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of piping & conduit/wire, and structural & miscellaneous steel.

REFERENCES

U.S. Department of Energy, 1993, *Operable Unit 3 Remedial Investigation and Feasibility Study Work Plan Addendum,* Final, prepared by Fluor Environmental Restoration Management Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996a, *Operable Unit 3 Record of Decision for Final Remedial Action*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996b, *FCP Stormwater Pollution Prevention Plan*, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997a, *Operable Unit 3 Integrated Remedial Design/Remedial Action Work Plan*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

APPENDIX A

PROPOSED SAMPLING

Several types of sampling were identified early in the design process to support both the design itself and to support logistical planning for field remediation. The scope and requirements for potential D&D sampling were outlined in the Sampling and Analysis Plan, included as Appendix D to the OU3 Integrated RD/RA Work Plan. A project-specific summary of the sampling types are included below.

Characterization Screening

Due to recent construction, there is a remote possibility of lead base paint on painted steel. Lead screening may be performed to verify lead is not present in the painted steel.

During silo demolition, the concrete from the actual silo structures may be sampled for silica.

The silo material constituents may be sampled for heavy metals during demolition based on sampling information gathered during silo operations.

Just prior to D&D activities, radiological surveying will be conducted for fixed and removable radioactive contamination using both Geiger-Mueller radiological contamination meters and scintillation counters (to monitor alpha) as well as low background counting systems. Radiological surveying will continue to be used throughout D&D activities to verify that radiological facility release criteria (i.e., release from containment) are met on equipment and materials being removed from the project containment.

Asbestos

Due to support facility construction in recent years, it is anticipated that there will be no friable asbestos containing materials (ACM) present in the OU4 Complex Silo 3 D&D Project. Prior to demolition activities, the OU4 Silo 3 D&D Project will be evaluated for asbestos containing materials (ACM) by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist. Results of the evaluation will be used to determine asbestos abatement requirements for the OU4 Complex Silo 3 D&D Project activity. The results of this evaluation will be forthcoming and therefore are not available to be presented in this implementation plan. If required, sampling criteria for asbestos abatement activities will be established just prior to the OU4 Complex Silo 3 D&D Project activities.

Secondary Waste (Decontamination Water)

Based on worst-case wash-down calculations, up to 50,000 gallons of decontamination washwater could be generated during equipment cleaning. Samples will be used to determine the need for treatment prior to discharge into the AWWT. Based on this worst-case washwater volume estimate, twenty-five samples would be needed to characterize

washwater for isotopic radionuclides & heavy metals, up to thirty-six samples would be needed to evaluate enrichment (i.e., levels of thorium-230).

A project-specific sampling plan for the decontamination washwater will be developed after decontamination washwater is generated but prior to actual sampling. An example of a typical wastewater sampling plan is attached to Appendix D of the OU3 Integrated RD/RA Work Plan.

Nevada Test Site (NTS) Confirmatory

To qualify debris for NTS shipment, one percent of each material/waste stream going to NTS will be sampled. For each container that makes up the one percent, three samples will be taken and analyzed in accordance with the NTS Waste Acceptance Criteria (WAC).

Permitted Off-site Commercial Disposal Facility

Sampling is anticipated from potential mixed waste sludge that will be collected from the settling of decontamination washwater and associated filtercake. Sampling and analysis required for shipment certification will be as specified by the permitted facility's WAC. Section 3.2.3 of the SAP contained in Appendix D of the OU3 Integrated RD/RA Work Plan addresses analytical requirements for off-site disposal.

Asbestos Air Monitoring

If friable and non-friable ACM is discovered, asbestos air sampling will be necessary for ACM removal prior to dismantlement under controlled abatement methods per Specification Section 01516 and 07415. If required, occupational air sampling for asbestos will be performed as required by OSHA standards.

Radiological Air Monitoring

Data from the IEMP site-wide routine environmental air monitoring program will be used to complement the occupational air monitoring program. Per the Fluor Fernald Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn as necessary by workers to evaluate the potential for intake when performing airborne radioactivity generating activities in a contamination area, high contamination area or an airborne radioactivity area. Per the Fluor Fernald Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn by one hundred percent (100%) of the workers in each work group/crew when performing thorium airborne generating activities in a contamination area, high contamination area, or an airborne radioactivity area, unless otherwise specified on the appropriate Radiological Work Permit.

Fluor Fernald reviews safe work plans to ensure that they include the appropriate engineering and administrative controls to mitigate the spread of radiological contamination and limit airborne radioactivity concentrations to levels at or below those specified in the IFB/RFP. Fluor Fernald performs an occupational ALARA review or evaluation (as appropriate) for each component undergoing D&D.

APPENDIX B

EVALUATION OF MATERIAL DISPOSITION ALTERNATIVES FOR SILO 3 AND ASSOCIATED STRUCTURES

Per the OU3 Record of Decision for Final Remedial Action, the selected disposition route for the majority of OU3 radiologically contaminated material, including accessible metals, is placement in the On-Site Disposal Facility (OSDF). However, in support of DOE's commitment to evaluate recycling on a case-by-case basis during each above-grade D&D project design (per Section 3.3.6.1 of the OU3 Integrated Remedial Design/Remedial Action Work Plan under the subheading of Unrestrictive Release Recycling/Reuse), an evaluation of disposition alternatives was performed for potentially recyclable/reusable materials estimated to be generated from the Silo 3 area. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), which was finalized in July 1997 following extensive stakeholder involvement and subsequent reevaluation of unit costs using 1998 recycling data from the Recycling Supplemental Environmental Project, 33.3 tons of potentially recyclable accessible metals (OU3 Debris Category A) from Silo 3 and associated structures was evaluated by comparing the three leading alternatives to on-site disposal. **PCN1**

The Decision Methodology consists of three phases: 1) Threshold Phase; 2) Life Cycle Analysis Phase; and 3) Decision Phase. The first phase, the Threshold Phase, includes a comparative evaluation of project costs for each alternative. The cost estimates which were established under the Plant 4 Case Study (presented during July 8, 1997 public meeting; cost data dated from September 27, 1996) were utilized for the 33.3 tons of structural steel from Silo 3 and associated structures. Since total cost estimates for each recycling alternative are current, and other factors such as vendor and market information have not significantly changed since the Plant 4 evaluation was performed, unit rates for each of the recycling alternatives shown in the Plant 4 Case Study are considered valid for the OU4 Complex alternative disposition alternative evaluation. The total cost comparison of the disposition alternatives is shown in Table B-1.