LUCIP for the
M Area Operable Unit (consists of Underground Sump 321 M #001, Underground Sump 321 M #002, Salvage yard, 741-A, and Potential Release of TCT, TET TCE, HNO3, U, Heavy Metals from 321-M Abandoned Sewer Line, NBN)
Land Use Control Implementation Plan for the M Area Operable Unit (MAOU)
(WSRC-RP-2008-4067, Revision 1, April 2009)

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United States Department of Energy

Savannah River Site

Land Use Control Implementation Plan (LUCIP) for the M Area Operable Unit (MAOU) (U)

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April 2009

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Aiken, South Carolina

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Area Completion Projects
bgs	below ground surface
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	contaminant migration
CMS/FS	Corrective Measures Study/Feasibility Study
COC	constituent of concern
ESD	Explanation of Significant Difference
FFA	Federal Facility Agreement
ft	feet
HH	human health
IC	institutional control
IPS	inactive process sewer
LETF	Liquid Effluent Treatment Facility
LUC	land use control
LUCIP	Land Use Control Implementation Plan
LUCAP	Land Use Control Assurance Plan
mg/kg	milligram per kilogram
MAOU	M Area Operable Unit
MIPS	M-Area Process Sewer
MIPSL	M-Area Inactive Process Sewer Line
OU	operable unit
PCE	tetrachloroethylene
PCR	Post-Construction Report
PSVE	passive soil vapor extraction
PTSM	principal threat source material
RA	remedial action
RCOC	refined constituent of concern
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RG	remedial goal
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SVE	soil vapor extraction
TCE	trichloroethylene
USDOE	U.S. Department of Energy
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WSRC	Washington Savannah River Company LLC (formerly Westinghouse Savannah River Company LLC)

1.0 INTRODUCTION

This Land Use Control Implementation Plan (LUCIP) has been prepared for the M Area Operable Unit (MAOU) at the Savannah River Site (SRS). The MAOU includes all subunits within M Area and covers approximately 75 acres. The *Land Use Control Assurance Plan (LUCAP)* for the Savannah River Site (WSRC 1999) designates M Area for future industrial non-residential use. As detailed in the *MAOU Record of Decision (ROD)* (WSRC 2008a), groundwater is not considered part of the scope for the MAOU and, therefore, is not addressed within the scope of this document. Any groundwater contamination resulting from the MAOU is being addressed as part of the SRS Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application for M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Postclosure. The purpose of the LUCIP is to describe how the land use controls (LUCs) selected in the ROD will be implemented and maintained. The LUC objectives have been documented in the MAOU ROD and are listed in Section 3.0.

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the soil and groundwater are at levels that allow for unrestricted use. The hazardous substances left in place could pose a risk if the waste is disturbed. As agreed on March 30, 2000, among the U.S. Department of Energy (USDOE), the U.S. Environmental Protection Agency (USEPA), and South Carolina Department of Health and Environmental Control (SCDHEC), SRS is implementing a LUCAP to ensure that the LUCs required by numerous remedial decisions at SRS are properly maintained and periodically verified. The requirements of that LUCAP also apply to the LUCs that were selected as part of the MAOU remedial action (RA). This document, the MAOU LUCIP, contains the detailed and specific measures required to implement and maintain the LUCs selected as part of this particular remedial decision. The LUCs shall be maintained until the operable unit (OU) is suitable for unlimited exposure and unrestricted use. Approval by USEPA and SCDHEC is required for any modification or termination of the institutional controls (ICs).

The USDOE is responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs in accordance with the approved LUCIP. Upon final approval, the LUCIP will be

appended to the LUCAP and should be considered incorporated by reference into the MAOU ROD (WSRC 2008a) and Explanation of Significant Difference (ESD) to the MAOU ROD (SRNS 2009), establishing implementation and maintenance requirements for the LUCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the SRS Federal Facility Agreement (FFA) (FFA 1993). The LUCIP will remain in effect unless and until modifications are approved by USEPA and SCDHEC as necessary for protection of human health and the environment. This LUCIP will be evaluated for accuracy during the five-year remedy review and any approved LUCIP modification will be appropriately documented for incorporation by reference into the MAOU ROD and ESD.

1.1 Format of LUCIP

The format of this LUCIP is consistent with the FFA protocol format approved by the USEPA and SCDHEC in March 2004.

2.0 OVERVIEW OF MAOU REMEDIAL ACTION

2.1 General Description and History of the Unit

SRS occupies approximately 310 square miles of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of South Carolina. SRS is located approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina. The MAOU is located in the northwest portion of SRS, covering approximately 75 acres, and is located within the Upper Three Runs Integrator Operable Unit (Figure 1).

The USDOE owns SRS, which historically produced tritium, plutonium, and other special nuclear materials for national defense and the space program. Chemical and radioactive wastes are byproducts of nuclear material production processes. Hazardous substances, as defined by the CERCLA, are currently present in the environment at SRS.

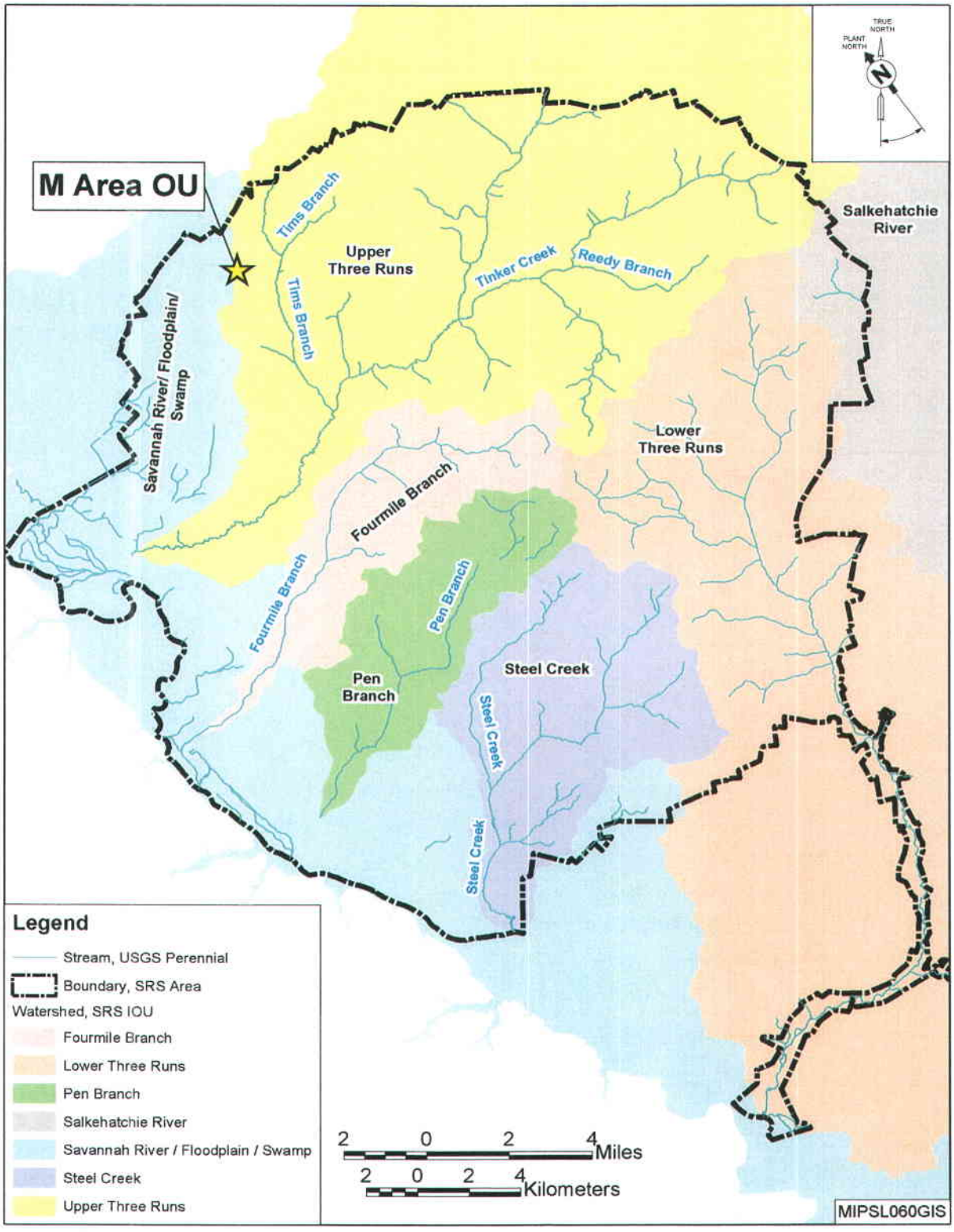


Figure 1. Location of the MAOU within the Savannah River Site

The MAOU is located in the northwest portion of SRS. For evaluation purposes, the MAOU was divided into four distinct areas based on the historical operations at the unit. These areas are the Production Area, the Liquid Effluent Treatment Facility (LETF), Test Reactor Facilities, and the Salvage Area. These areas are depicted on Figure 2 and include facilities that have been combined based on physical location and common problems warranting action:

- Production Area: 313-M, 321-M (including Underground Sumps #001 and #002), 320-M, 322-M, 340-M, and 324-M (including the northern portions of the M-Area Inactive Process Sewer Line [MIPSL] and associated feeder lines)
- LETF: 341-M, 341-1M, and 341-8M
- Test Reactor Facilities: 305-A and 777-10A
- Salvage Area: 740-A, 743-A, and 741-A
- Warehouses: 330-M and 331-M

The northernmost portion of the MAOU contains the Production Area, which has the earliest history of use. Reactor fuel and target assemblies were produced in this area between 1952 and 1988. The following major facilities were used to support production of special nuclear material:

- Building 313-M — Used for the canning and storage of uranium slugs for use in the production reactors
- Building 320-M — Used to produce lithium aluminum target tubes for target assemblies
- Building 321-M — Used for the production of reactor fuel assemblies

All of the major facilities used industrial cleaning processes and products (trichloroethylene [TCE], tetrachloroethylene [PCE], and trichloroethane) that were discarded to the M-Area Settling Basin via process sewer lines. The basin was closed with the installation of a protective cap in 1991 per the RCRA Closure Plan. The M-Area Settling Basin is not part of the MAOU but is shown on Figure 2 for information only.

The 330-M Slug Warehouse and 331-M Core Storage Warehouse were used to store slugs of depleted uranium. The inventory of depleted uranium was removed prior to decommissioning. Buildings 330-M and 331-M were dismantled and removed during the summer of 2003.

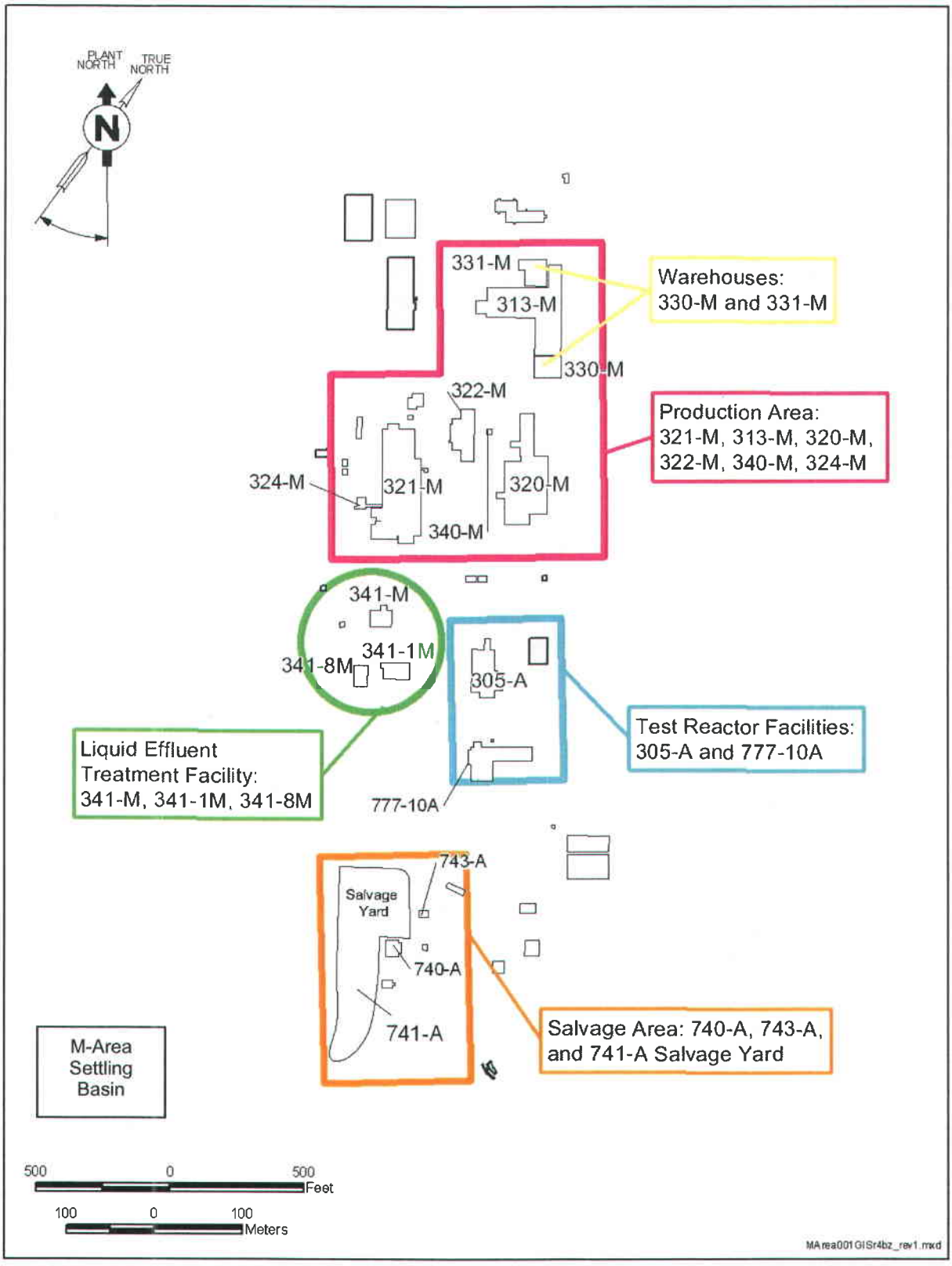


Figure 2. Layout of the M Area Operable Unit

The LETF is southwest of the Production Area. This facility was built in 1988, and all of the Production Area liquid effluent was sent to this treatment facility. This facility contained buildings that were used to treat the wastewater stream, to package and store the residue from the treatment, and to treat the residue.

The Test Reactor Facilities are east of the LETF. This area housed two buildings (305-A and 777-10A) that contained small test reactors used to determine the appropriate properties for the fuel elements and the target assemblies.

The southern portions of MAOU were designated as the Salvage Area and include the 741-A Salvage Yard where excess materials and equipment were stored on an approximate two-acre lot. In addition, Building 740-A was used to recondition non-nuclear material. This reconditioning involved painting and cleaning with solvents.

M Area is the second OU at SRS to be addressed under an area-wide remedial strategy. As part of this strategy, RCRA/CERCLA/Site Evaluation units and deactivation and decommissioning facilities (or remnants) in the former M-Area industrial area were consolidated into a single OU (i.e., the MAOU). The characterization evaluation and analysis of the MAOU were documented in the *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan, RFI/RI Report with Baseline Risk Assessment (BRA), and Corrective Measures Study/Feasibility Study (CMS/FS) for M Area Operable Unit* (WSRC 2007a). A summary of M-Area remedial and removal actions is shown in Table 1.

Table 1. M-Area Previous Corrective/Remedial or Removal Actions

	Status
M-Area Salvage Yard Removal Action (Approved Removal Action Report - WSRC 2008b, July 2008)	Complete
M-Area Production Area Removal Action (Removal Action Report - WSRC 2008c, October 2008)	Complete
RCRA Clean Closure for 315-4M and 316-M	Ongoing
MIPSL OU Remedial Action [1,3] (Soil Vapor Extraction [SVE] Enhanced with Soil Fracturing, Institutional Controls [WSRC 2008d])	Ongoing
M-Area Settling Basin Hazardous Waste Management Facility Source Control[2]	Ongoing
Metallurgical Laboratory Hazardous Waste Management Facility Source Control[2]	Ongoing
M-Area Groundwater[2]	Ongoing

[1] Separate Operable Unit [2] Per SCDHEC RCRA Permit [3] Subject to FFA Five-Year Remedy Review

The M Area at SRS is located in an area of historically heavy industrial and nuclear land use. The LUCAP (WSRC 1999) designates M Area for future industrial non-residential use. Remedial action objectives and likely response actions were developed consistent with future industrial non-residential land use. ICs will restrict use because of the large area of vadose zone and groundwater contamination, including operation of remedial systems. Appropriate LUCs against unrestricted and/or residential use will be part of all RAs for the MAOU. As detailed herein, the entire area outlined as the MAOU LUC boundary depicted on Figure 3 will be limited to industrial use, and further restrictions will be placed on certain portions of this area. However, the MIPSL OU has a separate ROD (WSRC 2007b) and LUCIP (WSRC 2007c), which includes access controls (grouting of manholes) and management of volatile organic compound (VOC) contamination in the vadose zone by SVE with soil fracturing. Therefore, the MAOU LUC boundary is formally defined as the MAOU LUC boundary on Figure 3 with the exclusion of the MIPSL OU boundary, which is the green-shaded area shown on Figure 3.

2.2 Nature and Extent of Contamination

The MAOU has been the subject of various investigations, including the following:

- Sampling of concrete slabs, below-grade concrete barriers, and soils in connection with the deactivation and decommissioning of various buildings
- Sampling of soils adjacent to the inactive process sewer lines
- Sampling of concrete slabs, below-grade concrete structures and soils beneath the slab, sumps, trenches and process feeder pipelines as part of the MAOU investigation

The *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan, RFI/RI Report with Baseline Risk Assessment (BRA), and Corrective Measures Study/Feasibility Study (CMS/FS) for M Area Operable Unit* (WSRC 2007a) records the cumulative results from these investigations and details the nature and extent of contamination and the problems warranting action. Table 1 documents completed early actions.

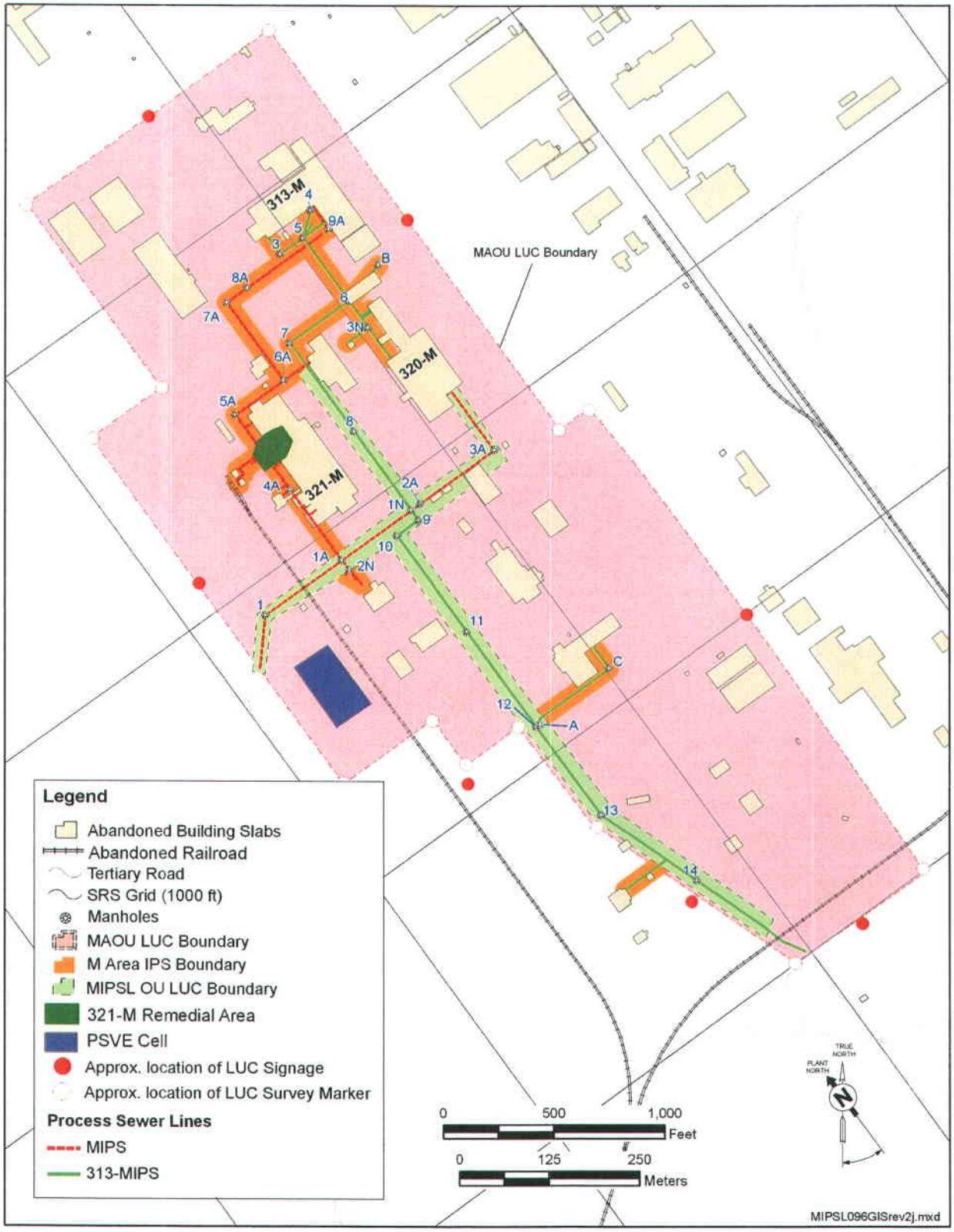


Figure 3. **M Area OU LUC Boundary and M Area Inactive Process Sewer OU LUC Boundary**

The MAOU early action removed approximately 70% of the soils containing >50 mg/kg VOCs beneath the 320-M and 321-M slabs and all of the >50 mg/kg VOC soils at 313-M (WSRC 2008c). Following the completion of MAOU early actions, the only contaminants requiring RA were PCE or TCE, which remain as contaminant migration (CM) constituents of concerns (COCs) at the Production Area (i.e., 313-M, 320-M, and 321-M facilities) in vadose zone soils. Additionally, residual PCE remains below 321-M in deep soils as principal threat source material (PTSM). The RA selected for the CM refined constituents of concern (RCOCs) and deep soil PTSM is designed to remove PCE and TCE from the soil and prevent additional groundwater impacts.

The selected remedy for the MAOU leaves hazardous substances in place that pose a potential future risk and will require land use restrictions until the concentrations of hazardous substances in the soil and groundwater are at levels that allow for unrestricted use and exposure.

2.3 Remedial Actions Selected

The below selected RA, established in the ROD (WSRC 2008a) and an ESD (SRNS 2009) to the MAOU ROD, is based on an evaluation of potential alternatives performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan and CERCLA (as amended).

Passive Soil Vapor Extraction and Institutional Controls

Vadose zone remediation using passive soil vapor extraction (PSVE) reduces and removes the VOC source and is typically performed to manage the release of VOCs to groundwater. The pressure gradient created by a PSVE well causes the soil-gas to flow through the soil pore spaces toward the well. This remedy has two beneficial aspects. The first is that the remedy focuses on the VOC contamination that has been mobilized and is in the form of soil-gas. By removing the soil-gas, there is a relatively immediate impact on groundwater since the source of contamination to the groundwater has been cut off. The second benefit is that PSVE is a treatment technology that reduces the contamination mass subsurface over time. As detailed in the MAOU ROD (WSRC 2008a) and an ESD (SRNS 2009) to the MAOU ROD, PSVE will be employed at five

locations (i.e., 313-M, 320-M, 321-M, Manhole 4A and the PSVE Cell, see Figure 3). As the 321-M PSVE wells and the PSVE Cell include shallow (2 to 9 ft below ground surface [bgs]) horizontal wells, a vapor barrier at 1 ft bgs is included to prevent the PSVE well screens from preferentially drawing from the surface rather than the underlying contaminated soils at 1 to 10 ft bgs. This phenomenon would hinder the effectiveness of SVE operations. Approximately 1 ft of clean common fill will be provided over the vapor barrier.

The LUCs, which include ICs and physical access controls, are listed below and will be implemented throughout the MAOU.

- property record notices and restrictions
- site use/site clearance program
- ICs will also consist of the site maintenance (site inspections, general housekeeping, repair of erosion damage and other routine maintenance as needed) and access controls (warning signs and land use restrictions). ICs will include continued use of SRS's Site Use and Site Clearance Programs to restrict disturbance of the site and to prevent access to or use of groundwater until cleanup levels are met. ICs will also include physical access controls. Specifically, the sewer connections to all manholes and Manholes 2N, 3, 3N, 4, 4A, 5, 5A, 6, 7, 7A, 8A, 9A, A and B shown within the orange shaded area of Figure 3 will be grouted. Warning signs will also be posted as depicted in Figure 3 at the LUC boundary surrounding the entire MAOU. Note: Manholes 6A and C and all manholes within the green-shaded area of Figure 3 were grouted as part of the early actions. Grouting makes access virtually impossible by accidental means and with warning signs at the MAOU boundary, human digging is controlled. These ICs will isolate the abandoned sewer line from future access by human or ecological receptors.
- CERCLA ROD RA Reviews – The ROD RA will be reviewed every five years to ensure that the selected remedy remains protective of human health and the environment.

Remedial goals (RGs) are target cleanup criteria. RGs are provided in Table 2.

The post-RA conceptual site model (Figure 4) shows the broken pathways and the remaining residual risk to the future industrial worker.

Table 2. Summary of Final Action RGs for MAOU

RCOC	Units	CM[1]	HH	RGs
SOIL MEDIA				
Organics				
Tetrachloroethylene (PCE)	mg/kg	1.80[2] 3.00[4]	NA[5]	1.80[2] 3.00[4]
Trichloroethylene (TCE)	mg/kg	15.00[3]	NA[5]	15.00[3]

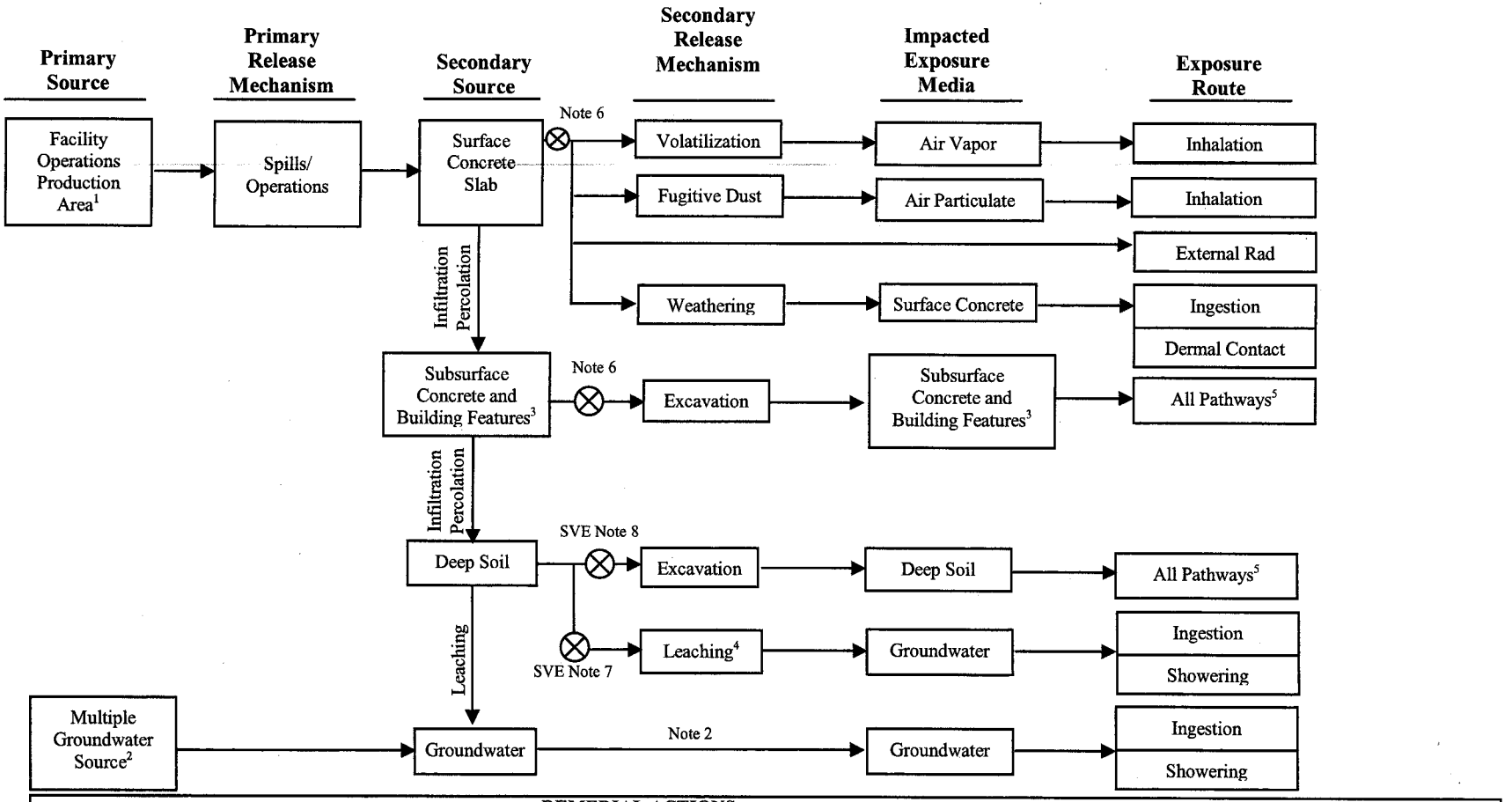
1. The contaminant migration (CM) RGs are the soil concentrations that are not predicted to impact groundwater above maximum contaminant levels based on the waste unit configuration after early actions.
2. RGs for Building 313-M and the PSVE cell.
3. RGs for Building 320-M MIPSL Tie-in and the PSVE cell
4. RGs for Building 321-M
5. NA - not applicable (no RCOCs)

3.0 LAND-USE CONTROL OBJECTIVES

The following MAOU LUC objectives have been developed to ensure the protectiveness of the remedy described above:

- Restrict worker access and prevent unauthorized contact, removal or excavation of contaminated media
- Prevent access through manholes and pipelines
- Prohibit the development and use of property for residential housing, elementary schools, child care facilities and playgrounds
- Maintain the integrity of any current or future remedial or monitoring systems such as SVE systems or groundwater monitoring wells
- Prevent access to or use of the groundwater until cleanup levels are met (under the RCRA program)

Current access controls and deed notification needed to maintain the future land use are described in the following sections of this LUCIP.



1. Production Area facilities include Buildings 313-M, 320-M, 321-M, 322-M, 324-M, 340-M and the inactive process sewer lines in the MIPSL OU and those portions from Manhole 6A to 322-M.
2. Groundwater has been impacted by multiple sources within M Area and will be addressed under the M Area RCRA Corrective Action Program.
3. Subsurface concrete and building features include sumps, trenches, pipelines, etc., that are currently below grade of concrete slab.
4. Leaching represents the potential of a contaminant in deep soil to migrate to groundwater above maximum contaminant levels per the CM analysis.
5. All pathways represent ingestion, inhalation, dermal contact, and external radiation exposure for PTSM. Evaluation for toxicity.
6. All contaminated surface concrete, subsurface concrete and building features were removed during the early actions (WSRC 2008c), thereby eliminating this pathway.
7. The early action (WSRC 2008c) removed 70% of the PTSM VOC contamination at 320-M and 321-M by auger removal. The remaining VOCs will be removed by PSVE. PSVE will also be employed at 313-M and Manhole 4A to remove VOCs.
8. Institutional Controls will prevent deep soil excavation.

Figure 4. Conceptual Site Model for the MAOU Final Action

4.0 IMPLEMENTATION OF LAND-USE CONTROLS

This section describes the LUCs selected in the ROD to achieve the objectives stated in Section 3.0. A summary of the types of controls is provided in Table 3. USDOE is responsible for implementing, maintaining, reporting on, and enforcing the MAOU LUCs. The LUCIP will become enforceable and will be implemented when approved by USEPA and SCDHEC following the completion of the RA prescribed by the MAOU ROD and ESD. USDOE shall notify USEPA and SCDHEC 60 days in advance of any proposed land use changes that are inconsistent with LUC objectives or the selected remedy.

The MAOU will be maintained as an industrial use area by implementation of the property record notices (Section 4.1) and restrictions (Section 4.2), and the use of a certified LUC survey plat (Section 4.3). Figure 3 illustrates approximate MAOU land use boundary requirements. As previously noted, groundwater is excluded herein and instead handled by the RCRA Part B Program, and the MIPSL OU boundary (depicted as the green-shaded area shown within the Figure 3 MAOU LUC boundary) is also excluded herein and instead is being managed under the MIPSL LUCIP (WSRC 2007c).

The Site Use Program (Section 4.4) will be implemented to prevent onsite worker exposure to contamination left in place at the MAOU. Other existing measures (i.e., Site Clearance Program, worker training, health and safety requirements, work controls) will also be used to ensure worker safety at the MAOU. Physical access controls (Section 4.5) are implemented at the SRS boundary to control and restrict public and trespasser access to the MAOU.

Signs at the MAOU will be maintained to alert onsite workers to the presence of hazardous substances. The signs will also convey the restrictions of unauthorized personnel. Access control warning signs will be placed and maintained around the MAOU to prevent unknowing entry and unrestricted use.

Table 3. MAOU Land Use Controls

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas[a]
1. Property Record Notices[b]	Provide notice to anyone searching records about the existence and location of contaminated areas.	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership.	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions
2. Property record restrictions[c]: A. Land Use B. Groundwater	Restrict use of property by imposing limitations. Prohibit the use of groundwater.	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Drafted and implemented by USDOE upon any transfer of affected areas. Recorded by USDOE in accordance with state law at County Register of Deeds office	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions
3. Other Notices[d]	Provide notice to city &/or county about the existence and location of waste disposal and residual contamination areas for zoning/planning purposes.	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Notice recorded by USDOE in accordance with state laws at County Register of Deeds office if the property or any portion thereof is ever transferred to non-federal ownership	All waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions
4. Site Use Program[e]	Provide notice to worker/developer (i.e., permit requestor) on extent of contamination and prohibit or limit excavation/penetration activity	As long as property remains under USDOE control	Implemented by USDOE and site contractors Initiated by permit request	Remediation systems, all waste management areas and other areas where hazardous substances are left in place at levels requiring land use and/or groundwater restrictions
5. Physical Access Controls[f] (e.g., fences, gates, portals)	Control and restrict access to workers and the public to prevent unauthorized access	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Controls maintained by USDOE	At select locations throughout SRS

Table 3. MAOU Land Use Controls *(Continued/End)*

Type of Control	Purpose of Control	Duration	Implementation	Affected Areas
6. Warning Signs[g]	Provide notice or warning to prevent unauthorized uses	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Signage maintained by USDOE	At select locations throughout SRS
7. Security Surveillance Measures	Control and monitor access by workers/public	Until the concentrations of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use	Established and maintained by USDOE Necessity of patrols evaluated upon completion of remedial actions	Patrol of selected area throughout SRS, as necessary

[a]Affected areas – Specific locations identified in the SRS LUCIP or subsequent post-ROD documents.
[b]Property Record Notices – Refers to any non-enforceable, purely informational document recorded along with the original property acquisition records of USDOE and its predecessor agencies that alerts anyone searching property records to important information about residual contamination or waste disposal areas in the property.
[c]Property Record Restrictions – Includes conditions and/or covenants that restrict or prohibit certain uses of real property and are recoded along with original property acquisition records of USDOE and its predecessor agencies.
[d]Other Notices – Includes information on the location of waste disposal areas and residual contamination depicted on as survey plat, which is provided to a zoning authority (i.e., city planning commission) for consideration in appropriate zoning decisions for non-USDOE property.
[e]Site Use Program – Refers to the internal USDOE/USDOE contractor administrative program(s) that requires the permit requestor to obtain authorization, usually in the form of a permit, before beginning any excavation/penetration activity (e.g., well drilling) for the purpose of ensuring that the proposed activity will not affect underground utilities/structures, or in the case of contaminated soil or groundwater, will not disturb the affected areas without the appropriate precautions and safeguards.
[f]Physical Access Controls – Physical barriers or restrictions to entry.
[g]Signs – Posted command, warning or direction.

4.1 Property Record Notices

In the long term, if the property is ever transferred to non-federal ownership, the United States Government will take those actions necessary pursuant to Section 120(h) of CERCLA. Those actions will include a deed notification disclosing former waste management and disposal activities as well as RAs taken on the site. The contract for sale and the deed will contain the notification required by CERCLA Section 120(h).

The deed notification shall notify any potential purchaser that the property has been used for the management and disposal of waste. These requirements are also consistent with the intent of RCRA deed notification requirements at final closure of a RCRA facility if contamination will remain at the unit.

4.2 Property Record Restrictions

The deed shall also include deed restrictions precluding residential use of the property and/or any other property record restrictions necessary to achieve the LUC objectives. The deed shall expressly prohibit activities inconsistent with the RGs and objectives in the MAOU ROD upon any and all transfers. USDOE shall provide a copy of the executed deeds to the regulatory agencies as soon as practicable after the transfer of fee title, but no later than 30 days. However, the need for these deed restrictions may be re-evaluated at the time of transfer in the event that exposure assumptions differ and/or the residual contamination no longer poses an unacceptable risk under residential use. Any re-evaluation of the need for the deed restrictions will be done through an amended ROD.

USDOE shall provide USEPA and SCDHEC six-months notice prior to transfer or sale to ensure that USEPA and SCDHEC can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective ICs. If it is not possible for the facility to notify USEPA and SCDHEC at least six months prior to any transfer or sale, then the facility will notify USEPA and SCDHEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. In addition to the land

transfer notice and discussion provisions above, USDOE further agrees to provide USEPA and SCDHEC with similar notice within the same time frames as to federal to federal transfer of property.

4.3 Other Public Notices

The LUCIP identifies the proposed area under land use restrictions via Figure 3 for the MAOU and the final survey plat (when available) located in Appendix A. After construction completion, a final survey plat will be prepared to document the as-built arrangement of the ICs and area subject to LUCs. The drawing will present a polygon of the MAOU subject to LUCs, including the benchmarks, the location of warning signs, access control points and other information for LUCs. This post-construction survey plat will be certified by a professional land surveyor and will be submitted to USEPA and SCDHEC concurrently with the Post-Construction Report (PCR). In addition, if the site is ever transferred to non-federal ownership, a professional land surveyor-certified survey plat of the OU will be prepared at or near the time of conveyance to support the LUCIP required restrictive covenants on land use and will be recorded with the appropriate county recording agency.

4.4 Site Use Program

Under DOE Order 430.1A, *Life Cycle Management* (USDOE 1998), SRS is required to implement an asset management program for the use, maintenance, and disposal of physical assets, including real estate. SRS complies with this order through its Site Use Program, which is conducted in accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control" (WSRC 2007d). All employees, contractors, and visitors at SRS are required to adhere to the Site Use Program. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. Also, in accordance with WSRC 1D, Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on SRS development maps (i.e., plot plans of facilities/utilities at SRS) will be authorized by a Site Clearance Permit before any activities are conducted. All Site Clearance Requests will be reviewed to verify that either an approved Site

Use Permit has been obtained or that the request is sanctioned by an existing Site Use Permit. All land use requirements applicable for the OU will be provided to the Site Use Program for use in determining issuance of Site Clearance Permits. In addition, the Site Use Permit must be amended when the geographic configuration or buffer zone used to establish the permit boundary changes or there is a change to the permitted land use.

SRS is responsible for updating, maintaining, and reviewing site maps, including FFA (FFA 1993) OU identifications. If a Site Clearance Request potentially impacts an FFA OU, the Site Clearance Request Form is sent to the appropriate FFA OU reviewer for approval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Before a Site Clearance Permit is issued, verification of USDOE approval for intended land use must be obtained. The site use and site clearance processes are applicable to all activities and personnel on site (including subcontractors). The USDOE will notify USEPA and SCDHEC in advance of any change to any internal procedure, including the Site Use Program, which would affect implementing or maintaining the LUCs. The processes are controlled within the SRS Quality Assurance Program in accordance with WSRC 1Q Manual, *Quality Assurance* (WSRC 2008e). The SRS Quality Assurance program governs all SRS activities.

SRS identifies all buildings and facilities on maps used in the Site Use Program. This waste unit is identified on these maps as a CERCLA facility.

Any work proposed in these areas will be strictly controlled, and workers will be appropriately trained and briefed about health and safety requirements if work is deemed necessary for maintenance. No change in land use or excavation at the MAOU shall be undertaken without USEPA and SCDHEC approval. Approval by USEPA and SCDHEC is required for any modification or termination of the ICs and implementation actions, and USDOE must obtain prior approval from USEPA and SCDHEC before taking any anticipated action that may disrupt the effectiveness of the LUCs or alter or negate the need for LUCs.

4.5 Physical Access Controls

Site-specific physical access controls are required at the MAOU. Specifically, Manholes 2N, 3, 3N, 4, 4A, 5, 5A, 6, 6A, 7, 7A, 8A, 9A, B and C shown within the orange-shaded area of Figure 3 and the sewer connections to those manholes will be grouted per the *Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP)* for the MAOU (U) (WSRC 2009). Note: As detailed in Section 2.1, the manholes within the green-shaded area of Figure 3 are managed as part of the MIPSL OU LUC and therefore excluded from the MAOU LUC. SRS-wide physical access controls are provided at the SRS boundary as mentioned in Table 3, item 5.

4.6 Warning Signs

To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while the unit is under ownership of the government, access control warning signs will be posted at the unit as shown in Appendix B. The signs shall be legible for a distance of at least 25 ft. Custodial responsibilities for maintenance and inspection of the MAOU will be maintained by a Post-Closure Maintenance Group. Warning signs will be installed as part of the MAOU construction per the CMI/RAIP (WSRC 2009) schedule. In addition, the final placement of the signage will be documented in the PCR.

4.7 Other Access Controls and Security/Surveillance Measures

While under the ownership of USDOE, access control of the entire SRS will be maintained in accordance with the 2000 RCRA Part B Permit Renewal Application, Volume I, Section F.1. This section describes the 24-hour surveillance system (R.61-79.264.14(b)(1)), artificial or natural barriers (R.61-79.264.14(b)(2)(I)), control entry systems (R.61-79.264.14(b)(2)(ii)), and access control warning signs (R.61-79.264.14(c)) in place at the SRS boundary to comply with the security requirements for a RCRA-permitted facility.

4.8 Field Inspection and Maintenance for Institutional Controls

After remediation of the MAOU, only inspection and maintenance activities will be required by the RA. The MAOU will be inspected per the Field Inspection Checklist (Appendix C). Field inspections will be performed annually. Additional inspections may be necessary in the event of unusual weather or any other condition warranting inspection. For the MAOU, inspections will be performed to ensure that signs are in place. Inspection records will be kept in the operations record file for future access.

Maintenance (including site inspections, general housekeeping, and repair of erosion damage) will be performed as needed at MAOU. Necessary upkeep of the access control signs for MAOU will be performed.

Any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs will be addressed by the USDOE as soon as practicable, but in no case will the process be initiated later than 10 days after the USDOE becomes aware of the breach. The USDOE will notify EPA and SCDHEC as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs. The USDOE will notify EPA and SCDHEC regarding how the USDOE has addressed or will address the breach within 10 days of sending EPA and SCDHEC notification of the breach. The FFA Annual Progress Report, submitted to the regulatory agencies by USDOE, will provide the status of the ICs and describe how any IC deficiencies or inconsistent uses have been addressed. In the event of property transfer or lease, the Annual Report will cite findings on the following: whether the use restrictions and controls referenced above were communicated in the deed(s) or lease restrictions; whether property use conforms with the deed or lease restrictions and controls; and whether the owners and state/local agencies have been notified regarding the deed or lease restrictions and controls. The FFA Annual Progress Report(s) will be used in the preparation of the Five-Year Remedy Review Report.

All other routine maintenance activities will be documented and maintained in files subject to USEPA and SCDHEC review and audit. A copy of the completed inspection form is maintained in the Area Completion Projects (ACP) Document Control Center. The LUCs shall be maintained until the concentration of hazardous substances associated with the unit have been reduced to levels that allow for unlimited exposure and unrestricted use.

The waste unit inspectors are to be trained in Hazardous Waste Operations and Emergency Response, RCRA Well Inspections (ACP-specific training), ACP RCRA Waste Unit Inspections, Radiological Worker Training, etc., as applicable for the specific inspection. They will also be trained based on the individual requirements of the regulatory approved closure documents for each waste unit. In addition, the inspectors are to attend yearly refresher courses. Over the years, different personnel may conduct the inspections.

This unit-specific LUCIP, including the checklist (Appendix C), will be appended to the SRS LUCAP upon final regulatory approval. After completion of the PCR, the preliminary checklist in the LUCAP will be replaced with the final approved checklist.

5.0 REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, (Effective Date: August 16, 1993)

SRNS, 2009. *Explanation of Significant Difference to the Revision 1 Record of Decision for the M Area Operable Unit (U),* SRNS-RP-2009-00406, Revision 1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

USDOE, 1998. DOE Order 430.1A, *Life Cycle Management* (approved October 14, 1998)

WSRC, 1999. *Land Use Control Assurance Plan (LUCAP) for the Savannah River Site (SRS),* WSRC-RP-98-4125, Revision 1.1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2007a. *RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan, RFI/RI Report with Baseline Risk Assessment, and Corrective Measures Study/Feasibility Study for M Area Operable Unit (U),* WSRC-RP-2006-4060, Revision 1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2007b. *Record of Decision Remedial Alternative Selection for the M Area Inactive Process Sewer Lines Operable Unit (081-M) (U),* WSRC-RP-2006-4001, Revision 1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2007c. *Land Use Control Implementation Plan (LUCIP) for the M Area Inactive Process Sewer Lines Operable Unit (081-M) (U),* WSRC-RP-2006-4068, Revision 1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2007d. WSRC Procedure Manual 1D, *Site Infrastructure and Services Manual (U)*, Procedure 3.02, "Site Real Property Configuration Control," Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2008a. *Record of Decision, Remedial Alternative Selection for the M Area Operable Unit (MAOU) (U),* WSRC-RP-2008-4030, Revision1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2008b. *Removal Action Report for the Contaminated Surficial Soil in the 741-A Salvage Yard at the M Area Operable Unit (U),* WSRC-RP-2008-4027, Revision 1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2008c. *Removal Action Report for the Production Area of M Area Operable Unit (U),* WSRC-RP-2008-4055, Revision 0, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2008d. *Post-Construction Report (PCR) for the M-Area Inactive Process Sewer Lines (MIPSL) (081-M) Operable Unit (OU) (U),* WSRC-RP-2008-4029, Revision 1, Washington Savannah River Company LLC, Savannah River Site, Aiken, SC

WSRC, 2008e. WSRC Procedure Manual 1Q, *Quality Assurance (U)*, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2009. *Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP) for the M Area Operable Unit (MAOU) (U),* WSRC-RP-2008-4063, Revision 1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

APPENDIX A – AS-BUILT DRAWINGS

(Drawing to be provided with the submission of the MAOU PCR.)

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APPENDIX B – ACCESS CONTROL WARNING SIGN

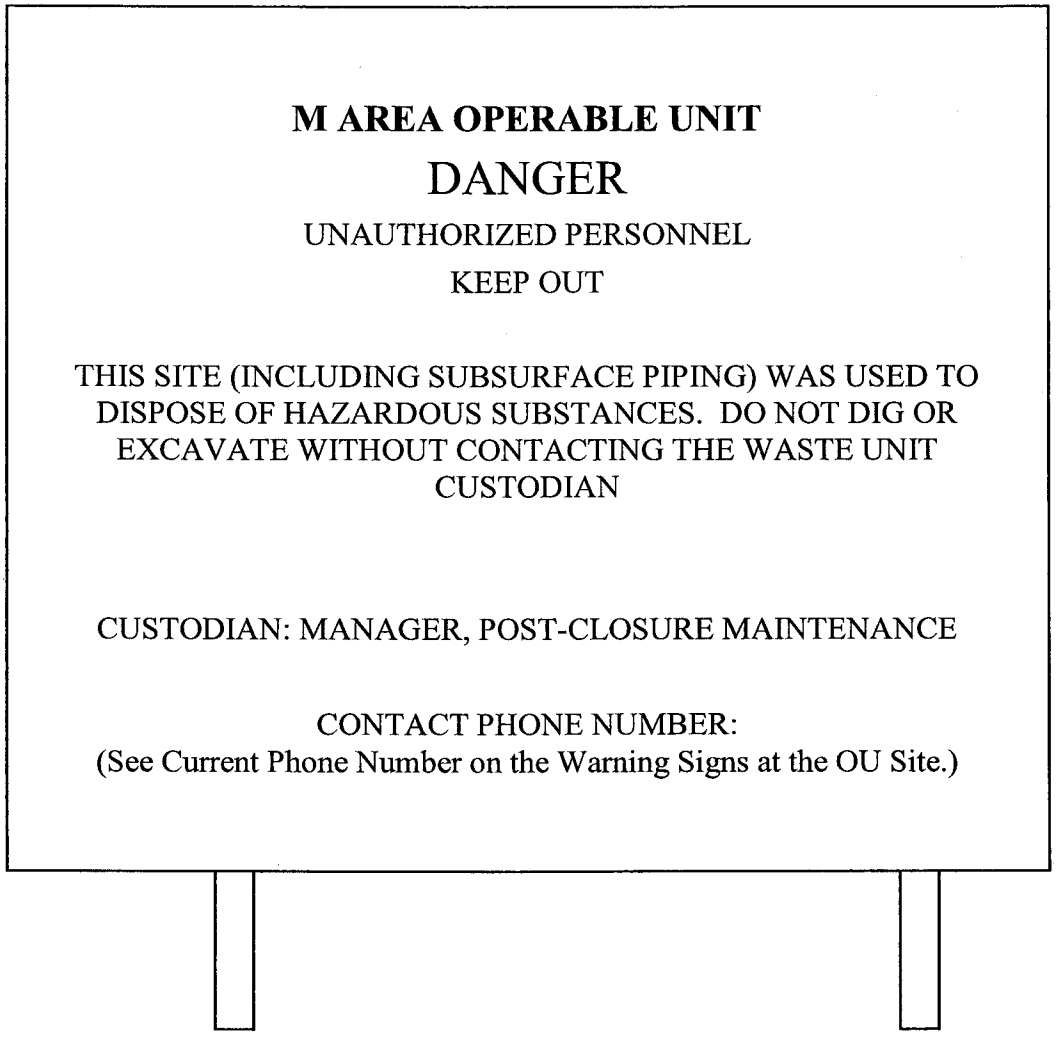

Figure B-1. Access Control Warning Sign

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APPENDIX C – MAOU FIELD INSPECTION CHECKLIST

FIELD INSPECTION CHECKLIST

❑ SCHEDULED ❑ UNSCHEDULED

A= Satisfactory X= Unsatisfactory (Explanation required)	A or X	Observation of Corrective Action Taken
1. Verify that roads are accessible.		
2. Verify that the waste unit signs (seven) are in acceptable condition, have the correct information, and are legible from a distance of 25 feet.		
3. Verify that there are no unauthorized excavation, digging, or construction activities at the PSVE sites (i.e., 313-M, 320-M, 321-M, the PSVE Cell and Manhole 4A) or at Manholes 2N, 3, 3N, 4, 4A, 5, 5A, 6, 6A, 7, 7A, 8A, 9A, B&C.		
4. Verify that the passive SVE wells at the PSVE sites (i.e., 313-M, 320-M, 321-M, the PSVE Cell and Manhole 4A) and support systems are accessible and in good condition.		
5. Verify the vapor intrusion barrier over 321-M and the PSVE Cell are not visible beneath the approximate 1 foot common fill and repair visible damage to vapor barrier.		

Inspected by:		
(Print Name)	(Signature)	(Date)

Post-Closure Manager:		
(Print Name)	(Signature)	(Date)

CAUTION: The inspector shall notify the Post-Closure Manager and Environmental Compliance Authority **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. The notification shall be in accordance with SRS post-closure inspection procedures.

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