United States Department of Energy

Savannah River Site

Final Remediation Report for the K-Area Bingham Pump Outage Pit (643-1G) (U)

WSRC-RP-98-4003
Revision 1
August 1998

Westinghouse Savannah River Company
Savannah River Site
Aiken. SC 29808

Prepared for the U. S. Department of Energy under Contract No. DE-AC09-96-SR18500

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LIST OF ACRONYMS

BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
LUC	Land Use Control
LUCAP	Land Use Control Assurance Plan
K BPOP	K-Area Bingham Pump Outage Pit
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SCDHEC	South Carolina Department of Environmental Control
SRS	Savannah River Site
WSRC	Westinghouse Savannah River Company

1.0 GENERAL DESCRIPTION OF THE K-AREA BINGHAM PUMP OUTAGE PIT

The K-Area Bingham Pump Outage Pit (K BPOP), Building Number 643-1G, is situated immediately south and outside the K-Reactor fence line (Figure 1) and is approximately 400 feet in length and 60 feet in width (Figure 2). The K-Reactor (Figure 3) is located in the west-central portion of the Savannah River Site (SRS), approximately 4 miles east of the nearest SRS boundary. The K BPOP waste unit is listed as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste unit in the SRS Federal Facility Agreement and is not subject to Resource Conservation and Recovery Act (RCRA) permit modification per the SRS Federal Facility Agreement, Appendix C.

Surface water drainage ditches surround the K BPOP to the north, west, and south. These ditches collect and redirect runoff water to reduce erosion. As depicted in Figure 1, the K BPOP is located on the west side of a small topographical high. Consequently, surface water drainage from other areas has little or no effect on the surface of the K BPOP. Generally, no surface water is found in the drainage ditches.

The K BPOP is situated in the Tobacco Road formation that extends from ground surface to a depth of 95 feet below ground surface. The Tobacco Road formation is composed of dark red to tan, very fine to fine sandy clay and clayey sands with laminated tan and purple, silty, clayey very fine to medium sands. The groundwater flow direction is to the southwest across the K BPOP and the groundwater flow rate for the Water Table Aquifer beneath the K BPOP is estimated at approximately 91.25 ft/year.

Between 1957 and 1958, miscellaneous construction debris generated by major modifications and repairs to the primary and secondary reactor cooling water systems was buried in the K BPOP. There were no pumps buried and no liquid waste was disposed of in the K BPOP. The depth of excavation at the K BPOP ranged from 9 to 14 feet, which indicates a sloping pit base (this is consistent with the use of the pit for disposal purposes). The radioactive contamination was less than 25 mR/hr with no detected alpha activity.

The K BPOP was backfilled with approximately four feet of fill material in 1958 and is now an open grassy area marked by orange ball markers and concrete monuments.

The contact person (title, address, and phone number) for the K BPOP is as follows:

Westinghouse Savannah River Company
Manager, Post Closure Maintenance
Building 730-2B
Aiken, SC 29808
(803) 952-6882

Figure 1. Location of the K-Area Bingham Pump Outage Pit

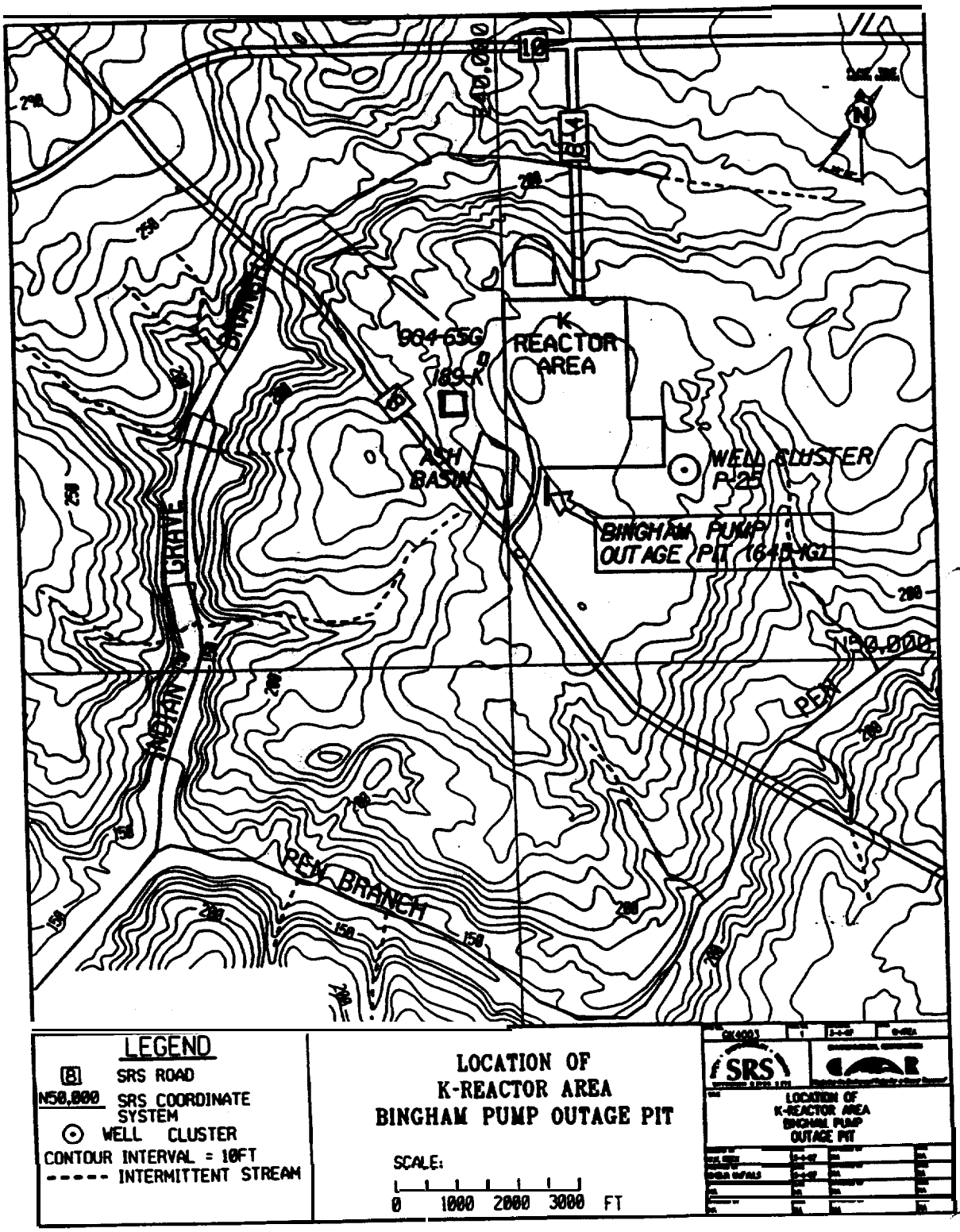


Figure 2. K-Area Bingham Pump Outage Pit Dimensions

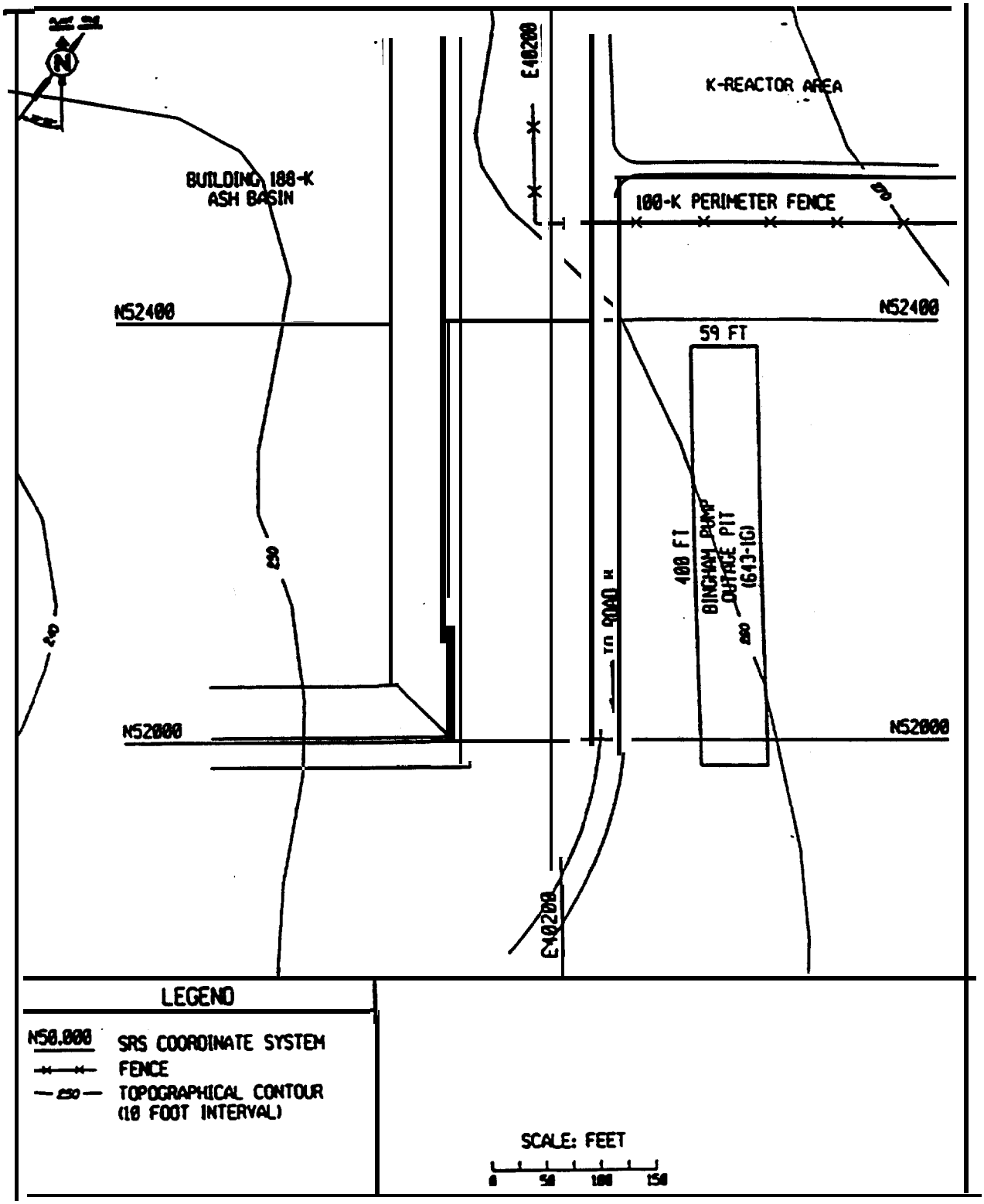
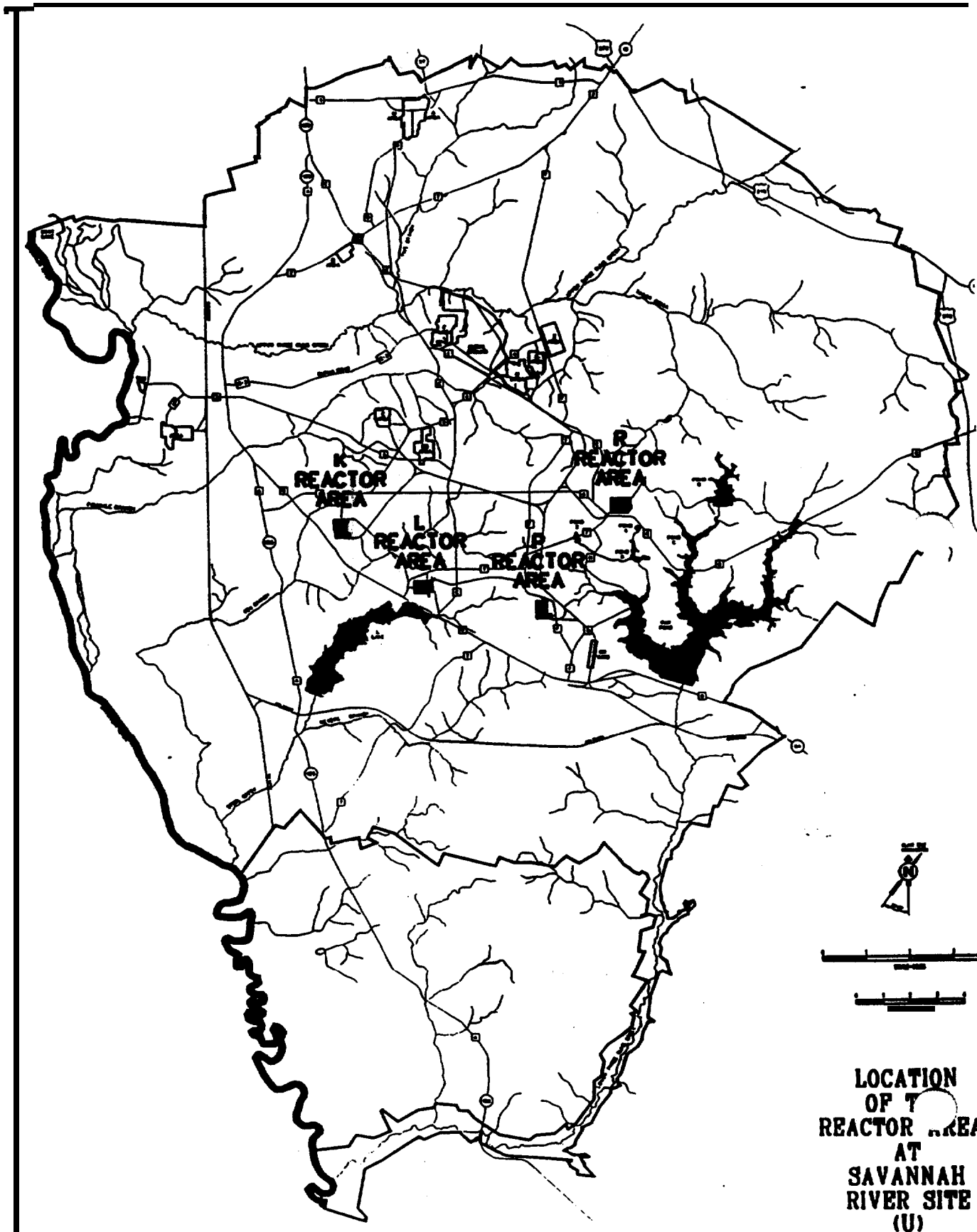


Figure 3. Location of the Reactor Areas at the Savannah River Site



2.0 LAND USE CONTROL IMPLEMENTATION PLAN

The K BPOP Land Use Control Implementation Plan will be appended to the SRS Land Use Control Assurance Plan (LUCAP) once the SRS LUCAP is approved.

Remedy Selection

The miscellaneous construction debris (i.e., pipes, cables, ladders, etc.) with fixed contamination (primary source) has been buried in the K BPOP since 1958. The presence of the debris plays a primary role in the remedy selection. There was no indication from the characterization data that the contamination present on the debris has moved and the level of radioactivity has diminished over the years. The degree of exposure toxicity to the waste is considered minimal and the potential for exposure is also considered to be minimal.

The K BPOP is located in an industrial zone as recommended by the Citizens Advisory Board and delineated on the SRS Future Land Use Map in the Federal Facility Agreement Implementation Plan. Under the current land use scenario, the possible receptor includes the known on-unit worker. Possible receptors under the future land use scenario include the on-unit industrial worker and on-unit resident (adult and child). Based on the risks identified for the K BPOP in the Remedial Investigation Report with Baseline Risk Assessment (RI/BRA) (WSRC, 1997b), the K BPOP poses minimal risk to human health. However, to manage any risk uncertainty and to ensure that the potential for exposure remains minimal, institutional controls are appropriate for the K BPOP operable unit. The No Action alternative would provide adequate protection of human health and the environment only for the near future. However, long-term protection for the duration of U.S. Government control of the SRS will be assured through institutional controls; and if the land is transferred to non-federal ownership via deed restrictions, in perpetuity, if deed restrictions are determined to be necessary.

For the K BPOP operable unit, institutional controls meet the remedial action objectives of risk reduction to human health and achievement of remedial goals for soil by precluding future on-site residential use of the area, buried waste contact, removal, or excavation. In addition, there is no need for remediation of the K BPOP from an ecological standpoint. Further, K BPOP is not impacting groundwater. Constituents are not observed to have migrated horizontally and clayey zones underneath the base of the pit will limit vertical migration potential.

Land Use Controls

Institutional controls are intended to be permanent and effective in the near- and long-term. It is considered to be the least cost option, which is still protective of human health and the environment. Implementation of this alternative will require both near- and long-term actions. For the near term, signs will be posted at the waste unit to indicate that this area was used to manage hazardous materials. In addition, existing SRS access controls will be used to maintain this site for nonresidential use.

Based on the conclusions of the K BPOP RI/BRA Report, groundwater does not pose a threat to human health and restrictions are not required. Therefore, groundwater land use control (LUC) objectives have not been established. However, to prevent the disturbance of soil in the LUC area the following LUC objectives for soil at K BPOP have been established.

For the K BPOP operable unit, the LUCobjectives are to:

- Prevent contact, removal or excavation of buried waste in the area and
- Preclude residential use of the area

The general means to achieve the objectives include:

- Continuation of the SRS access controls (i.e., security guards, security systems, badging, etc.) to preclude access to the SRS and the K BPOP by the general public,
- Continuation of the SRS Site Use/Site Clearance program to preclude work in the waste unit
- Installation of warning signs at the most probable access points that instruct personnel to contact the waste unit custodian prior to entry,
- Maintenance of the waste unit signs and visible markers to identify the waste unit to site workers,
- General maintenance of the waste unit (i.e. mowing, ensuring road accessibility, erosion and subsidence control, etc.), and
- Evaluation of the need for deed notifications/restrictions if the property is ever transferred to non-federal ownership, as required per CERCLA Section 120(h)

A survey plat, completed by professional land surveyors delineates the land subject to land use controls. (Figure 4).

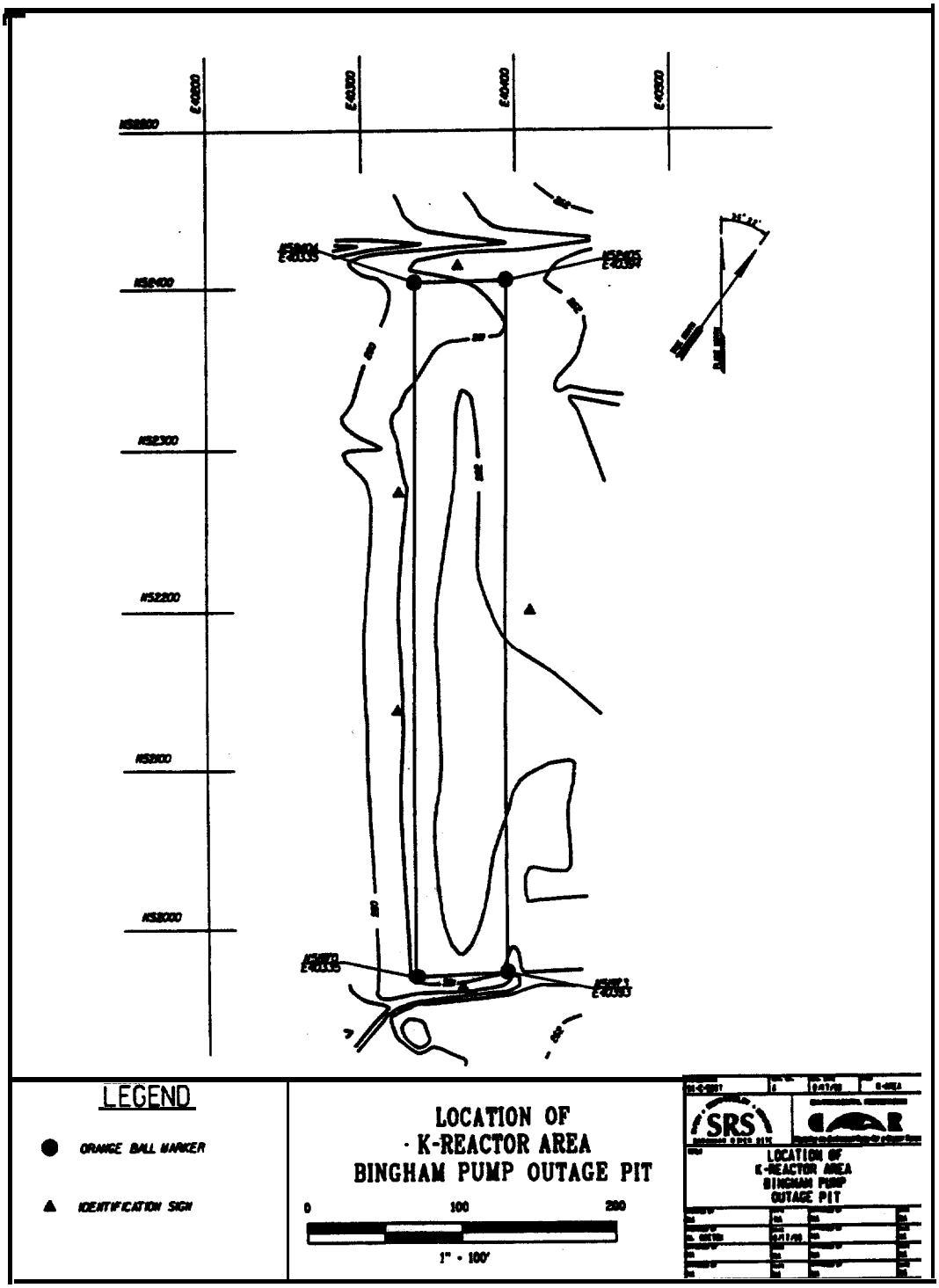
In the long term, if the property is ever transferred to non-federal ownership, the U.S. Government will take those actions necessary pursuant to CERCLA 120(h). These actions will include a deed notification disclosing former waste management and disposal activities, as well as any remedial actions taken at the waste unit. The deed notification will, in perpetuity, notify any potential purchaser that the property has been used for the management and disposal of construction debris and other materials, including hazardous substances. RCRA deed notification requirements are not required for this waste unit since it is not listed as a RCRA facility in the SRS Federal Facility Agreement, Appendix C. The deed will also include restrictions precluding residential use of the property. However, the need for modifications to the LUCs shall be reevaluated at the time of transfer in the event that exposure assumptions differ and/or contamination no longer poses an unacceptable risk under residential use. The Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) will be given advanced notification of plans for property transfer in order to ensure adoption of such additional measures as may be needed to assure continued compliance with LUCs on the transferred property. In addition, if the property is ever transferred to non-federal ownership, a survey plat of the area will be prepared, certified by a professional land surveyor, and recorded with the appropriate county recording agency.

This proposal is consistent with EPA guidance and is an effective use of risk management principles.

The elements of the institutional controls corrective action, which consists of land restriction without any engineering controls, are comprised of deed notifications, access controls that include posting of identification signs, and field walkdowns for general site conditions.

Each element of the institutional controls corrective action is discussed below.

Figure 4. Locations of the K-Area Bingham Pump Outage Pit Identification Signs



2.1 Deed Notification

A deed notification shall be filed in the appropriate county records in accordance with CERCLA 120(h), which requires the government to create a deed when land on which any hazardous substance was stored, released, or disposed is transferred to non-federal ownership. Per CERCLA 120(h)(3)(A), the deed shall contain, to the extent practical, such information as is available based on the complete search of agency files, to include

- a notice of the type and quantity of such hazardous substances;
- notice of the time at which such storage, release, or disposal took place;
- a description of the remedial action taken, if any.

Per CERCLA 120(h)(3)(B), the deed shall also contain a covenant warranting that

- all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer;
- any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States Government;
- a clause granting the United States Government access to the property in any case in which remedial action or corrective action is found to be necessary after the date of such transfer.

RCRA permit requirements are not applicable for this waste unit per the SRS Federal Facility Agreement, Appendix C.

2.2 Access Controls

2.2.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, *Site Real Property Configuration Control* (WSRC, 1996), use of all lands and waters on the SRS shall be coordinated via 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 Procedure 3.02, all work at SRS that adds to or modifies features or facilities portrayed on the SRS development maps (i.e., plot plans of facilities/utilities at SRS) is authorized by a Site Clearance Permit before execution. All Site Clearance requests are reviewed to verify that either an approved Site Use Permit has been obtained, or that an existing Site Use Permit has sanctioned the request. Verification of the Department of Energy approval for intended land use must be obtained before issuance of a Site Clearance Permit. The Site Use and Site Clearance processes are applicable to all activities and personnel on site (including subcontractors). The processes are controlled within the SRS Quality Assurance Program.

The SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance Program and includes a 200-foot buffer zone around each facility. 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. Any changes in the use or disturbance of the K BPOP will be cleared with the EPA and SCDHEC before the disturbance occurs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, identification signs will be posted at the waste unit access points (Figure 4). The signs will be legible from a distance of at least 25 feet. The signs will read:

K-Area Bingham Pump Outage Pit, 643-1G
"Danger - Unauthorized Personnel Keep Out.
This waste unit was used to manage hazardous substances.
Do not dig or excavate. Do not enter without contacting the
waste site custodian."
Custodian: Manager, Post Closure Maintenance
Phone: (803) 952-6882

Site-specific access controls (i. e., fences) are not required for the K BPOP since exposure to the casual worker or trespasser as calculated in the Baseline Risk Assessment does not warrant this level of protection.

2.2.2 *Trespassers*

Additionally, while under the ownership of the Department of Energy, access control of the entire SRS will continue to be maintained in accordance with the 1992 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.61-79.264.1 4(b)(2)(ii)), and 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.

2.3 Field Walkdowns and Maintenance

"Monitoring" will be performed to verify that LUC Implementation Plan requirements as specified in Section 2.0 of this documen t are met. Semi-annual monitoring of the K BPOP, 643-1G, will be conducted for items such as accuracy and legibility of identification signs, visible subsidence or erosion of the waste unit, proper vegetation growth, mowing, etc. Subsidence or erosion will be corrected by backfilling the affected area with clean soil and seeding the area to prevent direct exposure of the waste or creation of an exposure pathway. The results of any events and/or actions that could indicate some potential compromise of institutional controls will be documented in the Federal Facility Agreement Annual Progress Report. All other routine maintenance activities (i.e., mowing, etc.) will be documented and maintained in files that are subject to EPA and SCDHEC review and audit. Currently, K BPOP is located outside of the K-Area reactor security fence in an area of no planned future activity and existing SRS access controls and Site Use/Site Clearance programs support the LUC objectives. Also, no erosion or subsidence has been detected during current semi-annual inspections in recent years, and vegetation will not cover signs in a six-month period. Therefore, semi-annual, rather than quarterly, monitoring of the K BPOP will be required to ensure that LUC objectives are met. The typical field inspection checklist to be used to perform monitoring activities at K BPOP is included in this document as Attachment A.

"Inspections" at K BPOP will be performed to ensure that Institutional Controls remains protective and consistent with all remedial action objectives. Annual inspections of the K BPOP will be conducted. The results of the inspections will be reported in the annual certification.

2.4 Certification Mechanism

The U.S. Department of Energy Site Manager shall certify on an annual basis that the K BPOP is currently being restricted per the institutional controls corrective action described in the approved *Record of Decision Remedial Alternative Selection for the K-Area Bingham Pump Outage Pit (643-1G) (U)*, WRSC-RP-97-178, Revision 1, October 1997 (WSRC, 1997a). This certification shall be included in the Federal Facility Agreement Annual Progress Report.

2.5 Groundwater Monitoring and Reporting

Based on the conclusions of the RI/BRA, the K BPOP is not impacting groundwater. Constituents are not observed to have migrated horizontally and clayey zones underneath the base of the pit will limit vertical migration potential. No groundwater land use control objectives have been established. Therefore, groundwater monitoring and reporting is not required for the K BPOP.

3.0 SCHEDULE

The remedial actions to be implemented at the K BPOP include the installation of five identification signs. The installation of the identification signs, as described in Section 2.2.1, will occur during 1 QFY99. Semi-annual site monitoring activities will also begin with 1QFY99. The monitoring activities will included those items necessary to annually certify that the K BPOP is being restricted per the approved corrective action. Installation of the signs and site monitoring activities will commence within two months of regulatory approval of this FRR.

4.0 REFERENCES

WSRC, 1996. "Procedure 3.02, Site Real Property Configuration Control" located in WSRC 1D, *Site Infrastructure and Services Manual*, Westinghouse Savannah River Company, Aiken, SC (latest revision).

WSRC, 1997a. *Record of Decision Remedial Alternative Selection for the K-Area Bingham Pump Outage Pit (643-1G) (U)*, WSRC-RP-97-178, Rev. 1, Westinghouse Savannah River Company, Aiken, SC (October).

WSRC, 1997b. *Remedial Investigation Report with Baseline Risk Assessment for the K-Area Bingham Pump Outage Pit (U)*, WSRC-RP-95-1555, Rev. 1.2, Westinghouse Savannah River Company, Aiken, SC (March).

ATTACHMENT A

FIELD INSPECTION CHECKLIST

TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES

Page 1 of 3

Waste Site: _____ **A = Satisfactory** **X = Unsatisfactory (Comments required)**	**A or X**	**Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)**
Check for potential encroachments (Ensure that there is no building on the site).		
Does the site have brush or woody vegetation that needs cutting and disposal?		
Does the site need grass cut?		
Verify that the wells and roads are accessible.		
Are the wells properly locked per R.61-71.11.C.6?		

TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES

Page 2 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (Se Maintenance Register for Corrected Items
Is the concrete pad cracked or broken? Is the pad undercut or silted over?		
Is the well properly identified per R.61-71.6.H?		
Verify that the wells' posts and protective covers are in place.		
Verify that the waste units' signs have the correct and legible information.		
Does the site show signs of erosion or subsidence? Are there any signs of burrowing animals (holes)?		
Verify that the orange ball markers are in place.		

- TYPICAL

ER INSPECTION DATA SHEET FOR WASTE SITES

Page 3 of 3

Waste Site: _____ A = Satisfactory X = Unsatisfactory (Comments required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify that the fence is locked and in good condition (if applicable).		
Check the integrity of drainage ditches (if any) for presence of excessive erosion, sediment buildup, and any debris restricting water flow.		
Does the site need general clean up (housekeeping)?		
Comments:		

Inspected By: _____ / _____ Date: _____ Time: _____
(Print Name) (Signature)

Reviewed By: _____ / _____ Date: _____ Time: _____
Post Closure Manager or Designee (Print Name) (Signature)

Note: EPA and SCDHEC most be notified within 30 days of identification of any area where any breach or compromise or compromise of restrictions placed on this institutional control operable unit has occurred.