LUCIP for the
R-Area Bingham Pump Outage Pits, 643-8G, -9G, and –10G and R-Area Unknown Pits #1, #2, and #3, RUNKS-1, -2, and -3

Appendix B of Final Remediation Report for the R-Area Bingham Pump Outage Pits, 643-8G, -9G, and –10G and R-Area Unknown Pits #1, #2, and #3, RUNKS-1, -2, and -3

WSRC-RP-2003-4061, Revision.1, July 2003

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Appendix B

LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP)

for the

R-AREA BINGHAM PUMP OUTAGE PITS (643-8G, 643-9G, AND 643-10G)

and

R-AREA UNKNOWN PITS #1, #2, and #3 (RUNKS -1, -2 and -3)

LAND USE CONTROL IMPLEMENTATION PLAN

This R-Area Bingham Pump Outage Pits (643-8G, 643-9G, and 643-10G) and R-Area Unknown Pits #1, #2, and #3 (R BPOPs and RUNKs) OU Land Use Control Implementation Plan (LUCIP) will be appended to the Savannah River Site (SRS) Land Use Control Assurance Plan (LUCAP) (WSRC 1999b).]

The selected remedy leaves hazardous substances in place that pose a potential future risk and will require land use restrictions for an indefinite period of time. As negotiated with the United States Environmental Protection Agency (USEPA) and in accordance with USEPA Region IV policy (Johnston 1998), the SRS has developed a LUCAP (WSRC 1999b) to ensure that land use restrictions are maintained and periodically verified. This LUCIP provides detailed and specific measures required for the land use controls selected as part of this remedy. The United States Department of Energy (USDOE) is responsible for implementing, maintaining, monitoring, reporting upon, and enforcing the land use controls described herein. Upon final approval, the LUCIP will be appended to the LUCAP and is considered incorporated by reference into the FRR, establishing land use controls implementation and maintenance requirements enforceable under the Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA). The approved LUCIP will establish implementation, monitoring, maintenance, reporting and enforcement requirements for the unit. The LUCIP will remain in effect until modified as needed to be protective of human health and the environment. LUCIP modification will only occur through another CERCLA document.

1.0 REMEDY SELECTION

1.1 R-Area Bingham Pump Outage Pits (643-8G, 643-9G, and 643-10G and RUNKs 1, 2 and 3)

R Area is located in the central portion of SRS, approximately 5 miles from the nearest SRS boundary. The R BPOPs and RUNKs OU is situated northeast and outside the R-Area fence line. The R BPOPs and RUNKs OU consists of six pits including three known pits called R BPOPs (643-8G, 643-9G, and 643-10G) and three pits with unknown or incomplete histories called RUNKs (RUNK-1, RUNK-2, and RUNK-3). Pits 643-8G and 643-9G are approximately 250 ft long, 16 ft and 20 ft wide, respectively, and up to 13 ft deep. Pit 643-10G is approximately 522 ft long, 19 ft wide, and 14 ft deep. RUNK-1 and RUNK-3 are approximately 105 ft and 135 ft long, respectively, 25 ft wide, and up to 8 ft deep. RUNK-2 is approximately 445 ft long, 30 ft wide, and up to 12 ft deep. The sum of the areas for each pit is 0.9 acres; the area of a polygon around all the pits, which includes the areas between the pits, is 1.75 acres.

The land surface at R BPOPs and RUNKs OU is gently sloping and covered by grassy vegetation. Dense vegetation and trees are located around the unit. The habitats at the OU generally do not meet the needs of most threatened, endangered, or sensitive species. No unique or sensitive ecosystems have been identified.

RUNK-2 predates the R BPOPs and was in existence as early as 1953. Construction debris has been verified in RUNK-2 based upon a magnetic survey, ground penetrating radar (GPR) surveys, and soil sampling in the pit. Liquid wastes were also introduced into the pit, but no containerized liquids were discovered during characterization. RUNK-2 was closed in 1956.

The R BPOPs were constructed during 1957 and 1958 when major modifications were made to primary and secondary SRS reactor cooling water systems. The outages of the cooling water systems that occurred as a result of these modifications became known as Bingham Pump Outages. Wastes generated during these outages were segregated based

on levels of radioactivity. Higher activity waste was sent to the SRS Burial Ground Complex in E Area while lower activity waste was buried in the R BPOPs. Waste disposed of in the R BPOPs consisted of miscellaneous construction materials such as pipes, cables, ladders, concrete, and miscellaneous hardware. The R BPOPs were closed in the late 1950s by backfilling with approximately 4 ft of cover soil.

RUNK-1 and RUNK-3 were discovered in 1993 during a GPR survey of the area. The survey indicated that these areas had been previously disturbed, but their history is unknown. Magnetic surveys of these RUNKs indicated they do not contain metallic debris; furthermore, no metallic or non-metallic debris was encountered during soil sampling. Due to the lack of any identified debris, it is possible that no debris was ever placed in these two RUNKs.

The R-Area BPOPs and RUNKs waste units are listed as CERCLA waste units in the SRS Federal Facility Agreement (FFA) but are not subject to Resource Conservation and Recovery Act (RCRA) permit modification in accordance with Appendix C of the SRS FFA (FFA 1993).

The OU has been assessed through characterization and a series of documents written by USDOE and approved by the regulatory agencies (South Carolina Department of Health and Environmental Control [SCDHEC] and USEPA). These documents include a Work Plan (WSRC 1999a), a Remedial Investigation (RI) Report with Baseline Risk Assessment (BRA) (WSRC 2000), and a Proposed Plan (PP) (WSRC 2001b). A Feasibility Study (FS) was not prepared because USDOE, SCDHEC, and USEPA agreed that the problem warranting action and the scope of the problem was well-defined and that the list of likely response actions was short enough to proceed directly from the RI/BRA to the PP. The types of assessments typically done in an FS were included in Appendix A of the PP. A PP 30-day public comment period began on April 18, 2002, and ended on May 17, 2002. No comments were received during the public comment period. These documents culminated in a Record of Decision (ROD) (WSRC 2002) for

the OU. The scope of the problem addressed by this final ROD action was contamination in soil and on buried debris at R BPOPs and RUNKs OU. USDOE, USEPA, and SCDHEC have agreed in the R BPOPs and RUNKs OU ROD that groundwater at the OU will be evaluated separately in association with the R Area Groundwater OU.

1.2 Nature and Extent of Contamination in R BPOPs and RUNKs OU

The sampling data were evaluated in the RI/BRA to identify refined constituents of concern (RCOCs), which are constituents warranting remedial action. RCOCs were identified using the SRS protocols for data processing, human health and ecological risk assessment, and contaminant migration modeling. Table 1 lists the RCOCs and risks at the unit from the RI/BRA. Modeling indicated that there are no contaminant migration (CM) refined constituents of concern (RCOCs).

Table 1. Summary of Risks and Hazards: Surface Soil at R BPOPs and RUNKs

Known On-Unit Worker
No RCOCs

Future On-Unit Industrial Worker				
RCOC	**Ingestion**	**Inhalation**	**Dermal/External**	**Total of All Exposure Routes**
Benzo(a)pyrene	2.54×10^{-6}	----	5.24×10^{-6}	7.78×10^{-6}
Dibenzo(a,h)anthracene	----	----	1.54×10^{-6}	1.54×10^{-6}
Cesium-137	----	----	1.94×10^{-6}	1.94×10^{-6}
Cobalt-60	----	----	2.17×10^{-6}	2.17×10^{-6}
			Total Cumulative Risk	1.34×10^{-5}

---- = not a RCOC for this pathway.
There are no ecological RCOCs or CM RCOCs for the R BPOPs and RUNKs OU.
A risk of 1×10^{-6} means there is a risk of one additional incident of cancer per one million people.

There are no RCRA-listed or characteristic wastes at the unit. There is no principal threat source material (PTSM) (highly-mobile or highly-toxic source materials that require a bias toward treatment alternatives) at the R BPOPs and RUNKs OU. The contamination is largely isolated by backfill and exposure to RCOCs is limited by land use restrictions. Therefore, the waste is categorized as a low-level threat.

1.3 Remedial Action Overview

As documented in the ROD (WSRC 2002), based upon the characterization data and risk assessments in the RI/BRA (WSRC 2000), the RAOs, and the evaluation of alternatives, the selected remedy for the R BPOPs and RUNKs OU is Alternative 2: Institutional Controls.

The post-remedial action (RA) conceptual site model (see Attachment B-1) shows the broken pathways and the remaining residual risk to the future industrial worker.

According to the SRS Future Use Project Report (USDOE 1996), residential use of SRS land should be prohibited.

2.0 LAND USE CONTROLS

Considering the residual risk mentioned above, the land use control objectives are to

- maintain the use of the site for industrial activities only and
- prevent unauthorized access, contact, removal and excavation of buried RCOCs exceeding remedial goals at the closed CERCLA unit as long as the waste remains a threat to human health or the environment.

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

2.1 Access Controls

2.1.1 On-Site Workers

In accordance with WSRC 1D, *Site Infrastructure and Services Manual*, Procedure 3.02, "Site Real Property Configuration Control," use of all lands and waters on SRS shall be

coordinated via the Site Use Program. All employees, contractors, and visitors to the SRS must adhere with the requirements of the Site Use Program. This program ensures that all work performed on the SRS that adds, modifies, or removes features portrayed on the SRS development maps is authorized. No use of land (i.e., excavation or any other land use) shall be undertaken without prior approval documented by a Site Use Permit. This authorization is obtained through the completion of a Site Clearance Request Form. Also, in accordance with 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 excavation activities are conducted. All site clearance requests will be reviewed to verify that either an approved Site Use Permit has been obtained or that an existing Site Use Permit has sanctioned the request.

SRS, specifically the Site Development, Planning, and Mapping Department, is responsible for updating, maintaining, and reviewing site maps, including FFA (1993) operable unit (OU) identifications. If a site clearance request is made that may impact an FFA OU, the Site Clearance Request Form is sent to the FFA OU reviewer, who is in the Soil and Groundwater Closure Projects (SGCP), for either approval or disapproval. The roles and responsibilities of each individual are detailed in WSRC 1D, Procedure 3.02. Verification of USDOE 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 (QA) Program. The SRS QA program is the governing QA program for all SRS activities, including those in SGCP. The activities that are performed in SGCP must comply with SRS QA Program procedures as well as with SGCP -specific procedures.

SRS identifies all buildings and facilities on maps used in the Site Use/Site Clearance 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 major change in land use or excavation at the R BPOPs and RUNKs OU shall be undertaken without USEPA and SCDHEC approval. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, access control warning signs will be posted at the unit. The warning signs will be legible from a distance of at least 25 feet and will read as shown in Attachment B-2, which depicts a drawing of a typical access control warning sign. Custodial responsibilities for maintenance and inspection of the R BPOPs and RUNKs OU will be maintained by the Post-Closure Maintenance Group within SGCP.

2.1.2 Trespassers

While under the ownership of USDOE, access control of the entire SRS will 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.61-79.264.14(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.

2.2 LUCIP Deed Notification

In the long-term, if the property is ever transferred to non-federal ownership, the US 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 shall also include deed restrictions precluding residential use of the property. 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 with USEPA and SCDHEC review and approval.

In addition, if the site is ever transferred to non-federal ownership, a survey plat of the OU will be certified by a professional land surveyor and recorded with the appropriate county recording agency.

Note: Survey Plat (Attachment B-3), and the line marked "AREA SUBJECT TO LAND USE CONTROLS" define the area subject to Land Use Controls. The OU boundary is delineated by survey markers.

2.3 Field Walkdown and Maintenance for Institutional Controls

After the remediation of the R BPOPs and RUNKs OU, only maintenance activities will be required per this RA.

The USEPA and SCDHEC will be notified of the results of any events and/or actions that indicate some potential compromise of institutional controls within 30 days of identification. The events/actions will be documented in the FFA Annual Progress 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 complete inspection form is maintained in the SGCP Administrative Record Files. The land use controls will be implemented as long as the waste remains a threat to human health or the environment.

Site maintenance will consist of inspections of the OU and maintenance of existing drainage features to minimize the formation of large gullies. Minor earthwork will be

performed as needed to repair any erosion damage that may occur. No grading or construction of new drainage features is anticipated to be needed. Site maintenance will also include mowing of the existing cleared areas of OU. Trees will be removed as necessary to facilitate mowing. Site maintenance will ensure that site conditions for which the remedial action has been implemented do not change. Site maintenance and inspections will be performed annually.

Administrative controls (land use restrictions) will be implemented to restrict human exposure to contaminants remaining at the unit. Access controls will include security measures such as posting and maintenance of warning signs. To prevent unknowing entry and to ensure that unrestricted use of the waste unit does not occur while under ownership of the government, warning signs will be posted at each entrance to the restricted portion of the unit. Signs will be legible from a distance of at least 25 ft.

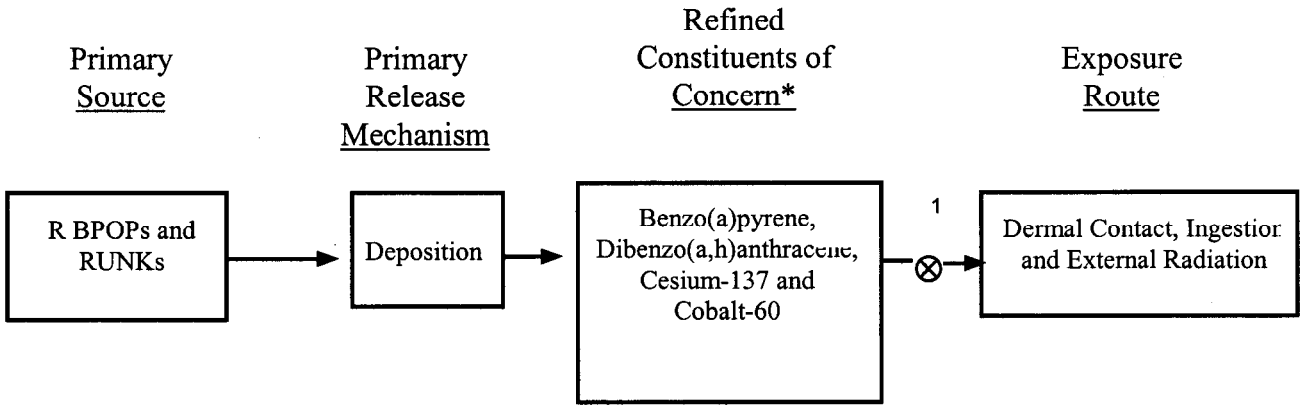
As required by the National Oil and Hazardous Substance Contingency Plan (NCP), statutory 5-year reviews of the RA for the R BPOP and RUNKs OU will be performed as long as the waste remains a threat to human health or the environment.

The waste site inspectors are to be trained in Hazardous Waste Operations and Emergency Response (i.e. HAZWOPER), RCRA Well Inspections (SGCP-specific training), SGCP RCRA Waste Unit Inspections, Radiological Workers, 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 will conduct the inspections and grass cutting operations.

This unit-specific LUCIP, including the inspection checklist (Attachment B-4), will be appended to the SRS LUCAP. If the OU is ever transferred to non-federal ownership, a survey plat of the area, prepared by a certified professional land surveyor, will be recorded with the county recording agency.

ATTACHMENT B-1

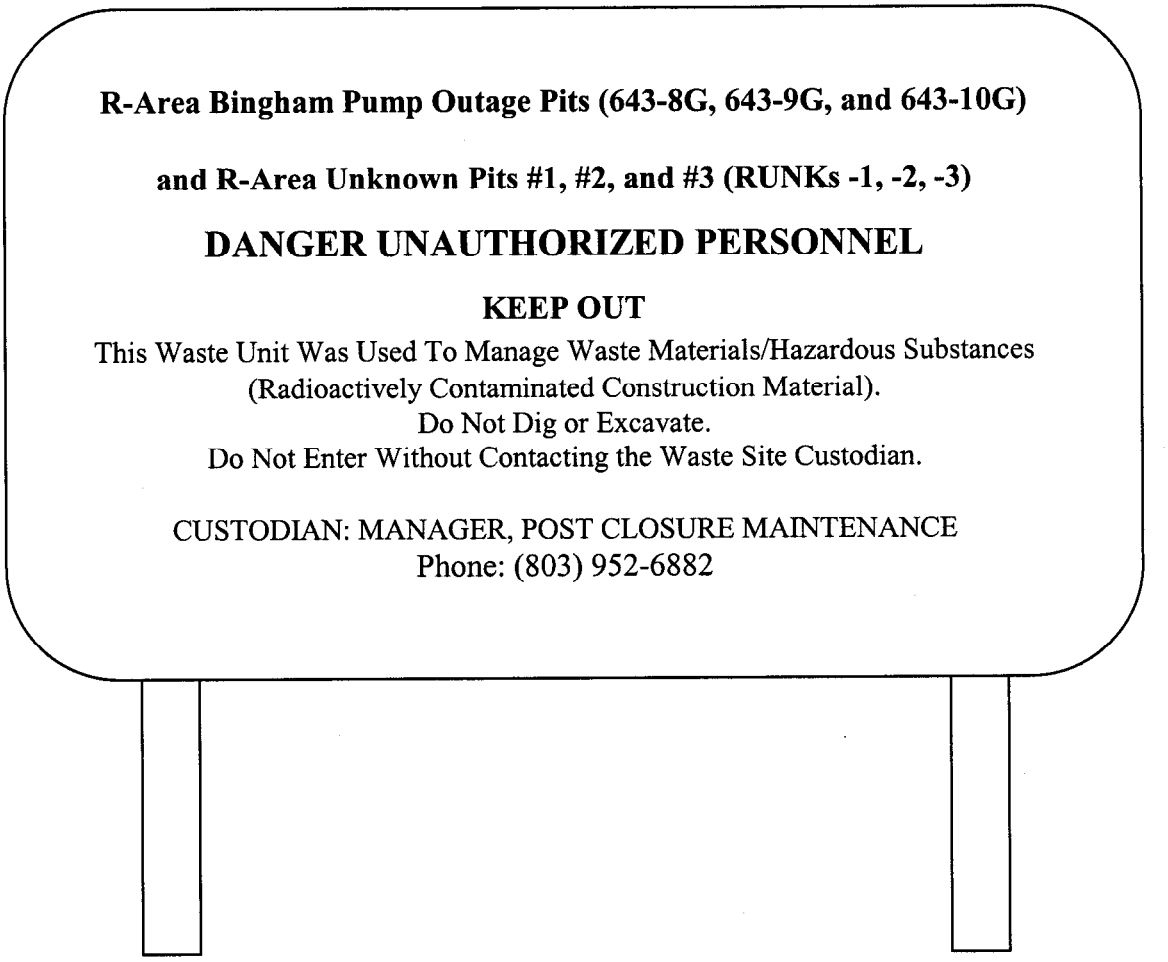
CONCEPTUAL SITE MODEL FOR THE R-AREA BPOPS AND RUNKs POST-REMEDIAL ACTION



Legend
⊗ Pathway break
Remedial Alternative:
(1) Institutional Controls
*Based on industrial worker scenario (found in soil at depths of 0 to 1 ft)

ATTACHMENT B-2

ACCESS CONTROL WARNING SIGNS

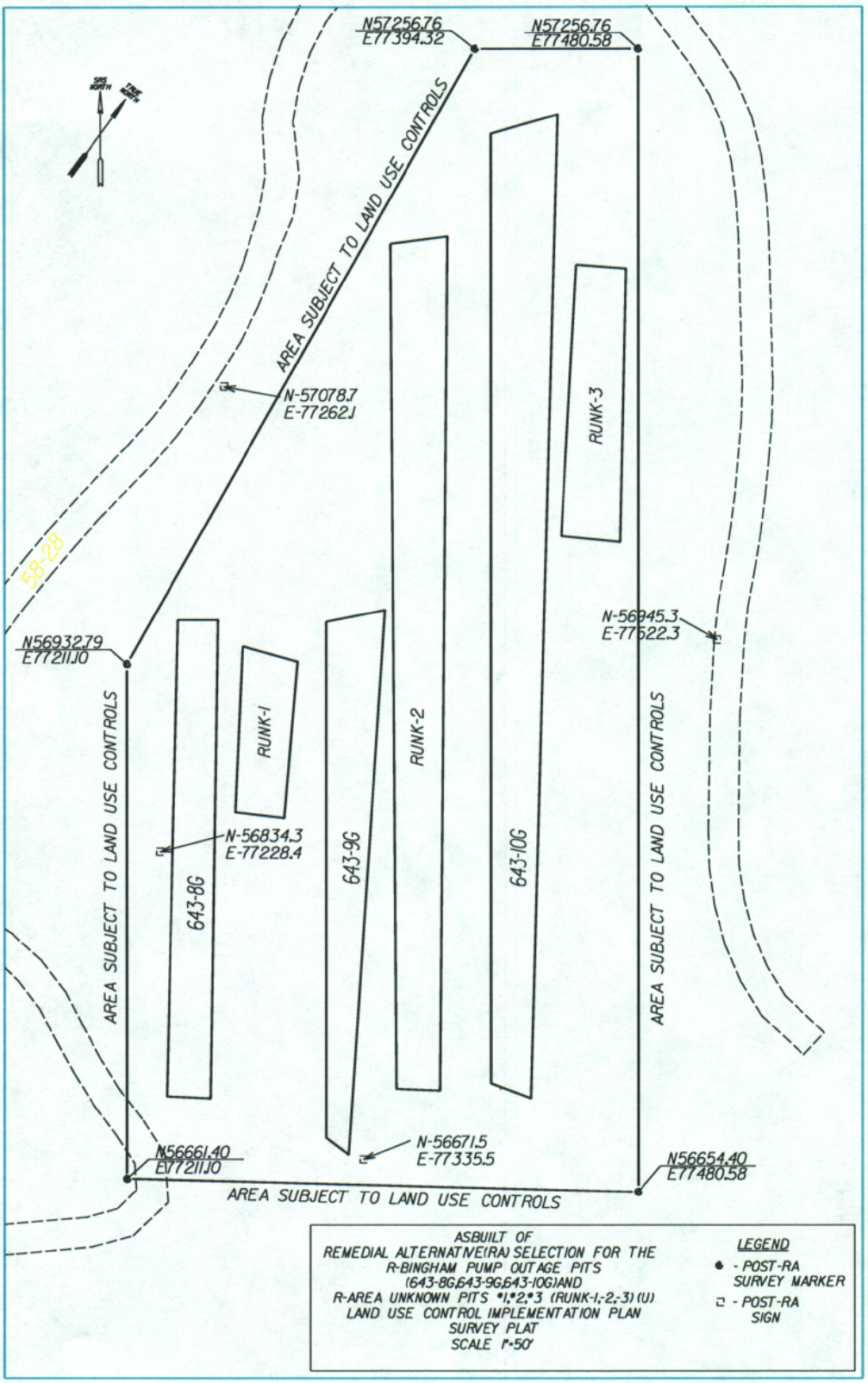


ATTACHMENT B-3

SURVEY PLAT

LAND USE CONTROL

IMPLEMENTATION PLAN SURVEY PLAT


N57256.76
E77394.32
N57256.76
E77480.58
SRS NORTH
TRUE NORTH
AREA SUBJECT TO LAND USE CONTROLS
N-57078.7
E-77262.1
RUNK-3
58-28
N56932.79
E772111.0
N-56945.3
E-77522.3
RUNK-1
RUNK-2
643-8G
643-9G
643-10G
N-56834.3
E-77228.4
AREA SUBJECT TO LAND USE CONTROLS
AREA SUBJECT TO LAND USE CONTROLS
N56661.40
E772111.0
N-56671.5
E-77335.5
N56654.40
E77480.58
AREA SUBJECT TO LAND USE CONTROLS
ASBUILT OF
REMEDIAL ALTERNATIVE(RA) SELECTION FOR THE
R-BINGHAM PUMP OUTAGE PITS
(643-8G,643-9G,643-10G)AND
R-AREA UNKNOWN PITS #1,#2,#3 (RUNK-1,-2,-3) (U)
LAND USE CONTROL IMPLEMENTATION PLAN
SURVEY PLAT
SCALE 1"=50'
LEGEND
- POST-RA SURVEY MARKER
- POST-RA SIGN

ATTACHMENT B-4

SGCP FIELD INSPECTION CHECKLIST

for the

R-AREA BINGHAM PUMP OUTAGE PITS (643-8G, 643-9G, and 643-10G)

and

R-Area Unknown Pits #1, #2, and #3 (RUNKs 1, 2, and 3)

SGCP ANNUAL INSPECTION DATA SHEET
for R-AREA BPOPs and RUNKs OU

A = Satisfactory X = Unsatisfactory (Explanation Required)	A or X	Comments or Corrective Action Taken (See Maintenance Register for Corrected Items)
Verify there is no unauthorized digging; excavation, or construction activities within the OU.		
Verify that roads are accessible.		
Verify that the waste unit signs are in acceptable condition, have the correct information, and they are legible from at least 25 feet.		
Mow vegetation (and remove trees to facilitate mowing) within the existing cleared area.		
Maintain existing drainage features to minimize the formation of large gullies (i.e. 3 ft. wide and 1 ft. deep). Minor earthwork will be performed as needed to repair any erosion damage that may occur. No grading or construction of new drainage features is needed.		
Comments:		

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

Reviewed By
Post-Closure Manager:_____/_____Date/Time:_____/_____
(or designee) (Print Name) (Signature)

CAUTION: The inspector shall notify the PCM and ECA **IMMEDIATELY** if there has been a breach or compromise of the institutional controls of this waste unit. Refer to post-closure inspection procedures.