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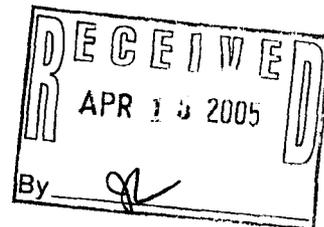


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January 2005
ER2004-0461

**Field Implementation Plan
for the Investigation and
Remediation of Area of
Concern (AOC) 03-001(i),
AOC 03-020(b),
Solid Waste Management Unit
(SWMU) 03-029, and SWMU 61-002**



Prepared by
Environmental Stewardship–Remediation Services

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List of Acronyms and Abbreviations

ACA	accelerated corrective action
AOC	area of concern
BMP	best management practice
DOE	US Department of Energy
DOT	US Department of Transportation
DRO	diesel range organics
EM	electromagnetic (induction)
ENV	Environmental Stewardship (Laboratory Division)
ENV-RS	Environmental Stewardship Remediation Services (Laboratory project)
ENV-SWRC	Environmental Stewardship Division–Solid Waste Regulatory Compliance (Laboratory Group)
EPA	US Environmental Protection Agency
FIP	field implementation plan
GRO	gasoline range organics
HSR-1	Health, Safety, and Radiation Protection (Laboratory Group)
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LIR	Laboratory Implementation Requirement
NFA	no further action
NMSW	New Mexico Special Waste
NMED	New Mexico Environment Department
OU	operational unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
QA	quality assurance
QC	quality control
QP	quality procedure
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
SAL	screening action level
SAP	sampling and analysis plan
SMO	Sample Management Office (Laboratory office)
SOP	standard operating procedure

Field Implementation Plan for AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002

SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
VOC	volatile organic compound
WCSF	waste characterization strategy form
WGII	Washington Group International, Inc.

1.0 INTRODUCTION

This field implementation plan (FIP) prescribes fieldwork to be accomplished in support of characterization and remediation for area of concern (AOC) 03-001(i), AOC 03-002(b), Solid Waste Management Unit (SWMU) 03-029, and SWMU 61-002 within Los Alamos National Laboratory (LANL or the Laboratory) Technical Area (TA) 3 and TA-61. These sites lie in the path of the planned TA-3 Security Perimeter Road and will be inaccessible during and after the road's construction, scheduled to begin in March 2005. To accommodate the construction schedule, the Laboratory submitted an accelerated corrective action (ACA) work plan for AOC 03-001(i), SWMU 03-029, and SWMU 61-002 to the New Mexico Environment Department (NMED) on December 3, 2004 (LANL 2004, 87474). All work will be performed in compliance with Statement of Work ER2004-0480.

Activities described in this FIP will be conducted in accordance with the requirements of the ACA work plan. AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002 may contain hazardous components but are not believed to contain radiological components. The following list presents the potential contaminants for each site:

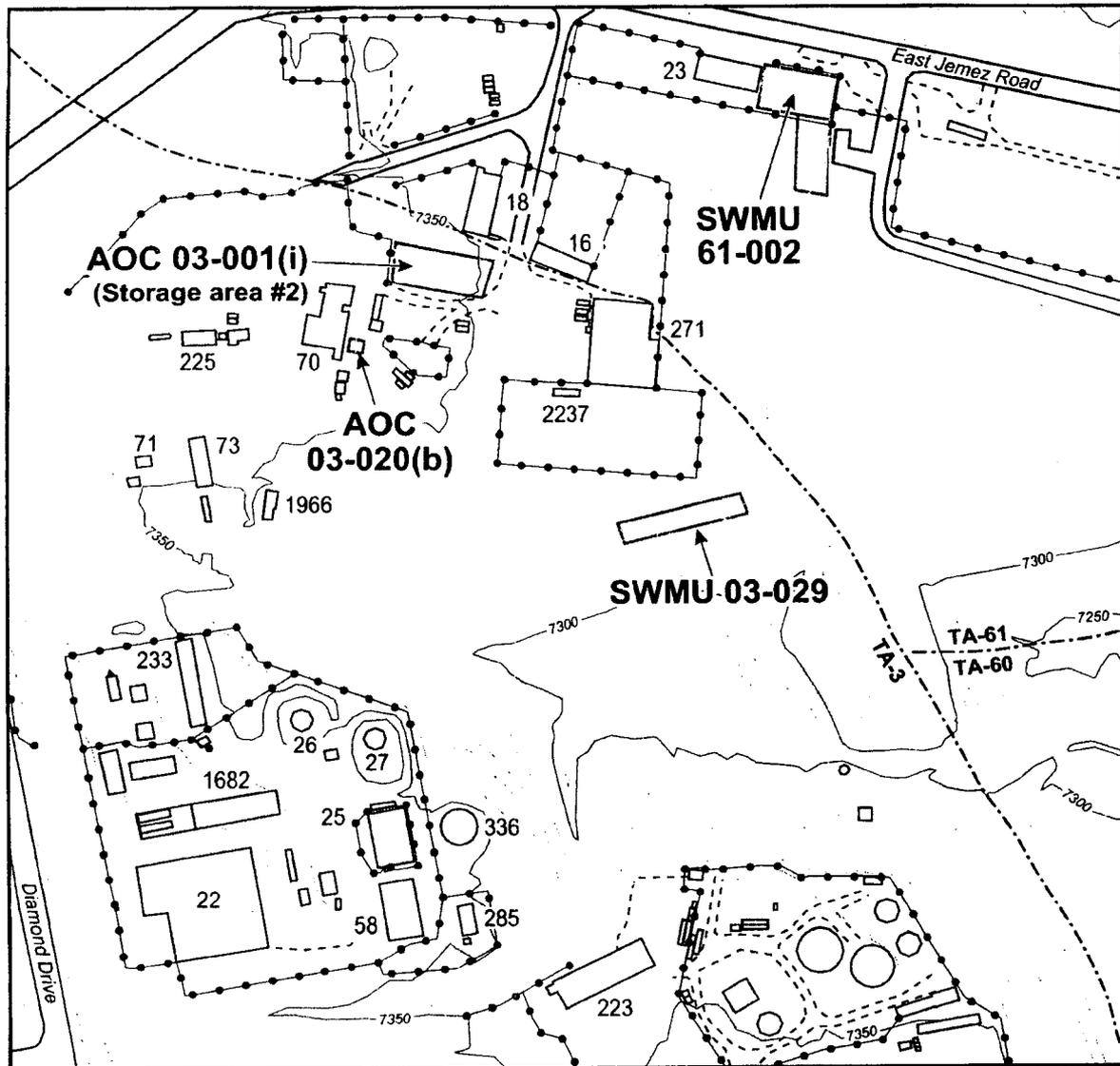
- AOC 03-001(i), material and equipment storage area: volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs) associated with historical site use
- AOC 03-020(b), sand-filled metal tray associated with small-engine degreasing and steam-cleaning activities: VOCs, SVOCs, metals, and oil associated with historical site use
- SWMU 03-029, landfill associated with the Asphalt Batch Plant: coal-tar-derived polycyclic aromatic hydrocarbons (PAHs), metals, and VOCs
- SWMU 61-002, Radio Repair Shop PCB storage area: contaminants of potential concern are PCBs, SVOCs, and metals found to exist during previous site investigations (LANL 1993, 20947)

Figure 1 shows the locations of the AOCs and SWMUs with respect to TA-3 and TA-61. Section 2.0 includes site descriptions and summaries of previous site investigations. All available historical sampling data are presented Tables 2, 3, 4, 5, 6, and 7 of the ACA (LANL 2004, 87474).

1.1 Regulatory Background

AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002 are located within the Upper Sandia Canyon Aggregate Area. According to the terms of the Proposed Order on Consent, the investigation work plan for this aggregate area is due to NMED in March 2008. The Laboratory submitted an ACA work plan to complete investigation and remediation of these sites in advance of construction activities that would make the sites inaccessible (LANL 2004, 87474).

SWMU 03-029 and SWMU 61-002 are listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit (EPA 1990, 01585; EPA 1994, 44146). NMED is the administrative authority for both SWMUs. NMED has not approved either SWMU for no further action (NFA). The Order on Consent will modify and replace the corrective action requirements of Module VIII. Under the terms of the Order on Consent, NMED may issue Certificates of Completion for corrective actions as either "complete without controls" or "complete with controls." The Laboratory plans to complete corrective actions at AOC 03-001(i), SWMU 03-029, and SWMU 61-002 to the levels required for NMED to issue a Certificate of Completion for each site for corrective action complete without controls. In the event that corrective action at a site receives NMED approval as complete with controls, the Laboratory will assume responsibility for the



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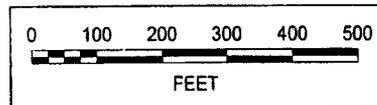
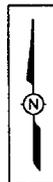
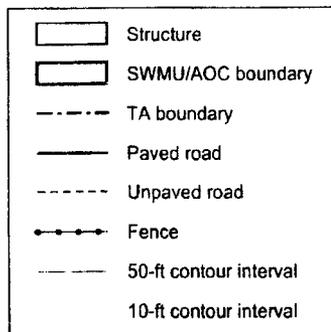


Figure 1. Locations of AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002

controls specified for the site by NMED. The Laboratory expects that such controls will be limited to institutional/administrative controls to ensure that land use remains consistent with residual contamination at the site. In the event that NMED will not issue a Certificate of Completion for corrective action at a site, the Facility Owner will assume long-term responsibility for the site. The US Environmental Protection Agency (EPA) previously approved AOC 03-020(b) for NFA (EPA 1994, 38813). However, because this site will be disturbed by construction activities, soil will be removed from the site and the site will be visually inspected for stains that may be evidence of historical subsurface releases. If evidence of historical subsurface releases is found during soil excavation, the site will be remediated and confirmation samples will be collected.

1.2 Project Objectives

The objectives of the activities described in this FIP are to complete characterization and remediation of AOC 03-001(i), SWMU 03-029, and SWMU 61-002 before construction of the planned security perimeter road, while the sites are still accessible. Corrective actions will be completed at AOC 03-020(b) if excavated soils from the site indicate historical subsurface releases. FIP activities include the following:

- Removing asphalt and debris from SWMU 03-029
- Removing asphalt and soil from AOC 03-020
- Defining the nature and extent of contamination at AOC 03-001(i), SWMU 03-029, and SWMU 61-002 following completion of soil and debris removal
- Supporting requests for Certificates of Completion for AOC 03-001(i), SWMU 03-029, and SWMU 61-002
- Investigating and, as necessary, performing remedial actions at AOC 03-020(b)

2.0 SITE DESCRIPTION AND HISTORY

2.1 AOC 03-001(i)

AOC 03-001(i) consists of two inactive material and equipment storage areas (Storage Areas #1 and #2) located near the Parks and Refuse Office building (Building 70) within TA-3 (Figure 1). Storage Area #1 will not be impacted by construction activities for the security perimeter road and will not be investigated or remediated under the FIP. This FIP describes investigation and remediation activities for Storage Area #2, a 50-ft by 150-ft level, unpaved area located directly northeast of Building 70. Storage Area #2 was used as a staging area for old transformers and containers of roofing compound, tars, and adhesives. Dumpsters within the area were used for storage of bagged and labeled asbestos materials to be disposed of at the Los Alamos County landfill. Storage Area #2 was in use from the 1970s to 1989.

2.2 AOC 03-020(b)

AOC 03-020(b) is the site of a pit that was located adjacent to the southeast corner of the Parks and Refuse Office building (Building 70) (Figure 1). The pit was an approximately 10-ft by 15-ft, 1-in.-deep metal box recessed into the asphalt pavement. The pit was filled with sand and covered with a metal grate. Small engines were placed on the grate to be cleaned. Oil and grease from the engines and condensed steam and detergent from the steam cleaner drained into the pit and were absorbed by the sand. When sand in the pit became saturated, it was removed and discarded at the Los Alamos County landfill and replaced with clean sand. The pit was cleaned, replenished with clean sand, and covered with asphalt when the parking lot for Building 70 was repaved in 1991. AOC 03-020(b) was recommended for NFA in the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) work plan for Operational Unit (OU) 1114 (LANL 1993, 20947). The EPA approved AOC 03-020(b) for NFA in 1994

(EPA 1994, 38813). Because the site will be disturbed by perimeter road construction activities, the Laboratory will inspect this site for evidence of past subsurface releases. If such evidence is found, the site will be remediated and confirmation samples will be collected.

2.3 SWMU 03-029

SWMU 03-029, which is now included in consolidated SWMU 03-009(a)-00, is an inactive 30-ft by 70-ft landfill located near the rim of Sandia Canyon and about 300 ft south of Building 271 (Figure 1). While active, the landfill was used as an asphalt cleanout area and received excess asphalt. Decommissioning included filling the landfill with sand to bring the surface level with the mesa rim. NMED issued a notice of violation to the Laboratory in November 1990 because pieces of asphalt and an oily sheen were found in the Sandia Canyon watercourse below Building 73. The Laboratory completed the corrective action required by NMED for SWMU 03-029 in early 1993 and, following approval of the corrective action, recommended the site for NFA in Addendum 1 to the 1995 RFI work plan for OU 1114 (LANL 1995, 57590). NMED disapproved the NFA recommendation and requested additional site investigation (NMED 1996, 65591). After removing the asphalt and other debris to accommodate the perimeter road construction activities, confirmation samples will be collected to address the requirement for additional investigation stated in the NMED letter of disapproval.

2.4 SWMU 61-002

SWMU 61-002 is a storage area east of the Radio Repair Shop (Building 23) on East Jemez Road. An 81-ft by 91-ft portion of the SWMU lies within a fenced area (Figure 1). This part of the SWMU was historically used as a storage area for capacitors and transformers and contained unmarked containers, several of which were oil-filled. Before 1985, oil contaminated with PCBs was stored in containers on the soil surface within the storage area. The containers were known to have leaked. In 1986, the Laboratory Environment, Safety, and Health Division collected thirty-two soil samples from the portion of the SWMU within the fenced area and from locations within the SWMU to the south of the fenced area. Analyses of these samples detected elevated PCB concentrations, and this area of the SWMU was subsequently excavated and resampled. Results of confirmation sampling conducted after the excavation showed that cleanup was successful, and the area was backfilled with clean soil and paved with asphalt (LANL 1993, 20947). Following remediation, the east side of the storage area was again used to store electrical equipment, some of which contained PCBs. Storage operations were discontinued in 1992. The 1993 OU 1114 work plan reported staining on the surface of the asphalt within the SWMU (LANL 1993, 20947). The Laboratory conducted an RFI in the summer of 1994 to determine if PCBs were present in the stains on the asphalt or in surface soils downgradient from the site. Based on investigation results published in the 1996 RFI report (LANL 1996, 52930), a Phase II RFI was conducted in 1997 to determine the extent of contamination. The RFI results are reported in section 2.5 and Appendix B of the ACA work plan (LANL 2004, 87474).

3.0 SCOPE OF WORK

The information presented in this section details the scope of work to be conducted under this FIP and work elements specific to AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002. Table 1 lists the proposed samples and analytical suites.

3.1 AOC 03-001(i)

Mobilization activities, site characterization sampling, excavation, and confirmation sampling will be conducted at AOC 03-001(i) within Storage Area #2 (Figure 2).

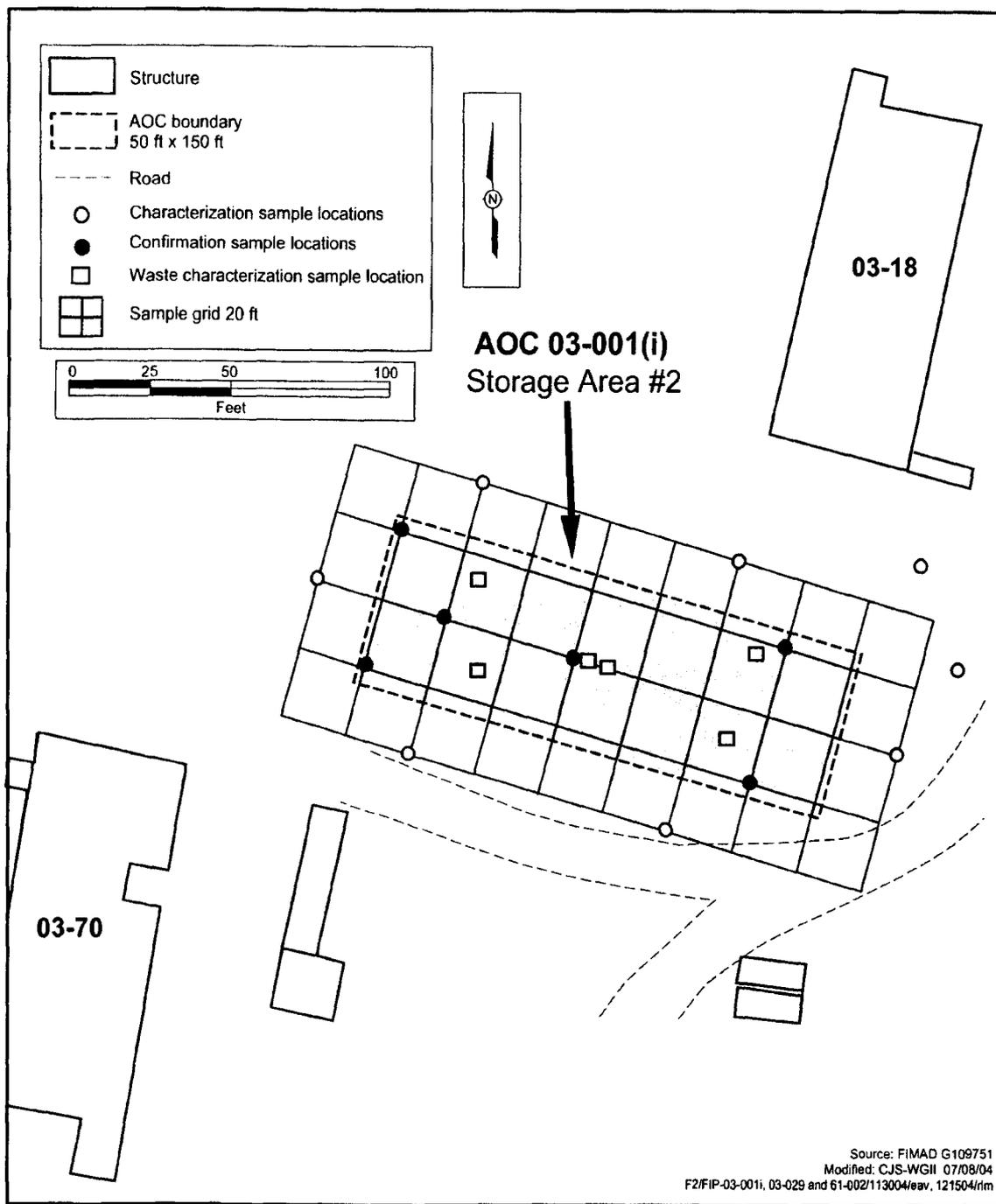


Figure 2. Proposed characterization and confirmation sampling locations for Storage Area #2 in AOC 03-001(i)

**Table 1
Proposed Samples and Analytical Suites**

AOC/SWMU	Estimated Number of Samples	Type of Sampling	Methods	Analytical Suite Type
03-001(i)	24 planned 2 duplicate 26 total	Characterization sampling by WGII ^a -SOP ^b -06.09 or -06.10. Headspace screening with PID ^c . Radiological field screening.	8082, 8270C, and 8260B, and TAL ^d metals by 6010B, 6020, and 7471A	PCBs, SVOCs, VOCs, and TAL metals ^e
03-001(i)	12 planned 1 duplicate 13 total	Confirmation sampling by WGII-SOP-06.09 or -06.10. Headspace screening with PID. Radiological field screening.	8082, 8270C, and 8260B, and TAL metals by 6010B, 6020, and 7471A	PCBs, SVOCs, VOCs, and TAL metals
03-020(b) ^f	10 as needed 6 step-out as needed 2 duplicate 18 total	Confirmation sampling by WGII-SOP-06.09 or -06.10. Headspace screening with PID. Radiological field screening.	8082, 8270C, 8260B, and TAL metals by 6010B, 6020, and 7471A	PCBs, SVOCs, VOCs, and TAL metals ^e
03-029	34 planned 3 duplicate 37 total	Confirmation sampling by WGII-SOP-06.09 or -06.10. Headspace screening with PID. Radiological field screening.	8082, 8270C, 8260B, and TAL metals by 6010B, 6020, and 7471A	PCBs, SVOCs, VOCs, and TAL metals ^e
61-002	53 planned 5 duplicate 58 total	Characterization sampling by WGII-SOP-06.09 or -06.10. Radiological field screening.	8082, 8270C, and TAL metals by 6010B, 6020, and 7471A	PCBs, SVOCs, and TAL metals ^e
61-002	47 planned 5 duplicate 52 total	Confirmation sampling by WGII-SOP-06.09 or -06.10. Radiological field screening.	8082, 8270C, and TAL metals by 6010B, 6020, and 7471A.	PCBs, SVOCs, and TAL metals
TOTAL	186 planned 18 duplicate 204 total			

^a WGII = Washington Group International, Inc.

^b SOP= Standard operating procedure.

^c PID = Photoionization detector.

^d TAL= Target analyte list.

^e Additional waste characterization analyses will be determined in accordance with the Waste Characterization Strategy Form.

^f Samples will be collected if contamination is confirmed visually.

3.1.1 Mobilization and Characterization Activities

Mobilization to the site will include delivery and inspection of heavy equipment and the establishment of site work areas; ropes, postings, or construction fencing will be used as appropriate to control public and untrained worker access to the site work areas. Erosion-control best management practices (BMPs) (e.g., silt fence and straw wattles) will be installed in accordance with the Laboratory Storm Water Pollution Prevention Plan for Environmental Restoration Construction Activities, Revision 0 (LANL 2004, 87464), as needed and before any soil-disturbing activities begin.

A survey grid will be established at the site to guide sampling. Additional geodetic data will also be collected to establish the existing topography of the site. The survey will be conducted by a New Mexico-licensed land surveyor in accordance with Washington Group International, Inc. (WGII) Standard Operating Procedure (SOP)-03.11, Geodetic Surveys, and the data will be delivered to the Laboratory in

accordance with WGII Quality Procedure (QP)-4.4, Record Transmittal to the Records Processing Facility, for migration to the Environmental Stewardship (ENV) Division Geographical Information System.

The field team will evaluate the current site conditions to determine if the current grade is in fact the operational ground surface. The evaluation may involve examination of on-site trees to determine if they have been buried with backfill material. The team may excavate pits at the site to identify buried soil horizons. Review of historical photos and interviews with workers at the site may also be conducted to obtain information as to whether the current grade is the surface for historical operations at AOC 03-001(i).

Samples will be collected from eight locations (Figure 2) at three depth intervals to define the lateral extent of contamination before beginning soil excavation. These samples will also be used for waste characterization purposes. Based on the results of the site evaluation, the field team will use best professional judgment to determine the final depth intervals to be sampled. Planned sampling depth intervals (0.0 to 0.5 ft, 1.5 to 2.0 ft, and 3.5 to 4.0 ft) are from the current grade, which is assumed to be the grade where site operations were conducted when the AOC was active. Final sampling depth intervals will be adjusted to the historical operational grade if necessary. Two locations will be sampled at the same depth intervals downslope from AOC 03-001(i) (Figure 2). The exact locations will be determined during sampling activities. Samples will be collected either by using the spade and scoop method (WGII-SOP-06.09) manually or with the assistance of a backhoe or similar equipment or by using a hand auger (WGII-SOP-06.10), as appropriate. Quality assurance (QA)/quality control (QC) samples will include trip blanks for VOC analysis, field duplicates to evaluate the reproducibility of the sampling technique, and rinsate blanks to evaluate decontamination procedures. These samples will be collected according to WGII-SOP-01.05, Field Quality Control Samples.

Headspace vapor screening for VOCs (WGII-SOP-06.33) will be conducted using a photoionization detector (PID) capable of measuring concentrations as low as 1 ppm. Screening samples will be sealed in mason jars and allowed to equilibrate in a warm area for not less than ten minutes. The headspace gas will then be screened using a PID equipped with an 11.7 KeV bulb. To assure compliance with US Department of Transportation (DOT) regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV Sample Management Office (SMO). Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current Health, Safety, and Radiation Protection (HSR-1) radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

3.1.2 Excavation and Confirmation Sampling

The site will be excavated to the grade planned for the security perimeter road. This will avoid excavation, characterization, and waste disposal during construction. Twelve confirmation samples will be collected from six locations on a grid established over the site (Figure 2). Planned sampling depth intervals are 0.0 to 0.5 ft and 1.5 to 2.0 ft from the surface after soil removal. Samples will be collected either by using the spade and scoop method (WGII-SOP-06.09) manually or with the assistance of a backhoe or similar equipment or by using a hand auger (WGII-SOP-06.10), as appropriate. QA/QC samples will include trip blanks for VOC analysis, field duplicates to evaluate the reproducibility of the sampling technique, and rinsate blanks to evaluate decontamination procedures. These samples will be collected according to WGII-SOP-01.05, Field Quality Control Samples.

Headspace vapor screening for VOCs (WGII-SOP-06.33) will be conducted using a PID capable of measuring concentrations as low as 1 ppm. Screening samples will be sealed in mason jars and allowed to equilibrate in a warm area for not less than ten minutes. The headspace gas will then be screened using a PID equipped with an 11.7 KeV bulb. To assure compliance with DOT regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV SMO. Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current HSR-1 radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

All samples will be submitted to the ENV SMO for fixed-laboratory analyses of PCBs, SVOCs, VOCs, and target analyte list (TAL) metals with a request for 10-day turn-around time of the analytical results. For waste characterization purposes, additional toxicity characteristic leaching procedure (TCLP) metals and total petroleum hydrocarbon (TPH) analyses will be requested, in accordance with the approved waste characterization strategy form (WCSF). The field team will coordinate sample collection and analysis with the ENV SMO. Once samples have been collected, samples will be stored and transported to the ENV SMO in accordance with WGII-SOP-01.03, Handling, Packaging, and Shipping of Samples. The ENV SMO will ship samples to an off-site analytical laboratory qualified according to ENV-QP-7.2, Supplier Evaluation, and on the ENV approved suppliers list.

3.1.3 Site Restoration

Because the bypass road construction will take place after sampling and soil removal activities, the only site restoration activity currently planned for AOC 03-001(i) is backfilling the excavation to rough grade. Site BMPs will be left in place and upgraded as needed to prevent the erosion of site soils. The Laboratory will inspect BMPs as part of the existing BMP maintenance and inspection program for ENV Division.

3.1.4 Survey Sampling Locations

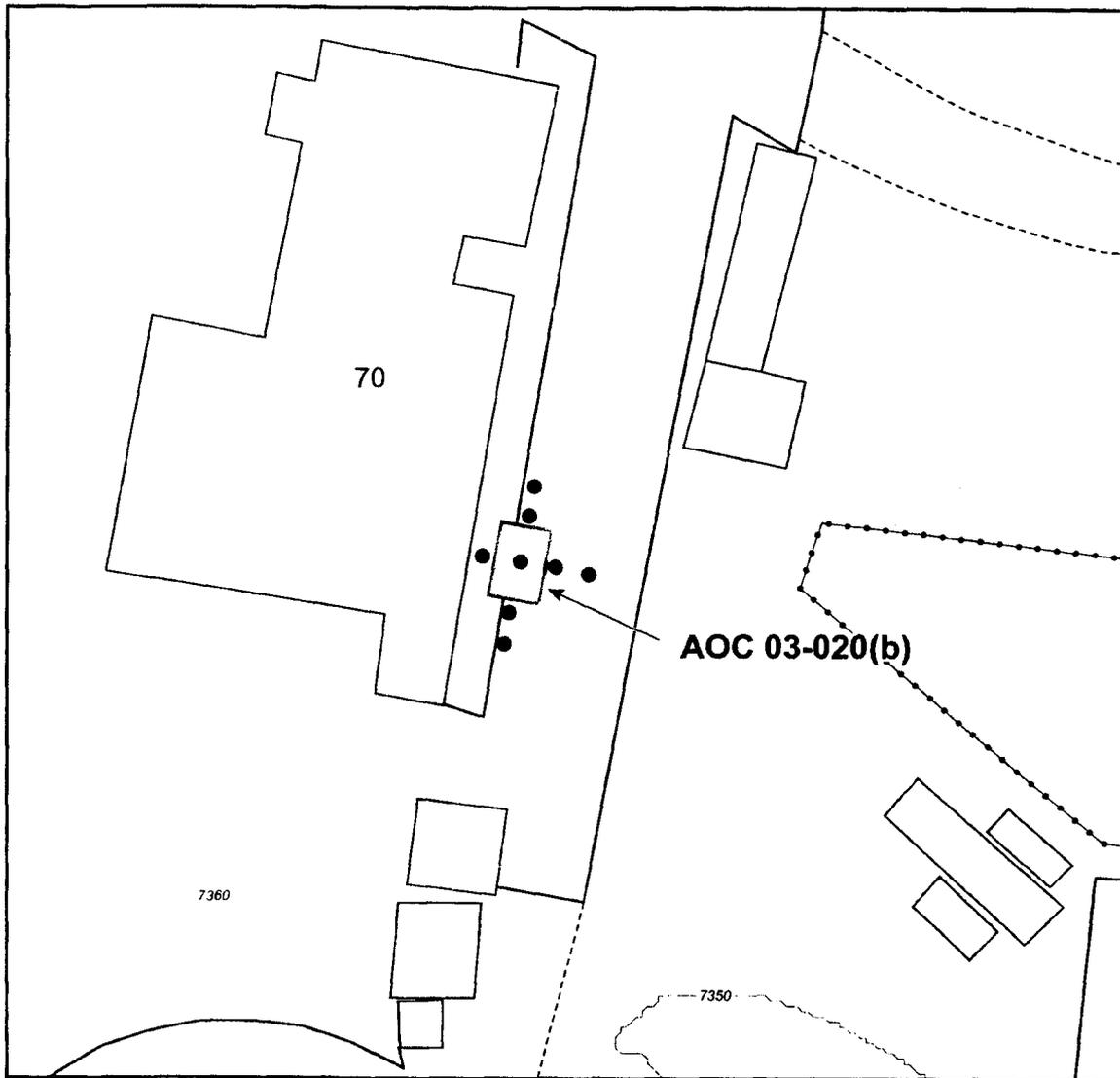
A geodetic survey, performed in accordance with WGII-SOP-03.11, Geodetic Surveys, will be conducted to define sampling locations at each site.

3.2 AOC 03-020(b)

Mobilization activities, excavation, and, if evidence of past subsurface releases is detected, confirmation sampling will be conducted at AOC 03-020(b).

3.2.1 Mobilization Activities

Mobilization to AOC 03-020(b) will include delivery and inspection of heavy equipment and the establishment of site work areas. Ropes, postings, or construction fencing will be used as appropriate to control public and untrained worker access. As required by the Laboratory Storm Water Pollution Prevention Plan for Environmental Restoration Construction Activities, Revision 0 (LANL 2004, 87464), erosion-control BMPs (e.g., silt fence and straw wattles) will be installed before any soil-disturbing activities are performed.



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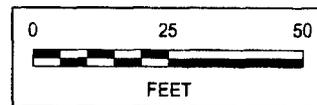
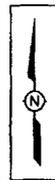
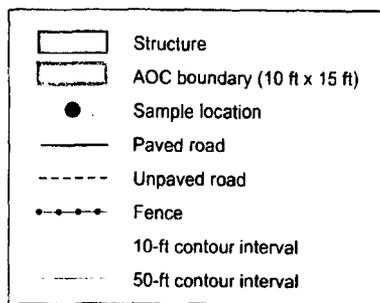


Figure 3. Potential confirmation sampling locations for AOC 03-020(b)

3.2.2 Excavation and Confirmation Sampling

AOC 03-020(b) is part of a ramp-like structure made of soil covered by asphalt. The entire ramp-like structure will be removed and the soil will be inspected for evidence of past subsurface releases. If evidence of past subsurface releases (e.g., visible staining of soil) is found during soil excavation, the site will be remediated and confirmation samples will be collected. Figure 3 shows the locations where samples will be collected after excavation if confirmation sampling is conducted at the site.

If confirmation sampling is conducted, the samples will be collected at depth intervals of 0 to 0.5 ft and 1.5 to 2.0 ft from the existing grade from five sampling locations: the center of the AOC and approximately 10 ft north, south, east, and west of the ramp (Figure 3). Spade and scoop or hand auger sample collection methods (WGII-SOPs-06.09 and -06.10) will be used as appropriate. QA/QC samples will include trip blanks for VOC analysis, field duplicates to evaluate the reproducibility of the sampling technique, and rinsate blanks to evaluate decontamination procedures. These samples will be collected according to WGII-SOP-01.05, Field Quality Control Samples.

Headspace vapor screening for VOCs (WGII-SOP-06.33) will be conducted using a PID capable of measuring concentrations as low as 1 ppm. Screening samples will be sealed in mason jars and allowed to equilibrate in a warm area for not less than ten minutes. The headspace gas will then be screened using a PID equipped with an 11.7 KeV bulb. To assure compliance with DOT regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV SMO. Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current HSR-1 radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

The samples will be submitted to the ENV SMO for fixed-laboratory analyses of TAL metals, PCBs, VOCs, and SVOCs, with a request for 10-day turn-around time of analytical results to verify the site's final condition. For waste characterization purposes, additional TCLP metals and TPH analyses will be requested in accordance with the approved WCSF. The field team will coordinate sample collection and analysis with the ENV SMO. Once samples have been collected, samples will be stored and transported to the ENV SMO in accordance with WGII-SOP-01.03, Handling, Packaging, and Shipping of Samples. The ENV SMO will ship samples to an analytical laboratory qualified according to ENV-QP-7.2, Supplier Evaluation, and on the ENV approved suppliers list.

3.2.3 Site Restoration

Because the bypass road construction will take place after sampling and soil removal activities, the only site restoration activity currently planned for AOC 03-020(b) is backfilling the excavation to rough grade. Site BMPs will be left in place and upgraded as needed to prevent the erosion of site soils. The Laboratory will inspect BMPs as part of the existing BMP maintenance and inspection program for ENV Division.

3.2.4 Survey Sampling Locations

A geodetic survey, performed in accordance with WGII-SOP-03.11, Geodetic Surveys, will be conducted to define sampling locations at each site.

3.3 SWMU 03-029

Mobilization activities, site characterization surveys, excavation, and confirmation sampling will be conducted at SWMU 03-029.

3.3.1 Mobilization and Characterization Activities

Mobilization to SWMU 03-029 will include delivery and inspection of heavy equipment and, as appropriate, the use of ropes, postings, or construction fencing to establish site work areas and control public and untrained worker access to the site. As required by the Laboratory Storm Water Pollution Prevention Plan for Environmental Restoration Construction Activities, Revision 0 (LANL 2004, 87464), erosion-control BMPs (e.g., silt fence and straw wattles) will be installed before any soil-disturbing activities are performed.

SWMU 03-029 will be trenched to define the physical limits of the asphalt dump. Following mobilization to the site, a geophysical survey will be performed to verify the limits of the landfill and to confirm that the estimated volume of material planned for removal is accurate. Electromagnetic (EM)-31, EM-61, and ground-penetrating radar surveys will be conducted by the geophysicist as necessary to estimate the vertical and lateral limits of the landfill.

For waste characterization purposes, additional TCLP metals and TPH analyses will be requested in accordance with the approved WCSF. The field team will coordinate sample collection and analysis with the ENV SMO. Once samples have been collected, samples will be stored and transported to the ENV SMO in accordance with WGII-SOP-01.03, Handling, Packaging, and Shipping of Samples. The ENV SMO will ship samples to an analytical laboratory qualified according to ENV-QP-7.2, Supplier Evaluation, and on the ENV approved suppliers list.

3.3.2 Excavation and Confirmation Sampling

The excavation limits to guide asphalt removal will be staked based on the results of the trenching and the geophysical surveys. Topsoil placed as fill over the landfill will be removed and stockpiled on site for later use as backfill material. The asphalt will be excavated; loaded directly to trucks for disposal in accordance with the WCSF, waste profile form, and chemical waste disposal requests; and transported off-site under Laboratory-generated manifests to a Laboratory-approved disposal facility. All asphalt materials and any stained soil or tuff beneath it will be removed, characterized, and disposed of as appropriate.

Following the removal of asphalt and stained soils, a 20-ft-square grid pattern will be established over and around the removal area. Assuming a 30-ft by 70-ft excavation area, 11 selected locations will be sampled at two interval depths (0.0 to 0.5 ft and 1.5 to 2.0 ft) (Figure 4). All sampling depths will be relative to the bottom of the excavation, and the appropriate depths for samples around the perimeter of the excavation will be determined in the field based on the depth of the excavation. Samples will also be collected at depth intervals of 0.0 to 0.5 ft and 1.5 to 2.0 ft from three additional step-out sampling locations at 20-ft distances from both ends of the landfill (Figure 4). Samples will be collected by spade and scoop or hand auger methods (WGII-SOP-06.09 and WGII-SOP-06.10, respectively). QA/QC samples will include trip blanks for VOC analysis, field duplicates to evaluate the reproducibility of the sampling technique, and rinsate blanks to evaluate decontamination procedures. These samples will be collected according to WGII-SOP-01.05, Field Quality Control Samples.

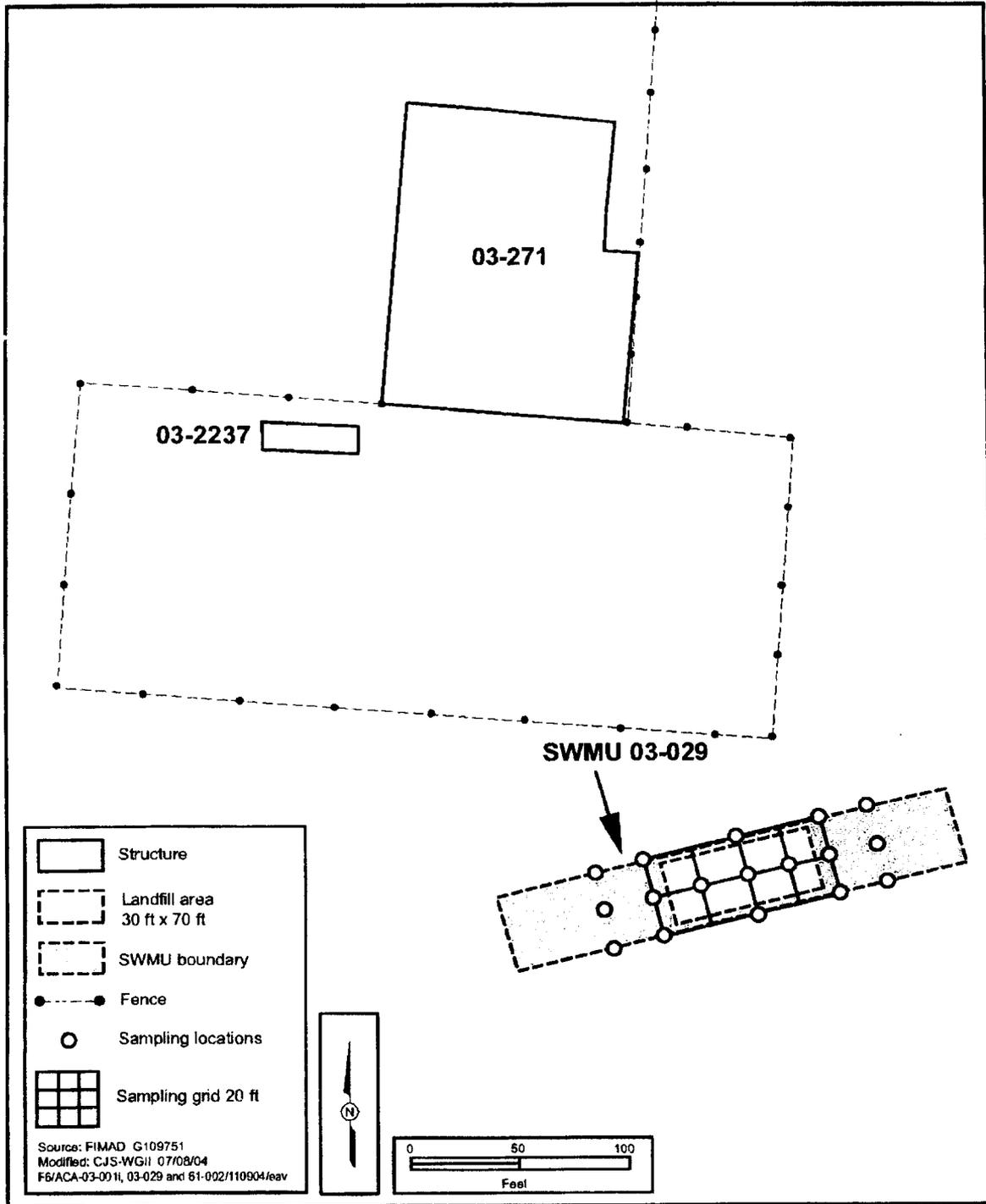


Figure 4. Proposed confirmation sampling locations for SWMU 03-029

Headspace vapor screening for VOCs (WGII-SOP-06.33) will be conducted using a PID capable of measuring concentrations as low as 1 ppm. Screening samples will be sealed in mason jars and allowed to equilibrate in a warm area for not less than ten minutes. The headspace gas will then be screened using a PID equipped with an 11.7 KeV bulb. To assure compliance with DOT regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV SMO. Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current HSR-1 radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

The samples will be submitted to the ENV SMO for fixed-laboratory analyses of SVOCs, VOCs, TAL metals, and PCBs, with a request for a 10-day turn-around time of the analytical results.

3.3.3 Site Restoration

Because the bypass road construction will take place after sampling and soil removal activities, the only site restoration activity currently planned for SWMU 03-029 is backfilling the excavation to rough grade. Site BMPs will be left in place and upgraded as needed to prevent the erosion of site soils. The Laboratory will inspect BMPs as part of the existing BMP maintenance and inspection program for ENV Division.

3.3.4 Survey Sampling Locations

A geodetic survey, performed in accordance with WGII-SOP-03.11, will be conducted to define sampling locations at each site.

3.4 SWMU 61-002

Mobilization activities, site characterization sampling, excavation, and confirmation sampling will be conducted at SWMU 61-002.

3.4.1 Mobilization and Characterization Activities

Mobilization to SWMU 61-002 will include delivery and inspection of heavy equipment and, as appropriate, the use of ropes, postings, or construction fencing to establish site work areas and control public and untrained worker access to the site. As required by the Laboratory Storm Water Pollution Prevention Plan for Environmental Restoration Construction Activities, Revision 0 (LANL 2004, 87464), erosion-control BMPs (e.g., silt fence and straw wattles) will be installed before any soil-disturbing activities are performed.

Fifty-three characterization samples will be collected from twenty-five locations on a 20-ft-square grid pattern established over the site (Figure 5). The sampling depth intervals will be relative to the existing surface. For sampling locations within the fenced area, the depth intervals are 0.5 to 1.0 ft and 2.0 to 2.5 ft. These intervals should ensure that samples collected are from beneath the pavement or fill material present in this area. For sampling locations within the unpaved area outside the fence, the proposed sampling depth intervals are 0.0 to 0.5 ft and 1.5 to 2.0 ft (Figure 5). Three sampling locations north and east of the SWMU will be sampled at three depth intervals, 0.0 to 0.5 ft, 1.5 to 2.0 ft, and 3.5 to 4.0 ft. These locations surround a 20-ft by 120-ft area of the SWMU that will be excavated to a depth of 3 to 4 ft. QA/QC samples will include field duplicates to evaluate the reproducibility of the sampling technique and

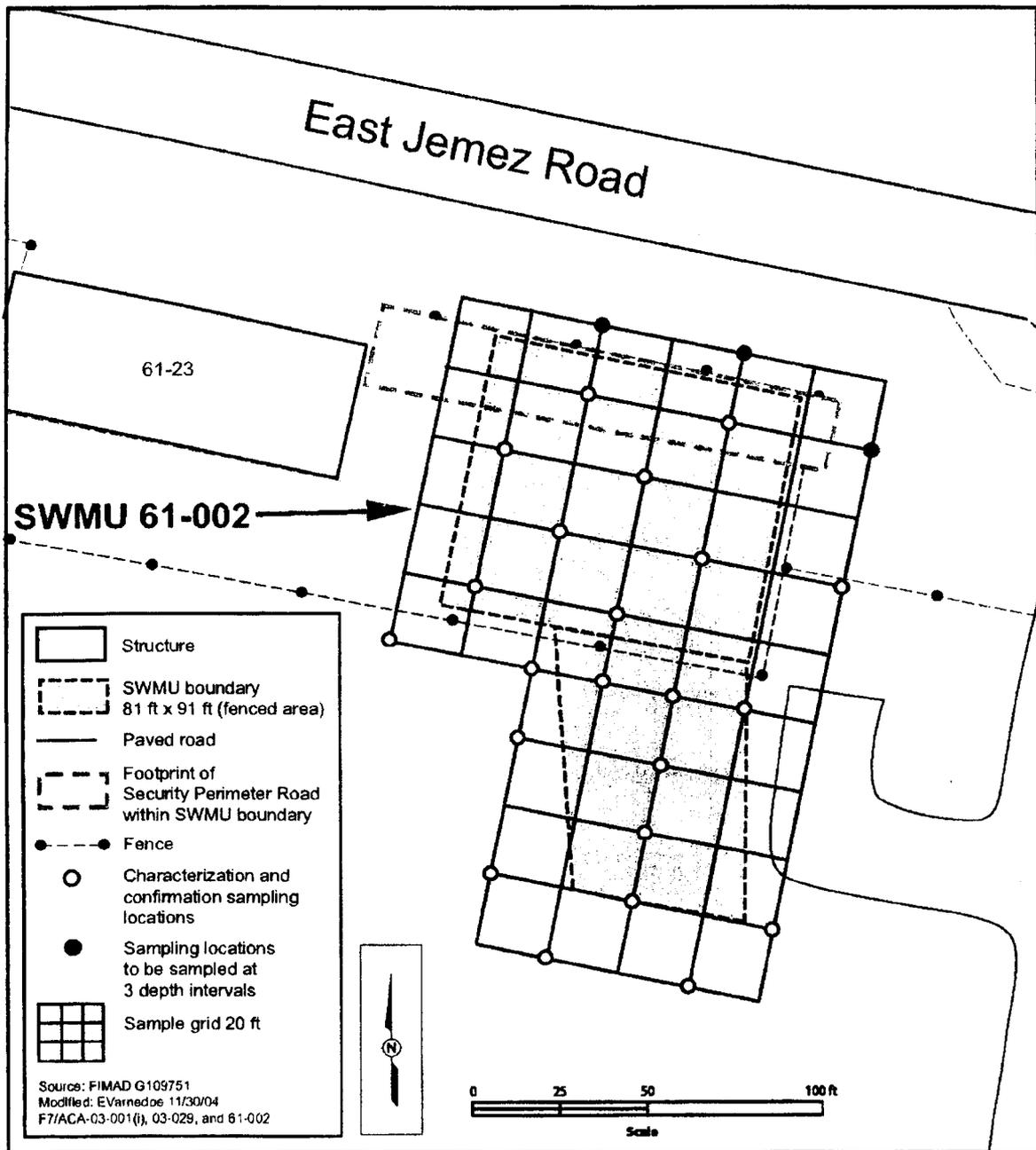


Figure 5. Proposed characterization and confirmation sampling locations for SWMU 61-002

rinsate blanks to evaluate decontamination procedures. These samples will be collected according to WGII-SOP-01.05, Field Quality Control Samples.

Samples will be collected by hand, or with the assistance of a backhoe or similar equipment, using the spade and scoop method (WGII-SOP-06.09) or using a hand auger (WGII-SOP-06.10), as appropriate.

To assure compliance with DOT regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV SMO. Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current HSR-1 radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

For waste characterization purposes, additional TCLP metals and TPH analyses will be requested in accordance with the approved WCSF. The field team will coordinate sample collection and analysis with the ENV SMO. Once samples have been collected, samples will be stored and transported to the ENV SMO in accordance with WGII-SOP-01.03, Handling, Packaging, and Shipping of Samples. The ENV SMO will ship samples to an analytical laboratory that is qualified according to ENV-QP-7.2, Supplier Evaluation, and on the ENV approved suppliers list.

3.4.2 Excavation and Confirmation Sampling

Excavation of soil to a depth of at least 1 ft is anticipated from within the boundary of SWMU 61-002. Excavation within a 20-ft by 120-ft area in the northern portion of the SWMU is planned to a depth of 3 to 4 ft (the grade planned for the security perimeter road). This will avoid excavation, characterization, and waste disposal during construction. After soil removal is conducted, confirmation samples will be collected from the site. Forty-seven samples will be collected from twenty-two locations on a 20-ft-square grid pattern established over the site (Figure 5). Sampling depth intervals will be 0.0 to 0.5 ft and 1.5 to 2.0 ft relative to the surface after soil removal. QA/QC samples will include field duplicates to evaluate the reproducibility of the sampling technique and rinsate blanks to evaluate decontamination procedures. Samples will be collected either by using the spade and scoop method (WGII-SOP-06.09) manually or with the assistance of a backhoe or similar equipment or by using a hand auger (WGII-SOP-06.10), as appropriate.

To assure compliance with DOT regulations, all samples will be field screened for alpha- and beta-gamma radiation before they are transported to the ENV SMO. Alpha screening will be conducted using a Ludlum model 139 rate meter with an air proportional probe. Beta-gamma radiation screening will be performed using an Eberline ESP-1 rate meter equipped with an HP-260 Geiger-Mueller probe. Only a technician with a current HSR-1 radiation screening authorization agreement, or an HSR-1 radiation control technician, will perform the screening of the samples to be transported. Measuring and test equipment will be controlled in accordance with WGII-QP-5.2, Control of Measuring and Test Equipment.

The samples will be submitted to the ENV SMO for fixed-laboratory analyses of PCBs, SVOCs, and TAL metals, with a request for a 10-day turn-around of analytical results to confirm final conditions at the site.

3.4.3 Site Restoration

Because the bypass road construction will take place after sampling and soil removal activities, the only site restoration activity currently planned for SWMU 61-002 is backfilling all sample locations to the surrounding grade of the ground surface. Site BMPs will be left in place and upgraded as needed to

prevent the erosion of site soils. The Laboratory will inspect BMPs as part of the existing BMP maintenance and inspection program for ENV Division.

3.4.4 Survey Sampling Locations

A geodetic survey, performed in accordance with WGII-SOP-03.11, Geodetic Surveys, will be conducted to define sampling locations at each site.

4.0 PROCEDURES

All work as specified in this FIP shall be performed in accordance with the most current version of the WGII Construction Quality Assurance Plan and the following QPs and SOPs:

- ENV-QP-7.2, Supplier Evaluation
- WGII-QP-2.1, Indoctrination and Training
- WGII-QP-2.2, Qualification and Certification of Inspection Personnel
- WGII-QP-3.2, Lessons Learned
- WGII-QP-3.4, Managing Nonconformance, Deficiency, and Corrective Actions
- WGII-QP-4.2, Documenting Oral Communications
- WGII-QP-4.4, Record Transmittal to the Records Processing Facility
- WGII-QP-5.2, Control of Measuring and Test Equipment
- WGII-QP-5.3, Readiness Review
- WGII-QP-5.7, Notebook Documentation for Environmental Restoration Technical Activities
- WGII-QP-7.1, Procurement
- WGII-QP-9.1, Management Assessments
- WGII-QP-10.1, Independent Assessment
- WGII-QP-10.3, Stop Work and Restart
- WGII-SOP-01.01, General Instruction for Field Investigations
- WGII-SOP-01.02, Sample Container and Preservation
- WGII-SOP-01.03, Handling, Packaging, and Shipping of Samples
- WGII-SOP-01.04, Sample Control and Field Documentation
- WGII-SOP-01.05, Field Quality Control Samples
- WGII-SOP-01.06, Management of ER Project Wastes
- WGII-SOP-01.08, Field Decontamination of Drilling and Sampling Equipment
- WGII-SOP-01.10, Waste Characterization

- WGII-SOP-01.12, Field Site Closeout Checklist
- WGII-SOP-03.11, Geodetic Surveys
- WGII-SOP-04.01, Drilling Methods and Drill Site Management
- WGII-SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
- WGII-SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
- WGII-SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
- WGII-SOP-09.10, Field Sampling of Core and Cuttings for Geological Analysis
- WGII-SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials

Additional procedures may be used as necessary to guide the work activities.

5.0 HEALTH AND SAFETY

All activities described in this FIP will be conducted under the applicable approved subcontractor site-specific health and safety plan. Integrated work documents will be prepared for each activity identified in the site-specific health and safety plan for the fieldwork.

6.0 WASTE MANAGEMENT AND DISPOSAL

The waste streams that may be generated and managed during investigation activities at AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002 include the following:

- excavated soil from AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002
- asphalt (excavated and co-mingled with soil)
- asbestos-regulated material co-mingled with asphalt at SWMU 03-029
- personal protective equipment, sampling supplies, decontamination trash, and other investigation-derived waste

Anticipated waste streams, regulatory classifications, estimated amounts, and disposal pathways are shown in Table 2. The volumes are estimated. More accurate volumes and final waste determinations and disposal pathways will be based on sample results and extent of contamination.

All wastes generated during the investigations of AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002 will be managed in a way that is protective of human health and the environment; compliant with applicable federal, state, US Department of Energy (DOE), and Laboratory regulatory requirements; and consistent with Laboratory waste minimization goals. All waste generated during field investigation activities will be managed in accordance with applicable WGII SOPs. WGII SOPs applicable to the characterization and management of solid waste are WGII-SOP-01.06, Management of ER Project Waste, and WGII-SOP-01.10, Waste Characterization.

Investigation activities will be conducted in a manner that minimizes the generation of waste. Waste minimization is accomplished by implementing the requirements of the ENV Division Remediation Services (RS) portion of the Pollution Prevention Roadmap (LANL 2003, 85205), which is updated annually as a requirement of Module VIII of the Laboratory's Hazardous and Solid Waste Amendments Permit.

The decision to excavate and dispose soil and asphalt and the characterization of the associated waste streams will be based on analytical results for the samples collected during the investigation, knowledge of historical operations, and additional waste samples, as applicable.

Table 2
Waste Streams from Investigations at AOC 03-001(i), AOC 03-020(b),
SWMU 03-029, and SWMU 61-002

Waste Stream	Waste Type	Estimated Maximum Volume (yd ³)	Ship To
Excavated hydrocarbon-contaminated soil and asphalt from AOC 03-001(i), AOC 03-020(b), SWMU 03-029	Solid, suspect New Mexico Special Waste (NMSW)	600-1600	Waste Management, Rio Rancho, New Mexico
Excavated soil and asphalt from AOC 03-001(i), AOC 03-020(b), SWMU 03-029 (not contaminated by petroleum)	Non-radioactive, non-hazardous solid waste	600-1600	Waste Management, Rio Rancho, New Mexico
Excavated regulated asbestos-containing material from SWMU 03-029	NMSW	0-50	Painted Desert Landfill, Joseph City, Arizona
Excavated PCB-contaminated soil and asphalt from SWMU 61-002	Solid, Toxic Substances Control Act (TSCA)-regulated waste (<50 ppm PCB)*	0-963	US Ecology, Beatty, Nevada
Excavated PCB-contaminated soil and asphalt from SWMU 61-002	Solid, non-TSCA-regulated waste (<1 ppm PCB)*	0-963	Waste Management, Rio Rancho, New Mexico
Personal protective equipment, sampling supplies, and other investigation-derived waste	Solid, suspect NMSW, or PCB waste*	<1	Waste Management, Rio Rancho, New Mexico, or US Ecology, Nevada

* Pending in-situ waste sampling.

Results from the analysis of in-situ soil samples collected at each AOC or SWMU will be used to determine the waste type of the soil and the asphalt before they are excavated (Table 3). Because of the suspected presence of hydrocarbons, if soil and/or asphalt removal is required from AOC 03-001(i), AOC 03-020(b), and SWMU 03-029, it is possible that excavated material will be managed as New Mexico Special Waste (NMSW) pending final characterization. Because there is a possibility of asbestos intermingled with the asphalt, a visual confirmation will be established. The NMSW will be managed in a less-than-90-day NMSW storage area registered with the ENV Solid Waste Regulatory Compliance Group (SWRC). One or more consolidated waste storage areas will be set up near the TA-03 and TA-61 AOCs and SWMUs. The storage areas will be inspected in accordance with requirements for the specific waste type and classification.

Because of the suspected presence of PCBs, if soil and asphalt removal is required from SWMU 61-002, it is possible that some excavated material will be managed as PCB waste, pending final characterization. PCB waste will be managed in a less-than-180-day PCB remediation waste storage area registered with ENV-SWRC. One waste storage area will be set up near SWMU 61-002 and will be inspected in accordance with requirements for the specific waste type and classification.

Table 3
Proposed In-situ Waste Samples and Analytical Suites

AOC/SWMU	Estimated Number of Samples	Type of Sampling	Methods	Analytical Suite Type
03-001(i)	6 planned 6 total	Waste characterization sampling by WGII-SOP-06.09 or -06.10.	8082, 8015M, 8270C, and 8260B	PCBs, TPH-DRO ^a and GRO ^b , SVOCs, VOCs, and TCLP metals
03-020(b)	1 planned 1 total	Waste characterization sampling by WGII-SOP-06.09 or -06.10.	8270C, 8015M, 8260B, and TCLP metals by 1311, 6010B, 6020, and 7470A	SVOCs, TPH-DRO and GRO, VOCs, and TCLP metals
03-029	4 planned 4 total	Waste characterization sampling by WGII-SOP-06.09 or -06.10.	8015M	TPH-DRO and GRO, VOCs, SVOCs, PCBs, TCLP metals
61-002	7 planned 1 duplicate 8 total	Waste characterization sampling by WGII-SOP-06.09 or -06.10.	8082, 8015M, and TCLP metals by 1311, 6010B, 6020, and 7470A	PCBs, TPH-DRO and GRO, SVOCs, and TCLP metals
TOTAL	18 planned 1 duplicate samples 19 total samples			

^a DRO = Diesel range organics.

^b GRO = Gasoline range organics.

To minimize or eliminate liquid waste generation, decontamination of equipment will be accomplished using dry methods.

Before field investigation activities begin, a WCSF will be prepared and approved in accordance with requirements of WGII-SOP-01.10, Waste Characterization. The WCSF will provide detailed information on waste characterization, waste handling and segregation strategy, containerization, and potential volume generation. Waste characterization will be achieved through direct sampling of the waste or sampling of the media being investigated (i.e., surface and subsurface soil, etc.). If direct waste characterization sampling is necessary, it will be described in the WCSF. Waste profile forms will be submitted for waste streams generated from this investigation.

The selection of waste containers will be based on DOT requirements and the type and amount of waste planned for generation. Immediately following containerization, each waste container will be individually labeled showing the waste classification, item identification number, and date of generation. Container and storage requirements described in the WCSF will be based on requirements outlined in the most recent versions of the Laboratory's Waste Management Facilities Waste Acceptance Criteria; Laboratory Implementation Requirement (LIR) 404-00-03, Hazardous and Mixed Waste Requirements; LIR-404-00-04, Managing Solid Waste; LIR-404-00-06, Managing Polychlorinated Biphenyls; and LIR 405-10-01, Packaging and Transportation. Transportation of waste will comply with appropriate DOT requirements. After determining waste classification, disposal of solid waste will take place at an approved off-site disposal facility. Transportation and disposal requirements will be detailed in the WCSF. ENV-RS waste management personnel will verify the sites as "waste free" before completion of the project by using the Field Site Closeout Checklist in WGII-SOP-01.12.

7.0 PHOTO DOCUMENTATION

Each phase of the activities outlined in this FIP, including site field work (excavation, sampling, etc.) and restoration, will be documented and photographed. A descriptive annotation will be provided for each photograph.

8.0 REFERENCES

EPA (US Environmental Protection Agency), April 10, 1990. Module VIII of RCRA Permit No. NM0890010515, EPA Region VI, issued to Los Alamos National Laboratory, Los Alamos, New Mexico, effective May 23, 1990, EPA Region VI, Hazardous Waste Management Division, Dallas, Texas. (EPA 1990, 1585)

EPA (US Environmental Protection Agency), January 7, 1994. "RFI Work Plan for OU 1114, Approval," US Environmental Protection Agency letter to J. Vozella (DOE-Environmental, Safety and Health Branch) from A. Davis (Hazardous Waste Management Division), Dallas, Texas. (EPA 1994, 38813)

EPA (US Environmental Protection Agency), April 19, 1994. Module VIII of RCRA Permit No. NM0890010515, EPA Region VI, new requirements issued to Los Alamos National Laboratory, Los Alamos, New Mexico, effective May 19, 1994, EPA Region VI, Hazardous Waste Management Division, Dallas, Texas. (EPA 1994, 44146)

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1114," Los Alamos National Laboratory document LA-UR-93-1000, Los Alamos, New Mexico. (LANL 1993, 20947)

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LANL (Los Alamos National Laboratory), December 1, 2003. "2003 Pollution Prevention Roadmap, December 2003," Los Alamos National Laboratory document LA-UR-03-9021, Los Alamos, New Mexico. (LANL 2003, 85205)

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NMED (New Mexico Environment Department), August 1996. "Disapproval of the RCRA Facility Investigation Work Plan for Operable Unit 1114, Los Alamos National Laboratory (NM0890010515)," NMED Hazardous Waste Bureau, Santa Fe, New Mexico. (NMED 1996, 65591)

Field Implementation Plan for AOC 03-001(i), AOC 03-020(b), SWMU 03-029, and SWMU 61-002

NMED (New Mexico Environment Department), February 1, 2004. "Soil Screening Guidance Technical Background Document," Volume 1, Tier 1 of "Technical Background Document for Development of Soil Screening Levels, Revision 2.0," NMED Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2004, 85615)

From: "Roy Bohn" <royb@lanl.gov>
To: <DThompson@TerranearPMC.com>
Cc: "Nancy Quintana" <nancyq@lanl.gov>
Subject: FW:
Date: Tue, 18 Jan 2005 14:57:05 -0700
X-Mailer: Microsoft Office Outlook, Build 11.0.6353
Thread-Index: AcT9oleceKBdaM65QcShUQiLKScjZQABh+5Q
X-PMX-Version: 4.7.0.111621

Dan,

Here is a copy of the final FIP. I will drop off a hard copy this afternoon. Thanks!

From: Elizabeth Varnedoe [mailto:varnedoe@lanl.gov]
Sent: Tuesday, January 18, 2005 2:12 PM
To: royb@lanl.gov
Subject:

Roy,

The Adobe version prints easier than the Word Version, which tends to get hung up around page 5.

Liz

Elizabeth Varnedoe
IM-1 Writer-Editor
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RRES Remediation Services (RS) Project Document Signature Form

Document Catalog Number: ER2004-0461

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Pre-construction Sampling at AOC 03-001(i) and SWMUs 03-020(b), 03-029, and 61-002

PRs: 03-001(i) 03-020(b) 03-029 61-002 **Privileged Information:** Y / N

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Author: Bohn, Roy 665-5138 royb@lanl.gov

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AA Deliverable: No **Certification Required:** No **Force Peer Review:** No

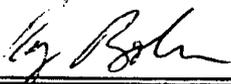
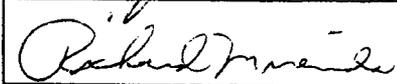
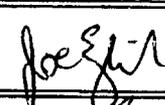
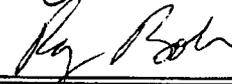
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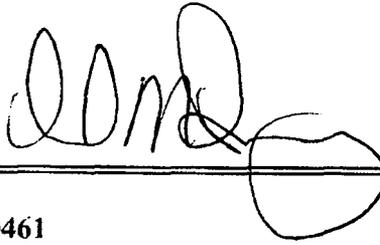
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Reviewer Signatures: (By signing below, the reviewer indicates that he/she reviewed and approved the document. Conditional approval may be indicated by checking the COMMENTS ATTACHED box)

Reviewer (Print reviewer's name under title)	Signature	Date	Comment Attached
Author Roy Bohn		1/4/04	
Peer Review Chair Rich MIRENDA		1/4/05	
Regulatory Compliance Reviewer Joe English		1/4/05	
RRES ADC Reviewer Roy Bohn		1/4/04	
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RRES-RS Program Manager,
Dave McInroy



1/13/05

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