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LANL 55986  
1997  
ZRID # 55986  
N. Riebe  
for

# Los Alamos

NATIONAL LABORATORY  
**memorandum**  
*Earth and Environmental Science Division*  
EES-15, Environmental Science Group  
Los Alamos, New Mexico 87545

To/MS: Distribution  
From/MS: T.E. Gould, EES-15, MS G787  
Phone/FAX: 5-4348/5-1976  
Symbol: EES-15: ER-97-025  
Date: May 30, 1997

**SUBJECT: EXTERNAL REVIEW - INTERIM ACTION PLAN FOR POTENTIAL RELEASE SITES 36-004(e), 15-008(f), and AOC C-36-006(e)**

The IA plan for PRSs 36-004(e), 15-008(f), and AOC C-36-006(e) is attached. Please review this document and return your comments to Nancy Riebe by June 6, 1997. (Comment resolution forms are attached.)

If you have any questions regarding the technical content of this report, please contact Jennifer Pope at 661-5249.

TEG/nr

Attachments: (1) IA Plan  
(2) Comment resolution forms

**Distribution:**

- Mike Gilgosh, LAAO, MS A316, w/Attachments 1 and 2
- Jennifer Pope, ICF Kaiser, MS M892, w/Attachment 1
- Dave Bradbury, EM/ER, MS M992, w/Attachments 1 and 2
- IA File w/Attachment 1
- RPF, MS M707, w/Attachment 1
- ESS-15 Files w/o Attachments

JUN 10 1997  
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# Interim Action Plan for

Potential Release Sites  
10-004(e) - I-J Firing Site  
15-008(f) - The Mounds,  
and AOC C-36-006(g) - Projectile Test Area

Field Unit 2

Environmental  
Restoration  
Project

Los Alamos



**INTERIM ACTION PLAN FOR POTENTIAL RELEASE SITES  
36-004(e) - I-J FIRING SITE,  
15-008(f) - THE MOUNDS,  
AND AOC C-36-006(e) - PROJECTILE TEST AREA**

**1.0 RATIONAL AND OBJECTIVE OF INTERIM ACTION**

This interim action (IA) plan addresses two potential release sites (PRSs) and one area of concern (AOC) located within the bounds of I-J Firing Site at Technical Area (TA) 36. These PRSs are as follows:

- I-J Firing Site [PRS 36-004(e)].
- the Mounds [PRS 15-008(f)].
- the Projectile Test Area [AOC C-36-006(e)].

Note: PRS 15-008(f) was originally identified in TA-15; however, the PRS is located in TA-36 and will be remediated as part of TA-36. For tracking purposes, however, the PRS will retain its original PRS number.

Small fragments of depleted uranium (DU) are visible across the area at I-J Firing Site and pose an environmental hazard subject to potential dispersion and migration. Remediation of these sites has been deferred pending the decommissioning of I-J Firing Site. This IA will reduce the risk to wildlife and site personnel from the effects of the contamination and minimize the impact of storm events on migration of the DU until these sites are decommissioned.

The total cost is estimated to be \$100,520, which includes mobilization, field work, disposal costs, demobilization, and reporting. Field work is scheduled to begin in June 1997. Onsite work will be completed in 3 to 4 weeks.

**2.0 SITE DESCRIPTION AND CHARACTERIZATION DATA**

I-J Firing Site is situated on a mesa top overlooking Potrillo Canyon, approximately 1,000 ft north northeast of the canyon water course (Figure 2-1). The area is comprised of two active firing points (I and J) [PRS 36-004(e)], several sand mounds [15-008(f)], and an embankment [C-36-006(e)] used to receive uranium projectile test shots. Additional structures associated with the firing activities are located across the bounds of the testing area. COPCs for the site include barium, beryllium, lead, mercury, and DU.

There has been no sampling of the sites. A radiological survey conducted in 1991 reported results ranging from 40,000 to 255,000 counts per minute at hot spots. During the remediation of the septic tank [PRS 36-003(b)] at the firing site, elevated radiological readings were reported in surface soil samples collected along the surface water runoff pathways from the firing site and sand mounds.

There are numerous erosion gullies created by stormwater runoff around the firing area, sand mounds, and projectile test area. Most of this stormwater runoff exits the site via one of two pathways and flows into Potrillo Canyon. The largest stormwater pathway is directly below a control building (TA-36-55), where a natural depression drains the vast majority of the firing site. The other obvious stormwater path was created when the unimproved road (Figure 2-1) was constructed. The southwest portion of the unimproved road was cut through tuff and provides a natural channel for stormwater drainage from the western portion of the site. Visible fragments of DU, metal, and other debris can be observed across this entire area.

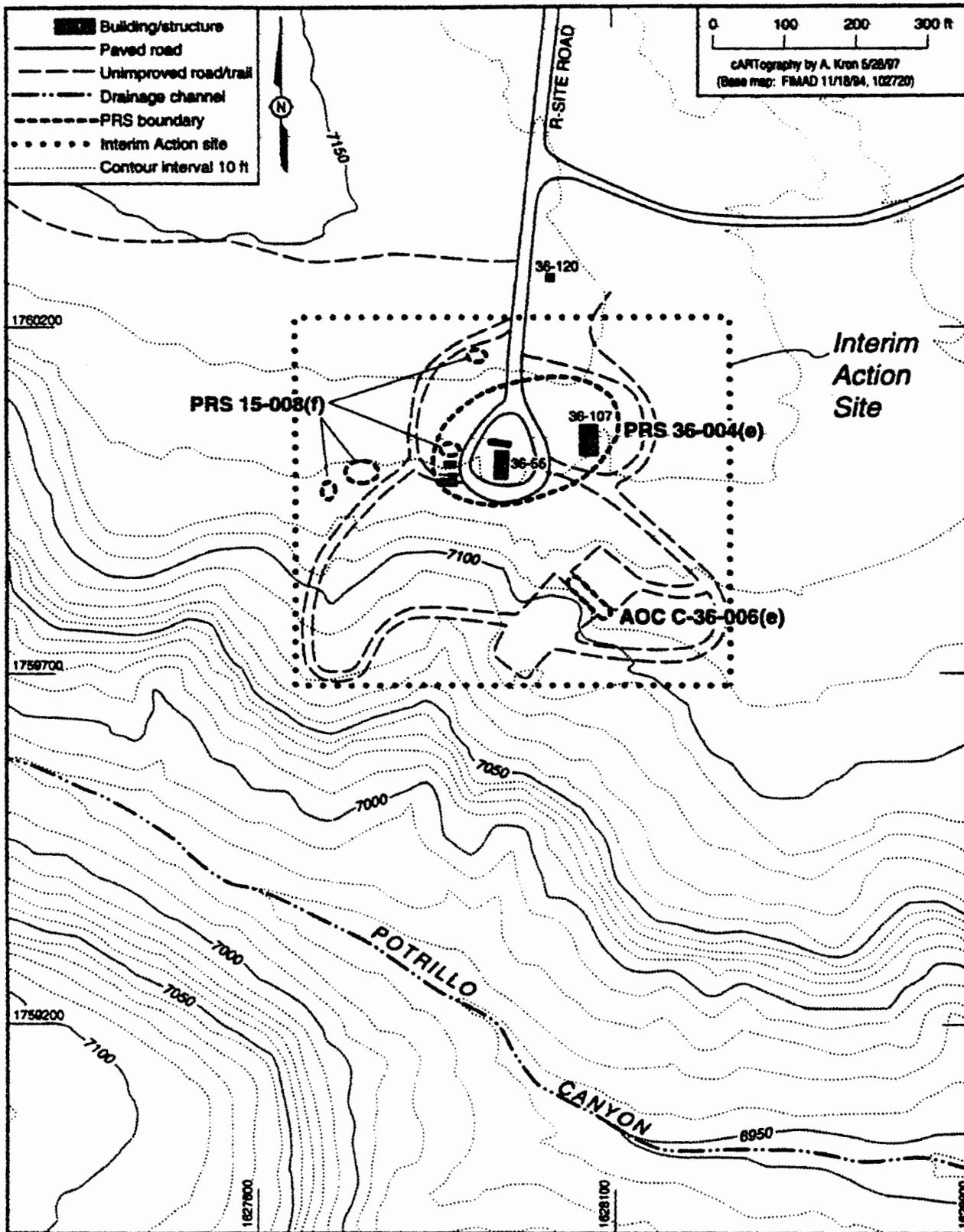


Figure 2-1. IJ Firing Site.

### **3.0 INTERIM ACTION**

#### **3.1 Description**

This IA consists of visually locating and removing DU fragments and explosives debris and putting stormwater runoff controls in place. Initially, survey markers will be set in place on a 20-ft grid to establish areas for a methodical site cleanup. Team members will then canvas the site in groups of two or more at a distance of about 5 ft from each other, sweeping each grid sector. The sweep will involve visual scanning of a small area for DU, high explosive (HE) residuals, and other debris. During this time, any visible HE debris will be flagged for removal by the operating group personnel.

Using hand tools or sampling spoons, the field team will then collect the DU. The surface will not be disturbed unless larger pieces of DU are identified under the surface. The RCT will confirm the presence of radioactivity of all identified and collected material. The collected DU will be placed in approved drums. Soil will not be included with the visible pieces of DU. All drums will be labeled in accordance with the LANL Radiological Control Manual.

Although the majority of the highly mobile radioactive materials will be collected and removed under the IA, stormwater controls will also be installed to further reduce the potential for offsite transport of contaminants. These controls will consist of flow diversions along the mesa top, uphill from the unimproved road. This diversion of stormwater from the natural channel created by the unimproved road cut will force water flow across the more densely vegetated, flatter hillside. The mounds [PRS 15-008(f)] will be covered with tarps and flow diversion devices will be installed to discourage stormwater from flowing across or around the immediate area of the mounds. The firing points and the projectile testing site will also have flow diversion devices installed to interrupt any possible contaminant migration. Finally, a silt fence or check dam will be placed downslope of the pathway of the primary drainage (natural depression) for the site, further reducing the potential for contaminant migration. The implementation of the stormwater controls will be conducted with the cooperation and approval of ESH-18.

#### **3.2 Function of IA in Source Reduction**

Although I-J Firing Site is a radiologically managed area, removing the visible DU will reduce the risk of inadvertent contact with the contaminant by site employees. Removal of visible pieces of DU from the surface also reduces the magnitude of source contaminant that may be ingested by wildlife. Stormwater controls will help reduce the offsite migration of DU into the Potrillo watercourse and, in the case of the road cut, prevent further site erosion from the drainage channel created when the road was constructed.

### **4.0 MONITORING AND CONFIRMATORY ACTIVITIES**

Continual monitoring of the site and confirmatory sampling following the IA activities will not be conducted. These activities may be part of the final remedy (i.e., accelerated cleanup or voluntary corrective action) following decommissioning. Until a final remedy is determined and implemented, this IA is being conducted to reduce the potential risk to human health and wildlife.

### **5.0 MAINTENANCE AND INSPECTION**

The best management practices (BMPs) implemented at this site will not be permanent. The BMPs include good housekeeping measures, flow diversion from the unimproved road, and the implementation of stormwater controls (e.g., silt fences). These controls will require both maintenance and inspection for as long as they are in place. During the period that field work is being conducted, field personnel will inspect the controls on a weekly basis. Once the IA is concluded, the inspection and maintenance of these controls will be conducted by the operating group—DX-4. The operating group will be responsible for the inspection and maintenance of these controls at a frequency to be determined by ESH-18. If

during an inspection, deficiencies in the controls are noted, it will be the responsibility of the inspector to take corrective actions to repair or replace the defective or inoperable portion of the control device.

### 6.0 WASTE MANAGEMENT

Wastes expected to be generated during the IA are identified in Table 6-1.

**TABLE 6-1  
EXPECTED WASTE TYPES AND VOLUMES**

Item	Waste Type	Anticipated Volume
Depleted uranium	Low-level radioactive	<5 55-gallon drums
Contaminated soil	Low-level radioactive-potential mixed	<1 55-gallon drum
Decontamination water	Liquid - low-level radioactive	None
Untamminated items from activities	Solid - nonradioactive/nonhazardous	<3 55-gallon drums
Contaminated items from activities	Solid - low-level radioactive	<1 55-gallon drum

A Waste Characterization Strategy Form (WCSF) has been approved by EM/SWO and reviewed by ESH-19. The waste characterization strategy for the waste type described in the WCSF are summarized below.

The drums of uranium will be labeled and retained onsite. Personal protective equipment (PPE) and/or equipment that is either visibly contaminated or exhibits radioactive characteristics above the levels described will be considered low-level radioactive waste. The waste will be characterized using process knowledge and careful segregation of waste streams. The PPE and equipment will be decontaminated and inspected for visual contamination prior to a nonradioactive, nonhazardous determination using the methods described in LANL-ER-SOP-10.07 (LANL, 0875). The volume of nonradioactive/nonhazardous PPE and waste sampling equipment is expected to be less than three 55-gallon drums.

Decontamination liquids will be returned to the site in accordance with notice of intent (NOI) submitted to the Surface Water Quality Bureau and the Ground Water Protection Bureau of the New Mexico Environment Department. Because of the nature of this IA (collection of visible debris), the water generated from decontamination activities will be minimal and radiological screening prior to wet decontamination will be conducted to establish the radiological characteristics of the wastewater. The volume of decontamination liquid is expected to be less than 5 gallons per day.

#### 6.1 Method of Management and Disposal

The results of the soil analyses will be used to classify the generated waste streams. EM/SWO personnel will assist in locating a suitable technical scope document (TSD) for all generated wastes. Waste profile forms have been approved, by EM/SWO personnel, for all waste slated for disposal. Drums of uranium and DU will be stored onsite until they are transferred to TA-54 for final disposal as low-level radioactive waste.

All PPE and equipment will be surveyed for radioactivity by hand held instruments using LANL-ER-SOP-10.07 (LANL, 0875). PPE and other equipment determined to be uncontaminated following guidance in

## IA Plan

LANL-ER-SOP-01.06 (LANL, 0875) may be removed to the county landfill after a waste profile form has been approved for this waste.

Contaminated soil and debris may be collected. These materials will be segregated and placed in approved drums. The materials will be sampled for TCLP metals, SVOCs, HE, isotopic uranium, and gamma spectroscopy. Solid uranium will be field screened for alpha, beta, and gamma radiation according to the procedure in LANL-ER-SOP-01.06. All drums containing waste that is potentially hazardous will be stored onsite on pallets in an approved <90 day storage until sample results have been evaluated.

### 7.0 SCHEDULE AND COST

The Table 7-1 presents the schedule and costs related to this IA.

**TABLE 7-1**  
**COST AND SCHEDULE INFORMATION**

Action	Cost	Start Date	End Date
IA Plan Development	\$ 16,830	May 3, 1997	May 30, 1997
Field Team Mobilization	\$ 7,020	June 10, 1997	June 11, 1997
Grid Site/Establish Work Zones (Radiological Survey)	\$ 6,980	June 12, 1997	June 25, 1997
Site Cleanup/Implement Stormwater Controls	\$ 28,490	July 1, 1997	July 15, 1997
Waste Management/ Sample Analysis	\$ 25,700	July 1, 1997	November 30, 1997
Post Field Operations Report	\$ 3,635	July 16, 1997	August 10, 1997
Develop Final IA Report	\$ 10,675	August 11, 1997	September 25, 1997
Issue Final IA Report	\$ 1,190	October 6, 1997	October 6, 1997
<b>Total</b>	<b>\$100,520</b>		

### 8.0 REFERENCES

(Los Alamos National Laboratory). "Los Alamos National Laboratory Environmental Restoration Program Standard Operating Procedures," Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL, 0875)

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**ANNEX 1**  
**SITE-SPECIFIC HEALTH AND SAFETY PLAN**

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## Appendix A-PRS Activity Summary

**Background:** PRS 36-006(e) and 15-008(f) are parts of active firing sites containing surface debris and depleted uranium. The depleted uranium poses an environmental hazard subject to potential dispersion and migration.

**Activity:** The activity at this site will consist of placing stormwater controls in place and picking up the surficial depleted uranium and other debris using hand tools. This debris and depleted uranium will be placed into separate 55-gallon drums.

### Hazard Assessment for Chemical/Rad Hazards:

**Chemical:** No chemicals are expected to be encountered at this site.

**Radiological:** Depleted uranium receives a HAR of minor due to the low possibility of skin contact. Also due to depleted uranium being fixed contamination that generally will not become airborne or smearable.

**Additional Task Requirements:** An RWP will be written and approved prior to the start of work.

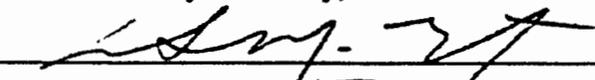
**Controls:** See RWP

**PPE:** See RWP

**Decon:** Standard level D decon procedures

### SSHASP APPROVAL FOR PERSONNEL WITH SIGNATURE AUTHORITY AT THIS PRS

(Personnel signing this Appendix are signifying adherence to this SSHASP and approval of this PRS Activity Summary)

FTL  Date 5-30-97  
SSO  Date 5/29/97

If possible, this summary sheet will be submitted as notification for start work to the following individuals 5 days prior to the activity being performed:

- William Brazile, ESH-5 Representative
- Pat La Frate, ESH-1 Representative
- Ivan Wachler, ICF Kaiser Corporate Health and Safety Officer

**ANNEX 2**  
**INTERIM ACTION APPROVAL FORM**

**ANNEX 2**

**INTERIM ACTION APPROVAL FORM**

I, \_\_\_\_\_ **DOE-LAO APPROVE** the interim action as proposed in this Interim Action Plan for PRSs 36-004(e), 15-008(f), and C-36-006(e).

I, \_\_\_\_\_ **DOE-LAO DO NOT APPROVE** the interim action as proposed in this Interim Action Plan for PRSs 36-004(e), 15-008(f), and C-36-006(e).

The following reasons reflect the basis for this disapproval.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

**ANNEX 3**

**WASTE CHARACTERIZATION STRATEGY FORM**

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f) <sup>*</sup> /C36-006(e)	I-J Firing Site
<b>All Waste Types or Wastestreams:</b> Pieces of depleted uranium, soil, PPE and waste handling equipment, and decontamination liquid		

Completed By: J. W. Heyser	Date: April 11, 1997
FPL: T. E. Gene Gould	WMC: Jeff Bingham, EES-15
Type of Activity (site investigation, EC, etc.): Interim Action	

**Description of the Activity (e.g., drilling, surface sampling, excavation and recontouring, soil washing, etc.)**

The interim action at these three PRSs located within the I-J Firing Site will consist of visually locating and removing depleted uranium fragments and placing stormwater controls in run-on and run-off areas of the site. The sites will be swept visually within each 20-ft. grid to identify pieces of DU. The RCT will confirm the presence of radioactivity in the identified pieces. The surface will not be disturbed unless larger pieces of DU are identified under the surface. Soil will only be removed when highly radioactive spots with nonfixed radioactivity are located. In that case the soils will be collected, segregated and placed in separate drums. Water erosion controls will consist of flow diversions placed along the mesa top above these sites and flow decelerating devices and sediment traps within the sites to allow particles to settle before approaching the Potrillo watercourse.

**Acceptable Knowledge**

Site Description, Site History, and Historical Waste Generating Processes or Activities: (Include dates for site history): PRS 36-004(e), I-J Firing Site consists of two active firing points, two control buildings, a dirt bunker, a covered work area and an old enclosed firing chamber. This firing site was constructed in 1948 and used starting in 1949 or 1950. The area was transferred from TA-15 to TA-36 in 1981. At I-J firing site, up to 500 lbs. of explosives were used in individual shots. Materials used included the explosives boracitol, baratol, TNT, Composition B, cyclotol, 9404, and nitromethane. Additional liquid explosives used included benzene-ring compounds, n-hexane, cyclohexane, nitrogen oxide, nitroglycerin, nitromethane, and TNT. The explosions were intended to consume all the mentioned HEs. Some shots were fired into iron, copper, and lead targets. In the early years depleted uranium was heavily used at this site. However, all shots with other radioactive materials were fired only in full containment vessels. In the late 1980s, approx. 138 lbs. of DU in the form of bullets, were used in projectiles fired into the cliff face at a site now renamed PRS C-36-006(e). COPCs at the I-J site include solid and liquid explosives residues, DU, barium, beryllium, lead, and mercury. Plutonium was used only inside containment vessels and there have been no documented releases to the atmosphere. Two sand mounds, PRS 36-008(f), are also located at the I-J Firing Site. Numerous pieces of DU and oxidized DU have been found in the area (RFI Work Plan for OU 1130, May 1993). Phase I sampling was planned but not yet performed.

Previous Investigation Analytical Results: (Report the analytical methods and results above background levels) A 1991 surface radiological survey found contamination ranging from 40,00 to 255,000 counts per minute at located hot spots. An DOE environmental report (1986) listed metals and uranium at the following maximum concentrations: barium (304 mg/kg), beryllium (1.2 mg/kg), chromium (9.5 mg/kg), copper (974 mg/kg), lead (198 mg/kg) and uranium (all isotopes) (43 mg/kg). Radioactive isotopes were at the following maximum levels: thorium-230 (2.6 pCi/g), thorium-232 (<15.5 pCi/g) and cesium-137 (0.722 pCi/g) (RFI Work Plan for OU 1130, May 1993)

Note: This plan makes reference to PRS 36-008(f). Note that PRS 36-008(f) is actually PRS 15-008(f).

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Pieces of depleted uranium		

## Waste Description

Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging

Waste Type Description: Pieces of DU.

Potential Regulatory Status: Low-level radioactive waste.

Volume Estimate: Less than five 55-gal. drums.

Waste packaging: DU pieces will be placed in a sealed containers.

## Characterization Strategy

Description of Strategy: Pieces of DU will be identified by visual observation and radioactive field screening. The DU will be field screened for gross alpha, beta and gamma radioactivity in accordance with the procedures contained in LANL-ER-SOP-10.07, "Field Monitoring for Surface and Volume Radioactivity Levels." Gross alpha will be screened using an alpha probe, gross beta will be screened using a beta/gamma probe, and gross gamma will be screened using two Ludlum Model 2221 Scaler/Ratemeter single channel analyzers, one with an Eberline SPA-3 scintillation probe which is equivalent to a micro-R-meter, and one with a Ludlum Model 44-9 pancake geiger-mueller detector. Each piece of depleted uranium will be visually inspected and all exterior soil will be physically removed to ensure that it is not contaminated with HEs or other potentially hazardous contaminants.

Waste Sampling\*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)

No analytical samples will be taken from the pieces of DU. Instead field screening and acceptable knowledge will be used to determine that the pieces of material gathered are pure DU and not other potentially hazardous materials. Laboratory analyses will be performed only if required by the waste acceptance criteria of the TSD such as TA-54.

\* Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.

\* Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		No		X	
Semivolatile Constituents		No		X	
Organic Pesticides		No		X	
Organic Herbicides		No		X	
Pesticides and PCBs		No		X	
PCBs		No		X	

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Pieces depleted uranium		

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Total Metals		No		X	
Total Cyanide		No		X	
Other Inorganic Constit. (specify)		No		X	
High Explosive Constituents		No		X	
Asbestos		No		X	
TPH		No		X	
TCLP Metals		No		X	
TCLP Organics		No		X	
TCLP Pesticides and Herbicides		No		X	
Gross Alpha	Field Screen	Yes	X		
Gross Beta	"	Yes	X		
Gross Gamma	"	Yes	X		
Tritium <sup>1</sup>		No		X	
Gamma Spectroscopy		Yes		X	
Isotopic Plutonium		No		X	
Total Plutonium		No		X	
Isotopic Uranium		Yes		X	
Total Uranium		Yes		X	
Strontium-90		No		X	
Americium-241		No		X	

<sup>1</sup> If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Pieces of depleted uranium		

Preliminary RCRA Determination
Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CFR 261. List the F-, D-, K-, P-, or U- category and number. Pieces of DU are low-level radioactive waste. They are not expected to be contaminated with RCRA-regulated levels of metals or listed constituents, because only intact DU pieces with their surrounding soil completely removed will be collected.
Preliminary RCRA Status
<input checked="" type="checkbox"/> Non-RCRA: (No 90-Day Storage Requirement) Describe how waste will be stored/handled: Wastes will be stored on site in sealed drums labeled as radioactive until they are accepted for disposal by a TSD (such as TA-54).
<input type="checkbox"/> RCRA: (90-Day Storage Requirement) Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity
Based on available information, indicate the amount and type of radiation contamination expected in the waste. DU is radioactive, so these wastes will be managed as low-level radioactive wastes.
Preliminary Radioactivity Status
<input type="checkbox"/> Material is not radioactive Describe how waste will be stored/handled
<input checked="" type="checkbox"/> Material is radioactive Describe the controlled area, labeling, and protection against inadvertent contamination The DU will be stored in sealed containers at the PRS. The storage area will be roped-off and labeled as a radioactive materials storage area in accordance with LANL requirements.

**WASTE CHARACTERIZATION STRATEGY FORM**

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Soil		

**Waste Description**  
Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:  
 Waste Type Description: Waste soil  
 Potential Regulatory Status: Potential RCRA mixed waste.  
 Volume Estimate: Less than one 55-gal. drum.  
 Waste packaging: Soil will be placed in a sealed container.

**Characterization Strategy**  
Description of Strategy:  
 Hot spots identified by radiological field screening that consist of soil rather than pieces of DU will be removed and placed in a 55-gal. drum. Onsite field screening will be used to minimize the volume of soil waste removed from each hot spot. Two composite soil samples will be collected as the soil is put in the drum. These will be analyzed for TCLP metals, SVOCs, HE, isotopic uranium and by gamma spectroscopy. VOCs will not be sampled because only surface soil (< 6 inches depth) will be removed.  
Waste Sampling\*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)  
 Two composite samples are considered adequate for small volume of soil waste.  
 \* Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.  
 \* Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.

**Analytical Strategy**

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containenzed Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		No		X	
Semivolatile Constituents	SW 846 8270	Yes	X		
Organic Pesticides		No		X	
Organic Herbicides		No		X	
Pesticides and PCBs		No		X	
PCBs		No		X	

WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Soil		

Analytical Strategy (Continued)					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Total Metals		Yes		X	
Total Cyanide		No		X	
Other Inorganic Constit. (specify)		No		X	
High Explosive Constituents	SW 846 8330	Yes	X		
Asbestos		No		X	
TPH		No		X	
TCLP Metals	SW 846 1311, 6010, 7470	Yes	X		
TCLP Organics		No		X	
TCLP Pest. & Herb.		No		X	
Gross Alpha	Field Screen	Yes			
Gross Beta	"	Yes			
Gross Gamma	"	Yes			
Tritium <sup>2</sup>		No		X	
Gamma Spectroscopy	HASL 300	Yes	X		
Isotopic Plutonium		No		X	
Total Plutonium		No		X	
Isotopic Uranium		Yes		X	
Total Uranium	HASL300	Yes	X		
Strontium-90		No		X	
Americium-241		No		X	

<sup>2</sup> If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

FORM 507-ES-010

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Soil		

**Preliminary RCRA Determination**

Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CFR 261. List the F-, D-, K-, P-, or U- category and number.

Soil waste gathered may be RCRA-mixed waste due to the presence of both depleted uranium and metals. HEs and other organic materials are expected to have been consumed in the explosive testing and not present in the surface soil (< 6 inches depth) removed during this IA. This waste will be initially managed as mixed waste until a final RCRA determination is made based on the soil analyses.

**Preliminary RCRA Status**

Non-RCRA: (No 90-Day Storage Requirement)  
Describe how waste will be stored/handled.

RCRA: (90-Day Storage Requirement)  
Waste will be stored/handled in accordance with 20 NMAC Generator Requirements. The soil waste will be stored in a sealed and labeled container at the PRS until the soil analyses are completed.

**Preliminary Determination for Radioactivity**

Based on available information, indicate the amount and type of radiation contamination expected in the waste.

The soil is expected to be low-level radioactive waste, because it will consist of local hot spots identified by radiological field screening. The RCRA mixed waste status of the waste will depend on the results of the laboratory analyses of this soil.

**Preliminary Radioactivity Status**

Material is not radioactive  
Describe how waste will be stored/handled

Material is radioactive  
Describe the controlled area, labeling, and protection against inadvertent contamination. The soil will be stored in a sealed drum at the PRS. The drum will be labeled radioactive and placed inside a roped-off area designated as a radioactive materials storage area in accordance with LANL requirements.

**WASTE CHARACTERIZATION STRATEGY FORM**

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: PPE and waste handling equipment		

**Waste Description** Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging: Waste Type Description: PPE and waste handling equipment  
 Potential Regulatory Status: Visibly contaminated items will be initially considered hazardous or mixed waste depending on the radiological field screening results. Visibly uncontaminated items will be considered non-hazardous or radioactive waste depending on the radiological field screening results.  
 Volume Estimate: The volume generated will be less than four 55-gal. drums  
 Waste Packaging: The PPE/waste handling equipment will be put in sealed plastic bags labeled with the PRS number and placed inside the drums. Visibly contaminated and uncontaminated items will be segregated

**Characterization Strategy**

**Description of Strategy:** The PPE/waste handling equipment will be decontaminated prior to disposal. After decontamination, the PPE/waste handling equipment will be field screened for gross alpha, gross beta, and gross gamma radiation in accordance with the procedures contained in LANL-ER-SOP-10 07, "Field Monitoring for Surface and Volume Radioactivity Levels." Gross alpha will be screened using an alpha probe, gross beta will be screened using a beta/gamma probe, and gross gamma will be screened using two Ludlum Model 2221 Scaler/Ratemeter single channel analyzers, one with an Eberline SPA-3 scintillation probe which is equivalent to a micro-R-meter, and one with a Ludlum Model 44-9 pancake geiger-mueller detector. The items will be inspected to determine if there is any visible contamination. If the items are not visibly contaminated and are nonradioactive, they will be placed in plastic bags, segregated by PRS, and managed as non-hazardous waste. If the PPE/waste handling equipment is not decontaminated or if decontamination is not effective, the contaminated items will be placed in separate plastic bags labeled with the PRS number and placed in a 55-gal. drum. If the contaminated items are radioactive based on field screening, then they will initially be managed as RCRA mixed waste. If the contaminated items are not radioactive based on field screening, then they will initially be managed as RCRA hazardous waste. The final RCRA status of the contaminated items will be based on the analytical results of liquid grab samples and soil waste samples. The final radioactivity status of the contaminated items will be based on the radiological field screening results and the analytical results of a grab sample of the liquid decontamination waste. The contaminated PPE/waste handling equipment will be assumed to have a similar level of contamination as that contained in the grab liquid sample or soil waste.

**Waste Sampling\*:** (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous )

The PPE/waste handling equipment will not be directly sampled

- Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.
- Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.

**Analytical Strategy**

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Const.		No		X	
Semivolatile Const.		Unk		X	
Organic Pesticides		No		X	
Organic Herbicides		No		X	
Pesticides and PCBs		No		X	

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: PPE and waste handling equipment		

Analytical Strategy (Continued)					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
PCBs		No		X	
Total Metals		Yes		X	
Total Cyanide		No		X	
Other Inorganic Constit. (specify)		No		X	
High Explosive Constituents		Unk		X	
Asbestos		No		X	
TPH		No		X	
TCLP Metals		Yes		X	
TCLP Organics		No		X	
TCLP Pesticides and Herbicides		No		X	
Gross Alpha	Field Screen	Yes	X		
Gross Beta	"	Yes	X		
Gross Gamma	"	Yes	X		
Tritium <sup>3</sup>		No		X	
Gamma Spectroscopy		Yes		X	
Isotopic Plutonium		No		X	
Total Plutonium		No		X	
Isotopic Uranium		Yes		X	
Total Uranium		Yes		X	
Strontium-90		No		X	
Americium-241		No		X	

<sup>3</sup> If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: PPE and waste handling equipment		

**Preliminary RCRA Determination**

Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CFR 261. List the F-, D-, K-, P-, or U- category and number.

Visibly contaminated PPE and waste-handling equipment will be initially classified as RCRA hazardous or mixed waste depending on the field screening results for radioactivity. A final RCRA determination for the visibly contaminated items will be made after the analytical results of the decontamination liquid and soil are evaluated. Visibly uncontaminated PPE and waste handling equipment will be considered either non-hazardous or radioactive depending on the field screening results for radioactivity.

**Preliminary RCRA Status**

Non-RCRA: (No 90-Day Storage Requirement)

Describe how waste will be stored/handled: Visibly uncontaminated and nonradioactive items will be segregated and managed as non-RCRA waste. The waste will be stored onsite in a sealed container.

RCRA: (90-Day Storage Requirement)

Waste will be stored/handled in accordance with 20 NMAC Generator Requirements.

Visibly contaminated items that are not radioactive will be initially managed as RCRA hazardous waste.

Visibly contaminated items that are radioactive will be initially managed as RCRA mixed waste. The RCRA waste will be stored onsite at the PRS in accordance with LANL requirements. A final RCRA determination will be based on the evaluation of the results of the decontamination liquid and soil samples.

**Preliminary Determination for Radioactivity**

Based on available information, indicate the amount and type of radiation contamination expected in the waste.

Decontaminated PPE and waste handling equipment are not expected to be radioactive. However, field screening for radioactivity will be performed because DU is present at this PRS. The results of the field screening and those of the liquid grab samples and soil samples will be used in making a final determination on radioactive status of these wastes.

**Preliminary Radioactivity Status**

Material is not radioactive

Describe how waste will be stored/handled

Visibly uncontaminated items that are not radioactive based on field screening will be managed as non-RCRA waste (see above).

Material is radioactive

Describe the controlled area, labeling, and protection against inadvertent contamination.

Visibly contaminated items that are radioactive will be stored onsite in sealed containers as mixed waste in a radioactive materials storage area.

## WASTE CHARACTERIZATION STRATEGY FORM

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Decontamination liquid		

**Waste Description**  
Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:  
Waste Type Description: Decontamination liquids consist of Liquinox® detergent, tap water and distilled water.  
Potential Regulatory Status: RCRA mixed waste.  
Volume Estimate: Less than two 55-gal. drums.  
Waste Packaging: The liquid will be placed inside sealed 55-gal. drums.

**Characterization Strategy**Description of Strategy:

The decontamination liquids will be characterized for RCRA constituents in each drum based on the results of an analysis of a grab liquid sample. The decontamination liquids from this PRS will be segregated, and stored in a separate drum that is labeled with the PRS number.

Waste Sampling\*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)

One grab sample of the decontamination liquids will be analyzed for TCLP metals, SVOCs, HE, gamma spectroscopy, and isotopic uranium. A grab sample was selected because the waste is expected to be homogeneous. One sample per drum was considered sufficient because of the small volume (less than two drums).

\* Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.

\* Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.

**Analytical Strategy**

Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		No		X	
Semivolatile Constituents	SW 846 8270	Unk	X		
Organic Pesticides		No		X	
Organic Herbicides		No		X	
Pesticides and PCBs		No		X	
PCBs		No		X	

**WASTE CHARACTERIZATION STRATEGY FORM**

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Decontamination liquid		

Analytical Strategy (Continued)					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Total Metals		Yes		X	
Total Cyanide		No		X	
Other Inorganic Constit. (specify)		No		X	
High Explosive Constituents	SW 846 8330	Yes	X		
Asbestos		No		X	
TPH		No		X	
TCLP Metals	SW 846 1311, 6010, 7470	Yes	X		
TCLP Organics		No		X	
TCLP Pest. & Herb.		No		X	
Gross Alpha		Yes		X	
Gross Beta		Yes		X	
Gross Gamma		Yes		X	
Tritium <sup>4</sup>		No		X	
Gamma Spectroscopy	HASL 300	Yes	X		
Isotopic Plutonium		No		X	
Total Plutonium		No		X	
Isotopic Uranium	HASL300	Yes	X		
Total Uranium		Yes		X	
Strontium-90		No		X	
Americium-241		No		X	

<sup>4</sup> If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

DO NOT WRITE IN THESE SPACES

**WASTE CHARACTERIZATION STRATEGY FORM**

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
Specific Waste Type: Decontamination liquid		

**Preliminary RCRA Determination**

Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CFR 261. List the F-, D-, K-, P-, or U- category and number.

Initially the decontamination liquid wastes will be managed as RCRA mixed waste because they may contain metals and radioactivity. A final RCRA determination will be made after the evaluation of the results for a liquid grab sample

**Preliminary RCRA Status**

Non-RCRA: (No 90-Day Storage Requirement)  
Describe how waste will be stored/handled:

RCRA: (90-Day Storage Requirement)  
Waste will be stored/handled in accordance with 20 NMAC Generator Requirements.  
The wastes will be stored onsite in sealed drums until the laboratory analyses are completed and a final RCRA evaluation is made.

**Preliminary Determination for Radioactivity**

Based on available information, indicate the amount and type of radiation contamination expected in the waste.

DU may be present in the decontamination liquids. A final determination of the radioactive status of the liquids will be made after the liquid sample results are evaluated.

**Preliminary Radioactivity Status**

Material is not radioactive  
Describe how waste will be stored/handled

Material is radioactive  
Describe the controlled area, labeling, and protection against inadvertent contamination  
The decontamination liquid will be stored onsite in sealed drums labeled radioactive in a roped-off area designated as a radioactive materials storage area according to LANL requirements.

**WASTE CHARACTERIZATION STRATEGY FORM**

OU Number/FU	PRS/SWMU Number	Title
1130/FU2	36-004(e)/36-008(f)/C36-006(e)	I-J Firing Site
<b>Specific Waste Type:</b> Pieces of depleted uranium, soil, PPE and waste handling equipment, and decontamination liquid		

**Signatures:**

Field Team Leader *L. J. Z. A.* 03-25-97

Field Team Waste Management Coordinator *John Bingham*

Waste Management Representative *Mary Jane Wind* 4/10/97