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Asphalt Monitoring and Removal Plan for Area of Concern C-00-041, Guaje/Barrancas/Rendija Canyons Aggregate

Los Alamos
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April 2008

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EXECUTIVE SUMMARY

Area of Concern C-00-041 is the site of a former asphalt batch plant located in the Rendija Watershed within the Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00. Asphalt was released during plant operations from the late 1940s to 1958 and could be found exposed in the ephemeral stream downgradient of the plant location. The plant was removed and the land transferred in 1969 to the U.S. Forest Service. Sampling was completed in 2007, and remnant asphalt and tar were removed from the surface of the site. Because of the potential for continued exposure of additional asphalt or tar by erosion during storms or other runoff events in the future, this work plan has been developed to monitor periodically, by visual inspection, asphalt contamination at the surface of the site and to remove visible asphalt and tar, if exposed.

The proposed activities include visual inspections of the entire site every 2 yr, beginning in the fall of 2009. The inspections will consist of site walkovers to identify any asphalt or tar exposed at the surface. Inspections will focus on the main drainage channel at the site, but the entire site will be inspected. Following inspection, any visible asphalt or tar will be containerized, managed, and disposed of in accordance with all applicable Los Alamos National Laboratory waste management procedures. A monitoring report will be submitted to the New Mexico Environment Department following each inspection.

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1.0 INTRODUCTION

Los Alamos National Laboratory (LANL or the Laboratory) is a multidisciplinary research facility owned by the U.S. Department of Energy (DOE) and managed by Los Alamos National Security, LLC. The Laboratory is located in north-central New Mexico approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers 40 mi^2 of the Pajarito Plateau, which consists of a series of finger-like mesas separated by deep canyons containing perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 to 7800 ft above sea level (asl).

The site addressed in this work plan, Area of Concern (AOC) C-00-041, may be contaminated with hazardous constituents. The New Mexico Environment Department (NMED), pursuant to the New Mexico Hazardous Waste Act, regulates cleanup of hazardous wastes and hazardous constituents. Corrective actions at the Laboratory are subject to the March 1, 2005, Compliance Order on Consent (the Consent Order). This work plan describes proposed work activities that will be executed and completed in accordance with the Consent Order.

1.1 General Site Information

The Guaje/Barrancas/Rendija Canyons Aggregate Area consists of solid waste management units (SWMUs) and AOCs that were formerly part of Operable Unit 1071 within Technical Area 00 (TA-00). The Laboratory began operations at TA-00 in 1943 and had largely ceased using this area by 1986. Figure 1.0-1 shows the Guaje/Barrancas/Rendija Canyons Aggregate Area SWMUs and AOCs with respect to the Laboratory boundary and surrounding land holdings. AOC C-00-041, the site of a former asphalt batch plant, is located in the Rendija Watershed, as shown in Figure 1.0-2.

1.2 Work Plan Objectives

Characterization sampling and hand removal of surface asphalt were conducted at AOC C-00-041 in 2007, and the nature and extent of contamination have been defined (LANL 2007, 098670). However, additional asphalt and tar may be unearthed by erosion during storms or other runoff events (e.g., snowmelt) in the active channel at AOC C-00-041. The objective of this work plan is to specify periodic monitoring and cleanup activities for AOC C-00-041, as directed by NMED's approval with direction of the 2007 investigation report for Guaje/Barrancas/Rendija Canyons Aggregate Area, revision 1 (NMED 2007, 099632).

2.0 BACKGROUND

2.1 Site Description and Operational History

AOC C-00-041 is approximately 50-ft-wide × 600-ft-long and is located in a portion of a side slope and ephemeral stream drainage channel that flows into Rendija Canyon on U.S. Forest Service (USFS) land. Aerial photographs indicate the asphalt plant operated from the late 1940s to 1958 (LANL 1996, 054925, p. 1). In 1969, after the plant had been removed, the land was transferred from the Atomic Energy Commission to USFS to manage as public land (LANL 1996, 054925, p. 1).

The site map of AOC C-00-041 is shown in Figure 2.1-1. Currently, the site is undeveloped and is located in a grassy open meadow that is bisected south to north by an ephemeral stream. A hiking trail, Rendija Trail, is located to the east of AOC C-00-041, and the Guaje Pines Cemetery is located to the west.

2.2 Land Use

Current use of the site is recreational, and it is expected to remain recreational for the foreseeable future.

2.3 Potential Contaminant Sources, Transport Mechanisms, and Receptors

Asphalt plant operations resulted in releases of asphalt and tar at the site. Asphalt and tar debris may remain unexposed in the channel bottom and in channel walls at some locations. Transport of the debris down the channel is possible when the ephemeral stream is flowing. Potential receptors of possible contamination include trail users in the watershed and plants and animals at the site.

2.4 Previous Site Investigations

In 1995, a voluntary corrective action was conducted at AOC C-00-041 in response to requests from USFS and NMED. Water, soil, and tar were sampled at five locations and analyzed for target analyte list (TAL) metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls, and pesticides (LANL 1996, 054925, p. 1). One tar sample was analyzed for metals and for waste characterization using the toxicity characteristic leaching procedure. Asphalt was generally confined to the stream channel. A horizontal layer of asphalt, varying in thickness from 0.5 to 8 in., was found 3 to 4 ft below ground surface (bgs). Most of this layer was excavated from the stream channel. However, excavation stopped when the remaining asphalt had thinned to 1/16–1/4 in. thick by 3 ft wide at a depth of 4 ft bgs beneath a cover of soil and vegetation and could not be excavated further with the backhoe (LANL 1996, 054925, p. 2). Approximately 300 yd^3 of material was excavated and taken to the Los Alamos County landfill for disposal. The USFS Los Alamos Area Office declared the clean-up efforts to be satisfactory (LANL 1996, 054925, p. 2).

In 1999, after public users of the area complained about tar and asphalt remaining at the site, a field inspection was conducted in the area. As a result, a small amount of visible tar and asphalt was removed from the drainage channel, a standpipe drain was installed downstream of the Ponderosa Estates subdivision to control storm-event runoff into the drainage channel, and rock check dams were installed in the drainage channel. The standpipe drain was designed to use the natural drainage basin downstream of the subdivision as a stormwater retention area and to dissipate flow from large runoff events into the drainage channel where this AOC is located (Veenis 1999, 069722).

In May 2005, the Laboratory constructed additional rock check dams and installed other erosion-control measures along the watercourse (LANL 2005, 089657, p. 9).

In February 2007, 17 locations were sampled at two depths (0–0.5 ft and 2.0–3.0 ft) (Figure 2.1-1). The samples were collected at approximately 100-ft intervals down the center of the AOC near the ephemeral watercourse. Sampling locations were biased toward sediment pockets. Two samples were collected in the footprint of the former asphalt batch plant. Three additional samples were collected downslope from the former batch plant location and analyzed at off-site laboratories for TAL metals, VOCs, SVOCs, TPH–gasoline range organics (TPH–GRO), and TPH–diesel range organics (TPH–DRO).

In April and May 2007, after samples were collected at AOC C-00-041, visible asphalt was removed from the vicinity of the stream channel by hand to avoid heavy-equipment damage to the drainage. Asphalt was not removed from the side of the bank if removal would cause additional erosion of the bank. A total of approximately 10 yd^3 of asphalt was removed.

2.5 Summary of Data Evaluation

Because the 1995 samples were collected from locations where soil and tar were removed, the analytical results are not indicative of current conditions and therefore were not used to determine nature and extent.

Analytical results for inorganic chemicals either detected without background values (BVs) or detected above BVs and for organic chemicals detected at AOC C-00-041 are presented in Figures 6.3-4 and 6.3-5 and Tables 6.3-4 and 6.3-5 in the approved investigation report (LANL 2007, 098670). On the basis of detections above BVs, the inorganic chemicals lead and selenium are identified as chemicals of potential concern (COPCs) at AOC C-00-041. On the basis of detections at AOC C-00-041, the organic chemicals identified as COPCs are acenaphthene; benzo(b)fluoranthene; benzoic acid; chloroform; chrysene; 1,4-dichlorobenzene; 1,1-dichloroethene; fluoranthene; phenanthrene; pyrene; toluene; TPH-DRO; TPH-GRO; and 1,2,4-trimethylbenzene.

Detailed discussions of the nature and extent of inorganic and organic COPCs at AOC C-00-041 are presented in the Appendix E of the investigation report. The nature and extent of inorganic and organic COPCs are defined at AOC C-00-041 (LANL 2007, 098670, pp. 22–23). Calculations and discussions of human health risk and ecological risk are presented in the Appendix F of the investigation report (LANL 2007, 098670). The screening assessments indicate no potential for unacceptable risk to human health at AOC C-00-041 under a residential scenario, and the identified chemicals of potential ecological concern do not present a potential risk to ecological receptors.

3.0 SITE CONDITIONS

3.1 Surface Conditions

Rendija Canyon is located immediately north of the Los Alamos townsite and has a drainage area of 9.5 mi^2. The canyon heads on the flanks of the Sierra de los Valles just west of the townsite at an elevation of 9826 ft asl. The channel extends approximately 9 mi east to its confluence with Guaje Canyon. The lowest elevation of the watershed is approximately 6300 ft asl (LANL 1997, 055622, p. 3-2). Rendija Canyon crosses USFS land and General Services Administration (GSA) land. Four tributaries are present in the Rendija Canyon Watershed. Rendija Canyon and its tributaries contain ephemeral streams, arising from stormwater runoff and snowmelt. The watershed drains portions of Los Alamos townsite, GSA land, and USFS land. As the surface water flows downstream, it infiltrates the alluvium and the underlying formations or is lost to evapotranspiration.

Between 1999 and 2005, surface water site assessments were completed for the SWMUs and AOCs in the Guaje/Barrancas/Rendija Canyons Aggregate Area. Based on the surface water site assessment for AOC C-00-041, the potential for erosion at the site is moderate.

3.2 Subsurface Conditions

The stratigraphy in the Guaje/Barrancas/Rendija Canyons Aggregate Area consists of the Quaternary Cerro Toledo interval and the Tshirege Member of the Bandelier Tuff overlain by a thin layer of alluvium and soil. Sampling at the site did not exceed 3.0 ft bgs, and the only stratigraphic unit encountered at the site was surface soil. No saturation was encountered at the site and no subsurface structures are known to exist at the site.

4.0 SCOPE OF ACTIVITIES

All activities will take place on USFS land, with access through Los Alamos County land. All the work proposed in this plan is subject to approval by the applicable land owner(s) through access agreements and/or special-use permits.

4.1 Site Inspection

AOC C-00-041 will be inspected every 2 yr, per the approval with direction from NMED (2007, 099632), to look for remnants of tar and asphalt exposed at the surface by runoff or erosion. Inspections will be performed by traversing the site on foot and visually inspecting the ground surface. The site will be divided into smaller areas, and multiple sweeps (or sweeps by multiple people) will be performed in each area to ensure all newly exposed asphalt is identified.

Inspections will take place in the early fall of odd-numbered years. The inspections will be conducted in the fall because the major erosion events of the year (i.e., runoff from spring snowmelt and summer monsoons) will have occurred by that time, allowing for maximum potential asphalt exposure since the previous inspection. Inspections must be conducted before significant snow accumulations obscure any exposed asphalt.

The remaining asphalt and tar are thought to be restricted largely to the immediate area of the drainage, from the location of the former asphalt batch plant downgradient to the confluence with Rendija Canyon. Although asphalt has been observed upgradient of the site, it appears to be originating from Diamond Drive, which is located at the head of the drainage.

4.2 Asphalt Collection and Disposal

Exposed asphalt fragments either will be picked up during the site inspection or will be flagged during the inspection and picked up as soon as practicable after the survey is completed. Asphalt will be picked up only if it is visible at the surface and involves no excavation or significant soil disturbance. If large pieces of asphalt are exposed and are too large to be safely lifted or containerized, they may be broken by hand or with hand tools into smaller pieces. Asphalt pieces will be collected in buckets or other portable containers and transferred to an appropriate waste container. All asphalt waste will be containerized, managed, and disposed of in accordance with applicable Laboratory waste management procedures and federal and/or state regulations. Management of waste is discussed in Appendix B.

5.0 INVESTIGATION METHODS

The standard operating procedures (SOPs) and details for characterization, management, and storage of investigation-derived waste are presented in Appendix B. No SOP is required for visual inspection and asphalt collection during the site walkover.

6.0 SCHEDULE

6.1 Asphalt Collection Interval and Schedule

The site walkover for visual inspection and collection of asphalt/tar will start in fall 2009 and will be conducted every 2 yr thereafter. The need to continue inspection and asphalt removal activities will be reevaluated with the USFS and NMED after every third inspection (i.e., every 6 yr).

6.2 Monitoring Report Schedule

Following each biennial inspection and removal of asphalt and tar, a monitoring report will be submitted to NMED documenting the inspection event, the area covered, and the volume of waste removed. The monitoring reports will be submitted on or before December 31st of the inspection year.

7.0 REFERENCES AND MAP DATA SOURCES

7.1 References

The following list includes all documents cited in this work plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

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LANL (Los Alamos National Laboratory), March 1996. "Voluntary Corrective Action Completion Report for Potential Release Site C-0-041, Former Asphalt Batch Plant Site," Los Alamos National Laboratory document LA-UR-96-434, Los Alamos, New Mexico. (LANL 1996, 054925)

LANL (Los Alamos National Laboratory), April 1997. "Core Document for Canyons Investigations," Los Alamos National Laboratory document LA-UR-96-2083, Los Alamos, New Mexico. (LANL 1997, 055622)

LANL (Los Alamos National Laboratory), July 2005. "Investigation Work Plan for Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00," Los Alamos National Laboratory document LA-UR-05-3869, Los Alamos, New Mexico. (LANL 2005, 089657)

LANL (Los Alamos National Laboratory), August 2007. "Investigation Report for Guaje/Barrancas/Rendija Canyon Aggregate Area at Technical Area 00," Los Alamos National Laboratory document LA-UR-07-5326, Los Alamos, New Mexico. (LANL 2007, 098670)

NMED (New Mexico Environment Department), December 20, 2007. "Approval with Direction, Investigation Report for Guaje/Barrancas/Rendija Canyons, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED HWB), Santa Fe, New Mexico. (NMED 2007, 099632)

Veenis, S., August 24, 1999. Tar Site C-00-041. E-mail message to B. Hoditschek (LANL) from S. Veenis (LANL), Los Alamos, New Mexico. (Veenis 1999, 069722)

7.2 Map Data Sources

Drainage. Modeled Surface Drainage, 1991; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0591; 1:24,000 Scale Data; Unknown publication date. NHD Route Drainage; National Hydrography Dataset Program, United States Geological Survey; Quadrangle 13020101; 08 October 2004.

Hypsography. Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

Los Alamos National Laboratory Boundaries. LANL Areas Used and Occupied; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007. Technical Area Boundaries; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Division; 19 September 2007.

Point Feature Locations of the Environmental Restoration Project Database. Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0189; 11 April 2008.

Potential Release Sites. Los Alamos National Laboratory, Waste and Environmental Services Division, Geotechnical Services Group, EP2008-0095; 1:2,500 Scale Data; 04 April 2008.

Roads and Trails. Forest Roads; County of Los Alamos, Information Services; as published 16 May 2006. Los Alamos County Land Parcels; County of Los Alamos, Information Services, as published 17 January 2008. Road Centerlines for the County of Los Alamos; County of Los Alamos, Information Services; as published 03 December 2007. Streets; County of Los Alamos, Information Services; as published 16 May 2006. Trails; County of Los Alamos, Information Services; as published 16 May 2006.

Structures. Approximate Location of Former Batch Plant; Investigation Work Plan for Guaje/Barrancas/Rendija Canyons Aggregate Area at Technical Area 00; Los Alamos National Laboratory Report LA-UR-05-3869; Figure 2.1-14 AOC C-00-041 site map; Map m201440; July 2005. Structures; County of Los Alamos, Information Services; as published 29 October 2007.

Watersheds. Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; EP2006-0942; 1:2,500 Scale Data; 27 October 2006.

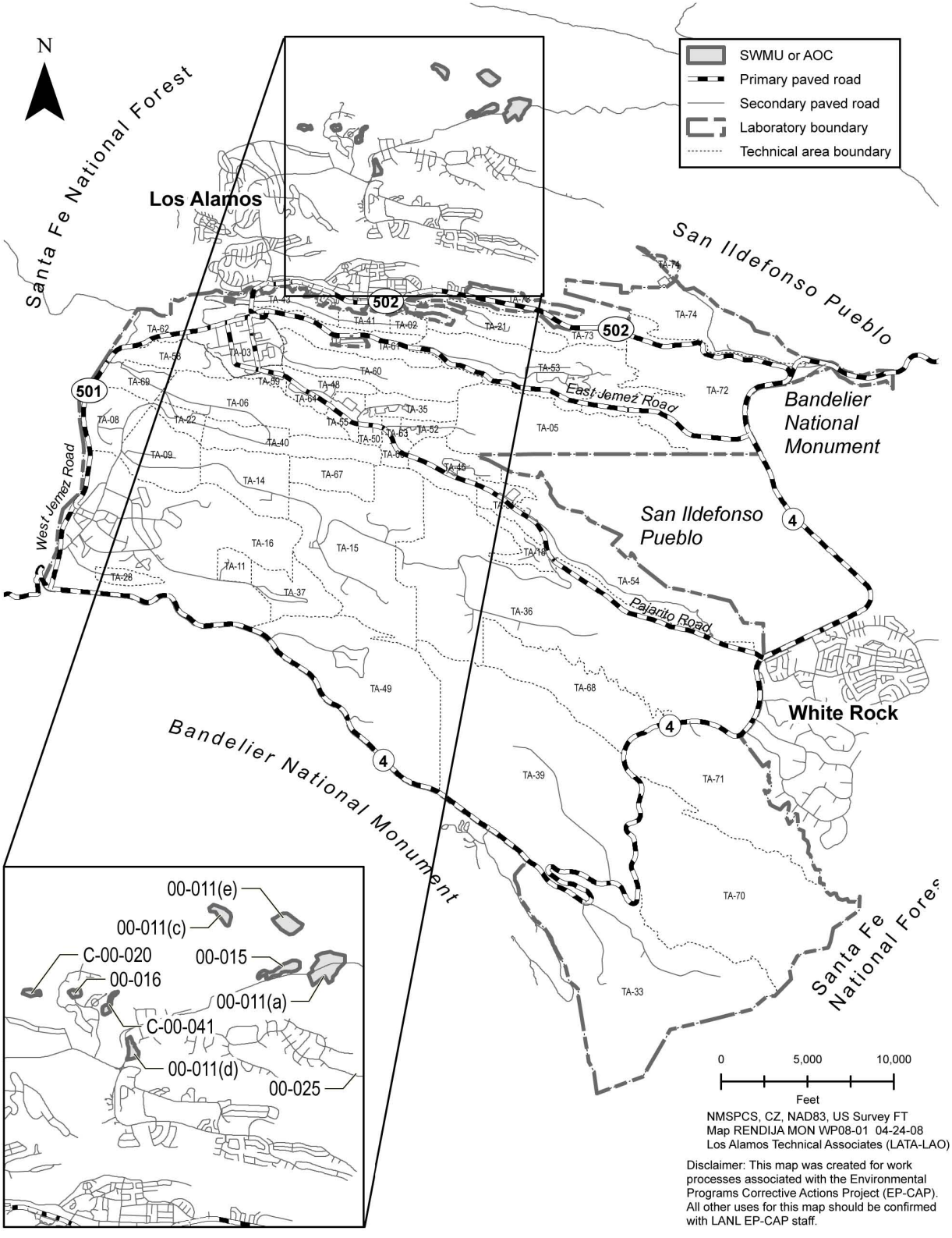

Figure 1.0-1 Guaje/Barrancas/Rendija Canyons Aggregate Area SWMUs and AOCs

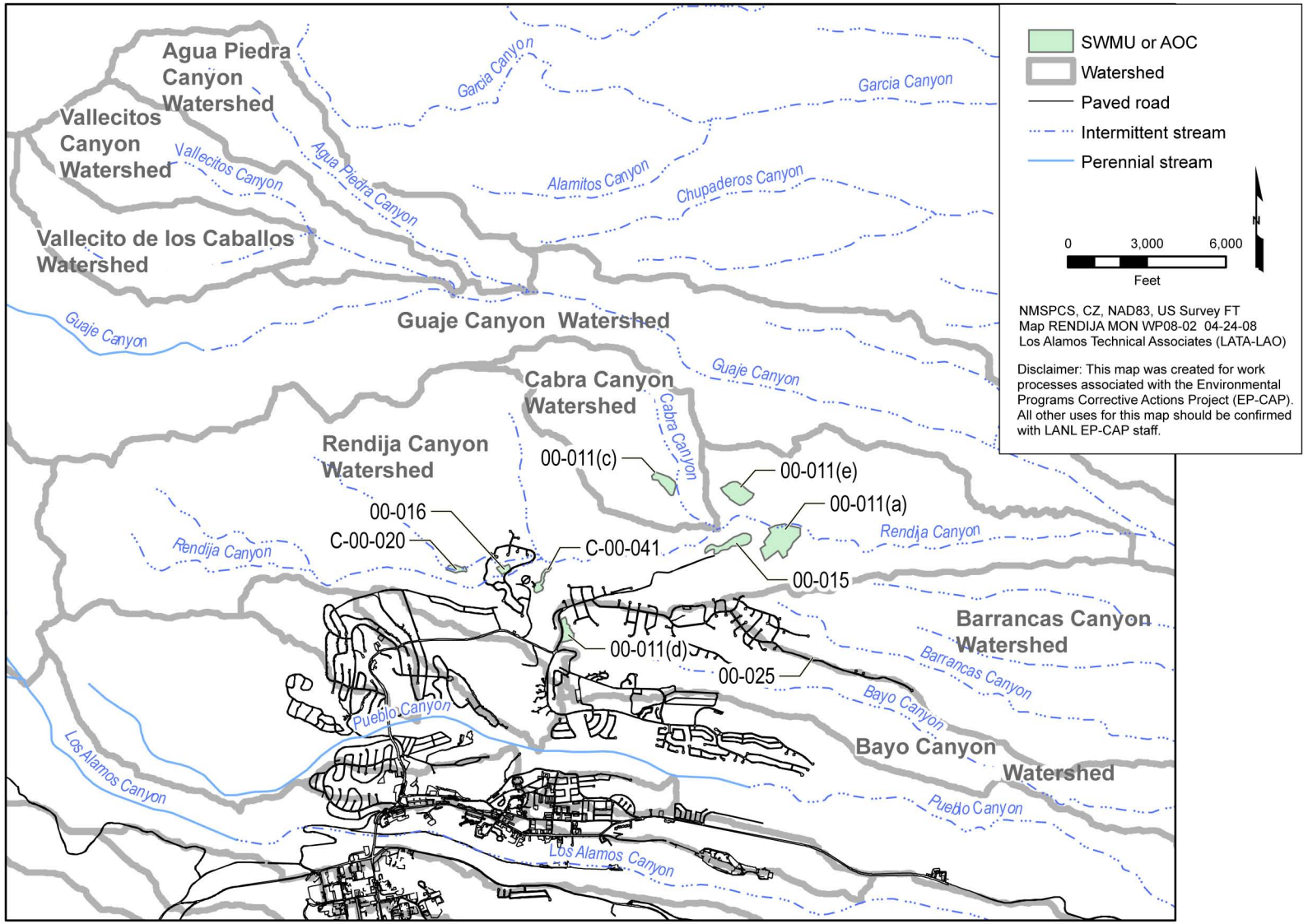

Figure 1.0-2 Location of AOC C-00-041 within the Rendija Canyon Watershed

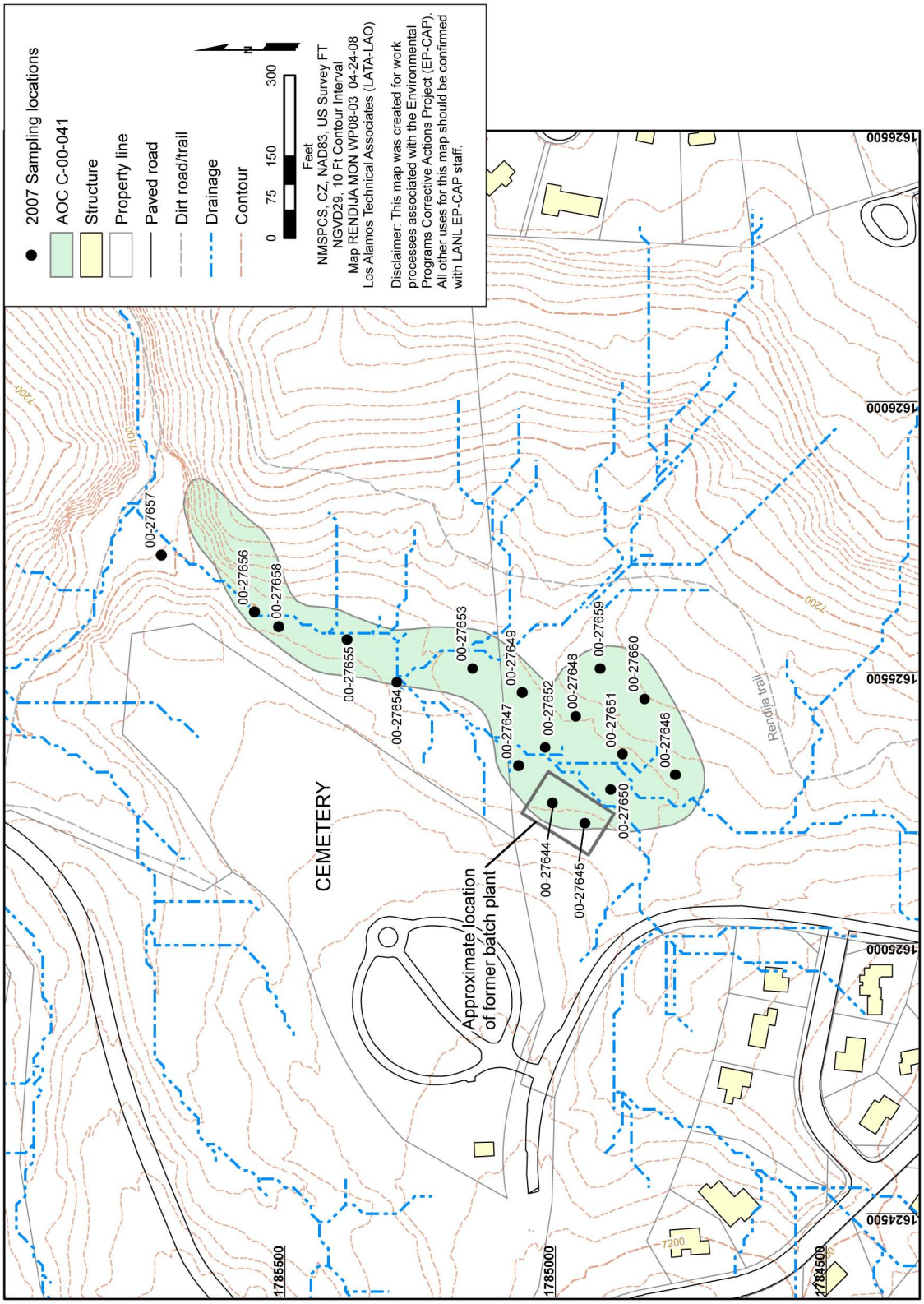

Figure 2.1-1 AOC C-00-041 site map

Appendix A

Acronyms and Metric Conversion Table

A-1.0 ACRONYMS AND ABBREVIATIONS

AOC	area of concern
asl	above sea level
bgs	below ground surface
BV	background value
COPC	chemical of potential concern
DOE	Department of Energy (U.S.)
DRO	diesel range organic
ER ID	Environmental Remediation and Surveillance Program identification number
GSA	General Services Administration
GRO	gasoline range organic
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
PPE	personal protective equipment
RPF	Records Processing Facility
SOP	standard operating procedure
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list (EPA)
TPH	total petroleum hydrocarbons
USFS	U.S. Forest Service
VOC	volatile organic compound
WCSF	waste characterization strategy form

A-2.0 METRIC CONVERSION TABLE

Multiply SI (Metric) Unit	by	To Obtain US Customary Unit
kilometers (km)	0.622	miles (mi)
kilometers (km)	3281	feet (ft)
meters (m)	3.281	feet (ft)
meters (m)	39.37	inches (in.)
centimeters (cm)	0.03281	feet (ft)
centimeters (cm)	0.394	inches (in.)
millimeters (mm)	0.0394	inches (in.)
micrometers or microns (µm)	0.0000394	inches (in.)
square kilometers (km^2)	0.3861	square miles (mi^2)
hectares (ha)	2.5	acres
square meters (m^2)	10.764	square feet (ft^2)
cubic meters (m^3)	35.31	cubic feet (ft^3)
kilograms (kg)	2.2046	pounds (lb)
grams (g)	0.0353	ounces (oz)
grams per cubic centimeter (g/cm^3)	62.422	pounds per cubic foot (lb/ft^3)
milligrams per kilogram (mg/kg)	1	parts per million (ppm)
micrograms per gram (µg/g)	1	parts per million (ppm)
liters (L)	0.26	gallons (gal.)
milligrams per liter (mg/L)	1	parts per million (ppm)
degrees Celsius (°C)	9/5 + 32	degrees Fahrenheit (°F)

Appendix B

Investigation-Derived Waste Management

The investigation-derived waste (IDW) resulting from the monitoring and cleanup activities by Los Alamos National Laboratory (the Laboratory) at Area of Concern (AOC) C-00-041 in the Guaje/Barrancas/Rendija Canyons Aggregate Area will include personal protective equipment (PPE) and asphalt/tar contaminated soil and asphalt/tar. The asphalt/tar-contaminated soil and asphalt/tar are nonhazardous industrial waste, unless they can be recycled. The PPE may come into contact with contaminated environmental media and is also anticipated to be nonhazardous industrial waste.

Any IDW generated during the investigation will be managed to protect human health and the environment, comply with applicable regulatory requirements, and adhere to Laboratory waste-minimization goals. All IDW generated during field-investigation activities will be managed in accordance with the applicable standard operating procedure (SOP), which incorporates the requirements of all applicable U.S. Environmental Protection Agency and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. The SOP applicable to the characterization and management of IDW is

- EP-ERSS-SOP 5022, Characterization and Management of Environmental Restoration (ER) Project Waste.

This SOP is available on the Laboratory's Environmental Programs Directorate web page at http://www.lanl.gov/environment/all/qa.shtml.

Before the site is inspected and asphalt is collected, a waste characterization strategy form (WCSF) will be prepared and approved per the requirements of EP-ERSS-SOP 5022. The WCSF will provide detailed information on IDW characterization, management, containerization, and possible volumes. The guidance described in the Laboratory's 2006 Hazardous Waste Minimization Report (LANL 2006, 096015) will be implemented during field activities to minimize waste generation.

The following waste streams are anticipated as a result of inspection and removal activities:

- Spent PPE—the spent PPE waste stream will consist of PPE that has potentially contacted contaminated environmental media and that cannot be decontaminated. The bulk of this waste stream will consist of protective clothing such as gloves. Spent PPE will be collected in appropriate containers. Characterization of this waste stream will be performed through acceptable knowledge of the waste materials and the methods of waste generation. The Laboratory expects this waste to be disposed of at an off-site disposal facility. It is anticipated that every 2 yr the waste volume will be less than 1 yd^3.

- Asphalt/Tar-Contaminated Soil and Asphalt/Tar—the asphalt/tar-contaminated soil and the asphalt/tar collected will be stored in plastic-lined drums or other appropriate container, depending on the amount of asphalt collected. Based on acceptable knowledge, this waste will be designated as nonhazardous industrial waste and disposed of at an authorized off-site disposal facility, unless it can be recycled. If this waste is generated, it is anticipated that the volume every 2 yr will be less than 10 yd^3.

Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information regarding waste classification, item(s), and date generated. The wastes will be contained in clearly marked and appropriately constructed waste accumulation areas. The accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of IDW and its classification. Container and storage requirements will be detailed in the WCSF and approved before the wastes are generated.

REFERENCE

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LANL (Los Alamos National Laboratory), November 2006. "Los Alamos National Laboratory Hazardous Waste Minimization Report," Los Alamos National Laboratory document LA-UR-06-8175, Los Alamos, New Mexico. (LANL 2006, 096015)