TA 73

DEPARTMENT OF ENERGY
National Nuclear Security Administration
Los Alamos Site Office
Los Alamos, New Mexico 87544

5/27/05

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MAY 2005
NMED Hazardous
Waste Bureau

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building I
Santa Fe, NM 87505-6303

Subject: Investigation Work Plan for SWMU 73-002

Dear Mr. Bearzi,

Enclosed are two copies and an electronic file (disk) of the Investigation Work Plan for SWMU 73-002 as cited in Table XII-2 of the Consent Order.

Please contact Bob Enz at (505) 667-7642 if you have any questions or concerns.

Sincerely,

for

David Gregory, P.E.
Federal Project Director

ES: 6BE-002

cc:
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Innovative Technical Solutions, Inc.

Corrective Action Workplan

For Solid Waste Management Unit (SWMU) 73-002 (Incinerator Ash Removal)
Los Alamos National Laboratory, New Mexico
Contract No. DACA05-99-D-0014, TaskOrder CM26

May 2005

Prepared For:
US Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814
and
Los Alamos National Laboratory
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PO Box 1663 MS-A316
Los Alamos, NM 87544

Prepared By:
Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, California 94598

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May 2005 (Updated by K. Konzen on 5/26/05 at 17:00 MST)
ITSI Project No: 04-400.12

Corrective Action Work Plan for SWMU 73-002 (Incinerator Ash Removal) Document Approvals

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ACRONYMS AND ABBREVIATIONS

mg/kg	milligrams per kilogram
pCi/g	picocurie per gram
BMP	Best Management Practice
CHP	Certified Health Physicist
CIH	Certified Industrial Hygienist
CQCSM	Contractor Quality Control System Manager
DOE	United States Department of Energy
DOT	United States Department of Transportation
GPS	Global Positioning Satellite
HEPA	High Efficiency Particulate Air filter
IDW	Investigation Derived Waste
ITSI	Innovative Technical Solutions, Inc.
LANL	Los Alamos National Laboratory
LLRW	Low Level Radiological Waste
NAVD	North American Vertical Datum
NAD	North American Datum
NIOSH	National Institute for Occupational Safety and Health
NMED	New Mexico Environmental Division
OSHA	Occupational Safety and Health Administration
PEB	Pre-Evolution Briefings
POC	Point of Contact
POD	Plan of the Day
ppm	part per million
PRS	Potential Release Site
QC	Quality Control
RAM	Real-time Aerosol Monitor
SAP	Sampling and Analysis Plan

Acronyms and Abbreviations (continued)

SHSO	Site Health and Safety Officer
SMO	LANL Sample Management Office
SS	Site Superintendent
SSHSP	Site-Specific Health and Safety Plan
SWMU	Solid Waste Management Unit
USACE	U.S. Army Corps of Engineers
WCSF	Waste Characterization Strategy Form
WP	Corrective Action Workplan

EXECUTIVE SUMMARY

The purpose of this Corrective Action Workplan (WP) is to provide details on the remediation of SWMU 73-002 (Los Alamos Incinerator Ash Project) located at the Los Alamos Airport on the south slope of Pueblo Canyon, immediately north of the incinerator building. This WP involves the removal of incinerator ash and debris from Pueblo Canyon; taking soil samples below the ash upon removal; and subsequently restoring the site.

This report summarizes the sampling data that was obtained in April 2005 to characterize the incinerator ash for determining appropriate disposal paths. According to these sample results, the incinerator ash will be treated as Low Level Radioactive Waste (LLRW). The basis for this determination was conducted by comparing the incinerator ash to the background values established in "Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory" ([LANL] 1998, ER ID 59730).

The incinerator ash will be removed from the majority of the site by use of a vacuum system that exhausts through a HEPA filtration system. This will minimize any dust migration during remediation of the ash. Ash that is not able to be removed by the vacuum system may be removed by excavation with use of a Spyder All-Terrain Excavator. The ash will be collected in appropriate United States Department of Energy (DOE) approved containers that can be used for staging in an approved storage area, while waiting for transportation to an approved disposal facility.

Debris will be removed by the assistance of a skyline that will be erected to run the vertical length of the canyon wall. The skyline will hoist material to the top surface of the canyon for packaging. Prior to transportation of the debris for off-site disposal, the industrial debris will be evaluated by LANL radiation safety personnel. Items meeting LANL release criteria will be disposed at a sanitary waste landfill. Items that cannot be released will be packaged for disposal at a low-level radiological waste facility.

Site restoration will be performed after evaluation and approval of site closure from soil samples taken after ash removal. If soil samples indicate the need for additional soil removal, that task will be performed under a separate Scope of Work, and separate Work Plan.

1.0 INTRODUCTION

This Corrective Action Workplan (WP) was developed by Innovative Technical Solutions, Incorporated (ITSI), for implementation of the Corrective Action to remove and package ash and debris from SWMU 73-002 located north-northwest of the existing Los Alamos Airport terminal building in Los Alamos, New Mexico (Figures 1, 2 & 3). Disposal of the ash and debris will occur as a separate action once the ash and debris is brought up out of the canyon and staged at the top of the mesa. This WP and its associated documents were prepared on behalf of the United States Army Corps of Engineers (USACE), Sacramento District and the United States Department of Energy (DOE) under the USACE Pre-Placed Remediation Action Contract (PRAC) number DACA05-99-D-0014, Task Order CM26.

This WP provides overall plans and a detailed description of the removal and packaging activities. Appendix A, Sampling and Analysis Plan (SAP), describes procedures to conduct confirmation soil sampling activities and the analytical protocols for analyses of the samples. Appendix B, Best Management Practice Plan- Storm Water Management, describes procedures to control the discharge or migration of sediment and runoff (using Best Management Practices [BMP]) during ash removal and packaging activities. Field activities will be conducted in compliance with the Site-Specific Health and Safety Plan (SSHSP), which will be maintained on-site during field work. Appendix C presents a copy of the Voluntary Corrective Action Fact Sheet for PRS 73-002.

1.1 Project Objectives

The primary purpose of the project activities is to implement the Corrective Action for the site which involves removal of the ash and associated debris. Confirmation samples will be taken of the soil. If additional remediation is required, then it will be accomplished under a separate Scope of Work, and separate Work Plan.

1.2 Project Organization

Figure 4 shows a project organization chart identifying key project personnel and depicting lines of reporting and communication. Table 1 lists key project personnel, responsibilities, and contact information.

Table 1

Position	Key Personnel	Contact Information
Program Manager	Dan Ledford	925-946-3124
Project Manager	Kent Dorr	303-420-6325
Project Superintendent	Jim Cox	925-946-3230
Corporate Health and Safety Manager	Irene Fanelli	336-446-0118

The USACE Project Manager, Hyland Morrow, will be responsible for providing project contract procurement services.

The DOE Project Manager, David Gregory, will be responsible for overall project execution at LANL, coordination with regulatory agencies, and DOE personnel management. The DOE Project Geologist, Robert Enz, will be the DOE Point of Contact (POC) for implementation of field activities and has the authority to suspend the project if DOE/USACE requirements are not fulfilled.

The ITSI Project Manager, Mr. Kent Dorr, will be the point of contact with USACE and DOE, and will be responsible for project execution and reporting. Mr. Dorr will report to Mr. Dan Ledford, PRAC Program Manager, who will assist Mr. Dorr in coordinating resources within the company to execute work in a timely and effective manner. Ms. Irene Fanelli, Certified Industrial Hygienist (CIH), is the ITSI Corporate Health and Safety Program Manager, and Mr. Jim Schollard is the ITSI Program Contractor Quality Control System Manager. Mr. Kevin Konzen is ITSI’s Certified Health Physicist (CHP) and will be periodically onsite, be available as a consultant, and act as the interface between ITSI and LANL's Radiation Safety department. Either Kevin or another member of ITSI's radiation

safety staff will visit the site on a weekly basis to support site personnel for questions or problems relating to radiological hazards during field activities.

Reporting directly to the Project Manager will be Mr. Jim Cox who will serve as both the Site Superintendent (SS) and the Contractor Quality Control System Manager (CQCSM). Mr. Cox will be responsible for all field activities, including managing labor and subcontractors, field performance, site health and safety issues, oversee the sampling, testing, and inspections, and to maintain the level of quality control required under the terms of the contract. Mr. Cox will be on site during all field activities, with full authority and control over all aspects of field performance to execute all activities in compliance with project requirements. The ITSI labor force, subcontractors, material suppliers, and vendors will report directly to Mr. Cox in the field. As the CQCSM, Mr. Cox will work closely with the Project Manager and Site Health and Safety Officer (SHSO) to ensure the quality of work, maintain quality data, and ensure performance in accordance with contract requirements.

The SHSO will assist the Project Manager in health and safety and quality management on this project. The SHSO will implement the SSHSP and ensure that a safe working environment is maintained. In addition, the SHSO will work with the Project Manager, Site Superintendent and CHP to ensure compliance with federal, state, and local, laws, rules, and regulations, and USACE/DOE requirements.

The Project Manager will have administrative support from the Contract Administrative Manager to procure subcontracts, lease agreements and purchases, and administer subcontracts. The Project Manager will also be supported with Cost and Schedule by ITSI's Cost and Schedule Specialist, which will update the schedule and provide regular cost reports.

Subcontractors shall meet ITSI's quality assurance and, Site Specific Health and Safety Plans while conducting their scopes of work. Each subcontractor is required to become familiar with ITSI's QMP and SSHSP, and document this understanding and compliance with ITSI. ITSI's SS will provide oversight and ensure compliance with all subcontractors. It is of

utmost importance that all goals are achieved in an appropriate manner especially with regard to worker health and safety and environmental impact. Any events, actions, or conditions that potentially affect worker health and safety or impact the environment shall be reported to the ITSI Project Manager immediately for resolution.

Keers Remediation will be subcontracted to perform the vacuum extraction to remove the incinerator ash.

Swaggart Enterprises will be subcontracted to install and operate the skyline system and provided the labor necessary for the installation and operation.

Kemp West will be subcontracted to provide and operate the spyder excavator that may be used to excavate material from the sloped canyon wall, if required.

The LANL Sample Management Office (SMO) will submit samples for laboratory analysis for the confirmation and verification samples collected.

Subcontractors may be changed or replaced, depending on availability and best-value determinations.

2.0 SITE DESCRIPTION AND BACKGROUND

Consolidated Unit 73-002-99 is comprised of Potential Release Sites (PRS) 73-002, 73-003, 73-004(a,b), and 73-006. The Correction Action Work Plan is for SWMU 73-002, a small incinerator operated for a short time at the site beginning in 1947. The incinerator's primary use was for the destruction of classified documents, however, it did not function properly and was removed from service shortly after completion.

In 1948, The Zia Company acquired the facility, which it held until 1973 and used the incinerator for other than classified sanitary waste, such as municipal trash from the townsite. The incinerator stack and equipment have been removed from the building, which is currently in use as a storage facility (USACE, 2004).

The ash pile generated by operations of the incinerator is located on the south slope of Pueblo Canyon, immediately north of the incinerator building. The ash and debris covers an area of approximately 30,000 square feet, and ranges in thickness from less than one foot to greater than eight feet. During recent ash characterization activities conducted by ITSI in preparation of implementing ash removal, the ash pile was surveyed and covers approximately 11,000 square feet with thicknesses ranging from six (6) inches to seven and a half (7.5) feet and consisting of approximately 1,200 cubic yards of ash. Inclusion of the debris field with the ash was determined to cover approximately 30,000 square feet.

Sampling was conducted of the incinerator's ash pile and within the associated drainages in 1996, 1997, and 1998. A preliminary review of the resulting data tentatively identified several potential contaminants of concern. In general, high concentrations of several inorganic chemicals have been noted in the ash samples but not in soil and sediment (non-ash) samples, with concentrations of lead as high as 13,100 milligrams per kilogram (mg/kg). The ash also contains low concentrations of several organic chemicals including, but not limited to, pesticides and dioxins/furans. Low levels of several radionuclides have been detected

above background in a limited number of ash samples. The past sample results were never finalized and the original data was not available. A summary of this data was documented in the Voluntary Corrective Action Fact Sheet for PRS 73-002 (Appendix C).

3.0 SITE CONDITIONS

This section provides a description of current site surface conditions and subsurface conditions.

3.1 Surface Conditions

The surface conditions of the incinerator ash contain a significant amount of debris such as metal posts, car fenders, cans, and broken glass similar to a landfill dump. The ash is soft but supports workers walking on it. The area is steep. Some sections of the canyon wall is greater than a 70 degree slope. The area has brush, plants and small trees located in the vicinity of the incinerator ash. At the bottom perimeter of the ash is several feet of cans and debris above the first ridge. Below the first ridge, there is some evidence of trace amounts of ash that follow normal drainage from the first ridge that stops well before the second ridge. There is more debris above the second ridge and some below. (See Figure 5).

3.2 Subsurface Conditions

Below the ash pile there is evidence of native soil and rock. No further investigation has been done of this area.

4.0 SCOPE OF ACTIVITIES

The Corrective Action for this site involves the removal of the ash and associated debris. The proposed Corrective Action represents work associated with removal of incinerator ash disposed of at the Los Alamos Airport.

The Work Plan for removal of the ash will be conducted in two phases— ash removal, and confirmation sampling. Ash characterization sampling, for waste disposal purposes, was completed the week of April 20 through 22, 2005. Mobilization for the ash removal and confirmation sampling activities are contingent on the approval of this WP. Target date for mobilization is TBD.

ITSI will conduct a Pre-Construction meeting (i.e., Readiness Review) to be attended by USACE, DOE, ITSI, and key subcontractors prior to the start of ash removal. The meeting will address the scope of work, lines of communication, health and safety, public relations, and contract requirements to be fulfilled. In addition, ITSI will conduct Pre-Evolution Briefings (PEB) each morning and a Plan of the Day (POD) after the mid-day break.

Project activities to be discussed will include:

- Mobilization and demobilization of equipment
- Preparation of equipment lay-down and staging areas
- Installation of BMP for storm water management
- Removal of ash and debris from the slopes.
- Sampling and characterization of any unknown sludges or liquids encountered during the removal
- Confirmatory soil sampling after waste removal.
- Site restoration

4.1 Mobilization

Mobilization and site preparation activities include setup of a field trailer for ITSI personnel; placement of sanitation facilities; location of underground utilities; connection of utilities to the field trailer; establishment of staging areas; and mobilization of health and safety and sampling equipment. Secured storage containers will be mobilized to the job site as needed to store materials, small tools, and equipment.

4.2 Site Layout and Security

The ITSI field trailer and container storage unit will be set up near the work area as approved by the airport representative with concurrence from the Los Alamos County representative (Figure 3). The location will be determined at a time prior to mobilization and will be based on field conditions such as proximity to utilities (water, electricity, phone, and sewer) and work areas. ITSI will use the following utilities during project execution:

- Potable water will be available.
- For sanitation, portable toilets and refuse containers will be set up near the office trailer and work areas. Hand washing facility will be available.
- If practicable, local electrical lines will be used to provide power to the office trailer.
- Telephone lines will be installed at the office trailer for telephone service, faxing, and computer connections.

Access to the work site will be restricted to LANL, DOE, USACE, ITSI and ITSI's subcontractors. ITSI project signs will be mounted at the site entrances near the site access.

The project site boundary will be secured by installing a temporary security fence. The access point to the staging area will be posted and locked to prevent unauthorized personnel from entry. The ITSI Site Superintendent will be the field point of contact for public relations and will refer any public relations questions/issues to the USACE and DOE Project Manager.

4.3 Daily Work Schedule

Onsite work hours will be Monday through Saturday, 7:00 AM to 6:00 PM. The typical work week will be Monday through Friday, with Saturday as an optional work day to make up for any delays. ITSI will notify LANL/DOE 24 hours in advance of working on Saturdays. The above working hours do not pertain to off-site activities such as office work, mobile lab work, morning safety meetings, or off-site trucking and disposal.

4.4 Equipment Certification and Inspection

Prior to initial on-site use, equipment will be inspected and tested by the equipment operator or manufacturer's representative. Certification in writing that the equipment is operating within the manufacturer's tolerances and specifications, is in safe operating condition, and complies with applicable safety requirements of the contract, and be maintained in the site office. Daily equipment inspections will be documented with the daily quality control (QC) reports.

4.5 Permits, Notifications, and Utility Clearance

ITSI will make formal notifications before field activities are initiated to DOE, USACE, Los Alamos County, and Airport Operations personnel.

Underground Service Alert will be notified a minimum of 2 days prior to intrusive activities for the access road and securing the office trailer so that utility companies can mark underground conduits and pipes.

4.6 Haul Routes and Traffic Control

Both on-site personnel and off-site truck traffic will proceed to work areas (e.g., excavation locations, sampling locations, applicable stockpile storage areas, etc.) over existing roads where possible. An additional access road will be constructed east of the incinerator building (Figure 3). Haul routes and traffic control measures will be established to control and

minimize soil dispersion by vehicle transport and runoff during wet weather. In addition, haul routes and traffic will be coordinated with the Los Alamos County Engineer and other area contractors to minimize potential work delays due to uncontrolled traffic. Prior to start of construction activities, ITSI will:

- Coordinate the proposed traffic route with the Los Alamos County Engineer,
- Identify on-site contractors, and
- Meet with the Los Alamos County Engineer to ensure that impacts to all airport operations are minimized during ash removal activities and to coordinate haul routes and equipment traffic.

Figure 3 depicts typical haul routes, and the BMP (Appendix B) describes traffic management and roadway cleanup activities.

4.7 Photographic Documentation

Before, during, and after photographs will be taken to document project activities and to record existing vegetation density. Photographs will be taken of the following: typical ash area with debris, ash area during removal, ash area at completion of removal, and locations of confirmation sample locations. In addition, photographs will be taken of runoff and dust prevention measures implemented during field activities.

4.8 Vegetation and Debris Removal

Work areas will be cleared of vegetation and debris as needed. Shrubs and brush within the clearing limits will be removed and disposed of with the debris. It is currently anticipated that there are no trees over 8-inches in diameter within the work area. If there is a change in the anticipated condition, then ITSI will coordinate with the Los Alamos County Engineer and the LANL Environmental Representative for permission to remove the trees.

4.9 Topographic Survey

Pre- and post-excavation surveys will be conducted to document the depths of the excavations. The post-excavation elevation will provide the as-built after ash removal contours.

All vertical surveying will reference North American Vertical Datum (NAVD) 1988 benchmarks. Each survey point within the ash pile area will be located using a global positioning satellite (GPS) coordinate or tape measured from the location to a known fixed horizontal point surveyed using North American Datum (NAD) 1983. All survey data will identify the sector number, reference the applicable plan sheet number, state the name of the survey company, and list the applicable certifications. A New Mexico licensed surveyor will conduct all topographic surveys and stamp documents submitted with the Post-Construction Report.

4.10 Erosion control

Silt fencing will be installed at the base of the ash pile near the drainages. Silt fences will extend between 16 and 34 inches above the ground surface. Joints in the filter fabric will be minimized, but where unavoidable, joints will overlap by a minimum of 6 inches. A trench approximately 4 inches wide and 4 inches deep will be excavated on the upslope side of the silt fences. This trench will be backfilled over the filter fabric. Silt fences will be removed as a part of demobilization with the approval of LANL and the Los Alamos County Engineer.

4.11 Ash and Debris Removal Activities

Prior to ash removal, crews will begin packaging the surface debris; cans, municipal debris, cut and or trimmed trees and remove shrubs within the work area. A skyline will be used to remove the bagged debris up the side of the canyon to a loading operation near the incinerator building. In conjunction with the hand picking operation ITSI will mobilize the vacuuming and packaging operation. The vacuum system utilizes two feed lines off an 8-inch main line to

the vacuum hopper. When the hopper is full, it is dumped into a container as appropriate to the packaging requirements of the ash. If required, a Spyder All-Terrain Excavator will be utilized to pick-up and remove heavy materials and load into special containers that will be skylined up the canyon and dumped into appropriate containers for disposal.

During removal, if an unknown sludge or liquid is encountered in any kind of a container, samples of this material will be collected and analyzed per the waste characterization strategy form (WCSF) by DOE personnel. The material will then be properly packaged and moved to the staging area. All waste segregation, management and disposal will be conducted pursuant to the WCSF.

DOE will provide Radiological Control Technicians for radiological support.

FIELD ACTIVITIES - Scope of work to being performed

Staging of Packaged Ash and Debris:

The 90-day staging location is shown on the site plan and work area (Figure 3). A forklift will load and unload waste material bags for staging as necessary.

Site Restoration:

Site Restoration is to prevent, retard or contain soil and sediment erosion. Site restoration work will be completed after all waste is removed and samples have been taken. Site restoration will include raking and re-contouring disturbed areas, placing jutematting, straw bales and/or straw wattles to prevent erosion, mulching and reseeding with approved LANL mixtures of seed to stabilize disturbed areas.

4.11.1 Ash Removal with Vacuum Truck - Keers Remediation

Action at this site will involve the complete removal of ash and associated debris as depicted in Figure 5. The collection of ash and associated debris will be performed utilizing a Guzzler Vacuum Loader system with high efficiency particulate air filter (HEPA) filtration. The vacuumed material will be packaged in approved containers supplied by ITSI and staged for

proper disposal. All associated debris such as plant material, trash, cans and miscellaneous municipal debris, will be hand picked and or segregated, bagged and disposed of as municipal waste. This may include brushing off ash from the debris to accomplish the goal of sending most of the debris to a local landfill.

Equipment and Materials:

A trailer mounted portable Guzzler Reach 2648 Module vacuum for wet or dry pick-up of ash and debris, complete with a HEPA filtration system, continuous cleaning bag filters, 136 hp diesel engine, V-belt drive, belt guard, high temperature safety switch, vacuum relief valve, silencer and Type 304 stainless steel cyclone collector.

4.11.2 Movement of Ash via Skyline - Skyline Yarding Plan

A skyline yarder will remove the debris up the slope into roll-off containers or as directed by ITSI. A Madill-Thunderbird TMY-40 Mobile Skyline Yarder equipped with a 40-foot tower and an Eaglet motorized carriage. This machine has a 2,000-foot external yarding capability. It runs with a 3/4-inch skyline and a 1/2-inch skidding line. The clamping carriage maintains a fixed position on the skyline during lateral yarding (Figure 7).

The skyline yarder is stabilized by anchoring the 40-foot tower with two guyline cables that run from internally-powered drums, up through sheaves at the top of the tower. The rigging crew anchors the skyline to a tailhold in the bottom of the canyon. Four men manage the skyline yarding system: an operator who runs the machine, two rigging men who set up the lines and hook the loads, and one chaser who unhooks the loads at the landing.

In the skyline yarding method, a radio-controlled, motorized carriage rides down the skyline, stops at a pre-determined spot, and pays out the skidding line to the hooking crew. The crew hooks the skidding line to the load. The yarder operator then hoists the loaded skidding line up to the carriage and “flies” it to the landing. The crew hooks onto large debris with wire-rope chokers. They hook the skidding line directly to loads of smaller debris that is pre-

bundled in heavy-duty cargo nets, tarps, bags, cans, or other containers. When the carriage arrives at the top of the tower, the operator lowers the load to the landing where a chaser unhooks it from the skidding line.

4.11.3 Removal of Large Debris Items

An All Terrain Spyder Excavator may be used, as needed, to remove designated debris that could not be hand picked or vacuumed. The all terrain Spyder excavator works safely on extreme grades.

4.11.4 Packaging and Staging of Ash for Disposal

The ash will be collected in appropriate containers that will be used for storage in an approved staging area, while waiting for transportation to an approved disposal facility. Figure 3 shows where the containers will be staged. Note: Upon initial evaluation of the incinerator ash sample results, it is likely that the material will be classified as Low Specific Activity Type 1 (LSA - 1). Per 49 CFR 173.427, LSA-1 solid material is required to be packaged for transportation in an IP-1/IP2 rated package (IP-1 indicates a poly propylene construction and IP-2 is a water proof inner liner placed inside an IP-1 package). This will require the packages to meet the requirements specified in 49CFR173.411 for IP-1 rated containers, such as Supersacks. IP-1/IP-2 containers will be obtained from a vendor or manufacturer that has certified the containers as meeting the specified regulatory requirements. Each container will be QA/QC visually inspected by ITSI for integrity prior to filling, during filling, and during movement. The ITSI Container Custodian is responsible for maintaining control over the waste containers from their arrival on site to their transport to the staging area. All waste will be placed in the approved waste packages. Filled containers will be stored in a secure area that is fenced.

Debris will be loaded directly into a dump truck, rolloff, or packaged in burlap or plastic bags. The debris will be evaluated by LANL Radiation Safety personnel for disposal at a sanitary waste landfill. If the debris cannot be released for sanitary waste, the waste will be packaged accordingly.

4.12 Hydroseeding and Hydromulching

After removal of the ash and debris and receipt of confirmation sample results, the disturbed work area will be hydroseeded and hydromulched to provide erosion control and re-vegetation. The steeply sloped and relatively small work area to be hydroseeded will require a higher seed rate (live seed pounds per acre) in order to optimize germination of the seeds[1]. In addition, seed blend selection will also take into consideration the timing of when hydroseeding will occur (i.e. cooler, wetter weather conditions verses warmer, drier weather conditions). Final selection of the hydroseed blend will be coordinated with and approved by LANL and Los Alamos County personnel.

4.13 Post-Construction Inspection and Cleanup

Prior to demobilizing from the work site, ITSI, DOE, NMED, and Los Alamos County will jointly inspect the site to ensure that final site conditions meet with the Scope of Work requirements. Any deficiencies noted during the site walk will be addressed, documented, and corrected before personnel and equipment are fully demobilized.

Upon completion of field activities, and subject to input from DOE and Los Alamos County, ITSI will perform final site cleanup and will leave work areas in a suitably restored condition.

4.14 Demobilization

ITSI will demobilize equipment and personnel as activities are completed. Temporary facilities, including staging areas, fencing, and temporary utilities, will be removed from each work area upon the completion of the field activities. The immediate work area will be inspected by the ITSI field representative to verify that all project-related equipment, trash, and debris have been collected and properly disposed.

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[1] LANL Engineering Standards Manual OST220-03-01-ESM, Section G2050 Landscaping, Subsection 6.0 Seeding. Rev.2, 8/16/04

Demobilization will include the removal of equipment, tools, and supplies; and evacuation of the temporary office space. Temporary fencing, traffic control devices, signs, storage containers, portable toilets, refuse containers, and any temporary power and phone lines will be removed from the site. Debris will be removed and disposed of in accordance with Contract requirements, and work areas will be cleaned and left in an appropriate condition. Final demobilization will include removal of all site fencing.

5.0 MONITORING AND SAMPLING PROGRAM

5.1 Ash Waste Characterization Sampling

The incinerator ash was characterized to provide accurate and recent information for characterizing the bulk material for waste disposition of the ash. This sampling was conducted by ITSI in April 2005. The sampling was performed based on a 30-foot grid pattern with one or two samples taken within the grid depending on the thickness of the ash to represent 100 cubic yards of material. A hand auger was used to gather both surface and subsurface ash samples through the extent of the ash. The suite of analyses requested included radionuclides, metals, volatile and semivolatile organic compounds, pesticides, and dioxins/furans.

The following tables summarize the radionuclide and metals results. The results and an evaluation of the results for purposes of disposal characterization are presented in a technical memorandum currently being prepared.

Table 2: Summary of Radionuclide Sampling Results

Radionuclide	Sample Results Range picocurie per gram (pCi/g)	95% Upper Confidence Level [UCL] (pCi/g)	Soil Background Value [BV] (pCi/g)
Cesium 137	0.025(ND) to 0.138	0.066	1.65
Radium 226	0.65(ND) to 25.2	7.41	2.59
Uranium 234	1.59 to 37.3	11.50	2.59
Uranium 235	0.057 to 2.02	0.59	0.2
Uranium 238	1.15 to 31.2	9.32	2.29
Plutonium 238	0.01(ND) to 0.022(ND)	0.015	0.023
Plutonium 239	0.10 to 2.34	0.832	0.054
Americium 241	0.003(ND) to 0.037	0.023[(1)]	0.013

Note 1: The Americium 241 UCL95 exceeded the BV partially due to the Minimum Detectable Concentration (MDC) exceeding the BV value. Six out of eighteen samples indicated a presence of Am-241 above the MDC.

Note 2: The following radionuclides showed up in some of the analytical results above Non Detectable (ND – also meaning below MDC) and were not included into the table above: Ac-228; Bi-211; Bi-214; K-40; Pa-234m; Pb-212; Pb-214; Ra-228; Tl-208; Th-231. All radionuclides normally exist in background; with most accounted for due to the natural decay series of Actinium, Thorium, and Uranium.

Note 3: 2005 sample results that were below MDC were calculated at 50% of MDC for statistical purposes.

Table 3: Summary of Selected Inorganic Chemical Sampling Results

Analyte	Sample Results Range milligrams per kilogram (mg/kg)	Sample Results Range for TCLP (mg/kg)	90% UCL (mg/kg)	Federal TCLP	Soil Background Value [BV][1]
Antimony	17.2 - 543	NA	NA	NA	29,200
Arsenic	19 - 138	0.5 (ND)	0	5	8.7
Barium	575 - 5030	0.786 - 3.84	1.888	100	295
Beryllium	0.089 - 2.4	NA	--	NA	NA
Cadmium	2.8 - 78.5	0.0112 - 1.73	0.265	1	0.4
Chromium	54.1 - 154	0.05 (ND)	0	5	19.3
Cobalt	10.1 - 49.7	NA	--	NA	8.64
Copper	490- 219,000	NA	--	NA	14.7
Lead	1740 - 33,000	0.316 – 6.29	2.264	5	22.3
Manganese	859 - 21,800	NA	--	NA	671
Mercury	0.28 - 2.1	0.00037 – 0.00037	0.00037	0.2	0.1
Nickel	43.7 - 792	NA	--	NA	15.4
Selenium	0.45 - 2.2	0.5 (ND)	0	1	1.52
Silver	15.4 - 190	0.05 (ND)	0	5	1
Thallium	0.34 – 0.54	NA	--	NA	0.73
Vanadium	3.8 - 24.7	NA	--	NA	39.6
Zinc	823 - 43,000	5.1 – 67.5	35.4969	NA	48.8

Notes:

[1] Soil BV from Voluntary Corrective Action Fact Sheet For PRS 73-002, LANL.

TCLP - Toxicity Characteristic Leaching Potential

NA – not analyzed or not available

5.2 Air Sampling During Ash Removal Activities

The following types of monitoring will be conducted during ash disturbing or handling activities:

Perimeter Air Sampling:

- Real-time monitoring utilizing a portable dust meter, such as the mini real-time aerosol monitor (RAM) or Personal DataRAM (Frequency - Daily during work activities)
- Air sampling for lead concentrations with subsequent lead analysis (Frequency - Daily during first week; Thereafter, weekly during work activities)
- Radiological Air Monitoring performed during work activities.

Personal Air Sampling

- Real-time monitoring utilizing a portable dust meter, such as a mini real-time aerosol monitor (RAM) or Personal DataRAM (Frequency - Daily during work activities)
- Personal exposure samples with subsequent laboratory analysis (Frequency - Daily during first week; Thereafter, weekly during work activities)

Real-time monitoring will be conducted regularly during all periods of active handling of ash materials. Monitoring will be conducted throughout the work zone, with special focus on the breathing zone of the workers most involved with the activities, and downwind of potential source areas.

Airborne lead concentrations will be measured through the collection of air samples with subsequent laboratory analysis. This monitoring will be performed daily during the first week of ash-handling activities, and at least once per week thereafter. Monitoring frequency may also be increased based upon the results of the sampling, in accordance with the Occupational Safety and Health Administration (OSHA) Lead in Construction Standard. This sampling will be performed in accordance with National Institute for Occupational Safety and Health (NIOSH) or OSHA Reference methods. Although a time delay exists between collection of the samples and receipt of the analytical results, these samples will provide an indication of

exposure levels during the work, so that work practices may be modified for ongoing activities as necessary.

5.3 Confirmation Soil Samples

Confirmation samples will be taken upon removal of the ash and debris. Appendix A describes the sampling plan in detail. In summary, surface samples will be taken on a grid with 30-foot intervals. Biased sampling will be performed in suspect areas, such as soil discoloration. Judgmental sampling will be performed along drainlines and outside the perimeter of the remediated area. Furthermore, samples will be taken to establish a background value comparison for the confirmation samples.

6.0 CLOSEOUT DOCUMENTATION

After completion of ash removal excavation activities and final confirmation sampling, a Corrective Action Report will be submitted.

6.1 Record Drawings

The as-builts will consist of drawings identifying updated coordinates from the survey for the ash/debris area before and after removal activities.

6.2 Corrective Action Report

The Corrective Action Report will be submitted to USACE/DOE within 90 calendar days after project completion or ITSI demobilization, whichever comes first, if the option is exercised. The following information will be included at a minimum:

- Pre- and post-construction surveys. These surveys will be certified by a New Mexico licensed surveyor.
- Topographic surveys. These surveys will be certified by a New Mexico licensed surveyor.
- As-built drawings of the ash/debris areas, showing the final elevations of the soil.
- Confirmation sampling results of all soil samples collected.
- A narrative description of construction project activities including surveying, confirmation sampling, major problems encountered and resolutions, lessons learned, and recommendations for improvement.
- The daily logbook (including daily inspection and spill cleanup records and toxic/hazardous materials inventory information) as an appendix.
- Digital photographs including pre- and post-excavation photographs.
- Any other technical information that is considered necessary by ITSI or DOE for historical purposes.
- A description of any modifications to the contract and the resulting impact.

Any deviations from the contract specifications will be listed in the report prior to the certification. The Corrective Action Report will be submitted as a CD-ROM in both native and PDF formats.

6.3 Safety Performance Report

The Safety Performance Report will be submitted in conjunction with the Post-Construction Report. The Safety Performance Report will summarize the overall performance of safety and lessons learned.

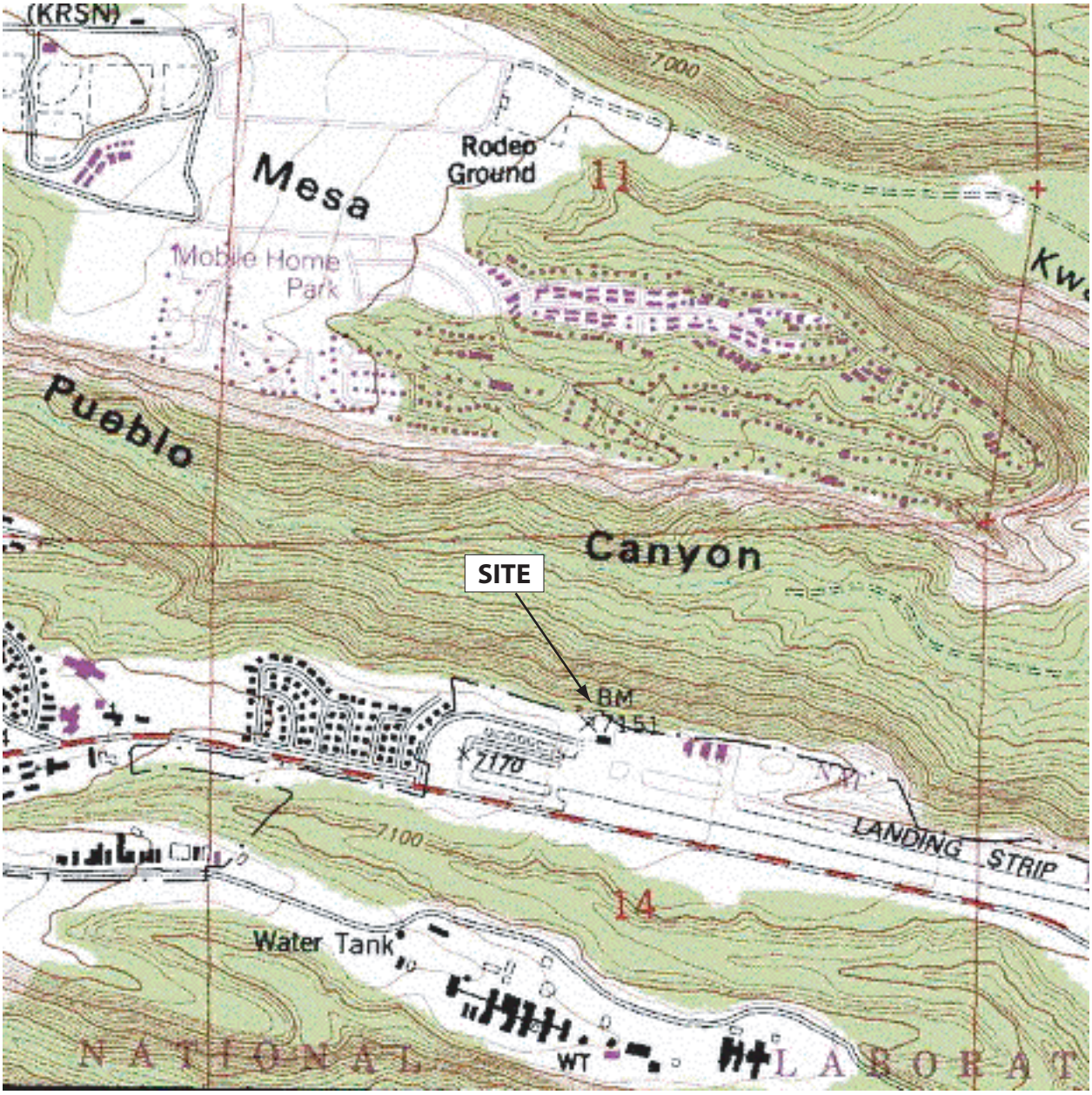
7.0 REFERENCES

"Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory" (LANL 1998, ER ID 59730).

LANL (Los Alamos National Laboratory), 2005, SWMU 73-002 Fact Sheet . (LANL 2005, 88700).

Compliance Order on Consent (Consent Order) between State of New Mexico Environmental Department and, the United Stated Department of Energy and Regents of the University of California for the Los Alamos National Laboratory, Los Alamos County, New Mexico. March 1, 2005.

United States Department of Transportation (DOT), 2004. "Shippers – General Requirements for Shipments and Packagings," Title 49 Code of Federal Regulations Part 173 (49 CFR 173).



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Source: USGS 7.5 minute, Guaje Mountain Quadrangle, 1984

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Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 1
Site Location Map

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 1 - Site Location Map.ai

N

Source: USGS Aerial Photograph for 1996 (from TerraServer).

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Los Alamos National Laboratory, U.S. Department of Energy

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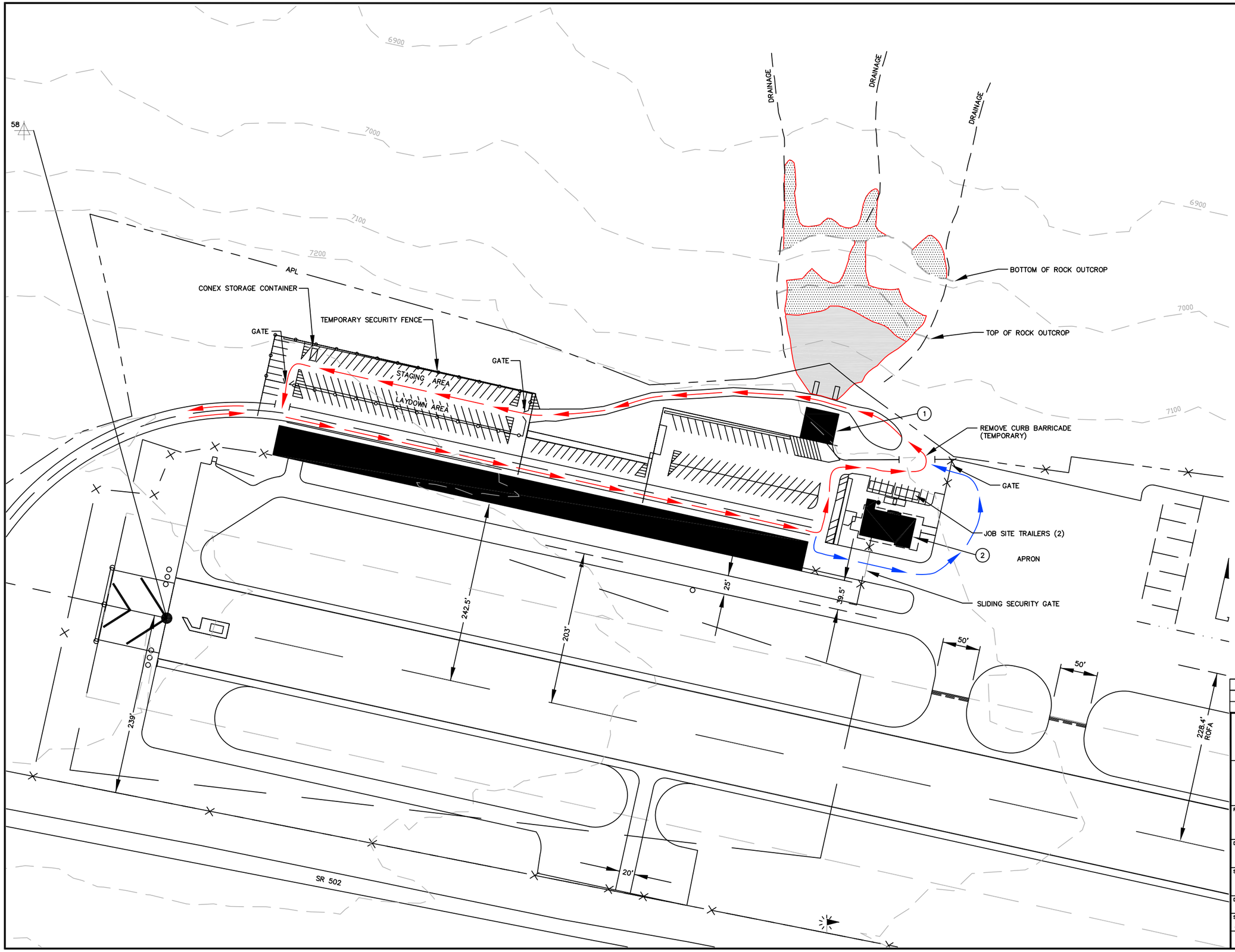
Figure 2
Site Layout

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 1 - Site Layout.ai



LEGEND

ITEM	EXISTING	FUTURE
AIRPORT PROPERTY LINE	APL	
AIRFIELD PAVEMENT		
TAXILANE OBJECT FREE LINE		
BUILDINGS		
8' CHAIN LINK FENCE		
TEMP. CHAIN LINK FENCE		
AIRPORT BEACON		
LIGHTED WIND CONE		
OBSTRUCTIONS		
CONTROL POINTS		
AIRPORT REFERENCE POINT (ARP)		
LIGHTED SEGMENTED CIRCLE AND WIND CONE		
THRESHOLD LIGHTS		
REIL		
VEHICLE PARKING		
BUILDING NBR.–BLDG. DATA TABLE	1	
HAUL ROUTE		
OPTIONAL HAUL ROUTE FOR LONGER TRUCKS (ONLY IF NECESSARY)		
APPROX. AERIAL EXTENT OF ASH		
APPROX. AERIAL EXTENT OF DEBRIS		

BUILDING DATA TABLE

BLDG #	DESCRIPTION
1	INCINERATOR BUILDING
2	TERMINAL BUILDING 73–1

VAR 11°7' E

AUGUST 1992
ANNUAL RATE OF CHANGE 0.1° W
SOURCE: ALBUQUERQUE SECTIONAL
November 1992

GRAPHIC SCALE IN FEET

60 0 60 120

FIGURE 3

REV	DATE	DESCRIPTION	DRAWN	APPR'D

ITSI Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, California 94598

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

PROJECT TITLE
LOS ALAMOS AIRPORT
LOS ALAMOS, NEW MEXICO

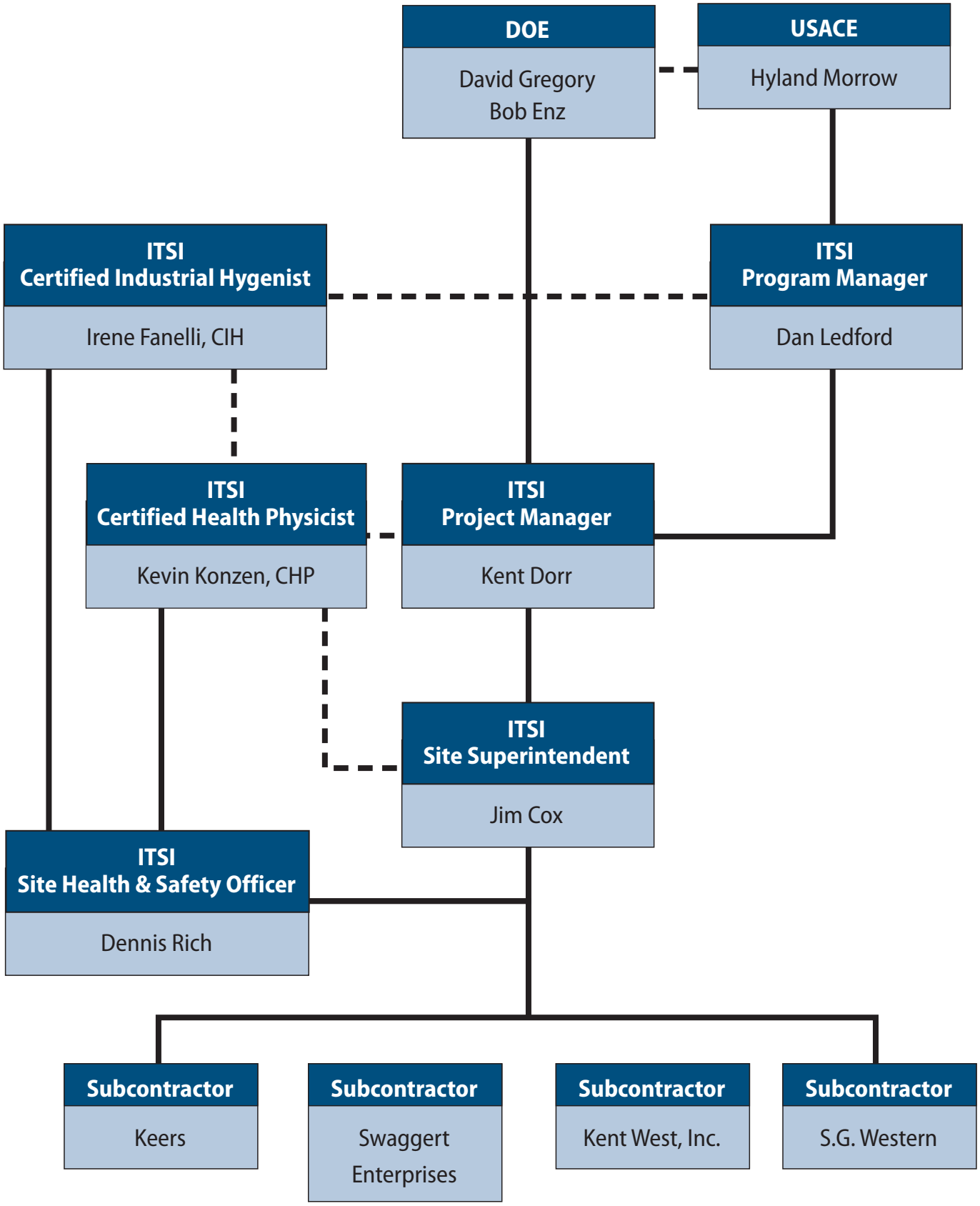
DRAWING TITLE
SITE PLAN WITH WORK AREAS

SUBMITTED	APPROVED	APPROVED
CHIEF ENGINEER	CIVIL ENGINEER	COMMANDER

DRAWN BY	DESIGNED BY	DATE	SHEET
RDB	JC	5–19–2005	

SCALE	ITSI PROJECT NO.	DRAWING NO.
AS NOTED	04.400.12.110	04400.12/GRAPHICS/CAD

FILE
SITE PLAN



Projects\2004\04-400 SPD PRAC\04-400.12 Los Alamos Ash Removal\Graphics\Project Org.ai

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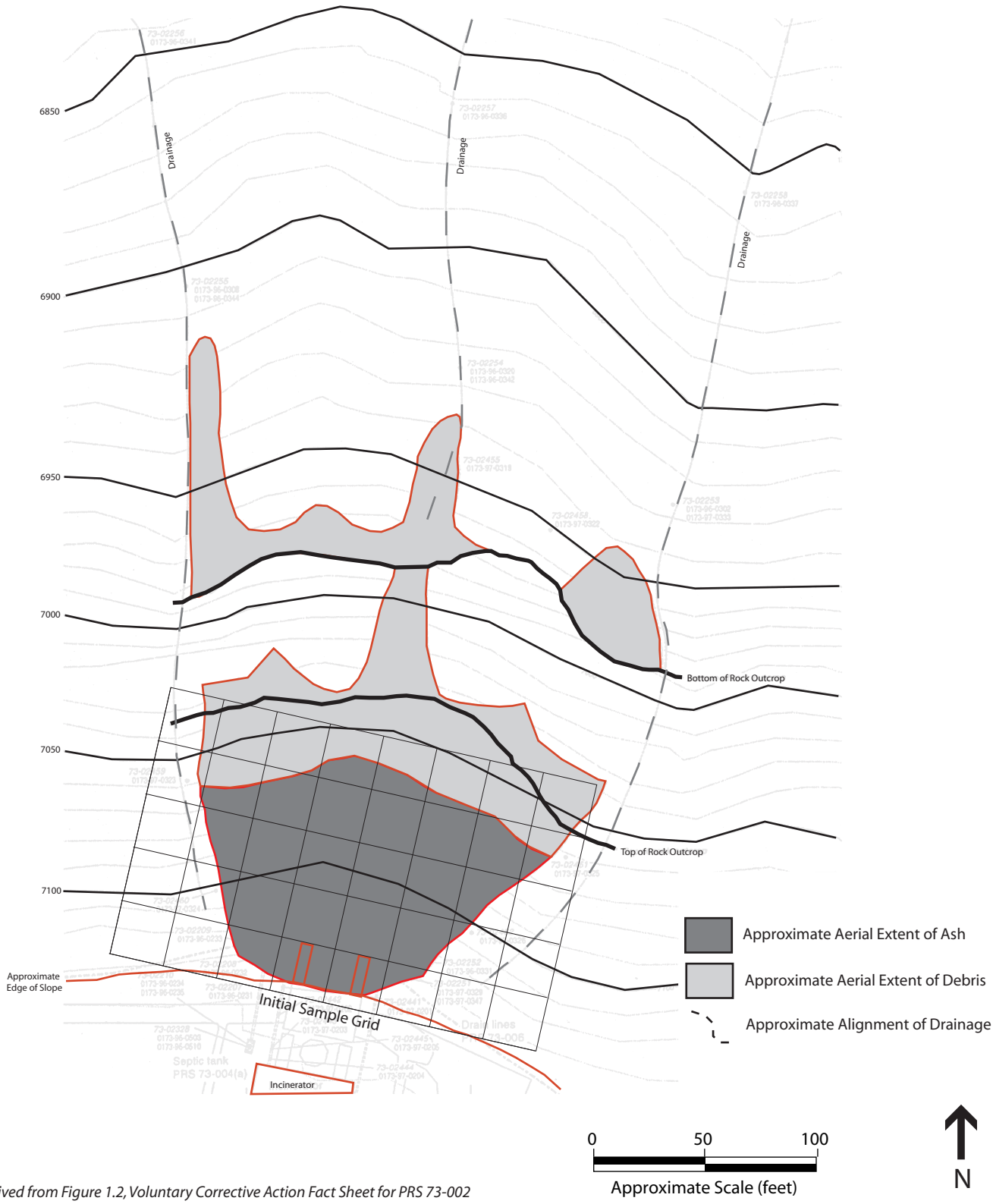
Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 4
Organization Chart



Source: Derived from Figure 1.2, Voluntary Corrective Action Fact Sheet for PRS 73-002

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Los Alamos National Laboratory, U.S. Department of Energy

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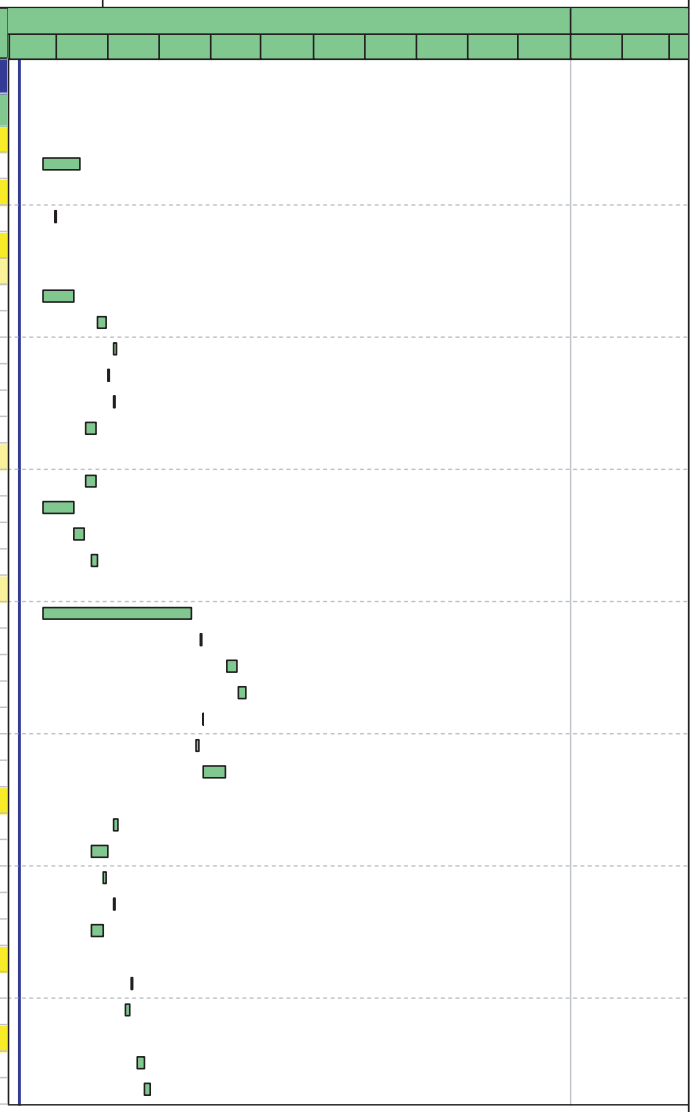
Figure 5
Distribution of Ash and Proposed Initial Sample Grid

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 5 - Distribution of Ash.ai

Los Alamos National Laboratory | SWMU 73-002

Activity ID	Activity Name	Original Duration	Physical % Complete	Start	Finish
Project: VCA for Construction Los Alamos Natl. Labs		234		21-Feb-05	12-Jan-06
WBS: Engineering		234		21-Feb-05	12-Jan-06
WBS: Kickoff Meeting & Site Visit		16		21-Feb-05	14-Mar-05
1.05	Kickoff Meeting & Site Visit - Sampling	16	0%	21-Feb-05*	14-Mar-05
WBS: Planning Communication & Management		1		28-Feb-05	28-Feb-05
1.10	Planning Communication & Management	1	0%	28-Feb-05	28-Feb-05
WBS: Plans		87		21-Feb-05	21-Jun-05
WBS: Waste Characterization Sampling Work Plan		32		21-Feb-05	05-Apr-05
2.01	Develop Waste Characterization Work Plan	15	0%	21-Feb-05	11-Mar-05
2.03	Incorporate USACE/DOE Comments	4	0%	25-Mar-05	30-Mar-05
2.07	Submit Final Sampling for Approval	2	0%	04-Apr-05	05-Apr-05
2.04	Submit Final Waste Characterization Work Plan	2	0%	31-Mar-05	01-Apr-05
2.05	Submit Final Waste Characterization WP to Disposal Facilities	1	0%	04-Apr-05	04-Apr-05
2.02	Submit Work Plan for Review	5	0%	18-Mar-05	24-Mar-05
WBS: Health & Safety Plan (SSHSP)		25		21-Feb-05	25-Mar-05
3.23	Complete Final SSHSP for Submittal & Approval Sigs	5	0%	18-Mar-05	24-Mar-05
3.19	Develop Site Specific Health & Safety Plan	15	0%	21-Feb-05	11-Mar-05
3.22	Incorporate USACE/DOE Comments	5	0%	11-Mar-05	17-Mar-05
3.24	Obtain USACE/DOE Approval Signatures	4	0%	22-Mar-05	25-Mar-05
WBS: Corrective Action Work Plan - Ash Removal		87		21-Feb-05	21-Jun-05
3.10	Develop Draft Corrective Action WP - Waste Sampling Results	65	0%	21-Feb-05	20-May-05
3.13	Incorporate Comments	2	0%	25-May-05	26-May-05
3.16	Incorporate USACE/DOE/Regulator Comments	5	0%	10-Jun-05	16-Jun-05
3.18	Public Meeting	3	0%	17-Jun-05	21-Jun-05
3.14	Submit Draft Final WP to USACE/DOE/Regulators	1	0%	27-May-05	27-May-05
3.12	USACE/DOE Review Draft CA Work Plan	2	0%	23-May-05	24-May-05
3.15	USACE/DOE/Regulators Review Draft CA Work Plan	10	0%	27-May-05	09-Jun-05
WBS: Site Access Request - Sampling		12		22-Mar-05	06-Apr-05
2.28	Radiological Work Permit Complete	3	0%	04-Apr-05	06-Apr-05
2.26	Radiological Work Permit Request Development	8	0%	22-Mar-05	31-Mar-05
2.27	Receive Site Access	2	0%	29-Mar-05	30-Mar-05
2.29	Received Radiological Work Permit	1	0%	04-Apr-05	04-Apr-05
2.25	Site Access Request	5	0%	22-Mar-05	28-Mar-05
WBS: Specialized Training - Sampling		5		11-Apr-05	15-Apr-05
2.31	8hr GET - Lead Awareness	2	0%	14-Apr-05	15-Apr-05
2.30	Rad Worker II Training	3	0%	11-Apr-05	13-Apr-05
WBS: Waste Characterization & Disposal Options - Sampling		48		11-Apr-05	15-Jun-05
2.13	Collect & Ship Samples	5	0%	18-Apr-05	22-Apr-05
2.14	Demobilize Sampling Team	2	0%	22-Apr-05	25-Apr-05



Actual Level of Effort | Remaining Work | Critical Remaining Work
Actual Work | Remaining Level of Effort | Milestone

Page 1 of 3

30-Mar-05 10:38

Contract No. DACA05-99-D-0014,

Task Order No. CM26 Baseline

Innovative Technical Solutions, Inc.

U.S. Army Corps of Engineers, Sacramento District

Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 6
Project Schedule

Los Alamos National Laboratory

SWMU 73-002

Activity ID	Activity Name	Original Duration	Physical % Complete	Start	Finish
2.17	Draft Waste Disposal Option Plan (WD04)	11	0%	13-May-05	27-May-05
2.19	Final Waste Disposal Option Plan	2	0%	06-Jun-05	07-Jun-05
2.12	Layout Survey Grid	2	0%	14-Apr-05	15-Apr-05
2.10	Mobilize Sampling Team for Training	1	0%	11-Apr-05	11-Apr-05
2.16	Review Analytical Data	3	0%	10-May-05	12-May-05
2.18	Review Draft Waste Disposal Option Plan	5	0%	30-May-05	03-Jun-05
2.15	Sample Analysis	15	0%	19-Apr-05	09-May-05
2.11	Sampling Readiness Review	1	0%	14-Apr-05	14-Apr-05
2.20	Submit Site Characterization Report	3	0%	08-Jun-05	10-Jun-05
2.21	Waste Profiling	3	0%	13-Jun-05	15-Jun-05
WBS: Site Access Request - Ash Removal		6		13-Jun-05	20-Jun-05
3.02	RWP Complete	2	0%	17-Jun-05	20-Jun-05
3.01	RWP Request Development	3	0%	14-Jun-05	16-Jun-05
3.00	Site Access Request	6	0%	13-Jun-05*	20-Jun-05
WBS: Work Plan Addendum		1		21-Jun-05	21-Jun-05
4.01	Work Plan Addendum	1	0%	21-Jun-05	21-Jun-05
WBS: Specialized Training - Ash Removal		5		22-Jun-05	28-Jun-05
4.14	8hr GET - Lead Awareness	2	0%	27-Jun-05	28-Jun-05
4.10	RadWorker II Training	3	0%	22-Jun-05	24-Jun-05
WBS: Mob & Site Readiness - Ash Removal		19		27-May-05	22-Jun-05
4.08	Ash Removal Readiness Review	1	0%	22-Jun-05	22-Jun-05
4.03	Assessment Pattern of Wildlife/Environmental Concerns	8	0%	27-May-05	07-Jun-05
4.07	Secure Site	0	0%	22-Jun-05	
WBS: Ash Removal Activities		108		27-Jun-05	23-Nov-05
4.43	Ash Removal	57	0%	14-Jul-05	30-Sep-05
4.42	Debris & Removal	10	0%	18-Jul-05	29-Jul-05
4.45	Demobilization/Ash Removal Team	1	0%	23-Nov-05	23-Nov-05
4.34	Kickoff Meeting & Site Visit - Ash Removal	1	0%	27-Jun-05	27-Jun-05
4.39	Mobilize Exavator Unit	15	0%	18-Jul-05	05-Aug-05
4.35	Mobilize Field Staff	5	0%	07-Jul-05	13-Jul-05
4.36	Mobilize Skyline Unit	5	0%	11-Jul-05	15-Jul-05
4.38	Mobilize Vacuum Unit	5	0%	11-Jul-05	15-Jul-05
4.44	Site Restoration	7	0%	15-Nov-05	23-Nov-05
WBS: Confirmation Sampling - Post Ash Removal		74		03-Oct-05	12-Jan-06
4.49	Analyze Samples	15	0%	18-Oct-05	07-Nov-05
4.52	Corrective Action Report	1	0%	15-Nov-05	15-Nov-05
4.54	DOE/USACE Review Correction Action Report	10	0%	21-Nov-05	02-Dec-05
4.53	Draft Correction Action Report	3	0%	16-Nov-05	18-Nov-05
4.55	Draft Final Corr. Action Report DOE/USACE/Regulators	2	0%	05-Dec-05	06-Dec-05
4.57	Final Corr. Action Reports DOE/USACE/Regulators	1	0%	21-Dec-05	21-Dec-05

Actual Level of Effort
Actual Work
Remaining Work
Remaining Level of Effort
Critical Remaining Work
Milestone

Page 2 of 3

30-Mar-05 10:38

Contract No. DACA05-99-D-0014,

Task Order No. CM26 Baseline

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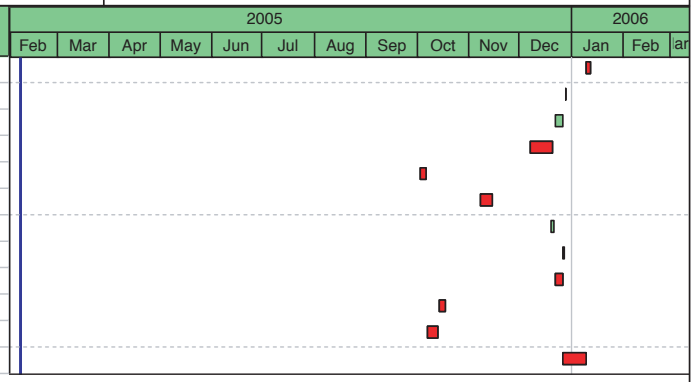
SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 6
Project Schedule

Los Alamos National Laboratory

SWMU 73-002

Activity ID	Activity Name	Original Duration	Physical % Complete	Start	Finish
4.60	Final Report for Approval	3	0%	10-Jan-06	12-Jan-06
4.64	Final Report for Approval	1	0%	28-Dec-05	28-Dec-05
4.62	Generate Final Site Characterization Report	3	0%	22-Dec-05	26-Dec-05
4.56	Incorporate Comments by DOE/USACE/Regulators	10	0%	07-Dec-05	20-Dec-05
4.46	Mobilize Sampling Team	4	0%	03-Oct-05	06-Oct-05
4.50	Record Results	5	0%	08-Nov-05	14-Nov-05
4.61	Review Data/Initiate Final Site Characterization Report	2	0%	20-Dec-05	21-Dec-05
4.63	Submit Final Site Characterization Report	1	0%	27-Dec-05	27-Dec-05
4.58	Submit Report for Review	3	0%	22-Dec-05	26-Dec-05
4.48	Submit Samples	2	0%	14-Oct-05	17-Oct-05
4.47	Take Confirmation Samples	5	0%	07-Oct-05	13-Oct-05
4.59	USACE/DOE Review	10	0%	27-Dec-05	09-Jan-06



Actual Level of Effort
Actual Work
Remaining Work
Remaining Level of Effort
Critical Remaining Work
Milestone

30-Mar-05 10:38

Contract No. DACA05-99-D-0014,

Task Order No. CM26 Baseline

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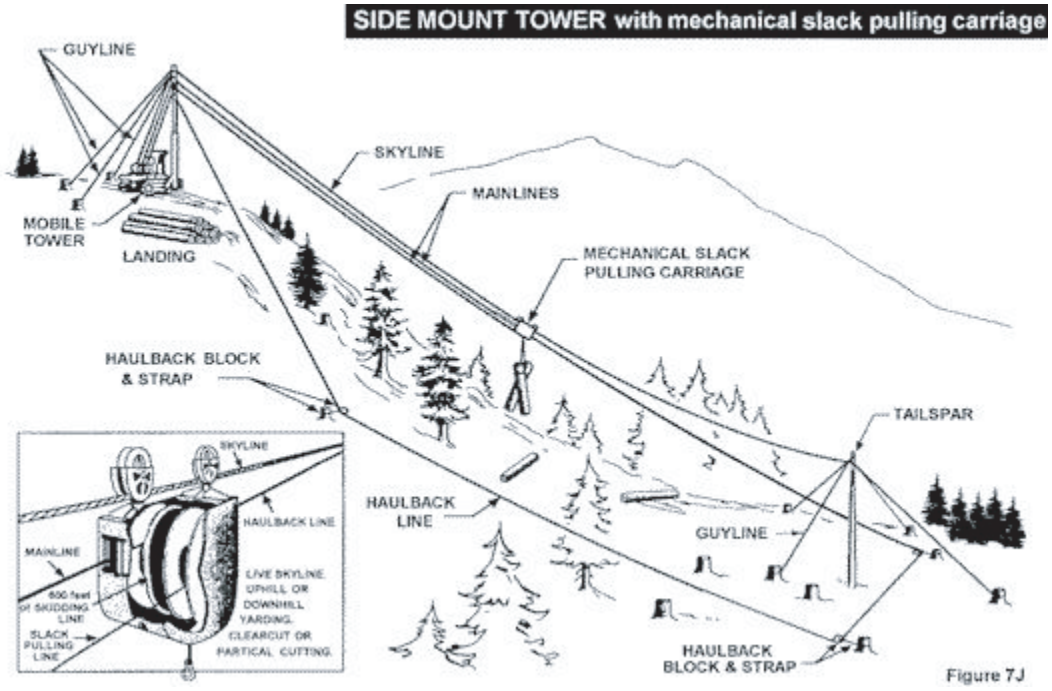
Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 6
Project Schedule



04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 7- Skyline Diagram.ai

ITSI Innovative Technical Solutions, Inc.	**U.S. Army Corps of Engineers, Sacramento District** **Los Alamos National Laboratory, U.S. Department of Energy** **SWMU 73-002, Los Alamos National Laboratory, New Mexico**	**Figure 7** **Skyline Diagram**

APPENDIX A

SAMPLING AND ANALYSES PLAN

SAMPLING AND ANALYIS PLAN FOR CONFIRMATORY SAMPLING

Corrective Action for SWMU 73-002
(Incinerator Ash Removal)
Los Alamos National Laboratory, New Mexico

Contract No. DACA05-99-D-0014
Task Order CM26

Prepared for:

United States Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

And

Los Alamos National Laboratory
National Nuclear Security Administration, US Department of Energy
P.O. Box 1663 MS-A316
Los Alamos, NM 87544

Prepared by:

Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, CA 94598

May 2005 (Updated by K. Konzen on 5/26/05 at 17:00 MST)
ITSI Project No: 04-400.12

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ACRONYMS AND ABBREVIATIONS

lbs/ft^3	pounds per cubic feet
mg/kg	milligrams per kilogram
yd^3	cubic yards
CCA	comprehensive certificate of analysis
CDQMP	Chemical Data Quality Management Plan
COC	Chain of Custody
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
EDDs	electronic data deliverables
ID	identification number
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
MDA	minimum detectable activity
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
Pb	lead
PCB	polychlorinated biphenyl
PQL	Practical Quantitation Limit
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RPD	relative percent difference
RL	reporting limit
SAP	Sampling and Analysis Plan
SEDD	Staged Electronic Data Deliverable
SOP	standard operating procedures
SVOC	semi-volatile organic compounds
SWMU	Solid Waste Management Unit
TCLP	toxicity characteristic leaching procedure
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
XRF	x-ray fluorescence

1.0 INTRODUCTION

Innovative Technical Solutions, Inc. (ITSI) has been contracted by U.S. Army Corps of Engineers, Sacramento District (USACE) to remove and properly dispose of ash located on the slope of Pueblo Canyon adjacent to the Los Alamos Airport on behalf of the National Nuclear Security Administration, U.S. Department of Energy (DOE). The ash was generated from the operation of a small incinerator located immediately adjacent to the ash.

To support the removal and proper disposal of the ash, the ash was sampled in April 2005 to properly characterize the ash for disposal purposes and to evaluate health and safety requirements associated with working with the ash during the removal process on the steep slope where it is located.

Upon completion of the removal of the ash, confirmation samples are needed to confirm that the extent of the excavation was sufficient to remove the ash and that no migration of contaminants from the ash to the surrounding soils has occurred. This Sampling and Analysis Plan (SAP) provides the details of the proposed sampling activities and subsequent analyses of the samples. This SAP includes the requirements for a field sampling plan (FSP) and a quality assurance project plan (QAPP).

1.1 BACKGROUND

Solid Waste Management Unit (SWMU) 73–002–99 is comprised of Potential Release Sites (PRS) 73–002, 73–003, 73–004 (a, b), and 73–006. The Correction Action is for SWMU 73-002, a small incinerator operated for a short time at the site beginning in 1947. The incinerator's primary use was for the destruction of classified documents, however, it did not function properly and was removed from service shortly after completion.

In 1948, The Zia Company acquired the facility, which it held until 1973 and operated the incinerator for other than classified sanitary waste. The stack and equipment have been removed from the building, which is currently in use as a storage facility

The ash is located on the south slope of Pueblo Canyon, immediately north of the incinerator building. The ash covers an area of approximately 30,000 square foot, and ranges in thickness from less than one foot to greater than eight feet (Voluntary Corrective Action Fact Sheet for PRS 73–002).

Sampling was conducted of the ash pile generated by operations of the incinerator and within the associated drainages in 1996, 1997, and 1998. A preliminary review of the resulting data tentatively identified several potential contaminants of concern. In general, high concentrations of several inorganic chemicals have been noted in the ash samples but not in soil and sediment (non-ash) samples, with concentrations of lead as high as 13,100 milligrams per kilogram (mg/kg). The ash also contains low concentrations of several organic chemicals including, but not limited to, pesticides and dioxins/furans. Low levels of several radiological constituents have been detected in a limited number of ash samples.

Sampling and analysis of the ash was conducted in April 2005 to adequately profile the material for waste disposal. The results and an evaluation of the results for purposes of disposal characterization are presented in a technical memorandum currently being prepared.

1.2 OBJECTIVE OF SAMPLING PROGRAM

The principal objective of the sampling program is to provide a sufficient number and types of analyses to confirm that the ash has been removed, and to verify components of the ash have not migrated into the underlying soils. The confirmation sample results may be used to support decisions for final closure of the site consistent with State of New Mexico and federal requirements.

2.0 FIELD SAMPLING PLAN

The general approach of the sampling program that will be conducted is described below.

- Delineate the approximate footprint where the ash was located using visual observations and survey coordinates from April 2005 ash sampling event.
- Choose a random location within 30 feet of one of the edges of the footprint. Establish the sampling grid to cover the footprint in a 30-foot by 30-foot grid, with the grid extending a minimum of one grid unit outside the footprint of the ash along the slope and down the slope from the former footprint of the ash.
- Collect samples based on the established grid using either shallow soil sampling technique (using scoop or thin-wall tube sampler techniques or similar). If the soil is deeper than 2 feet at any given sample location, an additional sample will be colleted 2 feet below the first.
- Collect soil samples from any areas of visible stained soil.
- Screen samples onsite using field screening techniques.
- Submit samples to Sample Management Office (SMO) for analysis (as negotiated, LANL is managing the laboratory analysis for this project, and ITSI will utilize their paperwork and procedures, where possible, to facilitate the process).
- Once analytical results are available, evaluate the results relative to data quality objectives specified in Section 3.1.

2.1 ESTABLISHING THE SAMPLING GRID

Figure 1 shows the proposed sampling grid for the confirmation sampling effort. The grid will be based on approximately 30-foot square grids. The sampling grid will be established using a randomly selected point within 30 feet of the edge of the former ash footprint. The grid will then be established off of this point, and will extend at least one full grid beyond the edge of the former footprint along the slope and down the slope from the former footprint of the ash.

2.2 COLLECTING THE SOIL SAMPLES

Samples will be collected from the approximate center of each grid. Where inadequate soil exists, the sample location will be moved in the down slope direction, staying within the grid, until sufficient soil is present to sample. If inadequate soil persists, the sample will be collected from the location closest to the center of the grid where adequate soil is present. Sample

locations will be designated using stakes and flags, and each location will be surveyed.

Samples will be collected in a manner consistent primarily with Los Alamos National Laboratory's (LANL) Standard Operating Procedures (SOPs), and ITSI's Chemical Data Quality Management Plan (CDQMP) (reviewed and approved by USACE Sacramento District for use under the PRAC).

Soil samples will be collected using a stainless steel or disposable trowel (SOP–06.09) within the top few inches from within each sample grid. If the soil is deeper than 2 feet at any given sample location, an additional sample will be colleted 2 feet below the first. Samples will also be collected from any areas where stained soil is observed.

Samples will be transferred into appropriate containers provided by the Sample Management Office (SMO). Samples will be labeled with unique sample identification number (ID) for each location and depth. Following labeling, samples will be placed in re-sealable plastic bags and transferred to the SMO under proper chain-of-custody (COC) procedures (consistent with SOP–15.09).

Sampling equipment will be decontaminated following each use by washing in a non-phosphate detergent, water rinse, and a distilled or de-ionized water rinse (consistent with SOP–01.08).

2.3 FIELD SCREENING OF SAMPLES

Samples will be field screened for lead (Pb) and selected other metals using field portable x-ray fluorescence (XRF). Based on a review of available laboratory results from previous sampling efforts, the ash contains measurable concentrations of Pb, other metals and radiological isotopes. Tentative screening criteria have been developed (Table 7) that should allow for screening of the soils prior to collecting formal confirmation samples.

Once screened, the samples will be packaged. A radiological survey will be performed external to the packaging by LANL (LANL is providing the onsite radiological monitoring and safety

oversight) and authorize delivery to the SMO for analysis.

2.4 ANALYTICAL CRITERIA

Confirmation samples will be analyzed for the following:

- Semi-volatile Organic Compounds (SVOCs) by EPA Method 8270C
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082
- Dioxins and Furans by EPA Method 8290
- Metals (Total) by EPA Method 6010B/7471
- Gross Alpha, Beta and Gamma by EPA Method 9310
- Alpha and Gamma Spectroscopy
- Specific Radioisotope analyses (based on previous detections)
  - Americium 241
  - Cesium 137
  - Plutonium (Pu-238, 239/240)
  - Radium 226
  - Uranium (U-234, 235, 238)

Table 1 provides the analytical methods and reporting limits for the above analyses. The reporting limits were established consistent with those from previous studies. Radiological levels were established based on 1/2 previously reported levels for the ash, and below background values. Table 2 provides the sample volumes and containers needed for the selected analyses (consistent with LANL ER–SOP–01.02).

2.5 QUALITY CONTROL SAMPLES

Quality control (QC) samples consisting of field duplicate samples, matrix spike/matrix spike duplicate (MS/MSD) samples, and equipment blanks (if applicable), will be collected as part of the sampling activity. QC samples will be collected as described below, and will be packaged, labeled, handled, and transported in the same manner as the primary samples. Field QC samples and frequencies are listed in Table 3 (consistent with LANL ER–SOP–01.05).

2.5.1 Quality Assurance Samples

At the sole discretion of USACE and/or DOE, duplicate samples may be collected at a frequency of 5% (one duplicate sample will be collected for every 20 primary samples collected) and sent to an alternate laboratory for independent comparison of results. These split samples will be labeled in the same manner as the primary samples, and will be recorded on a separate COC

form for shipment to the designated alternate laboratory.

2.5.2 Field Duplicate Samples

Field duplicate samples will be collected as part of the normal QA/QC procedures at a frequency of 5% of the primary samples for each analytical method (consistent with LANL ER–SOP–01.05). Each duplicate sample will be collected from a location as close to the primary sample as possible.

2.5.3 Matrix Spike/Matrix Spike Duplicate Samples

At a frequency of 5% (one per every 20 primary samples submitted to the laboratory), a sample will be provided in sufficient quantity to allow sample analysis, MS/MSD analysis, and re-extraction/re-analysis of the MS/MSD. Field blanks will not be used for MS/MSD analysis.

2.5.4 Equipment Rinse Blanks

Equipment rinse blank samples will be collected at a frequency of 5% (one per every 20 samples) (consistent with LANL ER–SOP–01.05). Equipment rinse blanks will be collected for any non-disposable sampling equipment used. The rinse blank samples will be collected by pouring analyte-free source water over the sampling equipment that comes in direct contact with the environmental sample. Equipment rinse blank samples will be used to assess the efficiency of the decontamination process and possible cross-contamination between environmental samples. Rinse blank samples will be collected and analyzed for the same constituents as the primary sample. Due to differences between the sample matrix (e.g., solids) and the equipment rinse, the analytical method for the equipment rinse may be different than that of the primary sample. A comparable analytical method will be used in these instances for the equipment rinse blanks.

2.6 RECORDKEEPING

2.6.1 Sample Labels

Samples will be labeled for identification. Pre-printed sample labels will be provided by LANL SMO. Labels will be secured to the sample container with clear tape wider than the label itself before the samples are packaged for transportation to the laboratory. At a minimum, labels will contain the information listed below.

- Sample identification number
- Sample location
- Date and time of collection
- Initials of the person collecting the sample
- Analysis requested
- Preservation method
- Any other information pertinent to the sample.

2.6.2 Chain of Custody/Documentation

The purpose of sample custody procedures is to maintain the integrity of field samples throughout field activities, from the point of collection through delivery to and acceptance by the laboratory. Sample collection activities will be documented using COC procedures consistent with LANL ER–SOP–15.09.

Chain of Custody Records

A COC form will be completed and will accompany each group of samples sent to the laboratory to document sample possession from the time of collection to sample receipt. The COC form will contain information listed below.

- Sample number or identification
- Name and signature of the collector, sampler, or recorder
- Name and location of the project
- Date of sample collection
- Sample matrix
- Preservative type, if any
- Analyses requested
- Signatures of the persons relinquishing and receiving the samples
- Date and time of laboratory receipt of the samples.

Field Logbook

Daily field activities and relevant sampling information will be documented in a field logbook. The field team involved in the collection of data in the field will maintain the logbook with serially numbered pages, consistent with requirements in the CDQMP (ITSI, 1999). The logbook will be signed and dated each day before field work begins. Logbook corrections will be made by striking out the incorrect entry with a single line and entering the correct information. The person making the entry will initial and date the correction. Unused partial logbook pages will be crossed out and signed and dated at the end of each workday. Entries must be legible, in ink, and factual in content.

Logbook entries may include the following information, as appropriate:

- Project name and number
- Site name and location
- Arrival and departure dates/times for project personnel
- Names and affiliations of personnel on site, and any other individuals or organizations contacted
- Author's name and date
- Field instruments, calibration methods and equipment identification numbers
- Chronology, locations, and descriptions of activities conducted
- Sampling locations
- Sample identification numbers
- Sample type and amount collected
- Date and time of sample collection
- Name of sampler
- Sampling method and container (size/type) for each sample collected, including QC samples. (Alternatively, this information may be contained on the COC form, soil sampling form, or other field form. The logbook will then contain a unique identifier linking the field logbook entry to the field form).
- Field observations and appropriate comments
- Modifications to or deviations from the Work Plan.

3.0 QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance Project Plan (QAPP) presents the Data Quality Objectives (DQOs), procedures for sample custody and holding, laboratory analytical methods, and general QC procedures for this project. This QAPP was prepared in accordance with ITSI's Chemical Data Quality Management Plan (CDQMP) (ITSI, 1999).

3.1 DATA QUALITY OBJECTIVES

The following table is a brief description of the seven-step DQO process used in developing the scope of work outlined in the FSP.

Step 1: State the Problem
1. Analytical results demonstrating that ash removal has been completed are required, and identify potential migration of contaminants into underlying native soils.
Step 2: Identify the Decisions
Study Questions: 1) What characteristics of the ash may be used as markers to confirm adequate removal and identify potential migration? Decisions: 1) Assess concentrations of target compounds to confirm that ash removal goals has been met and no contaminants have impacted native soils.
Step 3: Identify Inputs to Decisions
Inputs for Study Question 1 include: Historical data from previous investigations, analytical data collected during the April 2005 sampling event and analytical data collected in accordance with this SAP, which will identify concentrations of metals that can be used as markers to confirm ash removal and assess vertical migration of contaminants.
Step 4: Define Study Boundaries
The physical limits of the study area are just beyond the physical limits of the ash, as confirmed through visual inspection, and unimpacted areas that are to be sampled to determine background concentrations. This study is limited to approximately 100 samples.

Step 5: Develop Decision Rules
Decision 1: Assess concentrations of target compounds to confirm that ash removal goals have been met. Decision Rule 1:Are the concentrations of lead (Pb) and zinc (Zn) below background concentrations? If yes, then the ash has been confirmed to have been removed. If no, and the visual inspection at that location indicates that the ash is no longer present, then the presumption will be that some contaminants migrated from the ash to the surrounding soil. Decision 2: Soil samples will be taken and analyzed for target compounds. Decision Rule 2: Are the levels of target compounds present in the soil indicating that compounds from the ash have migrated into the surrounding soil? If no, then the results of the confirmation samples and the corresponding background samples will be forwarded to a final closure study. If yes, then a recommendation for possible further soil remediation may be determined.
Step 6: Specify Tolerable Limits on Decision Errors
In order to support the project purposes, the data generated from this sampling effort needs to be accurate and reliable. All samples collected for this activity will be analyzed in accordance with accepted methods and protocols. The precision, accuracy, and sensitivity requirements for the laboratory data generated during this sampling effort will be in accordance with the published requirements for each method.. Decision errors will be considered tolerable when data meet stated goals for precision, accuracy, representativeness, completeness, and comparability (collectively known as PARCC parameters). Data associated with precision and accuracy results outside acceptance criteria will be evaluated for usability.
Step 7: Optimize Sampling Design
The sampling locations for this effort will be established at the perimeter of the excavated ash, as identified during previous sampling efforts. A sampling grid will be established at the site based on an anticipated 30-foot grid.

3.2 SAMPLE CUSTODY AND HOLDING TIMES

As samples are collected, they will be logged on a COC form. COC procedures are addressed in Section 2.6.2 above.

3.3 ANALYTICAL PROCEDURES

Field screening will be performed using an XRF to provide real-time semi-quantitative results for metals. Table 4 provides the calibration procedure and precision requirements for this field-screening instrument.

Laboratory analyses will be coordinated by LANL SMO. Thus, sections of this QAPP dealing with laboratory selection and specific QC requirements of the laboratory and individual methods are not included here. However, specific quality assurance project goals are presented in Tables 5 and 6 to insure the objectives of the sampling program are met. The analytes and methods for the project are listed below.

- SVOCs by EPA Method 8270C
- PCBs by EPA Method 8082
- Dioxins and Furans by EPA Method 8290
- Metals (Total) by EPA Method 6010B/7471
- Gross Alpha, Beta and Gamma by EPA Method 9310
- Alpha and Gamma Spectroscopy
- Specific Radioisotope analyses (based on previous detections):
  - Americium 241
  - Cesium 137
  - Plutonium (Pu-238, 239/240)
  - Radium 226
  - Uranium (U-234, 235, 238)

3.4 REPORTING LIMITS

Project-required reporting limits (RLs) are provided in Table 1. Where appropriate, the practical quantitation limit (PQL) will be a minimum of 2 to 5 times lower than the RL, and the minimum detectable activity (MDA) should be a minimum of 2 times lower than the RL.

4.0 DATA REDUCTION, VALIDATION, AND REPORTING

Only data necessary for the purposes of this project will be collected. Necessary data include the laboratory analyses for target analytes. One hundred percent of the laboratory-generated data will be evaluated by ITSI upon receipt of the results from LANL.

4.1 COMPREHENSIVE CERTIFICATES OF ANALYSIS

The project laboratories will report all analytical results in the form of comprehensive certificates of analysis (CCAs). Each CCA will include the field sample ID, the corresponding laboratory ID, and a clear association to the applicable preparation and method QA/QC batch results. Each CCA will also contain a case narrative.

Case narratives will be written on laboratory letterhead and the laboratory manager or his/her designee will authorize the release of data. Items to be included in the case narrative include the items listed below.

- The field sample ID with the corresponding laboratory ID
- Analytic parameters for each sample and the methodology used (USEPA method numbers or other citation)
- A statement on the status of samples analyzed with respect to holding times (met or exceeded)
- A detailed description of all problems encountered
- A discussion of possible reasons for out-of-control QA/QC criteria
- Observations regarding any occurrences which may effect sample integrity or data quality

4.2 ELECTRONIC DATA DELIVERABLES

Use of electronic data deliverables (EDDs) and electronic data validation promotes objectivity, substantially reduce costs, and facilitate data exchange. EDDs will be provided in a format consistent with LANL requirements.

4.3 DATA VALIDATION REPORTS

Formal Level 3 Verification or Level 4 Validation will be performed for the confirmation samples, as appropriate to the level of detail contained in the laboratory report. Table 8 provides an overview of the validation procedures, and Table 9 provides the appropriate qualifiers applied

during the validation process. All laboratory data will be reviewed for completeness and to insure the data is adequate for its intended purposes. A data usability summary will then be provided in the Final Report.

4.4 FINAL REPORT

The sample results from confirmation samples collected in accordance with this SAP will be included as part of the Corrective Action Report.

5.0 REFERENCES

Innovative Technical Solutions, Inc. (ITSI), 1999. Chemical Data Quality Management Plan, SmART (Small Action Remediation Type) Services Contract No. DACA05-98-R-0007. September 21.

U.S. Environmental Protection Agency (USEPA), 1986. Test Methods for Evaluating Solid Wastes–Physical/Chemical Methods, SW-846, Office of Solid Waste and Emergency Response, USEPA, Washington, D.C., 3rd Edition, September 1986 (including Update III, January 1995).

U. S. Department of Energy, Environmental Measurements Laboratory (EML), 1997, HASL-300; EML Procedures Manual, 28th Edition

Table 1

Analytical Methods, Parameters for Analysis, and Reporting Limits

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 8082: Polychlorinated Biphenyls		
Aroclor 1016	1.0	500
Aroclor 1221	1.0	500
Aroclor 1242	1.0	500
Aroclor 1248	1.0	500
Aroclor 1254	1.0	500
Aroclor 1260	1.0	500
EPA Method 8270C: Semivolatile Organic Compounds		
Acenaphthene	10	330
Acenaphthylene	10	330
Anthracene	10	330
Benzoic acid	50	1,660
Benzo[a]anthracene	10	330
Benzo[b]fluoranthene	10	330
Benzo[k]fluoranthene	10	330
Benzo[g,h,i]perylene	10	330
Benzo[a]pyrene	10	330
Benzyl alcohol	10	330

Table 1 (Continued)

Analytical Methods, Parameters for Analysis, and Reporting Limits

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 8270C: Semivolatile Organic Compounds		
Bis(2-chloroethoxy)methane	10	330
Bis(2-chloroethyl)ether	10	330
Bis(2-ethylhexyl)phthalate	10	330
4-Bromophenyl phenyl ether	10	330
Butylbenzylphthalate	10	330
4-Chloroaniline	10	330
4-Chloro-3-methylphenol	10	330
2-Chloronaphthalene	10	330
2-Chlorophenol	10	330
4-Chlorophenyl phenyl ether	10	330
Chrysene	10	330
Dibenzo(a,h)anthracene	10	330
3,3'-Dichlorobenzidine	20	660
Dibenzofuran	10	330
1,2-Dichlorobenzene	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	10	330
2,4-Dichlorophenol	10	330
Diethylphthalate	10	330
2,4-Dimethylphenol	10	330
Dimethyl phthalate	10	330
Di-n-butylphthalate	10	330
4,6-Dinitro-2-methylphenol	50	1,660
2,4-Dinitrophenol	50	1,660
2,4-Dinitrotoluene	10	330
2,6-Dinitrotoluene	10	330

Table 1 (Continued)

Analytical Methods, Parameters for Analysis, and Reporting Limits

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
Di-n-octyl phthalate	10	330
Fluoranthene	10	330
Fluorene	10	330
Hexachlorobenzene	10	330
Hexachlorobutadiene	10	330
Hexachlorocyclopentadiene	10	330
Hexachloroethane	10	330
Indeno(1,2,3-cd)pyrene	10	330
Isophorone	10	330
2-Methylnaphthalene	10	330
2-Methylphenol	10	330
4-Methylphenol	10	330
Naphthalene	10	330
2-Nitroaniline	50	1,660
3-Nitroaniline	50	1,660
4-Nitroaniline	50	1,660
Nitrobenzene	10	330
2-Nitrophenol	10	330
4-Nitrophenol	50	1,660
N-Nitrosodiphenylamine	10	330
N-Nitroso-di-n-propylamine	10	330
2,2'-Oxybis(1-chloropropane)	10	330
Pentachlorophenol	50	1,660
Phenanthrene	10	330
Phenol	10	330
Pyrene	10	330

Table 1 (Continued)

Analytical Methods, Parameters for Analysis, and Reporting Limits

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
1,2,4-Trichlorobenzene	10	330
2,4,5-Trichlorophenol	10	330
2,4,6-Trichlorophenol	10	330
EPA Method 8290: Dioxins and Furans		
2,3,7,8-TCDF	0.00001	0.001
1,2,3,7,8-PeCDF	0.00001	0.001
2,3,4,7,8-PeCDF	0.00001	0.001
1,2,3,4,7,8-HxCDF	0.00001	0.001
1,2,3,6,7,8-HxCDF	0.00001	0.001
1,2,3,7,8,9-HxCDF	0.00001	0.001
2,3,4,6,7,8-HxCDF	0.00001	0.001
1,2,3,4,6,7,8-HpCDF	0.00001	0.001
1,2,3,4,7,8,9-HpCDF	0.00001	0.001
OCDF	0.00001	0.001
2,3,7,8-TCDD	0.00001	0.001
1,2,3,7,8-PeCDD	0.00001	0.001
1,2,3,4,7,8-HxCDD	0.00001	0.001
1,2,3,6,7,8-HxCDD	0.00001	0.001
1,2,3,7,8,9-HxCDD	0.00001	0.001
1,2,3,4,6,7,8-HpCDD	0.00001	0.001
OCDD	0.00001	0.001

Table 1 (Continued)

Analytical Methods, Parameters for Analysis, and Reporting Limits
Chemical Data Quality Management Plan

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 6010B/6020: Metals by ICP		
Aluminum	50	50,000
Antimony	5.0	500
Arsenic	5.0	500
Barium	20	2,000
Beryllium	3.0	300
Cadmium	2.5	250
Calcium	500	50,000
Chromium	5.0	500
Cobalt	70	7,000
Copper	60	6,000
Iron	70	7,000
Lead	5.0	500
Magnesium	500	50,000
Manganese	20	2,000
Molybdenum	80	8,000
Nickel	40	15,000
Potassium	500	50,000
Selenium	5.0	500
Silver	70	7,000
Sodium	500	50,000
Thallium	2.0	1,000
Vanadium	4.0	400
Zinc	50	5,000

Table 1 (Continued)

Analytical Methods, Parameters for Analysis, and Reporting Limits
Chemical Data Quality Management Plan

Method and Parameters	Reporting Limit	
	Water (µg/L)	**Soil** (µg/kg)
EPA Method 7470A/7471A		
Mercury	0.2	100
Radiochemistry	**pCi/g**	**pCi/g**
Gross alpha, beta and gamma	10/10/5	10/10/5
Gamma spectroscopy	1	1
Specific radioisotopes		
- Americium 241	0.013	0.013
- Cesium 137	0.1	0.1
- Plutonium 238, 239/ 240	0.01	0.01
- Radium 226	0.1	0.1
- Uranium 234, 235, 238	0.01	0.01

(1) Reporting Limits (RLs) in this table are typical values. Variations between different labs, techniques, equipment, etc may be permitted. Permissible RL values must be examined on an individual project basis.

Table 2

Sample Preservation and Storage Requirements

Method Number	Parameters	Matrix	Holding Time (from sample date)	Containers	Preservative	Minimum Sample Size
8082	Polychlorinated Biphenyls	water	extraction - 7 days analysis - 40 days	1.0 liter glass	Store at 4 deg C	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	8-ounce glass jar or stainless steel tube	Store at 4 deg C	500 g
8270C	Semivolatile Organic Compounds	water	extraction - 7 days analysis - 40 days	1.0 liter glass	Store at 4 deg C	2 X 1.0 L
		soil	extraction - 14 days analysis - 40 days	8-ounce glass jar or stainless steel tube	Store at 4 deg C	500 g
8290	Dioxins and Furans	water	extraction - 30 days analysis - 45 days	1.0 liter glass	Store at 4 deg C	2 X 1.0 L
		soil	extraction - 30 days analysis - 45 days	8-ounce glass jar or stainless steel tube	Store at 4 deg C	500 g

Table 2 (Continued)

Sample Preservation and Storage Requirements

Method Number	Parameters	Matrix	Holding Time (from sample date)	Containers	Preservative	Minimum Sample Size
6010B/6020	Metals by ICP	water	analysis - 6 months	500 mL plastic (a)	Nitric acid to pH < 2	500 mL
		soil	analysis - 6 months	8-ounce glass jar or stainless steel tube	Store at 4 deg C	250 g
7471A	Mercury by CVAA	water	analysis - 28 days	500 mL plastic (a)	Nitric acid to pH < 2	500 mL
		soil	analysis - 28 days	8-ounce glass jar or stainless steel tube	Store at 4 deg C	500 g
	Radiochemistry	water	analysis – 6 months	1.0 liter plastic	Nitric acid to pH < 2	1 L
		soil	analysis – 6 months	8-ounce glass jar or stainless steel tube	Store at 4 deg C	500 g

(a) = The following methods can be sampled together in a 1.0 L plastic container preserved with nitric acid: 6010A, 6020, 7041, 7060A, 7421, 7740, 7841, and 7471A

Table 3

Summary of External (Field) QC Samples

Method Number	Parameters	Trip Blanks	Equipment Rinse Blanks	Field Water Blanks	QA Samples (if requested)	Field Duplicates
8082	Polychlorinated Biphenyls	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
8270C	Semivolatile Organic Compounds	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
8290	Dioxins and Furans	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
6010B/6020	Metals by ICP	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
7471A	Mercury by CVAA	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
	Gamma Spectroscopy	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples
	Specific Radioisotopes	NA	1 per 20 samples	1 per lot of water	1 per 20 samples	1 per 20 samples

1 per container indicates one trip blank per shipping container per laboratory.
1 per event indicates one equipment blank per day for groundwater sampling activities if reusable bailers are used. The frequency of equipment blanks for soil sampling activities (if required) will be specified in the SAP.
1 per lot of water indicates one field water blank per discrete lot of water used for rinsing reusable sampling equipment.
Field water blanks are not required when dedicated or disposable sampling equipment is used.
QA samples are Quality Assurance samples, if requested, which will be submitted to the COE contract QA laboratory as specified by the USACE District Chemist.

Table 4

Field Measurement Calibration Procedures and Precision Requirements

Field Measurement	Instrument	Calibration Procedure	Precision
Elevation of Sample Site	Level and rod or Total Station	Surveyor Calibration	0.01 foot
Location of Sample Site	Steel or Fiberglass Tape or Total Station	Reference to New Tape or Surveyor Calibration	1 foot
Soil Sample Depth	Steel or Fiberglass Tape	Reference to New Tape	Variable, depending on depth and surface irregularities
	Length of Sample Rod	Reference to Steel Tape	0.5 foot
Portable Metals Analysis	XRF	NIST Standards	Variable, depending on specific metals reported

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD[1]	
	MS/MSD	Field Duplicates
EPA Method 8082: Polychlorinated Biphenyls		
Aroclor 1016	20	50
Aroclor 1221	20	50
Aroclor 1242	20	50
Aroclor 1248	20	50
Aroclor 1254	20	50
Aroclor 1260	20	50
EPA Method 8270C: Semivolatile Organic Compounds		
Acenaphthene	20	50
Acenaphthylene	20	50
Anthracene	20	50
Benzoic acid	20	50
Benzo[a]anthracene	20	50
Benzo[b]fluoranthene	20	50
Benzo[k]fluoranthene	20	50
Benzo[g,h,i]perylene	20	50
Benzo[a]pyrene	20	50
Benzyl alcohol	20	50

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD	
	MS/MSD	Field Duplicates
EPA Method 8270C: Semivolatile Organic Compounds		
Bis(2-chloroethoxy)methane	20	50
Bis(2-chloroethyl)ether	20	50
Bis(2-ethylhexyl)phthalate	20	50
4-Bromophenyl phenyl ether	20	50
Butylbenzylphthalate	20	50
4-Chloroaniline	20	50
4-Chloro-3-methylphenol	20	50
2-Chloronaphthalene	20	50
2-Chlorophenol	20	50
4-Chlorophenyl phenyl ether	20	50
Chrysene	20	50
Dibenzo(a,h)anthracene	20	50
3,3'-Dichlorobenzidine	20	50
Dibenzofuran	20	50
1,2-Dichlorobenzene	20	50
1,3-Dichlorobenzene	20	50
1,4-Dichlorobenzene	20	50
2,4-Dichlorophenol	20	50
Diethylphthalate	20	50
2,4-Dimethylphenol	20	50
Dimethyl phthalate	20	50
Di-n-butylphthalate	20	50
4,6-Dinitro-2-methylphenol	20	50
2,4-Dinitrophenol	20	50
2,4-Dinitrotoluene	20	50
2,6-Dinitrotoluene	20	50

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD	
	MS/MSD	Field Duplicates
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
Di-n-octyl phthalate	20	50
Fluoranthene	20	50
Fluorene	20	50
Hexachlorobenzene	20	50
Hexachlorobutadiene	20	50
Hexachlorocyclopentadiene	20	50
Hexachloroethane	20	50
Indeno(1,2,3-cd)pyrene	20	50
Isophorone	20	50
2-Methylnaphthalene	20	50
2-Methylphenol	20	50
4-Methylphenol	20	50
Naphthalene	20	50
2-Nitroaniline	20	50
3-Nitroaniline	20	50
4-Nitroaniline	20	50
Nitrobenzene	20	50
2-Nitrophenol	20	50
4-Nitrophenol	20	50
N-Nitrosodiphenylamine	20	50
N-Nitroso-di-n-propylamine	20	50
2,2'-Oxybis(1-chloropropane)	20	50
Pentachlorophenol	20	50
Phenanthrene	20	50
Phenol	20	50
Pyrene	20	50

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD	
	MS/MSD	Field Duplicates
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
1,2,4-Trichlorobenzene	20	50
2,4,5-Trichlorophenol	20	50
2,4,6-Trichlorophenol	20	50
EPA Method 8290: Dioxins and Furans		
2,3,7,8-TCDF	20	50
1,2,3,7,8-PeCDF	20	50
2,3,4,7,8-PeCDF	20	50
1,2,3,4,7,8-HxCDF	20	50
1,2,3,6,7,8-HxCDF	20	50
1,2,3,7,8,9-HxCDF	20	50
2,3,4,6,7,8-HxCDF	20	50
1,2,3,4,6,7,8-HpCDF	20	50
1,2,3,4,7,8,9-HpCDF	20	50
OCDF	20	50
2,3,7,8-TCDD	20	50
1,2,3,7,8-PeCDD	20	50
1,2,3,4,7,8-HxCDD	20	50
1,2,3,6,7,8-HxCDD	20	50
1,2,3,7,8,9-HxCDD	20	50
1,2,3,4,6,7,8-HpCDD	20	50
OCDD	20	50

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD	
	MS/MSD	Field Duplicates
EPA Method 6010B/6020: Metals by ICP		
Aluminum	20	50
Antimony	20	50
Arsenic	20	50
Barium	20	50
Beryllium	20	50
Cadmium	20	50
Calcium	20	50
Chromium	20	50
Cobalt	20	50
Copper	20	50
Iron	20	50
Lead	20	50
Magnesium	20	50
Manganese	20	50
Molybdenum	20	50
Nickel	20	50
Potassium	20	50
Selenium	20	50
Silver	20	50
Sodium	20	50
Thallium	20	50
Vanadium	20	50
Zinc	20	50

Table 5

Quality Assurance Goals, Precision, Relative Percent Difference

Method and Parameters	Soils Maximum RPD	
	MS/MSD	Field Duplicates
EPA Method 7470A/7471A		
Mercury	20	50
Radiochemistry	**pCi/g**	**pCi/g**
Gross alpha, beta and gamma	NA	50
Gamma spectroscopy	NA	50
Specific radioisotopes		
- Americium 241		50
- Cesium 137		50
- Plutonium 238, 239/240	NA	50
- Radium 226		50
- Uranium 234, 235, 238		50

(1) Maximum relative percent difference unless otherwise specified by the analytical method.

NA Not Applicable

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

Method and Parameters	Soils Minimum Recovery[1]	
	LCS	MS/MSD
EPA Method 8082: Polychlorinated Biphenyls		
Aroclor 1016	65-135	65-135
Aroclor 1221	65-135	65-135
Aroclor 1242	65-135	65-135
Aroclor 1248	65-135	65-135
Aroclor 1254	65-135	65-135
Aroclor 1260	65-135	65-135
EPA Method 8270C: Semivolatile Organic Compounds		
Acenaphthene	65-135	65-135
Acenaphthylene	65-135	65-135
Anthracene	65-135	65-135
Benzoic acid	65-135	65-135
Benzo[a]anthracene	65-135	65-135
Benzo[b]fluoranthene	65-135	65-135
Benzo[k]fluoranthene	65-135	65-135
Benzo[g,h,i]perylene	65-135	65-135
Benzo[a]pyrene	65-135	65-135
Benzyl alcohol	65-135	65-135

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

Method and Parameters	Soils Minimum Recovery	
	LCS	MS/MSD
EPA Method 8270C: Semivolatile Organic Compounds		
Bis(2-chloroethoxy)methane	65-135	65-135
Bis(2-chloroethyl)ether	65-135	65-135
Bis(2-ethylhexyl)phthalate	65-135	65-135
4-Bromophenyl phenyl ether	65-135	65-135
Butylbenzylphthalate	65-135	65-135
4-Chloroaniline	65-135	65-135
4-Chloro-3-methylphenol	65-135	65-135
2-Chloronaphthalene	65-135	65-135
2-Chlorophenol	65-135	65-135
4-Chlorophenyl phenyl ether	65-135	65-135
Chrysene	65-135	65-135
Dibenzo(a,h)anthracene	65-135	65-135
3,3'-Dichlorobenzidine	65-135	65-135
Dibenzofuran	65-135	65-135
1,2-Dichlorobenzene	65-135	65-135
1,3-Dichlorobenzene	65-135	65-135
1,4-Dichlorobenzene	65-135	65-135
2,4-Dichlorophenol	65-135	65-135
Diethylphthalate	65-135	65-135
2,4-Dimethylphenol	65-135	65-135
Dimethyl phthalate	65-135	65-135
Di-n-butylphthalate	65-135	65-135
4,6-Dinitro-2-methylphenol	65-135	65-135
2,4-Dinitrophenol	65-135	65-135
2,4-Dinitrotoluene	65-135	65-135
2,6-Dinitrotoluene	65-135	65-135

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

Method and Parameters	Soils Minimum Recovery	
	LCS	MS/MSD
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
Di-n-octyl phthalate	65-135	65-135
Fluoranthene	65-135	65-135
Fluorene	65-135	65-135
Hexachlorobenzene	65-135	65-135
Hexachlorobutadiene	65-135	65-135
Hexachlorocyclopentadiene	65-135	65-135
Hexachloroethane	65-135	65-135
Indeno(1,2,3-cd)pyrene	65-135	65-135
Isophorone	65-135	65-135
2-Methylnaphthalene	65-135	65-135
2-Methylphenol	65-135	65-135
4-Methylphenol	65-135	65-135
Naphthalene	65-135	65-135
2-Nitroaniline	65-135	65-135
3-Nitroaniline	65-135	65-135
4-Nitroaniline	65-135	65-135
Nitrobenzene	65-135	65-135
2-Nitrophenol	65-135	65-135
4-Nitrophenol	65-135	65-135
N-Nitrosodiphenylamine	65-135	65-135
N-Nitroso-di-n-propylamine	65-135	65-135
2,2'-Oxybis(1-chloropropane)	65-135	65-135
Pentachlorophenol	65-135	65-135
Phenanthrene	65-135	65-135
Phenol	65-135	65-135
Pyrene	65-135	65-135

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

Method and Parameters	Soils Minimum Recovery	
	LCS	MS/MSD
EPA Method 8270C: Semivolatile Organic Compounds (Continued)		
1,2,4-Trichlorobenzene	65-135	65-135
2,4,5-Trichlorophenol	65-135	65-135
2,4,6-Trichlorophenol	65-135	65-135
EPA Method 8290: Dioxins and Furans		
2,3,7,8-TCDF	65-135	65-135
1,2,3,7,8-PeCDF	65-135	65-135
2,3,4,7,8-PeCDF	65-135	65-135
1,2,3,4,7,8-HxCDF	65-135	65-135
1,2,3,6,7,8-HxCDF	65-135	65-135
1,2,3,7,8,9-HxCDF	65-135	65-135
2,3,4,6,7,8-HxCDF	65-135	65-135
1,2,3,4,6,7,8-HpCDF	65-135	65-135
1,2,3,4,7,8,9-HpCDF	65-135	65-135
OCDF	65-135	65-135
2,3,7,8-TCDD	65-135	65-135
1,2,3,7,8-PeCDD	65-135	65-135
1,2,3,4,7,8-HxCDD	65-135	65-135
1,2,3,6,7,8-HxCDD	65-135	65-135
1,2,3,7,8,9-HxCDD	65-135	65-135
1,2,3,4,6,7,8-HpCDD	65-135	65-135
OCDD	65-135	65-135

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

Method and Parameters	Soils Minimum Recovery	
	LCS	MS/MSD
EPA Method 6010B/6065-135: Metals by ICP		
Aluminum	80-120	75-125
Antimony	80-120	75-125
Arsenic	80-120	75-125
Barium	80-120	75-125
Beryllium	80-120	75-125
Cadmium	80-120	75-125
Calcium	80-120	75-125
Chromium	80-120	75-125
Cobalt	80-120	75-125
Copper	80-120	75-125
Iron	80-120	75-125
Lead	80-120	75-125
Magnesium	80-120	75-125
Manganese	80-120	75-125
Molybdenum	80-120	75-125
Nickel	80-120	75-125
Potassium	80-120	75-125
Selenium	80-120	75-125
Silver	80-120	75-125
Sodium	80-120	75-125
Thallium	80-120	75-125
Vanadium	80-120	75-125
Zinc	80-120	75-125

Table 6

Quality Assurance Goals: Accuracy, Percent Recovery

	Soils Minimum Recovery	
Method and Parameters	**LCS**	**MS/MSD**
EPA Method 7470A/7471A		
Mercury	80-120	75-125
Radiochemistry	**pCi/g**	**pCi/g**
Gross alpha, beta and gamma	As specified in method	NA
Gamma spectroscopy	As specified in method	NA
Specific radioisotopes	As specified in method	
- Americium 241		
- Cesium 137		NA
- Plutonium 238, 239/240		
- Radium 226		
- Uranium 234, 235, 238		

(1) Maximum relative percent difference unless otherwise specified by the analytical method.

NA Not Applicable

Table 7

Selected Ash Characteristic Parameters[1]

Parameters	Ash Concentration Average[3]	Background Concentration[2] Upper Threshold Limit (UTL)[4]
Metals (in mg/kg)		
Barium	2,171	295
Copper	3,423	14.7
Lead	5,756	22.3
Nickel	212	15.4
Zinc	6,577	48.8
Radionuclides (in pCi/g)		
Americium-241	0.018	0.013
Cesium-137	0.055	1.65
Plutonium-238	ND	0.023
Plutonium-239	0.588	0.054
Plutonium-240	(reported as Plutonium 239)	Not available
Plutonium-241	Not reported	Not available
Radium-226	5.171	2.59
Uranium-234	7.909	2.59
Uranium-235	0.395	0.20
Uranium-238	6.252	2.29

[1]Parameters have been selected based upon the waste characterization sampling conducted in April 2005. Other parameters may be added if warranted.
[2]Results taken from *Draft Inorganic and Radionuclide Background Data for Soils, Canyon Sediments and Bandelier Tuff at Los Alamos National Laboratory*, Environmental Restoration Project, 1998, September
[3]One value for copper has been excluded as an anomaly.
[4]Upper Threshold Limit is determined at the 95% confidence interval.

Table 8

Data Validation Procedures

Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results
Holding Times (Volatile organic methods)	Holding time exceeded by 1 - 7 days	J-	J-	All method results in affected sample
	Holding time exceeded by > 7 days	J-	R	All method results in affected sample
Holding Times (Mercury and hexavalent Cr)	Holding time exceeded	J-	R	All method results in affected sample
Holding Times (All other methods)	Holding time exceeded	J-	J-	All method results in affected sample
Laboratory Blanks	Analyte detected in blank. Determine action level, x10 for common lab contaminant or x5 for other analytes	U detected results below action level	Not qualified	Analyte results in the analytical batch
Trip Blanks	Same as laboratory blanks	U detected results below action level	Not qualified	Analyte results in samples in the same cooler
Equipment Blanks	Same as laboratory blanks	U detected results below action level	Not qualified	Analyte results in samples in the same sampling event
Surrogate Recovery (GC, HPLC methods)	recovery > UCL LCL > recovery > 50% recovery < 50%	J+ J- J-	Not qualified J- R	All method results in affected sample
Surrogate Recovery (GC/MS methods)	recovery > UCL LCL > recovery > 10% recovery < 10%	J+ J- J-	Not qualified J- R	All method results in affected sample

[1]Not all analytical methods may be included in the study. Data validation procedures may be modified for radiological methods, as appropriate.

Table 8 (Continued)

Data Validation Procedures

Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results
Laboratory Control Sample (LCS) Recovery (GC, HPLC methods)	recovery > UCL LCL > recovery > 50% recovery < 50%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch or sub-analytical batch
LCS Recovery (GC/MS methods)	recovery > UCL LCL > recovery > 10% recovery < 10%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch or sub-analytical batch
LCS Recovery (Inorganic methods)	recovery > UCL LCL > recovery > 50% recovery < 50%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch or sub-analytical batch
Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries (GC, HPLC methods)	recovery > UCL LCL > recovery > 50% recovery < 50%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch (1)
MS/MSD Recoveries (GC/MS methods)	recovery > UCL LCL > recovery > 10% recovery < 10%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch (1)
MS Recovery (Inorganic methods)	recovery > UCL LCL > recovery > 30% recovery < 30%	J+ J- J-	Not qualified J- R	Analyte results in the analytical batch (1)
MS/MSD RPD (Organic methods)	RPD > CL	J	J	Analyte results in the spiked sample
Matrix Duplicate RPD (Inorganic methods)	RPD > CL and sample and duplicate results > 5x PQL	J	Not qualified	Analyte results in the analytical batch (1)
	RPD > CL and sample and/or duplicate results < 5x PQL	J	Not qualified	Analyte results in the analytical batch (1)

Table 8 (Continued)

Data Validation Procedures

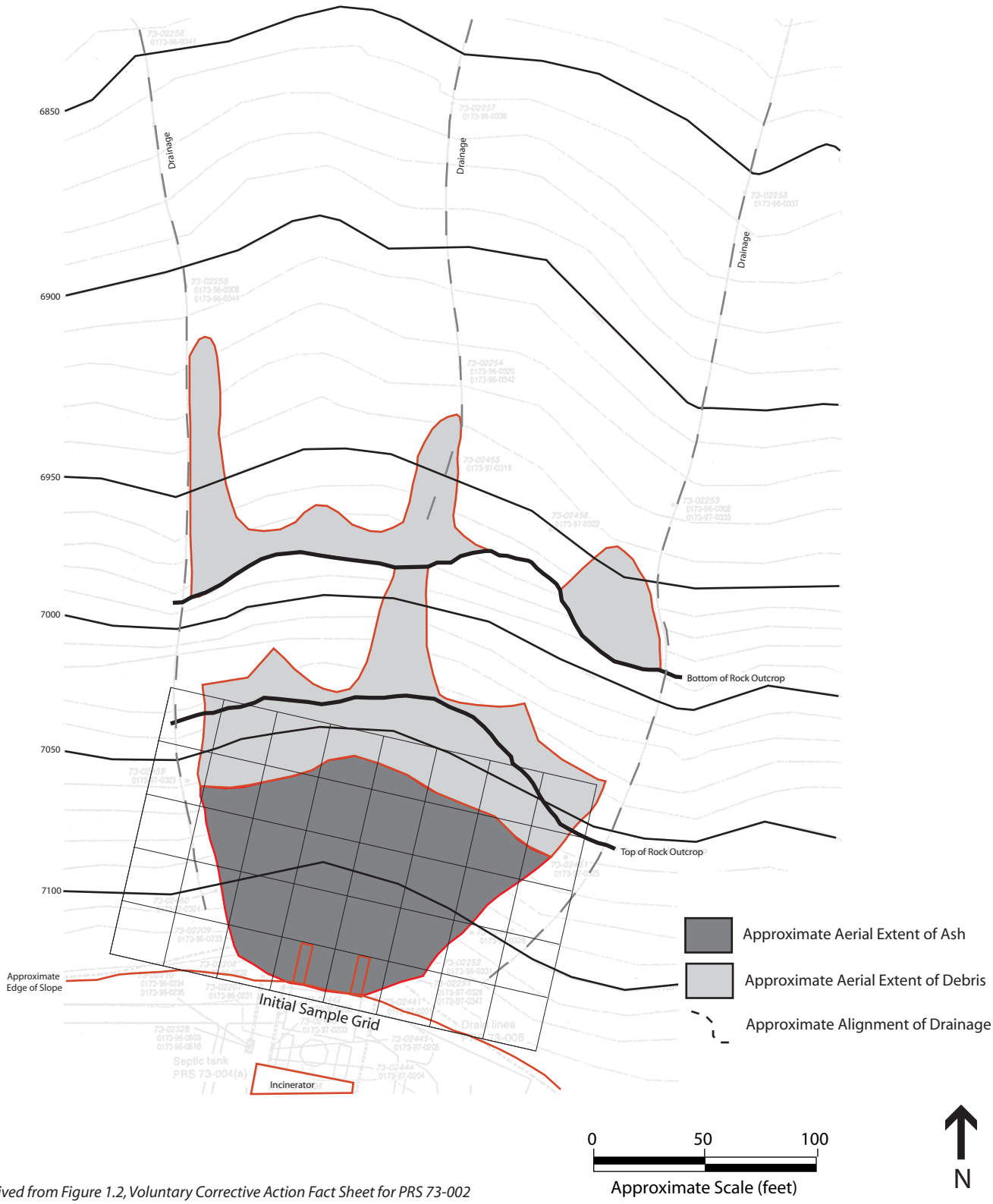
Control Parameter	Exceedance of Control Limits	Qualification of Detected Results	Qualification of Nondetected Results	Associated Results
Initial Calibration %RSD (Organic methods)	%RSD > CL or r < 0.995	J	J	Analyte results associated with the initial calibration
Initial Calibration RRF (GC/MS methods)	RRF < 0.05	J	R	Analyte results associated with the initial calibration
Continuing Calibration %D (Organic methods)	%D > UCL -50% < %D < LCL %D < -50%	J+ J- J-	Not qualified J- R	Analyte results associated with the continuing calibration
Initial Calibration and Continuing Calibration Verification (ICV and CCV) Recoveries (Inorganic methods)	recovery > 125% 125% > recovery > UCL LCL > recovery > 75% recovery < 75%	R J+ J- R	Not qualified Not qualified J- R	Analyte results associated with the ICV or CCV
Field Duplicate RPD (All Methods)	RPD > CL	Not qualified; discuss in report	Not qualified; discuss in report	Analyte results in the sample and duplicate
Internal Standard Area Counts (GC/MS methods)	Area counts > 2x the associated standard	J+	Not qualified	Associated analyte results in the sample
	Area counts < 0.5x the associated standard	J-	R	Associated analyte results in the sample
Interference check sample recovery	recovery > UCL LCL > recovery > 30%	J+ J-	Not qualified J-	Analyte results in the analytical batch
Serial dilution %D	%D > UCL	J	J	
Post-digestion spike recovery	recovery > UCL LCL > recovery > 10% recovery < 10%	J+ J- J-	Not qualified J- R	All analyte results in affected sample

(1) If the spiked sample or duplicate is not considered representative of the analytical batch, only the sample is qualified.

Table 9

Qualifiers Applied During Data Validation

Qualifier	Definition of Qualifier
A	Sample has undergone routine data validation.
J+	Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
J-	Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
J	Data are qualified as estimated; it is not possible to assess the direction of the potential bias.
	False positives or false negatives are unlikely to have been reported.
R	Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
U	Data are qualified as nondetected, because the analyte was observed in an associated laboratory or field blank.



Source: Derived from Figure 1.2, Voluntary Corrective Action Fact Sheet for PRS 73-002

ITSI Innovative Technical Solutions, Inc.	**U.S. Army Corps of Engineers, Sacramento District** **Los Alamos National Laboratory, U.S. Department of Energy** **SWMU 73-002, Los Alamos National Laboratory, New Mexico**	**Figure 1** **Distribution of Ash and Proposed Initial Sample Grid**

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 1 - Distribution of Ash.ai

APPENDIX B

BEST MANAGEMENT PRACTICES – STORMWATER MANAGEMENT

BEST MANAGEMENT PRACTICES PLAN

STORM WATER MANAGEMENT

Los Alamos National Laboratory, New Mexico
Corrective Action for SWMU 73-002
(Incinerator Ash Removal)

Contract No: DACA05-99-D-0014
Task Order No.: CM26

Prepared for:

United States Army Corps of Engineers, Sacramento District
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LIST OF ATTACHMENTS

Attachment 1 Spill/Discharge and Emergency Contacts List

ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
BMP	Best Management Practices
CFR	Code of Federal Regulations
DCQR	Daily Contractor Quality Report
DOE	United States Department of Energy
ITSI	Innovative Technical Solutions, Inc.
LANL	Los Alamos National Laboratory
LSA-1	Low Specific Activity Type 1
mg/kg	milligrams per kilogram
MSDS	Material Safety Data Sheets
NMED	State of New Mexico Environmental Department
OSHA	Occupational Safety and Health Administration
pCi/g	picocurie per gram
PPE	personal protective equipment
ppm	parts per million
PRAC	Pre-placed Remedial Action Contract
PRS	Potential Release Sites
QA	quality assurance
SOP	Standard Operating Procedures
SSHO	Site Safety and Health Officer
SSHSP	Site-Specific Health and Safety Plan
SWMU	Solid Waste Management Unit
USACE	United States Army Corps of Engineers
WP	Corrective Action Workplan

1.0 INTRODUCTION

This Best Management Practices (BMP) Plan a description of the procedures that will be followed to protect the environment during implementation of the Corrective Action to remove and package ash and debris from Solid Waste Management Unit (SWMU) 73-002-99 located north-northwest of the existing Los Alamos Airport terminal building in Los Alamos, New Mexico (Figures 1 and 2). SWMU 73-002-99 is comprised of Potential Release Sites (PRS) 73-002, 73-003, 73-004(a, b), and 73-006. The Corrective Action Workplan is for SWMU 73-002, a small incinerator which operated for a short time at the site beginning in 1947 by Los Alamos National Laboratory (LANL).

This BMP supplements (and is an appendix to) the Corrective Action Workplan for SWMU 73-002, Corrective Action Workplan (WP) (Innovative Technical Solutions, Inc. [ITSI], 2005) that provides the overall plans and a detailed description of the removal and packaging activities. The WP and its supporting documents were prepared on behalf of the United States Army Corps of Engineers (USACE), Sacramento District and the United States Department of Energy (DOE) under the USACE Pre-Placed Remediation Action Contract (PRAC) number DACA05-99-D-0014, Task Order CM26.

This BMP describes the potential pollutant sources that may be disrupted during ash removal activities and identifies methods to minimize the potential for sediment erosion, storm water contamination, and release of airborne sediment (dust). BMPs include measures for stabilization, sediment and erosion control, and storm water management. The BMPs for this project will include structural (such as silt fencing, straw waddles, and construction entrances) and non-structural (such as limited removal of established vegetation, good housekeeping, preventative maintenance, management of runoff, employee training, record keeping and reporting, visual inspections, and spill prevention and response) measures.

1.1 OBJECTIVES

The main objective of this BMP is to present the measures that will be implemented during ash removal activities to prevent/control the discharge or migration of pollutants, primarily ash and sediment, from disturbed areas. These BMPs will maintain compliance with the State of New Mexico Environmental Department (NMED) and LANL Compliance Order on Consent (Consent Order) (NMED/LANL 2005). Because the site is less than one (1) acre, no National Pollutant Discharge Elimination System Permit is required for this project.

2.0 IMPLEMENTATION AND ADMINISTRATION

The primary BMP coordinator who will have direct authority and primary responsibility for implementation of the plan during field activities will be the Project Site Supervisor, Mr. Jim Cox. The Site Safety and Health Officer (SSHO), Mr. Dennis Rich, will serve as Mr. Cox's designee responsible for implementation of the BMP when Mr. Cox is not available on site. The BMP coordinator will ensure that all work is performed in a manner that minimizes the pollution of air, water, and land resources and complies with all applicable Federal, State, and local regulations. In addition, the BMP coordinator is responsible for recognizing any changes in the project due to field conditions that may affect the BMP or increase the risk of storm water pollution. Compliance with this document is required of all ITSI and subcontractor personnel.

The BMP will be available during working hours at the site during the ash removal activities, commencing with the mobilization and set up of equipment and ending with the demobilization and site cleanup. The BMP will be located in a readily accessible and known location in the on-site ITSI field trailer identified during the pre-construction (kick off) meeting with DOE/LANL, ITSI and its subcontractors. When the on-site field trailer is closed, an emergency telephone number (24 hours) to the BMP coordinator will be clearly posted for situations other than those requiring 911.

Whenever ITSI, DOE/LANL or any other site worker observes noncompliance with environmental laws, regulations, permits, or other elements of the BMP, the noncompliance will be recorded in the daily contractor quality control report (DCQCR) and quality assurance (QA) reports. ITSI will inform DOE/LANL and USACE promptly of the proposed corrective action and take appropriate corrective action to prevent potential release or impact to the environment.

Environmentally related inspections, records, and other documentation identified in this BMP and Contract documents will be managed as one element of the overall project record.

2.1 REVISION AND MODIFICATION

The BMP and other relevant segments of this BMP will be amended under the following circumstances:

- If a change in operations/field conditions that may affect the potential discharge of pollutants (such as sediments from erosion) to surface waters and drainages, and/or to the air (as airborne dust);
- If unforeseen pollution risks are identified during ash removal activities;
- If measures described in the plan are not achieving the stated objectives;

As necessitated by any such events, ITSI will establish and implement additional BMPs to eliminate or minimize the risk of pollution from storm water or other vectors. The amendment will identify the BMP and be documented on a separate sheet with hand-written mark-up to the original BMP that will refer to the amendment. All modifications other than minor schedule changes are subject to DOE/LANL and USACE approval in writing.

Approved deviations from and modifications to the accepted BMP will be documented in the DCQCR. Copies of the revised information will be posted on the site as required, and project personnel will be informed of the modifications and their potential impact to site activities.

2.2 TRAINING

ITSI and subcontractor personnel will be trained in all relevant and necessary phases of environmental protection and pollution control. Potential subject topics include methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; and protection of existing site conditions during ash removal and packaging activities.

Environmental protection/pollution control meetings will be conducted for ITSI personnel, subcontractors, superintendents, and foremen prior to the start of each trade's activities at the site. Additional meetings will be conducted when new personnel are assigned to the project and when required by changes in site conditions. Training will continue and be reinforced at superintendents' safety meetings and tailgate safety meetings. Training records will be maintained by the ITSI QC staff.

3.0 SITE DESCRIPTION

The project site is located on DOE and Los Alamos County properties. The site is comprised of an incinerator building and surface disposal area (referred to as the ash debris located north/northwest of the existing Los Alamos county Airport Terminal Building near the southern slope of Pueblo canyon. The ash debris is located immediately north of the incinerator building on the south-facing slope of Pueblo Canyon just below the rim. The upper portion of the ash debris is located on DOE property with the majority of the area located on Los Alamos County property. The ash debris was generated as a result of incinerator operations to destroy classified documents and later the burning of municipal trash. During recent ash characterization activities conducted by ITSI in preparation of implementing ash removal, the ash debris area was surveyed and sampled. The ash pile was found to cover approximately 11,000 square feet with thicknesses ranging from 6-inches to 7.5-feet and to consist of approximately 1,200 cubic yards of ash. The ash and debris area is expected to contain moderate levels of heavy metal (e.g. lead detected from 1,740 to 33, 000 millgrams per kilogram [mg/kg] or parts per million [ppm]) and low levels of radiological constituents (e.g. radium 226 detected from non-detect to 25.2 picocurie per gram [pCi/g]). The ash characterization results are presented in the WP and in the Sampling and Analyses Plan (Appendix A to the WP).

Aside from the moderate levels of heavy metals and low radiological levels, the natural pollutant sources are soil erosion, sedimentation, and airborne dust associated with a typical soil excavation and removal project as well as high wind conditions typical of the project area. The drainage patterns are identified in Figure 3.

4.0 SITE LAYOUT & MANAGEMENT (WORK AREA PLAN)

A variety of temporary pollution control devices will be maintained for the duration of ash removal activities. This section defines the management of project activities and traffic within and between various work areas on the site, and the procedures that will be implemented to identify and mark the limits of working, travel, and support areas; identify and protect existing site resources; and generally minimize the impact of project personnel, materials, and equipment on the immediate environment during site activities.

Figure 3 includes the locations of proposed storage areas and decontamination areas; limits of work for ash removal and packaging activities; and structural controls required to control erosion and to contain materials on the site. Project activities will be confined to the areas defined by project drawings, and variations from these identified locations will be subject to approval by DOE/LANL and USACE.

4.1 PROTECTION OF LAND RESOURCES

Except in areas within the ash debris area specified to be cleared, ITSI will not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, or land forms outside the project work areas without prior approval, using the means of protection described in this BMP or the WP, or as determined in the field to be appropriate.

4.2 PROTECTION OF WATER RESOURCES

Ash and debris removal activities will be monitored by the assigned ITSI personnel to prevent pollution of surface and ground waters. Toxic or hazardous chemicals will not be applied to soil or vegetation. Any chemicals or fluids (for equipment) will be dispensed in a manner that ensures no spillage to the ground or water. Dispensing areas will be inspected periodically to identify leakage and initiate corrective action. Any water or

wetland areas directly affected or potentially impacted by construction activities will be monitored by ITSI.

4.3 PROTECTION OF BIOLOGICAL RESOURCES

Project activities will be executed in a manner that will minimize interference with, disturbance of, and damage to fish, wildlife, and plants, including their habitats. ITSI will be responsible for the protection of threatened and endangered animal and plant species, including their habitats, in accordance with Federal, State, regional, and local laws and regulations. At this time, there are no known biological restrictions at this site.

4.4 PROTECTION OF HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

There are no known historical, archaeological, or cultural resources within the project area. However, during the project excavation, if there is a discovery of any suspected archaeological and cultural resources (including but not limited to human skeletal remains or burials; artifacts; shell, bone, charcoal, or other deposits; rock or coral alignments, paving, walls, or other constructed features; and any indication of agricultural or other human activities) the following steps will be taken:

- All activities that may damage or alter such resources will be temporarily suspended.
- ITSI will immediately notify LANL/DOE and USACE so that the appropriate authorities or archeological monitoring services may be notified.
- ITSI will secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.
- A determination will be made as to the significance of the resource and what, if any, special disposition of the finds should be made.

4.5 TRAFFIC CONTROL PLAN

Movement of all project-related traffic, including haul trucks, construction/excavation equipment, and deliveries, as well as personnel vehicles, will be managed to minimize noise, dust, congestion, and any environmental impact. Project roadways will be delineated with cones, barriers, or other means as necessary, and drivers will be instructed to remain within the established roadways at all times. Existing roadways and proposed haul routes are shown on Figure 3 and related figures in the WP, with roadway surfaces indicated.

A general speed limit of 15 miles per hour will apply to project traffic within the project area. Speed limit signs will be posted as necessary, and all personnel will be instructed as to speed limits and other project traffic-control guidelines.

Haul traffic will use existing paved roads as practicable, and temporary (unpaved) roads will be established only as required to facilitate access to excavation or fill areas. Temporary roads constructed for project activities will be graded, compacted, and surfaced as appropriate to minimize dust and erosion and to channel any runoff to structural controls established for that purpose. During rain events, unpaved roadways will be inspected regularly to identify any existing or potential erosion problems. Any necessary repairs, mitigation, or structural controls will be implemented promptly.

Haul routes and traffic will be coordinated with other contractors to minimize potential work delays due to uncontrolled traffic. Prior to start of construction activities, ITSI will:

- Identify onsite contractors,
- Meet with all onsite contractors to coordinate haul routes and equipment traffic.

5.0 BEST MANAGEMENT PRACTICES

This section presents the measures that will be used to prevent mobilization of ash/soil particles (erosion control), to trap mobilized soil/ash particles (sediment control), to control and minimize air pollution (e.g. dust and odors) during removal activities, and to provide general site and material management as related to materials and equipment imported and used onsite.

5.1 EROSION CONTROL

Erosion control BMPs are designed to prevent the initial mobilization of soil particles during the likelihood of high winds and a potential rain event (e.g. light misting of the ash debris surface prior to and between ash removal in dry conditions and the use of a vacuum truck to minimize escape of airborne particles). Where feasible, erosion control will be addressed by preserving existing vegetation or by stabilizing disturbed areas as soon as possible after completion of ash debris removal activities.

The following practices will be implemented as appropriate during project activities to prevent initial mobilization of soil particles during a rain event, trap soil particles where mobilization has occurred, and conduct cleaning and maintenance activities in a manner that minimizes the generation or migration of soil or other pollutants:

- Use of fiber rolls to protect the soil surface and prevent soil particles from being detached by rainfall or wind;
- Placement of straw wattles or other protection to control/limit inflow of sediment or contaminants to storm drain inlets;
- Use of hydroseeding/hydromulch after completion of ash debris removal;
- Establishment of a stabilized construction entrance to reduce tracking of sediment onto public and private lands;

- Implementation of periodic sweeping to remove sediments from hard surfaces within and adjacent to the site;
- Control of vehicle and equipment servicing procedures and locations to minimize contact of construction vehicles, equipment, and materials with storm water;
- Implementation of a daily equipment inspection program to identify and repair any fuel or hydraulic oil leaks;
- Control of the delivery, storage, and handling procedures for fuels used in project activities, to minimize the potential for polluting runoff;
- Location of loading/unloading/staging of bagged waste zones away from storm drains to limit the possibility of contaminating runoff through accidental spills during construction material handling;
- Implementation of appropriate handling techniques for sanitary/septic waste, and other solid wastes, to prevent or reduce the discharge of pollutants to storm water.

5.2 SEDIMENT CONTROL

Sediment control BMPs are designed to trap soil and/or ash particles assuming that mobilization of the particles have already occurred. Sediment controls for this project will include the use of silt fences and straw wattles.

Silt fencing will be installed at the base of the ash pile near the drainages (Figure 4). Silt fences will extend between 16 and 34 inches above the ground surface. Joints in the filter fabric will be minimized, but where unavoidable, joints will overlap by a minimum of 6 inches. A trench approximately 4 inches wide and 4 inches deep will be excavated on the upslope side of the silt fences. This trench will be backfilled over the filter fabric. Silt fences will be removed as a part of demobilization.

Straw wattles (mesh covered straw bales) will be installed along the outside edges of the ash pile to prevent runoff of ash, sediments outside of the work area (Figure 4).

5.3 DUST CONTROL

Project activities may result in the release of respirable dust particulates; therefore, control of fugitive dust is a critical project requirement. Work procedures will be designed to control, prevent, and minimize these releases, both to protect site workers and area residents and to prevent the migration of soil/ash particles. Dust suppression will be implemented at the direction of the Site Superintendent to control observed dust emissions or as a preventive measure based on observations of site, work, and ambient weather conditions.

Fugitive dust emissions during excavation activities will be controlled by misting water from a hose attached to a water source stage outside of the ash/debris area. Ash/debris removal areas will be visually monitored for dust during project activities; spraying will be conducted as needed on the excavation areas, access roads, and paved areas during the day. At the end of each workday, active work areas will be swept or washed as appropriate to minimize the potential for fugitive dust during non-working hours. Haul routes will be inspected at the end of each workday, and mud or other debris will be picked or swept up for disposal. Paved work areas and roadway surfaces may be swept and/or cleaned with water periodically as needed to remove dust and debris.

Water for dust control applications may be obtained from off-site or from a fire hydrant near site. Connections to the fire hydrant will be coordinated with LANL/DOE in advance. During all applications of water, care will be taken to control overspraying and to minimize discharges of dust control spray water down the drainage areas.

5.4 AIR POLLUTION CONTROL

A number of procedures will be used to assure that dust, debris, construction materials, and trash do not become airborne and travel off the project site; to prevent the inhalation

of ash/soil by project personnel and the nearby public; and to inhibit the possible migration of ash/soil particles to other areas. Equipment operation, activities, and processes performed by ITSI will be in accordance with all Federal and State air emission and performance laws and standards.

5.4.1 Air Monitoring

For the protection of public health and project personnel, the SSHO will conduct air monitoring to identify and control contaminant emissions to the air from the ash debris removal area. Guidelines for the use of air monitoring to quantify the level of exposure to contaminant emissions to the air caused by removal activities are presented in the Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis (AHA) prepared as a separate and internal document for this project; the SSHSP will be maintained on-site during field activities. Site contaminants of potential concern data are presented in the WP,that this BMP is an attachment to.

It is anticipated that use of a vacuum truck in conjunction with misting of the ash debris area will migrate the potential for dust emissions during removal activities. However, in the event that dust cannot be controlled and visible dust is unavoidable, the SSHO will determine the monitoring and/or mitigation procedures required to protect the health of project personnel and the public, and will implement the appropriate changes to work activities and personal protective equipment (PPE).

5.4.2 Particulates

The ash debris area, the packaged ash/debris staging area, haul and temporary access roads, and other work areas within or outside the project boundaries will be maintained free from particulates which would cause the Federal, State, and local air pollution standards or visibility regulations to be exceeded or which would cause a hazard or a nuisance.

Particulate control will be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. Sprinkling (water spray) will be used to control particulates in the work area. Sufficient equipment and competent operators will be available during working hours to accomplish these tasks.

5.4.3 Odors and Emissions

Odors from construction activities will be controlled at all times to avoid causing a health hazard or nuisance and to maintain compliance with State regulations and/or local ordinances. If odors are detected, water will be misted/sprayed to keep ash debris removal areas moist. To ensure the protection of both on-site personnel and surrounding occupants and facilities, the SSHO will be on-hand during the removal activities to monitor air quality. The SSHO will be responsible for recording wind direction and speed, and for establishing appropriate air monitoring stations in the vicinity of excavations, stockpiles, or soil staging areas. Additional information on monitoring procedures and responses is contained in the SSHSP.

Motorized construction equipment operating on-site and trucks used for hauling material offsite must be properly equipped with emission control devices equivalent to original manufacture and must be operating as designed. Hydrocarbons and carbon monoxide emissions from equipment must be within allowable Federal and State limits at all times.

Generators for electrical power must meet all local and State requirements for emissions.

5.4.4 Sound Intrusions

Ash debris removal activities will be kept under surveillance and control to minimize environmental damage by noise. All motorized equipment must be equipped with manufacturer-provided mufflers or other sound-mitigating devices in proper operating condition.

ITSI will comply with applicable Occupational Safety and Health Administration (OSHA) and local noise standards. Equipment operators, contractors, and other personnel will be required to wear appropriate hearing protection when necessary, as detailed in the SSHSP.

5.4.5 Burning

Burning is prohibited on the site during this project.

5.5 MANAGEMENT OF HAZARDOUS AND TOXIC SUBSTANCES

The section describes the procedures that will be followed to monitor and manage toxic or hazardous substances that are brought to or stored on the site for construction-related purposes, to minimize the potential for accidental spills or releases to the environment or personnel exposure. These procedures include prevention of lubrication leaks from equipment, fuel, hydraulic fluid, and transmission fluid, properly storing imported material (both hazardous and non-hazardous) in a protected storage area with secondary containments, having a spill control plan, maintaining and inspecting portable toilets, and ensuring all waste containers or dumpsters have covers.

In accordance with EM 385-1-1 (USACE, 2003), a copy of the Material Safety Data Sheet (MSDS) for each hazardous material on the site at any given time will be kept on the site and available for review in ITSI's field trailer. Additional information about chemical hazards and MSDSs is provided in the SSHSP, and relevant chemical safety fact sheets are included in an attachment to the SSHSP.

5.5.1 Monitoring

The identification and amounts of toxic and hazardous materials being used on the site will be inventoried and tracked in the daily Field Logbook. As hazardous materials are brought on site, used, or removed from the site, the record will be updated to remain current throughout the project.

Toxic materials that will be transported to the site and may be affected by a storm water event, non-toxic construction materials or equipment that may cause a discharge of material to the ground or into receiving water, and the specific activities and BMPs associated with each of these items, if any, will be identified in ITSI's annotations to the BMP.

5.5.2 Material Handling Guidelines

The following guidelines will be used for the handling of liquids, hydraulic fluids/lubricants, and pesticides:

Liquids: Other than water used for dust control, no liquids will be dispersed to the ground during project activities.

Hydraulic Fluids and Lubricants: Construction vehicles and equipment will use vegetable-based hydraulic fluids and lubricants wherever possible. If this is not practical, the vehicle or equipment will be inspected for leaking fluids and lubricants after every four hours of operation, and any conditions leading to leakage will be corrected before the vehicle or equipment is returned to service. The submitted list of equipment to be used on the project will indicate which units comply with this guideline; inspections of non-complying vehicles and equipment will be noted on the DCQR.

Pesticides/Herbicides: Application of pesticides/herbicides to vegetation or ground surfaces is prohibited during this project. The application of personal tick and mosquito repellent for worker protection is limited to applications to the worker's clothing and/or skin in accordance with the manufacturer's instructions for use of the repellent.

5.6 NON-STORM WATER MANAGEMENT

Non-storm water liquid and waste will not be discharged during project activities. Construction worker wastewater (such as portable toilet water, office trailer wastewater, etc.) will be discharged in accordance with State and local requirements. Accidental discharges will be managed according to the provisions of Section 6 of this BMP.

5.7 INSPECTIONS, MAINTENANCE, AND REPAIR

Inspections will be conducted by the designated ITSI personnel on an ongoing basis to identify areas contributing to storm water discharge, evaluate whether control measures have been installed and are functioning effectively, and determine whether additional control practices or corrective maintenance activities are needed.

Beginning with the start of soil-disturbing activities, inspections will be conducted, and corresponding maintenance/repair of BMPs will be implemented, in accordance with the following schedule:

Periodic Inspections

- Daily

Weather-Related Inspections

- Prior to a forecast storm;
- During and after a major storm event that causes runoff from the construction site;
- At 24-hour intervals (excluding non work days) during an extended rain event.

Inspections may be omitted during storm events if they cannot be conducted safely due to conditions including flooding, lightning, high wind, lightning, or engulfing mud. Inspections will include all structural and non-structural BMPs installed at the site, and will be documented in DCQR. Records management for inspection reports is discussed in the WP. Equipment, materials, and workers will be available for rapid response to any failures or emergencies, and corrective maintenance will be performed as soon as

possible, consistent with appropriate worker safety as defined in the SSHSP and corporate Standard Operating Procedures (SOP), and the discretion of project management.

6.0 SPILL PREVENTION AND CONTROL

The potential for accidental spills exists during work activities including fueling of vehicles and equipment, transportation of excavated soil, and site or vehicle cleanup activities. This section outlines the practices to be implemented to minimize the possibility of accidental spills and discharges, and the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 Code of Federal Regulations (CFR) 68, 40 CFR 302, 40 CFR 355, and/or State or local laws and regulations. This spill control plan supplements the requirements of EM 385-1-1 (USACE, 2003).

The ITSI Site Superintendent will be responsible for coordination of all spill prevention, control, and response activities, including items listed below.

- Spill-prevention training
- Reporting of any spills or hazardous substance releases
- Implementing and supervising the containment and cleanup

6.1 SPILL PREVENTION

Project personnel will be trained in proper spill-prevention and response techniques as part of overall project training activities. Personnel will be trained on the specific techniques applicable to their areas of responsibility, and spill-response team members will receive additional training in response and cleanup methods, as appropriate.

Special attention will be given to activities that involve the handling of potentially hazardous materials, including but not limited to the items listed below.

- Transferring fuels to or from machinery and equipment at the site
- Hauling soil from excavation areas to stockpile or fill areas
- Vehicle and equipment accidents

Project health and safety and QC management personnel will monitor these activities to assure that approved techniques and general health and safety guidelines are employed consistently and effectively.

Storage, fueling, and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Storage and transfer of fuel, lubricants, and oil will be managed and stored in accordance with all Federal, State, regional, and local laws and regulations. All potential fuels and lubricants to be imported to the site will be handled as discussed in Section 5.4 of this BMP.

Plastic buckets or similar containers will be placed under hose connections, and plastic sheeting will be placed under tank or container openings and associated piping to contain possible spills, during fueling and other transfers of hazardous liquids, as appropriate.

6.2 SPILL RESPONSE

Primary guidance for spill and response activities at ITSI project sites is contained in the Spill Response SOP in the ITSI Corporate Health and Safety Program (EHCI, 1998). Additional site-specific guidance for this project is provided in the SSHSP, which will be maintained on-site. A copy of the SOP is presented as an attachment to the SSHSP.

6.3 REPORTING

In the event of any spill or release, the Site Superintendent will immediately notify the DOE/LANL/USACE and the legally required Federal, State, and local reporting channels (including the National Response Center at 1-800-424-8802) if a reportable quantity is released to the environment. Emergency points of contact, telephone numbers, and other reporting information are presented in Attachment 1 to this BMP.

ITSI will conduct a visual inspection of the haul routes at the end of each working day, and clean up any soil spillage. A daily Field Logbook will be maintained to document the daily inspections and any cleanup activities.

6.4 CONTROL AND CLEANUP

Fuel-spill cleanup equipment consisting of granular absorbent, absorbent booms, Department of Transportation approved empty drums or other containers, shovels, brooms, and absorbent pads will be available at the vehicle storage and fueling area. Personal protective equipment including disposable gloves and booties and Tyvek coveralls will also be available. All personnel designated as spill response team members will have properly fitted eyewear and respirators appropriate to anticipated site-specific cleanup activities.

The methods and procedures to be used for safe and expeditious contaminant cleanup are outlined in the SSHSP.

7.0 WASTE MANAGEMENT

Project activities will be conducted to minimize the environmental impact of wastes by limiting waste production, recycling waste materials where possible, and managing storage and cleanup procedures to reduce the quantity of materials requiring disposal. For this project, no recyclable or reusable wastes will be generated. In addition, the generation of construction wastewater is not anticipated as a dry equipment decontamination procedure will utilized. Portable sanitary units used during ash removal activities will be self-contained and will be appropriately serviced.

The BMP Coordinators, or their designees, will be responsible for implementation of the procedures for handling and disposal of wastes generated or encountered during field activities, as described in the following paragraphs. Waste management practices will comply with applicable Federal, State, and local requirements and ordinances; and all ITSI personnel, subcontractors, vendors, and suppliers will be required to comply with this plan and participate in the waste-minimization effort.

Records will be maintained during field activities to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. These records will be available to the DOE/LANL/USACE during construction, and a copy of the records will be provided to DOE/USACE at the end of the project.

7.1 PACKAGING AND STAGING OF ASH FOR DISPOSAL

The ash will be collected in appropriate containers that will be used for storage in an approved staging area, while waiting for transportation to an approved disposal facility. Figure 3 shows where the containers will be staged. Note: Upon initial evaluation of the incinerator ash sample results, it is likely that the material will be classified as Low

Specific Activity Type 1 (LSA - 1). Per 49 CFR 173.427, LSA-1 solid material is required to be packaged for transportation in an IP-1/IP-2 rated package (IP-1 indicates a poly propylene construction and IP-2 is a water proof inner liner placed inside an IP-1 package). This will require the packages to meet the requirements specified in 49CFR173.411 for IP-1/IP-2 rated containers, such as Supersacks. IP-1/IP-2 containers will be obtained from a vendor or manufacturer that has certified the containers as meeting the specified regulatory requirements. Each container will be inspected for integrity prior to filling, during filling, and during movement. Filled containers will be stored in a secure area that is fenced. Containers will be inspected daily during operations, and weekly thereafter for integrity, tampering, and leakage.

7.2 NON-ASH DEBRIS AND OTHER SOLID WASTE MANAGEMENT AND DISPOSAL

Debris will be loaded directly into a dump truck, rolloff, or packaged in burlap or plastic bags. Other waste items that will be handled with the debris include vegetation cleared prior to removal, silt fencing, packaging materials for constructions products, and miscellaneous personal protective equipment. The debris will be evaluated by LANL Radiation Safety personnel for disposal at a sanitary waste landfill. If the debris cannot be released for sanitary waste, the waste will be packaged accordingly.

8.0 REFERENCES

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NARA, (ND), 40 CFR 279, Standards for the Management of Used Oil.

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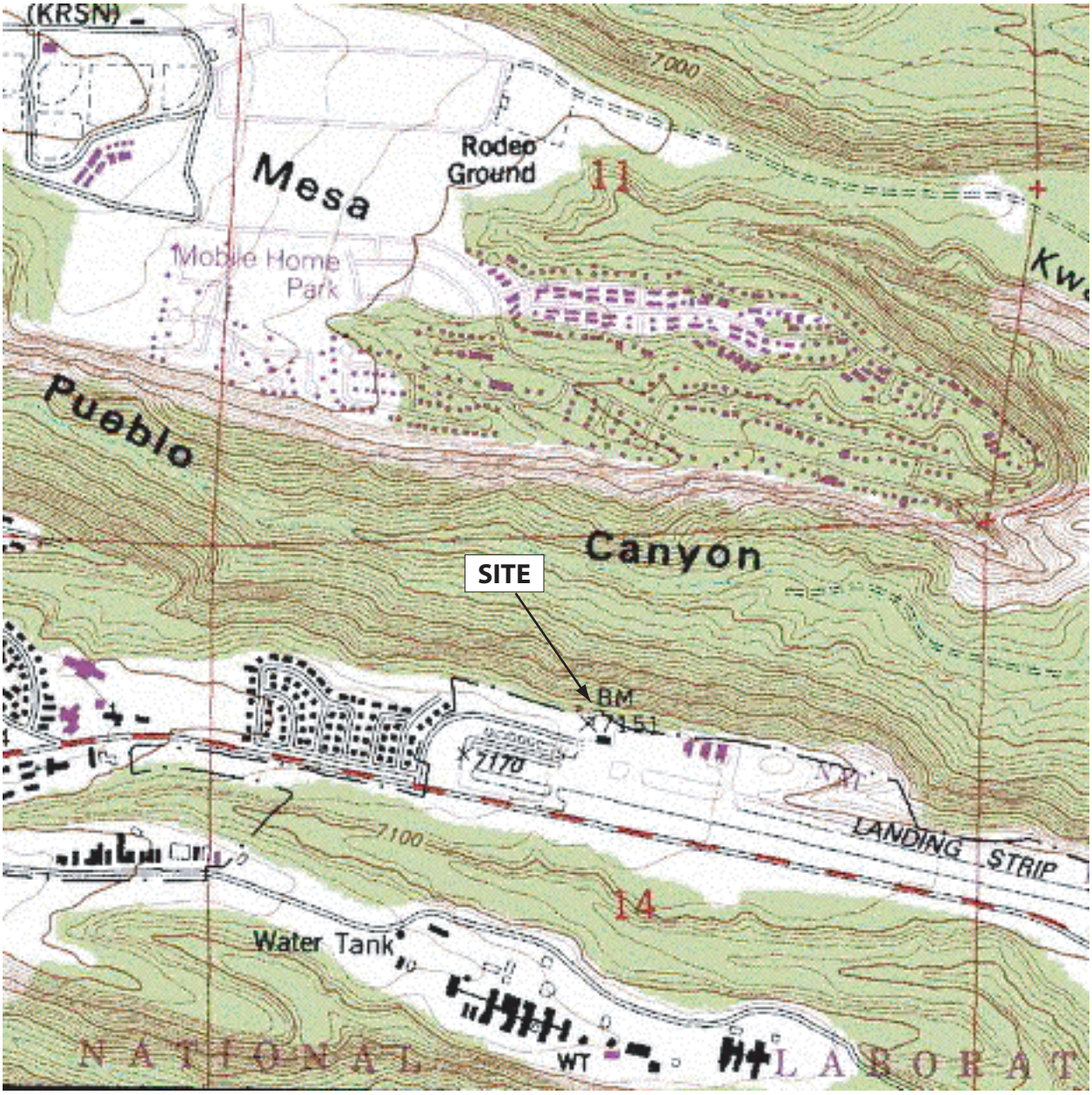

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Source: USGS 7.5 minute, Guaje Mountain Quadrangle, 1984

Innovative Technical Solutions, Inc.

U.S. Army Corps of Engineers, Sacramento District

Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 1
Site Location Map

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 1 - Site Location Map.ai

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Source: USGS Aerial Photograph for 1996 (from TerraServer).

Innovative Technical Solutions, Inc.

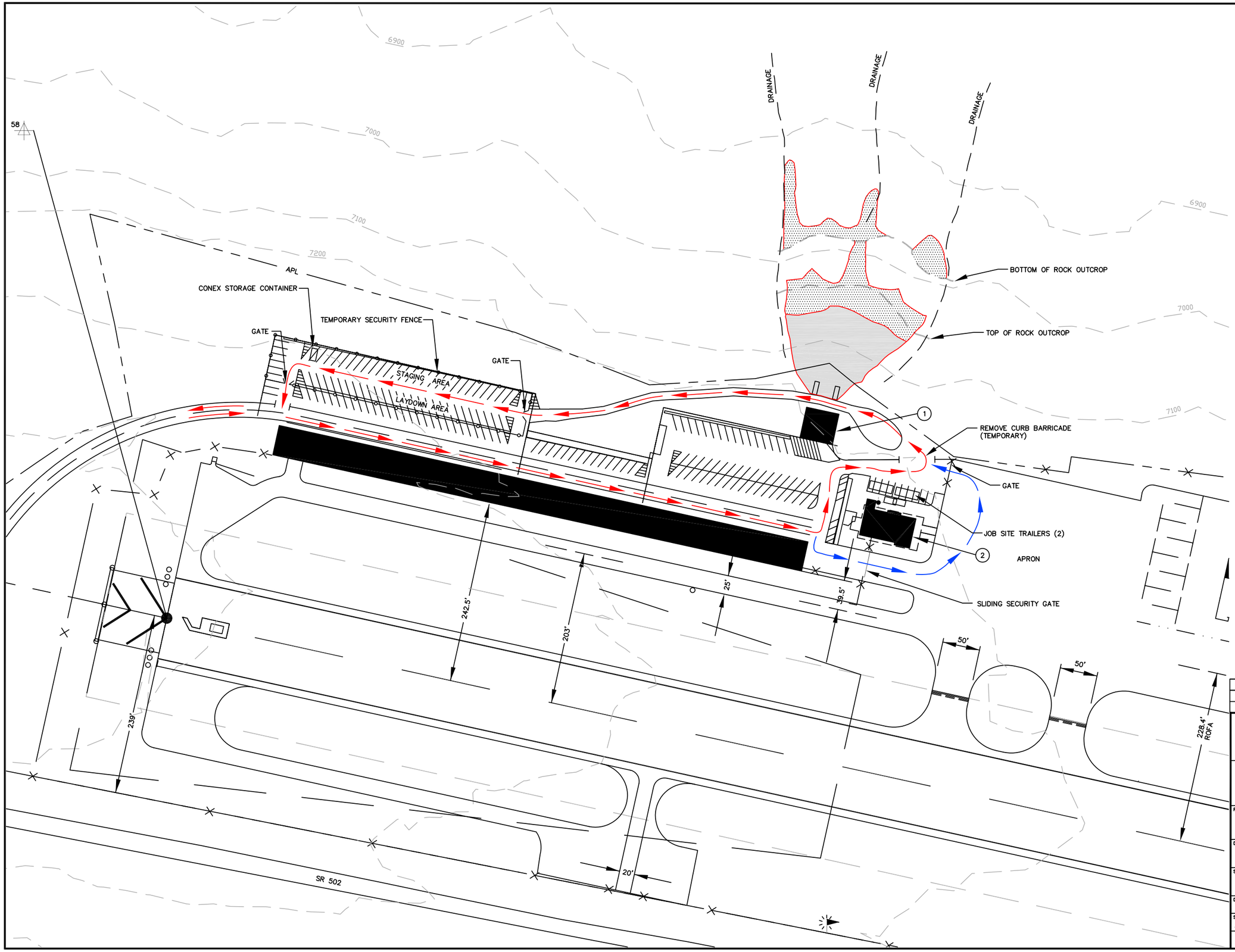
U.S. Army Corps of Engineers, Sacramento District

Los Alamos National Laboratory, U.S. Department of Energy

SWMU 73-002, Los Alamos National Laboratory, New Mexico

Figure 2
Site Layout

04-400.12\LANL\Graphics\Waste Characterization Workplan\Fig 1 - Site Layout.ai



LEGEND

ITEM	EXISTING	FUTURE
AIRPORT PROPERTY LINE	APL	
AIRFIELD PAVEMENT		
TAXILANE OBJECT FREE LINE		
BUILDINGS		
8' CHAIN LINK FENCE		
TEMP. CHAIN LINK FENCE		
AIRPORT BEACON		
LIGHTED WIND CONE		
OBSTRUCTIONS		
CONTROL POINTS		
AIRPORT REFERENCE POINT (ARP)		
LIGHTED SEGMENTED CIRCLE AND WIND CONE		
THRESHOLD LIGHTS		
REIL		
VEHICLE PARKING		
BUILDING NBR.–BLDG. DATA TABLE	1	
HAUL ROUTE		
OPTIONAL HAUL ROUTE FOR LONGER TRUCKS (ONLY IF NECESSARY)		
APPROX. AERIAL EXTENT OF ASH		
APPROX. AERIAL EXTENT OF DEBRIS		

BUILDING DATA TABLE

BLDG #	DESCRIPTION
1	INCINERATOR BUILDING
2	TERMINAL BUILDING 73–1

VAR 11°7' E

AUGUST 1992
ANNUAL RATE OF CHANGE 0.1° W
SOURCE: ALBUQUERQUE SECTIONAL
November 1992

GRAPHIC SCALE IN FEET

60 0 60 120

FIGURE 3

REV	DATE	DESCRIPTION	DRAWN	APPR'D

ITSI Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, California 94598

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

PROJECT TITLE
LOS ALAMOS AIRPORT
LOS ALAMOS, NEW MEXICO

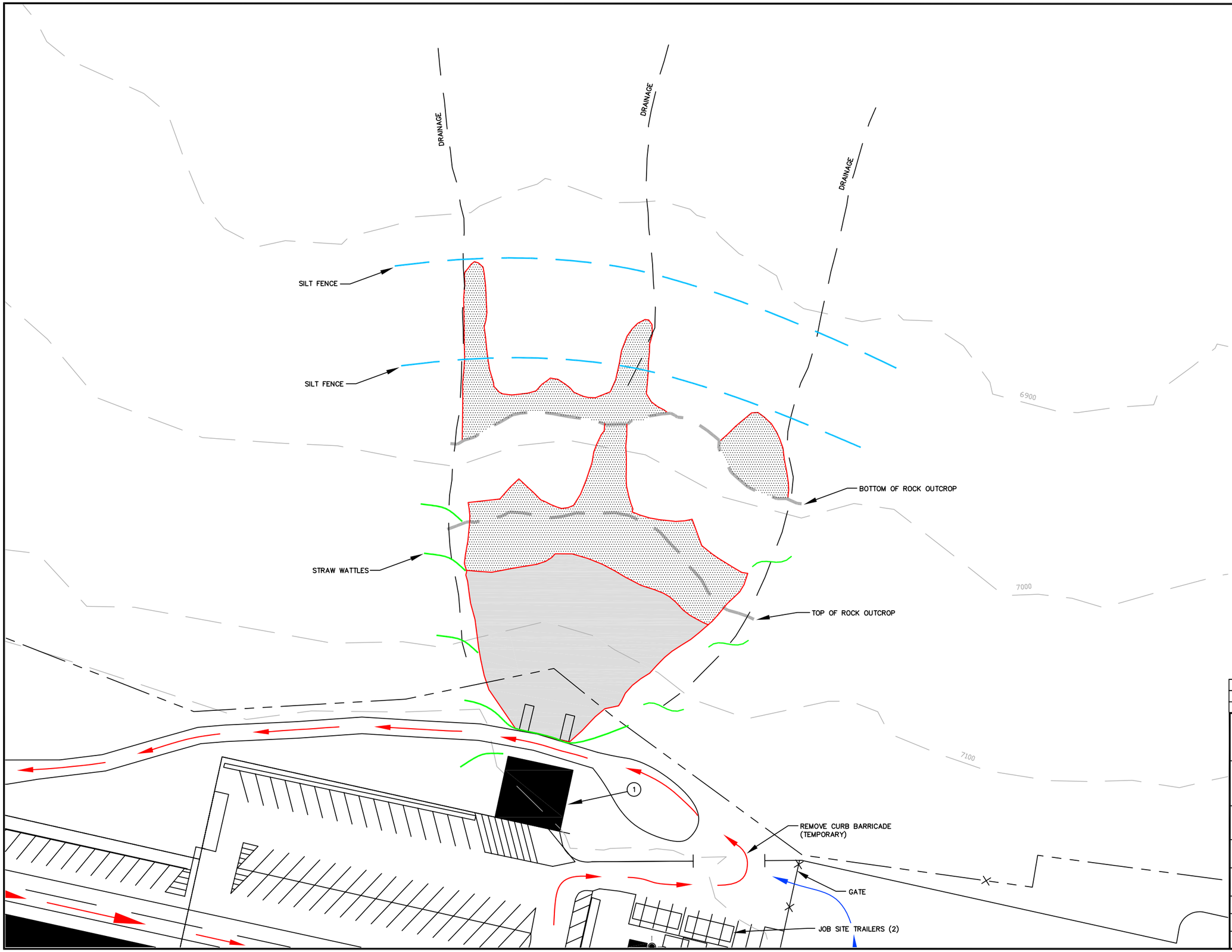
DRAWING TITLE
SITE PLAN WITH WORK AREAS

SUBMITTED	APPROVED	APPROVED
CHIEF ENGINEER	CIVIL ENGINEER	COMMANDER

DRAWN BY	DESIGNED BY	DATE	SHEET
RDB	JC	5–19–2005	

SCALE	ITSI PROJECT NO.	DRAWING NO.
AS NOTED	04.400.12.110	04400.12/GRAPHICS/CAD

FILE
SITE PLAN



LEGEND

ITEM	EXISTING	FUTURE
AIRPORT PROPERTY LINE	APL	
AIRFIELD PAVEMENT		
TAXILANE OBJECT FREE LINE		
BUILDINGS		
8' CHAIN LINK FENCE		
TEMP. CHAIN LINK FENCE		
SILT FENCE		
STRAW WATTLE		
AIRPORT BEACON		
LIGHTED WIND CONE		
OBSTRUCTIONS		
CONTROL POINTS		
AIRPORT REFERENCE POINT (ARP)		
LIGHTED SEGMENTED CIRCLE AND WIND CONE		
THRESHOLD LIGHTS		
REIL		
VEHICLE PARKING		
BUILDING NBR.–BLDG. DATA TABLE	1	
HAUL ROUTE		
OPTIONAL HAUL ROUTE FOR LONGER TRUCKS (ONLY IF NECESSARY)		
APPROX. AERIAL EXTENT OF ASH		
APPROX. AERIAL EXTENT OF DEBRIS		

BUILDING DATA TABLE

BLDG #	DESCRIPTION
1	INCINERATOR BUILDING
2	TERMINAL BUILDING 73–1

MAG 11°7' E

AUGUST 1992
ANNUAL RATE OF CHANGE 0.1° W
SOURCE: ALBUQUERQUE SECTIONAL
November 1992

GRAPHIC SCALE IN FEET

30 0 30 60

FIGURE 4

REV	DATE	DESCRIPTION	DRAWN	APPR'D

ITSI Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, California 94598

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

PROJECT TITLE
LOS ALAMOS AIRPORT
LOS ALAMOS, NEW MEXICO

DRAWING TITLE
BEST MANAGEMENT PRACTICES–
STORM WATER PREVENTION

SUBMITTED	APPROVED	APPROVED
CHIEF ENGINEER	CIVIL ENGINEER	COMMANDER

DRAWN BY	DESIGNED BY	DATE	SHEET
RDB	JC	5–13–2005	

SCALE	ITSI PROJECT NO.	DRAWING NO.
AS NOTED	05.400.12.110	05400.12/GRAPHICS/CAD
		FILE STORM WATER

Attachment 1

Spill/Discharge and Emergency Contact List

Emergency Contacts
Corrective Action for SWMU 73-002
(Removal of Incinerator Ash)

Police Department	911
Fire Department	911
Hospital: Los Alamos Medical Center 3917 West Road, Los Alamos, NM 87544	(505) 662-4201
Innovative Technical Solutions, Inc. Corporate Offices	(925) 946-3100
Innovative Technical Solutions, Inc. USACE Program Manager: Dan Ledford	Office: (925) 946-3124 Mobile: (925) 250-5726
Innovative Technical Solutions, Inc. D&D Program Manager for Nuclear Services: Kent Dorr, PMP	Office: (303) 420-6325 Mobile: (303) 710-7480
Innovative Technical Solutions, Inc. Site Superintendent: Jim Cox	Office: (925) 946-3230 Mobile: (925) 324-5606
Innovative Technical Solutions, Inc. Director, Health & Safety Programs/CIH: Irene S. Fanelli, CIH	Office: (336) 446-0118 Mobile: (650) 906-7397
Innovative Technical Solutions, Inc. Certified Health Physicist: Kevin Konzen, CHP	Office: (303) 420-6325 Mobile: (720) 234-7574
Innovative Technical Solutions, Inc. Health and Safety Officer: Dennis Rich	Office: (925) 946-3129 Mobile: (925) 525-1547
U.S. Army Corps of Engineers, Sacramento District Project Manager: Hyland Morrow	Office: 916-557-6924
U.S. Department of Energy, Los Alamos National Laboratory Project Manager: David Gregory, P.E.	Office: 505-665-5808
U.S. Department of Energy Project Manager: Robert Enz	Office: 505-667-7640

When calling emergency responders, the following information should be provided:

- Name and telephone number of the person making the call
- Nature and location of the incident
- What assistance is needed
- Actions already taken

IMPORTANT! Do not hang up until the operator has all the information needed.

Contained Discharges

Part 110-Discharge of Oil: 110.10 Notice: Any person in charge of a vessel or of an onshore or offshore facility shall, as soon as he or she has knowledge of any discharge of oil from such vessel or facility in violation of 110.6 immediately notify the National Response Center (NRC) at 800- 424-8802. If direct reporting to the NRC is not practicable, reports shall be made to the Coast Guard or EPA pre-designated On-Scene Coordinator (OSC) for the geographic area where the discharge occurs.

All such reports shall be promptly relayed to the NRC. If it is not possible to notify the NRC or the pre-designated OSC immediately, reports may be made immediately to the nearest Coast Guard unit, provided that the person in charge of the reports shall be made in accordance with such procedures as the Secretary of Transportation may prescribe. The procedures for such notice are set forth in the U.S. Coast Guard Regulations 33 CFR153 subpart B and in the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR part 300 subpart E. (Approved by the Office of Management and Budgets under control number 2050-0046).

Unconfined Discharges

For discharges that have reached, or have the potential to reach waters of associated waterways, or waters of the United States, the following will be notified immediately, in addition to OSC and fire department:

Agency: National Response Center

Phone Number : (800) 424-8802

Situations Requiring Notification: Spills of oil that reach navigable waters that cause a film, sheen, or discoloration of the water, or cause sludge or emulsion to deposit beneath the surface. Spills of hazardous substances into the environment in excess of the reportable quantity within 24 hours.

APPENDIX C

VOLUNTARY CORRECTIVE ACTION FACT SHEET FOR PRS 73-002

Los Alamos National Laboratory, New Mexico

VOLUNTARY CORRECTIVE ACTION FACT SHEET FOR PRS 73-002

Description and History

Potential Release Site (PRS) 73-002, a former incinerator and associated disposal area, is located north-northwest of the existing Los Alamos Airport terminal building. The incinerator's primary purpose was to destroy classified documents from the Laboratory. It was used for this purpose for only about one year because of incomplete combustion problems. The incinerator was also used to incinerate municipal trash from the townsite. The incinerator equipment and stack have been removed, but no information on the removal operation is available.

The ash disposal area is located on the south slope of Pueblo Canyon, immediately north of the incinerator building, and covers an area of approximately 30,000 square feet. The ash ranges in thickness from less than one foot to greater than eight feet.

Contaminants

Based on the results of sampling events conducted in 1996 and 1997, several contaminants of potential concern (COPCs) have been tentatively identified. Several inorganic chemicals were detected at concentrations exceeding their background values (BVs). Of these, lead is the most notable with a maximum concentration of 13,100 ppm. Other inorganic chemicals exceeding BVs are antimony, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, and zinc.

The list of detected organic chemicals includes the pesticides 4,4'-DDE, 4,4'-DDT, and alpha chlordane. Dioxins and furans were detected at concentrations in the part per trillion to low part per billion range. Several volatile and semivolatile organic chemicals were also detected, including aroclor-1254.

Radiological constituents, U-234 and U-238, were detected above BVs in two samples. Waste characterization samples collected from within one of the incinerator building's drainlines (PRS 73-006), also contained low levels of Pu-239. Additional sampling of the ash debris was completed for radiological analyses, but the results are not yet available.

Voluntary Corrective Action

The corrective action at this site will involve the complete removal of the ash and associated debris, and any contaminated soil beneath the ash and debris. The outfall areas of the associated PRSs 73-004(a) (incinerator building septic system) and 73-006 (incinerator building drainlines) have been removed since they were incorporated with the ash material. Details of the ash removal have not been finalized, but it is currently believed that these activities could be completed using the combined efforts of a vacuum truck and other heavy equipment capable of moving large volumes of material with minimum disturbance to the surrounding environment. Site restoration most likely would involve the installation of erosion control matting and seeding, as appropriate.

Anticipated Waste Types and Volumes

ITEM	WASTE TYPE	ANTICIPATED VOLUME
Incinerator ash and debris	Special waste (thought to be non hazardous but potentially low level radioactive)	3,700 cu yd
Contaminated soils	Non hazardous	200 cu yd
Sampling materials and PPE	Sanitary	2 cu yd

Estimated Cost

Since the details of the ash and debris removal have not been finalized, it is difficult to estimate the cost of the VCA activities at PRS 73-002. The remedial activities, including planning, cleanup, waste disposal, site restoration, and report preparation, could easily range from $2.5M to $8.0M. The single factor most affecting the final cost will be waste disposal. The cost of waste disposal could increase significantly if much or all of the ash must be disposed of as a low level radioactive special waste.

Ash Disposal Area
PRS 73-002
Maximum Inorganic Chemical Concentrations

Analyte	Maximum Concentration (ppm)	TCLP Concentration (ppm)	BV (ppm)
Aluminum	32000	–	29200
Antimony	159	–	0.83
Arsenic	90	ND	8.7
Barium	6280	1.45	295
Cadmium	42.9	0.151	0.4
Calcium	45900	–	6120
Chromium	133	0.033 (B)	19.3
Cobalt	37.8	–	8.64
Copper	6320	–	14.7
Iron	431000	–	21500
Lead	13100	4.1	22.3
Magnesium	6010	–	4610
Manganese	1960	–	671
Mercury	19	ND	0.1
Nickel	236	–	15.4
Potassium	5040	–	3460
Selenium	3.8	ND	1.52
Silver	448	ND	1
Sodium	7760	–	915
Thallium	10.6	–	0.73
Vanadium	65	–	39.6
Zinc	7170	–	48.8

Note: Max. concentrations all occur in ash.

Ash Disposal Area
PRS 73-002
Maximum Radionuclide Concentrations

Analyte	Maximum Concentration (pCi/g)	BV (pCi/g)
Pu-239	2.54	0.054
U-234	17.1	2.59
U-235	0.97	0.2
U-238	15.93	2.29

Note: Max. concentrations all occur in ash.

Ash Disposal Area
PRS 73-002
Maximum Organic Chemical Concentrations

Analyte	Maximum Concentration (ppm)	No. of Detects	Location	EQL (ppm)
Volatile Organics				
Benzene	0.005 (J)	2	Ash	0.005
1,4-Dichlorobenzene	0.048 (J+)	1	Ash	0.005
4-Isopropyltoluene	24 (J+)	3	006 Outfall	0.005
Tetrachloroethene	0.019 (J)	6	Ash	0.005
Toluene	1 (J+)	3	006 Outfall	0.005
1,1,1-Trichloroethane	0.025	7	Ash	0.005
Trichloroethene	0.03	7	Ash	0.005
Trichlorofluoromethane	0.018	1	Ash	0.005
1,3,5-Trimethylbenzene	0.01 (J)	1	006 Outfall	0.005
Semivolatile Organics				
Napthalene	0.36 (J)	3	004(a) Outfall	0.33
Phenol	0.52 (J)	1	004(a) Outfall	0.33
Pesticides/PCBs				
4,4-DDD	8.5	5	In 006 Drainline	0.0033
4,4-DDE	4.38	14	In 004(a) Drainline	0.0033
4,4-DDT	35.4	10	In 004(a) Drainline	0.0033
Beta-BHC	0.0026	1	Ash	0.00165
Alpha Chlordane	0.13	4	In 006 Drainline	0.00165
Gamma Chlordane	0.19	3	In 006 Drainline	0.00165
Aroclor 1254	0.17	6	Ash	0.0033

Note: Several samples were diluted resulting in detection levels well in excess of the EQLs.

Ash Disposal Area
PRS 73-002
Maximum Dioxin/Furan Concentrations

Analyte	Maximum Concentration (pptrillion)
TCDDs Total	2100
2,3,7,8-TCDD	140
PeCDDs Total	870
1,2,3,7,8-PeCDD	96
HxCDDs Total	1000
1,2,3,4,7,8-HxCDD	26
1,2,3,6,7,8-HxCDD	140
1,2,3,7,8,9-HxCDD	120
HpCDDs Total	1800
1,2,3,4,6,7,8-HpCDD	1100
OCDD	4800
TCDFs Total	42000
2,3,7,8-TCDF	6700
PeCDFs Total	9600
1,2,3,7,8-PeCDF	750
2,3,4,7,8-PeCDF	840
HxCDFs Total	2100
1,2,3,4,7,8-HxCDF	670
1,2,3,6,7,8-HxCDF	230
2,3,4,6,7,8-HxCDF	200
1,2,3,7,8,9-HxCDF	10
HpCDFs Total	610
1,2,3,4,6,7,8-HpCDF	400
1,2,3,4,7,8,9-HpCDF	14
OCDF	150

Note: Max. concentrations all occur in the ash.

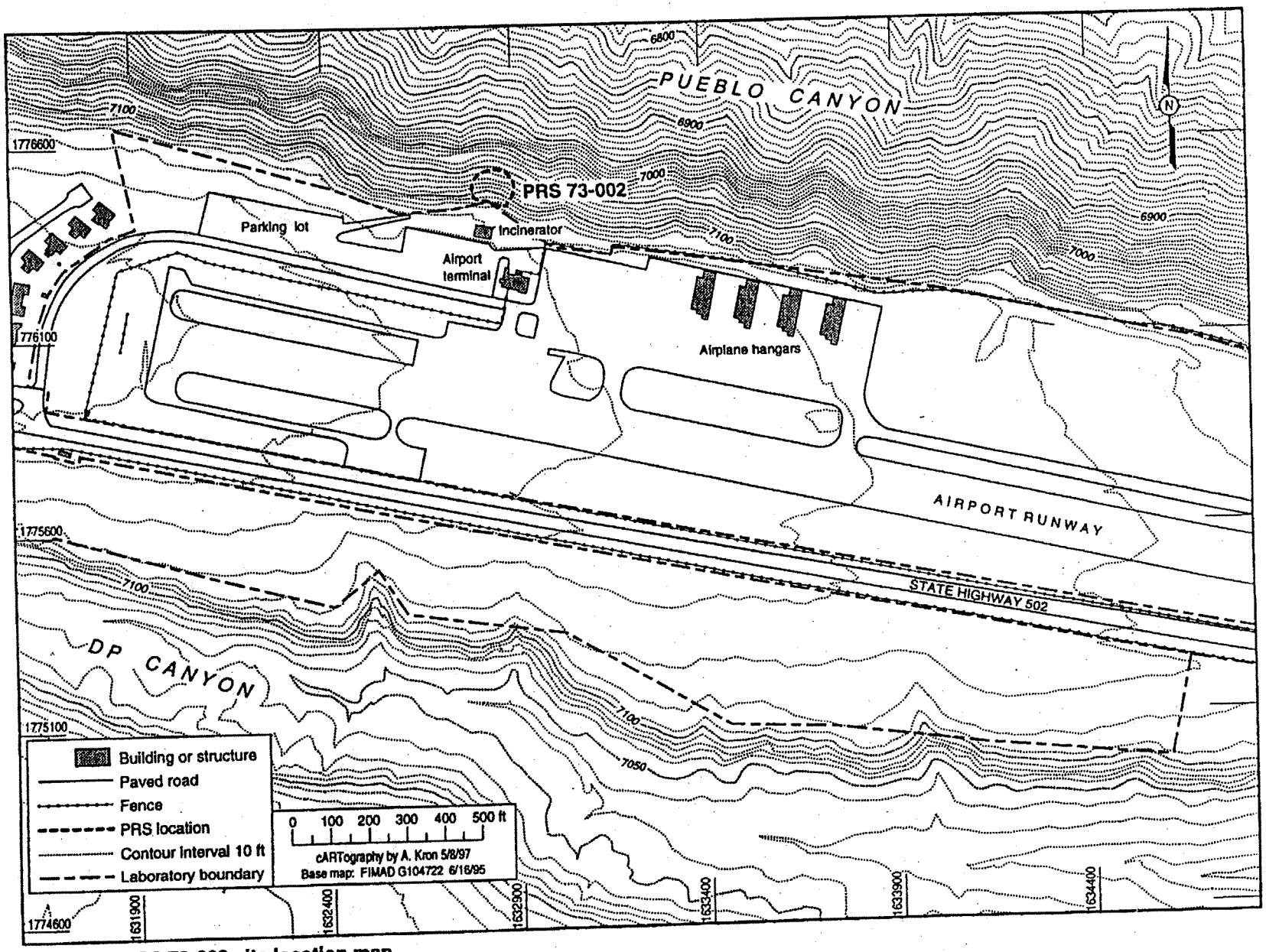
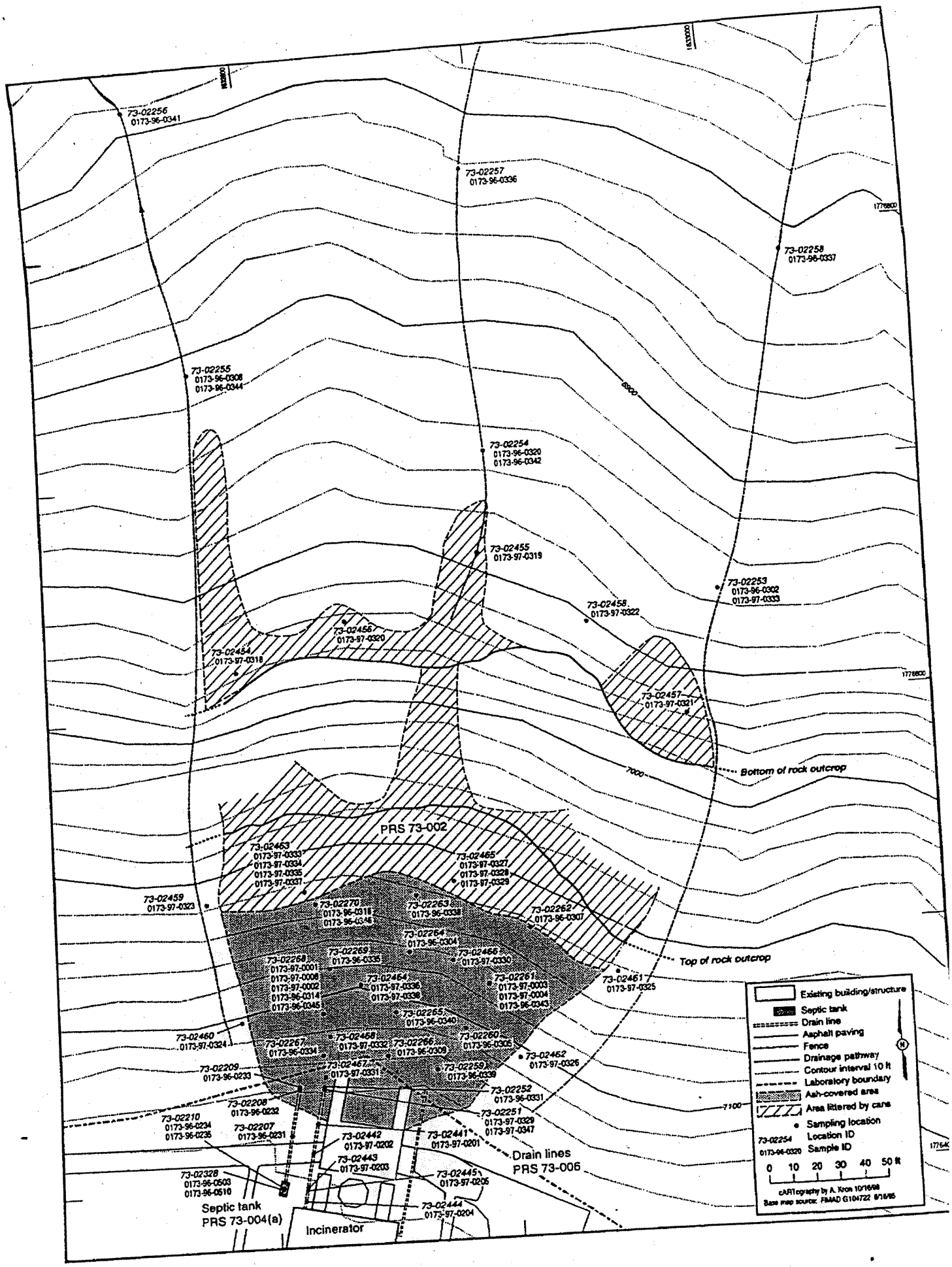


Figure 1.1 PRS 73-002 site location map.


73-02256
0173-96-0341
73-02257
0173-96-0336
73-02258
0173-96-0337
73-02255
0173-96-0308
0173-96-0344
73-02254
0173-96-0320
0173-96-0342
73-02455
0173-97-0319
73-02253
0173-96-0302
0173-97-0333
73-02458
0173-97-0322
73-02456
0173-97-0320
73-02454
0173-97-0318
73-02457
0173-97-0321
Bottom of rock outcrop
PRS 73-002
73-02463
0173-97-0333
0173-97-0334
0173-97-0335
0173-97-0337
73-02465
0173-97-0327
0173-97-0328
0173-97-0329
73-02459
0173-97-0323
73-02270
0173-96-0318
0173-96-0346
73-02263
0173-96-0338
73-02262
0173-96-0307
73-02264
0173-96-0304
73-02269
0173-96-0335
73-02466
0173-97-0330
Top of rock outcrop
73-02268
0173-97-0001
0173-97-0006
0173-97-0002
0173-96-0314
0173-96-0345
73-02464
0173-97-0336
0173-97-0338
73-02261
0173-97-0003
0173-97-0004
0173-96-0343
73-02461
0173-97-0325
73-02265
0173-96-0340
73-02460
0173-97-0324
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0173-96-0334
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0173-96-0339
73-02209
0173-96-0233
73-02252
0173-96-0331
73-02208
0173-96-0232
73-02210
0173-96-0234
0173-96-0235
73-02207
0173-96-0231
73-02251
0173-97-0329
0173-97-0347
73-02442
0173-97-0202
73-02441
0173-97-0201
Drain lines
PRS 73-006
73-02443
0173-97-0203
73-02445
0173-97-0205
73-02328
0173-96-0503
0173-96-0510
Septic tank
PRS 73-004(a)
73-02444
0173-97-0204
Incinerator
Existing building/structure
Septic tank
Drain line
Asphalt paving
Fence
Drainage pathway
Contour interval 10 ft
Laboratory boundary
Ash-covered area
Area littered by cans
Sampling location
73-02254 Location ID
0173-96-0320 Sample ID
0 10 20 30 40 50 ft
cARTography by A. Kron 10/16/98
Base map source: FMAD G104722 8/18/95

PRS 73-002
ASH DISPOSAL AREA
SAMPLE SUMMARY (DRAFT)

1996 SAMPLING ACTIVITY

A total of 28 samples were collected at 22 locations. This total includes 12 samples that were analyzed for XRF metals only. The remaining 16 samples (one of which is not in the FIMAD data base) are summarized as follows:

- Three sediment samples, one from each of the three drainages below the ash disposal area, were collected from within the 0-12-inch interval. All three samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, gross alpha/beta/gamma, and tritium.
- Thirteen ash samples were collected from within the 0-12-inch interval. All were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, gross alpha/beta/gamma, and tritium

1997 SAMPLING ACTIVITY

A total of 31 samples were collected at 19 locations. These samples are summarized as follows:

- Seven sediment samples were collected from three locations within the two primary drainage pathways below the ash disposal area and close to the bottom of Pueblo Canyon. One was from a depth of 1.5-2 feet, the others were surface samples. All were analyzed for dioxins/furans and metals.
- Five surface soil samples were collected from below the rock outcrop to evaluate downgradient migration of contaminants. All but one were also collected below accumulations of tin cans. All were analyzed for dioxins/furans, SVOCs, and metals.
- Four surface soil samples, two from within 10 feet of each side of the ash disposal area, were collected to evaluate lateral migration. Two were analyzed for dioxins/furans, and all were analyzed for SVOCs and metals.
- Ten ash and debris samples were collected from depths ranging from the surface to 7.5 feet. Eight were analyzed for dioxins/furans, three for VOCs and SVOCs, three for pesticides/PCBs, five for metals, two for TCLP metals, and two for gross alpha/beta/gamma, gamma scan, and isotopic uranium.
- Five soil and tuff samples were collected from beneath the ash at depths ranging from 3.5 to 4.8 feet to determine if leaching was occurring. All were analyzed for dioxins/furans, four for VOCs, and three for SVOCs and metals.

Only a preliminary review of this data has been completed. In general, high concentrations of several inorganic chemicals have been noted in the ash samples but not in the soil and sediment samples. The ash also contains low concentrations of several organic chemicals including, but not limited to, dioxins/furans and certain pesticides. Two ash samples within the drainage pathway from the west outfall of PRS 73-006 contained elevated levels of uranium 234 and 238. Because of this, several additional samples were recently collected for rad. analyses, but these results are not yet available.

It is believed that the nature and extent of contamination will be sufficiently defined by existing and pending data to support the preparation of a Voluntary Corrective Action Plan.

APPENDIX D

INVESTIGATION DERIVED WASTE FOR SWMU 73-002

Los Alamos National Laboratory, New Mexico

Investigation Derived Waste

Corrective Action for SWMU 73-002
(Incinerator Ash Removal)
Los Alamos National Laboratory, New Mexico

Contract No. DACA05-99-D-0014
Task Order CM26

Prepared for:
United States Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814

And

Los Alamos National Laboratory
National Nuclear Security Administration, US Department of Energy
P.O. Box 1663 MS-A316
Los Alamos, NM 87544

Prepared by:
Innovative Technical Solutions, Inc.
2730 Shadelands Drive, Suite 100
Walnut Creek, California 94598

May 2005
ITSI Project No: 04-400.12

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3.0 Methodologies for Management of Investigation Derived Waste 3

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3.2 Liquid Investigation Derived Waste Generation and Handling 4

3.2.1 Liquid Investigation Derived Waste Profiling for Off-Site Disposal 4

4.0 References 5

1.0 INTRODUCTION

This plan describes the management of Investigation Derived Waste (IDW), which has been prepared to support the Incinerator Ash Removal of Solid Waste Management Unit (SWMU) 73-002 in Los Alamos, New Mexico. A copy of the referenced plan will be maintained in the ITSI Field Trailer.

The objective of this plan is to describe the procedure for storage and disposal of IDW in a manner that will meet regulatory requirements while limiting the on-site handling and storage of materials. The IDW includes waste materials generated during performance of sampling and remediation activities.

2.0 REQUIREMENTS FOR MANAGEMENT OF INVESTIGATION DERIVED WASTE

Investigation-derived waste will consist of solid and liquid waste. Solid waste, consisting of general refuse, disposable personal protective equipment (PPE), and disposal equipment generated during the remediation activities, will be placed in garbage bags, sealed, and disposed of in on-site trash receptacles following evaluation by LANL Radiation Safety personnel for release to a sanitary landfill.

Some liquid waste will be generated from decontamination and sampling activities. All liquid waste will be temporarily stored in an on-site selected staging area and labeled as non-hazardous waste for waste characterization, profiling and final offsite disposal. Regardless of its classification, every effort will be made to characterize, profile, and remove IDW from the site within 90 days from which it is generated.

Liquid waste generally will be stored before final disposition by one of the following processes:

- Non-hazardous liquids will be profiled and disposed at an offsite permitted industrial wastewater treatment plant.
- Hazardous liquids, if identified, will be disposed at an offsite permitted treatment/disposal facility.

3.0 METHODOLOGIES FOR MANAGEMENT OF INVESTIGATION DERIVED WASTE

This section presents the methodologies for management and disposal of IDW. The following standard practices will be followed:

- Solid IDW will be placed in garbage bags, sealed, evaluated for release by LANL Radiation Safety, and appropriately disposed of at either a sanitary landfill via on site trash receptacles, or disposed of at an industrial waste landfill for low-level radioactive material.
- All liquid IDW generated during purging will be placed into DOT approved 55 gallon-drums or other appropriate containers.
- DOT approved drums containing liquid waste will be temporarily labeled as non-hazardous waste and stored on-site pending waste characterization, profiling and final off-site disposal.
- The generation, management, characterization, and disposal of IDW will be documented.

3.1 SOLID INVESTIGATION DERIVED WASTE GENERATION AND HANDLING

Solid IDW will primarily be generated from the accumulation of used and discarded PPE during sampling activities. Field activities will generate used PPE, which may include Tyvek™ over-garments, latex gloves, disposable bailers, filters, tape, plastic sheeting, and plastic packaging. These materials will be collected in a plastic bag. The filled bags will be stored in a designated general refuse container or receptacle at the site.

- Evaluation criteria for Solid Waste is anticipated to include the following: Physical inspection to ensure no waste material has accumulated on solid waste
- Evaluated by LANL Radiation Safety personnel to ensure the release requirements of 10CFR835 are satisfied.

3.2 LIQUID INVESTIGATION DERIVED WASTE GENERATION AND HANDLING

Liquid IDW will primarily be consisted of decontamination water generated during confirmation soil sampling activities. The liquid will be placed into 55-gallon DOT-rated steel drums and staged near the packaged ash in the designated staging area. Following receipt of the analytical results, an appropriate offsite disposal facility will be selected for treatment and/or disposal. It is anticipated that liquid IDW will be non-hazardous.

3.2.1 Liquid Investigation Derived Waste Profiling for Off-Site Disposal

Profiling of the containerized liquid IDW will be necessary for waste acceptance by a receiving facility. A representative sample will be collected from liquid IDW stored in each drum using a clean disposable bailer and transferred into clean sample containers provided by the laboratory. Sample containers will then be labeled, placed in an ice-chilled cooler, and transported under chain-of-custody procedures to the LANL Sample Management Office for analysis.

Analytical criteria will be dependent on the requirements of the receiving facility, but are anticipated to include the following:

- VOCs/SVOCs
- Metals
- Polychlorinated biphenyls (PCBs)
- Radioactive Material

Additional tests beyond the above methods may be required based on the results of the above tests and discussions with the receiving facilities.

With the results of the waste characterization analysis, the liquid IDW will be properly profiled and disposal will be coordinated with the DOE and New Mexico State-permitted disposal facility. The facility will then issue a letter of waste acceptance for each waste stream as indicated by the waste characterization. The liquid IDW stored in drums will then be loaded and transported to the approved facility.

4.0 REFERENCES

Compliance Order on Consent (Consent Order) between State of New Mexico Environmental Department and, the United Stated Department of Energy and Regents of the University of California for the Los Alamos National Laboratory, Los Alamos County, New Mexico. March 1, 2005.