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ENVIRONMENTAL RESTORATION (RRES-R)
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ER Records Index Form

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Start Pg	Doc Type	Doc Date	Title	Box	Package
1	TRANSMITTAL FORM	2/15/2005	RRES-RS RECORDS PACKAGE TRANSMITTAL FORM N/A N/A N/A	1631	
2	INTEGRATED WORK DOCUMENT	2/17/2005	INTERGRATED WORK DOCUTME FOR CHARACTERIZATION OF MATERIAL DISPOSAL AREA L. ER 2004-0586 N/A ER2004-0586 N/A	1631	
58	SIGNATURE FORM	2/17/2005	RRES-RS PROJECT DOCUMENT SIGNATURE FORM FOR ER2004-0586 FOR CHARACTERIZATION OF MATERIAL DISPOSAL AREA L N/A ER2004-0586 N/A	1631	



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RPLD)

RRES-R Records Package Transmittal Form

Section I — Records Transmitter Information: (Completed by Records Transmitter.)

Name: Kenneth Gillespie Package transmittal date: 2/15/05 TA: 54
 Organization: Apogen Technologies Electronic file(s) transmitted? Yes NA OU: _____
 Z number: 177477 Phone: 662-0690 Privileged record? Yes No Project: TA-54

This record package transmittal (check one)
 is an addition to a previous package. (Include number: 1631) PRS(s): 54-006
 Is a reconciliation report requested? Yes No

is a new package. Records package number: _____
 (RPF use only)

Records package title: TA-54

Record Package Table of Contents

File Folder Name	Record Title or Subject (Limited to 255 characters)	Doc. Date	Author/Originator	Page Count	ER ID #
	Integrated Work Document for Characterization of Material Disposal Area L	11/16/04	Kenneth Gillespie	58	88415

Section II (Completed by RPF personnel only.)
 Name: Mike Rodriguez (Print Name) 4-15-05 (Date)

QP-4.4, R2

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 By: MA

Los Alamos National Laboratory
 RRES-Remediation Services Project

Science and Engineering Associates Inc.
Integrated Work Document
Part 1 - Activity Specific Information

Private

IWD#:ER2004-0586 Revision#:0		Activity/Task Title: Characterization of Material Disposal Area L	
Work Document #: (work order #) AR-54-03-21			
TA: 54	Building: NA	Room: NA	Additional Location Description: Los Alamos National Laboratory, Technical Area 54, Solid Waste Management Unit 54-006

Activity Description/Overview

Material Disposal Area (MDA) L is located in the east-central portion of the Los Alamos National Laboratory on a mesa at Technical Area (TA-) 54. During the late 1950s, the Laboratory, with the approval of the US Atomic Energy Commission and upon recommendation of the US Geological Survey, selected Mesita del Buey, within TA-54, for underground disposal of Laboratory-generated waste. Since that time, the main waste storage and disposal facilities for the Laboratory have been located at TA-54. MDA L is one of four inactive disposal areas on Mesita del Buey between Pajarito Canyon (south) and Cañada del Buey (north) at TA-54.

MDA L is located within an 1100- by 3000-ft (2.5-ac) fenced area (known as TA-54 Area L) and consists of one inactive subsurface disposal pit (Pit A); three inactive subsurface treatment and disposal impoundments (Impoundments B, C, and D); and 34 inactive disposal shafts (Shafts 1 through 34) with depths ranging from 10 to 65 ft below the original ground surface. An asphalt cover was placed over the site between 1989 and 1996. The pit, impoundments, and shafts are constructed in the Tshirege Member of the Bandelier Tuff, a consolidated tuff unit. The regional aquifer is estimated to be at a depth of approximately 930 ft, based on data from other wells at the Laboratory and the predictions of the hydrogeologic conceptual model for the Pajarito Plateau. The topography of Area L is relatively flat, and the majority of the surface overlying MDA L is paved with asphalt to house ongoing waste management activities; surface water runoff from this area is controlled and diverted to an outfall at the northeast corner of the site.

Historically, MDA L was used for disposal of non-radiological liquid chemical wastes. Disposal of these types of wastes no longer occurs at this site. LANL drawings have been used to identify the locations of the pit, impoundments, and shafts comprising MDA L. There are no visible surface expressions of the pit or the impoundments because asphalt covers most of the surface of MDA L. Most but not all the shaft locations are marked with brass caps pressed into the asphalt indicating the approximate location of each shaft. Area L, which consists of the entire fenced surface area over MDA L, is an active RCRA-permitted hazardous waste management unit.

The objectives of the investigation activities are to complete the determination of the nature and extent of contamination identified during past investigations, including the Phase I RFI fieldwork conducted at MDA L, and to collect additional information on the hydrogeologic properties and other physical characteristics of the vadose zone beneath MDA L. In addition, the objectives of the investigation described in the work plan are to determine the nature and extent of hazardous waste constituents and/or radionuclide releases to the environment identified during the Phase I RFI.

To accomplish these objectives, seven boreholes have been planned for installation in and around MDA L. Five boreholes will be located within the boundaries of MDA L, and 2 boreholes will be located to the east of MDA L within Zone 4 of Area G. The investigation boreholes have target depths ranging from 150 ft to 700 ft, and will be drilled using hollow stem auger and air rotary drilling methods. For this IWD, the project has been broken down into the following major activities: General Site Hazards; Drill Rig and Site Setup; Hollow Stem Auger Drilling and Setting the Surface Casing; Air Rotary Drilling; Core Sampling, Screening, and Logging Activities; Waste Management; Flush Mount Borehole Completion; Above Ground Casing Borehole Completion; and Equipment Maintenance and Refueling.

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C*

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
<i>General Site Hazards</i>				
General fieldwork	Vehicular accident	<ul style="list-style-type: none"> Transport wide loads during off-hours, when possible. Determine the safest route to the site prior to mobilization. Maintain vehicles in safe condition and wear seat belts. Minimize and consider not using cellular phones or like devices while the vehicle is in motion. Do not leave unattended vehicles idling. Obey all posted speed limits. Be observant for animals, bicyclists, joggers and other pedestrians on or near the roadway. Ensure that the towing vehicle and associated equipment have the rated capacity to handle the trailer. Ensure that the trailer lights and brakes, if equipped, are functioning and that the safety chains are connected to the vehicle prior to moving the vehicle and trailer. 	SSHASP ER2004-0062 LIR402-1320.01.X Vehicle and Pedestrian Safety	Read Training
	TA-54 facility hazards	<ul style="list-style-type: none"> Personnel are required to have current TA-54 site specific or shall be escorted by someone with current TA-54 site specific training. 	SSHASP ER2004-0062	Read Training TA-54 Site Specific Training
	Head, foot, and eye injury.	<ul style="list-style-type: none"> While in the work area, personnel will wear hard hats, long pants, steel-toed boots, and safety glasses. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Slips, trips and falls	<ul style="list-style-type: none"> Use caution and be observant while in areas of potential concern such as grassy areas. Implement good housekeeping practices and clearly mark slip, trip, fall hazards that cannot be eliminated. 	SSHASP ER2004-0062	Read Training
	Fuel fired equipment fires and wildland fires	<ul style="list-style-type: none"> At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible near fuel fired equipment. At least one employee will be onsite at the work location who has completed fire extinguisher training. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix	Read Training Fire Extinguisher Training
	Inability to summon emergency personnel	<ul style="list-style-type: none"> Use the Buddy system. At least one field team member will have a cellular telephone and be trained in First Aid/CPR. 	SSHASP ER2004-0062	Read Training First aid and CPR

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General fieldwork (cont.)	Lightning	<ul style="list-style-type: none"> If thunder is heard, personnel shall maintain awareness of the proximity of the thunderstorms and changing weather conditions. If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter in a vehicle with the windows rolled up, trailer, or permanent structure. Remain in the sheltered location for 30 minutes following the last lightning strike within 6 miles. Do not remain upright in an open area or seek shelter near tall, upright objects (e.g., trees, drill rig mast). 	SSHASP ER2004-0062 LIG 402-10-01A.X Lightning Safety	Read Training
	Hanta virus	<ul style="list-style-type: none"> Look for and avoid rodent droppings and nests. If droppings or nests must be disturbed to complete work, notify the FM and/or KSL for disinfecting. 	SSHASP ER2004-0062 LIR 402-530-00.X Biological Safety	Read Training
	Wildlife encounters	<ul style="list-style-type: none"> Avoid contact with all wildlife, especially those that are injured or exhibiting unusual behaviors which may be a sign of illness. 	SSHASP ER2004-0062 LIR 402-530-00.X Biological Safety	Read Training
	Snake/spider bites	<ul style="list-style-type: none"> When possible, walk only on established trails and paths as much as practicable to avoid rattlesnakes. Watch for snakes and spiders when walking through or standing in grassy areas. Avoid turning over items in the field such as rocks, wood, under which rattlesnakes, insects, or spiders may be present. 	SSHASP ER2004-0062	Read Training
	Bee/wasp stings	<ul style="list-style-type: none"> Watch for and do not disturb bee/wasp nests. 	SSHASP ER2004-0062	Read Training
	Bloodborne pathogens	<ul style="list-style-type: none"> Treat all blood and bodily fluids as if known to be infectious for HIV, HBV, and other bloodborne pathogens. At least one field team member will have current Bloodborne Pathogens training. 	SSHASP ER2004-0062 LIR 402-530-00.X Biological Safety	Read Training Bloodborne Pathogens
	Heat and cold stress	<ul style="list-style-type: none"> Inform personnel of signs and symptoms of stress. Monitor personnel for indications of stress. Prevent exposure by implementing appropriate work regimen, including work breaks so personnel can warm up or cool down. In cold weather personnel shall wear dry insulated clothing. 	SSHASP ER2004-0062 Current ACGIH Threshold Limit Values (TLVs) LIR 402-820-01.X Noise and Temperature Extremes	Read Training
	Poor housekeeping	<ul style="list-style-type: none"> Practice good housekeeping. Personnel shall not allow tools, equipment, and materials to become a hazard (tripping hazard). 	SSHASP ER2004-0062	Read Training

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General fieldwork (cont.)	Improper hand and power tool use	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. All guards shall in place and no modifications shall be made. Portable power tools shall be plugged into GFCI protected outlets and will be UL listed with a three wire grounded plug. If the cord is not three wired, the tool shall be double insulated. Cords shall be inspected by the user prior to use and protected from unnecessary damage. Any tool whose cord shows signs of damage or deterioration shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training
	Pinch points	<ul style="list-style-type: none"> Personnel should be aware of items on the drill rig, drilling equipment, and field support equipment (i.e., trailers and connecting trailers to hitches) that can cause pinch points and take care when conducting operations where pinch point hazards exist. Personnel shall wear leather or equivalent work gloves when pinch points are present. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Hot surfaces	<ul style="list-style-type: none"> Exhaust pipes and other hot surfaces shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties. 	SSHASP ER2004-0062	Read Training
All work in TA-54, Area L and Area G, Zone 4	Radiological contamination	<ul style="list-style-type: none"> At the discretion of the RCTs, equipment and materials shall be surveyed prior to entering Areas L and G. With the exception of tritium monitoring, RCT coverage shall be on an intermittent basis determined by RCT supervision utilizing best management practices, acceptable knowledge, and sound rad-con practices. A RCT shall monitor for airborne tritium during the initial penetration of the asphalt. Based on the monitoring results, further monitoring and actions may be required. Personnel shall radiologically screen the core. If levels greater than five times background are encountered, work shall be suspended and a RCT shall be notified. All personnel shall self-frisk prior to exiting Area G. At the discretion of the RCTs, equipment and materials shall be surveyed prior to leaving Areas L and G. All radiological decontamination efforts shall be directed by HSR-I personnel. 	SSHASP ER2004-0062 LIR 402-700.01.X Occupational Radiation Protection Requirements	Read Training HAZWOPER 40/8-hr Medical Surveillance

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Drill Rig and Site Setup				
Accessing the site in drill rig	Overhead electrical lines	<ul style="list-style-type: none"> Conduct pre-job site walkdown to identify borehole and electrical line locations. Maintain the following minimum distances for transit operations with boom lowered, as specified in 29 CFR 2926.550(a)(15)(iii): <ul style="list-style-type: none"> For live lines rated < 50 kV; Maintain a minimum distance of 4 ft between live lines and any part of equipment or load. For live lines rated above 50 kV and up to and including 345 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. For live lines rated above 345 kV and up to and including 750 kV; Maintain a minimum distance of 16 ft between live lines and any part of equipment or load. Designate a person to observe clearances of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. 	SSHASP ER2004-0062 LIR 402-600-01.X Electrical Safety	Read Training
Operating the drill rig	Drill rig in poor operating condition	<ul style="list-style-type: none"> A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. 	SSHASP ER2004-0062 Manufacturer's recommendation	Read Training
	Hydraulic line failure resulting in leak, personnel exposure, or fire	<ul style="list-style-type: none"> Inspect hydraulic lines and connections. To the extent practicable, construct secondary containment under hydraulic lines, pumps, and reservoirs. 	SSHASP ER2004-0062	Read Training
Drill rig setup	Improper setup	<ul style="list-style-type: none"> Drill rigs must be leveled. Outriggers shall be fully extended. Use outrigger pads as necessary. 	SSHASP ER2004-0062	Read Training

Site Preparation
Brush Removal
with Hand tools

Back strain.

- Proper Technique, Proper use of tool.
- Avoid Twisting at the waist
- Keep lower back at normal arched position
- Personnel shall wear leather gloves, safety glasses

SSHASP ER2004-0062
LIR 402-870-01.X
Ergonomics
Read Training

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Drill rig setup (cont.)	Overhead electrical lines	<ul style="list-style-type: none"> Conduct pre-job site walkdown to identify electrical line locations. Maintain the following minimum distances for stationary operations, as specified in 29 CFR 1926.550(a)(15)(i) and (ii): <ul style="list-style-type: none"> For live lines rated ≤ 50 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. For live lines rated > 50 kV; Maintain a minimum distance of $10 \text{ ft} + 0.4 \text{ inches} (.033333333 \text{ feet})$ for each 1 kV over 50 kV or twice the length of line insulator but never less than 10 ft. Examples: voltage ≤ 50 kV: 10 ft minimum 345 kV: 20 ft minimum ($10 \text{ ft} + 295 \times .033333333$) 750 kV: 33 ft minimum ($10 \text{ ft} + 700 \times .033333333$) Designate a person to observe clearances of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. 	SSHASP ER2004-0062 LIR 402-600-01.X Electrical Safety	Read Training
	Loose material falling from the mast	<ul style="list-style-type: none"> Inspect mast for loose objects such as wrenches or grease guns prior to raising. 	SSHASP ER2004-0062	Read Training
Unload plastic, posts, and plywood and constructing secondary containments	Pinch points and splinters	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Be aware of pinch points when staging materials next to each other or next to other objects. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable, use two (or more) people to lift and carry loads > 50 lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Cutting plastic for secondary containments	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Use scissors Knife blades shall be retracted or sheathed when not in use. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

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Cutting plywood for secondary containments	Power tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. All guards shall be in place and no modifications shall be made. Portable power tools shall be plugged into GFCI protected outlets and will be UL listed with a three wire grounded plug. If the cord is not three wired, the tool shall be double insulated. Cords shall be inspected by the user prior to use and protected from unnecessary damage. Any tool whose cord shows signs of damage or deterioration shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training
	Splinters and flying debris	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall wear safety glasses. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Manually unloading augers, hex rods, core barrels, casing, grout, core pipe, tremmie pipe, drums and other materials	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Be aware of pinch points when staging materials next to each other or next to other objects. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Slips and falls	<ul style="list-style-type: none"> Personnel shall not "walk" augers, hex rods, or core barrels. 	SSHASP ER2004-0062	Read Training

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Unloading augers, hex rods, core barrels, casing, grout, core pipe, tremmie pipe and other materials with forklift	Forklift hazards	<ul style="list-style-type: none"> • Inspect forklift daily prior to operations. • Operator shall be forklift trained and certified in accordance with 29 CFR 1910.178. • Inspect path of travel for holes, soft spots, rocks and other obstacles/hazards. • Operate forklift in a slow, deliberate manner. • Use a spotter in areas with tight clearances. • Watch for and stay clear of pinch points. • Ensure forklift has the rated capacity to safely lift loads. • Secure loads to forklift as necessary. 	SSHASP ER2004-0062 LIR 402-1110-01.X Forklifts and Powered Industrial Trucks	Read Training Forklift Operator Training
	Overhead electrical lines	<ul style="list-style-type: none"> • Conduct pre-job site walkdown to identify electrical line locations. • Maintain the following minimum distances for stationary operations, as specified in 29 CFR 1926.550(a)(15)(i) and (ii): <ul style="list-style-type: none"> - For live lines rated ≤ 50 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. - For live lines rated > 50 kV; Maintain a minimum distance of 10 ft + 0.4 inches (.03333333 feet) for each 1 kV over 50 kV or twice the length of line insulator but never less than 10 ft. Examples: voltage ≤ 50 kV: 10 ft minimum 345 kV: 20 ft minimum (10 ft + 295 x .03333333) 750 kV: 33 ft minimum (10 ft + 700 x .03333333) • Maintain the following minimum distances for transit operations, as specified in 29 CFR 2926.550(a)(15)(iii): <ul style="list-style-type: none"> - For live lines rated < 50 kV; Maintain a minimum distance of 4 ft between live lines and any part of equipment or load. - For live lines rated above 50 kV and up to and including 345 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. - For live lines rated above 345 kV and up to and including 750 kV; Maintain a minimum distance of 16 ft between live lines and any part of equipment or load. • Designate a person to observe clearances of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. 	SSHASP ER2004-0062 LIR 402-600-01.X Electrical Safety	Read Training

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Staging equipment and materials	Unstable stacks of materials	<ul style="list-style-type: none"> • Bagged materials shall be cross-keyed and shall not be more than 10 bags high. • Augers, hex rods, core barrels, casing, and pipe shall be stacked and blocked to prevent spreading and rolling. • Avoid staging materials in close proximity to work activities where they may be knocked over or fall on personnel. 	SSHASP ER2004-0062	Read Training

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Hollow Stem Auger Drilling and Setting the Surface Casing				
Manually moving augers, hex rods, core barrels, and casing	Back injury	<ul style="list-style-type: none"> • Use mechanical lift assist equipment when practicable. • Repackage to reduce weight and/or bulk. • Ensure path of travel is clear. • Use a wide balanced stance. • Keep item being lifted as close to the body as possible. • Keep lower back in normal arched position. • Keep head and shoulders up as the lifting motion begins. • Lift with legs and stand up in a smooth, even motion. • Avoid twisting at the waist. • When practicable, use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Lifting augers, hex rods, core barrels, and casing and removing bollards with drill rig	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> • A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • The drill rig shall be operated in accordance with the manufacturer's specifications. • Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. • A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. • Wire rope shall be taken of service when: <ul style="list-style-type: none"> – There are six randomly broken wires in one lay – There are three broken wires in one strand in one lay – Wear of one-third the original diameter of outside individual wires – Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure – Evidence of any heat damage from any cause • A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • Hooks, slings, and rigging accessories shall not be loaded in excess of their safe working load limits. • Hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training

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Connecting augers and hex rods to drill rig head and drill string and core barrels to hex rods	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall keep hands away from the connection point between drill rig head and the augers. Personnel shall keep hands away from the connection point between the hex rod and the core barrel. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
	Compressor and pneumatic tools	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the tool to the hose. Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
Drilling through asphalt, overburden, and tuff	Augers “walking” on the asphalt surface	<ul style="list-style-type: none"> During initial penetration of the asphalt personnel shall stay clear of the auger. 	SSHASP ER2004-0062	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training
	Drilling into waste pits, impoundments, or shafts	<ul style="list-style-type: none"> Review historical maps and geophysical surveys to locate pits, impoundments, and shafts. Locate boreholes near previously drilled boreholes that did not encounter pits, impoundments, and shafts. 	SSHASP ER2004-0062 Geophysical Investigation of Material Disposal Area L, Technical Area 54	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Drilling through asphalt, overburden, and tuff (cont.)	Crushing hazards and rotating parts	<ul style="list-style-type: none"> Emergency kill switches shall be confirmed operational. Be observant as to your location with respect to moving, rotating, and overhead parts. Personnel shall not wear loose clothing, badge lanyards, or jewelry around rotating parts and long hair shall be pulled back. Approach the drill rig only after making eye contact with the operator and then only when necessary. Reciprocating, rotating, or other moving parts shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed $2\text{mg}/\text{m}^3$, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to volatile organic compounds (VOCs)	<ul style="list-style-type: none"> Monitor for VOCs during the initial penetration of the asphalt. Periodically monitor downhole and in breathing zones when drilling. If breathing zone levels exceed 1 part-per-million, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when drilling. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Shoveling cuttings	Back injury	<ul style="list-style-type: none"> Avoid excessive bending at the waist. Take turns shoveling as needed. Personnel shall take breaks as needed to prevent overexertion. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Injury from shovel getting caught in auger	<ul style="list-style-type: none"> Use caution when shoveling around turning augers. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed $2\text{mg}/\text{m}^3$, activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
Removing augers, hex rods, and core barrels from borehole with drill rig	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Removing augers, hex rods, and core barrels from borehole with drill rig (cont.)	Compressor and pneumatic tools	<ul style="list-style-type: none"> • Periodically inspect all hoses, fittings, valves, safety valve and regulators. • Caution – Compressors may start automatically. • Do not expose body parts to compressed air. • A positive means shall connect the tool to the hose. • Secure hoses to prevent whipping as necessary. • Hoses shall not be used for hoisting or lowering tools. • Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> • A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • The drill rig shall be operated in accordance with the manufacturer's specifications. • Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. • A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. • Wire rope shall be taken of service when: <ul style="list-style-type: none"> – There are six randomly broken wires in one lay – There are three broken wires in one strand in one lay – Wear of one-third the original diameter of outside individual wires – Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure – Evidence of any heat damage from any cause • A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • Hooks, slings, and rigging accessories shall not be loaded in excess on their safe working load limits. • With the exception of the auger grab hook, hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Removing augers, hex rods, and core barrels from borehole with drill rig (cont.)	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
Cutting plastic for sealing the augers at the end of the shift	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Use scissors Knife blades shall be retracted or sheathed when not in use. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Cutting wood to build concrete forms	Power tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. All guards shall in place and no modifications shall be made. Portable power tools shall be plugged into GFCI protected outlets and will be UL listed with a three wire grounded plug. If the cord is not three wired, the tool shall be double insulated. Cords shall be inspected by the user prior to use and protected from unnecessary damage. Any tool whose cord shows signs of damage or deterioration shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training
	Splinters and flying debris	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall wear safety glasses. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Mixing, handling, and finishing concrete/grout	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable, use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Inhalation hazards	<ul style="list-style-type: none"> Cement and bentonite shall be slowly mixed to prevent the generation of dust. Personnel shall work upwind from the cement/bentonite mixing operation. If necessary, a water mist shall be used to control dust. 	SSHASP ER2004-0062	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Mixing, handling, and finishing concrete/grout (cont.)	Cement burns to skin	<ul style="list-style-type: none"> • Personnel shall wear waterproof gloves when handling or contacting wet cement. • Do not wear gloves containing natural rubber latex as allergic reactions may occur. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Compressor and diaphragm pump	<ul style="list-style-type: none"> • Periodically inspect all hoses, fittings, valves, safety valve and regulators. • Caution – Compressors may start automatically. • Do not expose body parts to compressed air or grout stream. • A positive means shall connect the hoses to the pump. • Secure hoses to prevent whipping as necessary. • Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Air Rotary Drilling				
Setting up and operating generator for dust suppression system	Movement of generator after being disconnected from towing vehicle	<ul style="list-style-type: none"> Block tires and set stabilizer jacks. 	SSHASP ER2004-0062	Read Training
	Electrical shock	<ul style="list-style-type: none"> Ground generator. Cords shall be inspected by the user prior to use and protected from unnecessary damage. If cord from generator to dust suppression system shows signs of damage or deterioration it shall be immediately removed from service. 	SSHASP ER2004-0062 LIR 402-600-01.X Electrical Safety	Read Training
	Exposure to or damage to underground utilities when driving ground rod	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training
Setting up and operating compressor for drilling and dust suppression system	Movement of compressor after being disconnected from towing vehicle	<ul style="list-style-type: none"> Block tires and set stabilizer jacks. 	SSHASP ER2004-0062	Read Training
	Compressor and pneumatic systems	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the hoses to the systems. Secure hoses to prevent whipping as necessary. Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training

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Manually lifting casing, tremmie pipe, core pipe, and core barrels	Back injury	<ul style="list-style-type: none"> • Use mechanical lift assist equipment when practicable. • Repackage to reduce weight and/or bulk. • Ensure path of travel is clear. • Use a wide balanced stance. • Keep item being lifted as close to the body as possible. • Keep lower back in normal arched position. • Keep head and shoulders up as the lifting motion begins. • Lift with legs and stand up in a smooth, even motion. • Avoid twisting at the waist. • When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Lifting casing, tremmie pipe, core pipe, core barrels, and dust suppression components with the drill rig.	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> • A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • The drill rig shall be operated in accordance with the manufacturer's specifications. • Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. • A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. • Wire rope shall be taken of service when: <ul style="list-style-type: none"> - There are six randomly broken wires in one lay - There are three broken wires in one strand in one lay - Wear of one-third the original diameter of outside individual wires - Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure - Evidence of any heat damage from any cause • A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • Hooks, slings, and rigging accessories shall not be loaded in excess on their safe working load limits. • With the exception of the auger grab hook, hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Placing clamp on casing and hanging in borehole	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear work gloves. Personnel shall keep hands away from the connection point between air rotary casing and borehole casing. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Welding casing together	Welding hazards and ignition of fires	<ul style="list-style-type: none"> Welding of casing shall not occur until pore gas data has been obtained and reviewed for possible flammable atmospheres. Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any welding operations. At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where welding operations occur. A trained fire watch will be required during all welding operations. Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of welding. The piece being welded and the welding machine shall be grounded. Cables shall be free of repairs for 10 feet back from the electrode holder. Splices 10 feet back from the electrode holder shall have insulating quality equal to that of the cable. The welding machine shall be turned off when unattended. Dry gloves shall be worn to protect from electrical shock. Perform welding operations in well ventilated areas. Personnel shall wear welding helmets or welding hoods that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. Personnel shall wear welding gloves and flame retardant welding jackets or capes. When practicable, use noncombustible or flameproof screens to protect other persons in the work area from direct arc rays. Any welding operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

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Placing vice on tremmie pipe and hanging on casing	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall keep hands away from the pinch point between the tremmie pipe and the casing. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Carrying containers of bentonite	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Pouring bentonite down the tremmie pipe	Inhalation hazard	<ul style="list-style-type: none"> Bentonite shall be poured slowly to prevent the generation of dust. Personnel shall work upwind from the cement/bentonite mixing operation. 	SSHASP ER2004-0062	Read Training
Connecting core pipe to drill string and drill rig head	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall keep hands away from the core pipe connection points. Personnel shall keep hands away from the pinch point created between the core pipe and the "jars". Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Drilling through tuff and basalt	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training

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Drilling through tuff and basalt (cont.)	Drilling into waste pits, impoundments, or shafts	<ul style="list-style-type: none"> Review historical maps and geophysical surveys to locate pits, impoundments, and shafts. Locate boreholes near previously drilled boreholes that did not encounter pits, impoundments, and shafts. 	SSHASP ER2004-0062 Geophysical Investigation of Material Disposal Area L, Technical Area 54	Read Training
	Crushing hazards and rotating parts	<ul style="list-style-type: none"> Emergency kill switches shall be confirmed operational. Be observant as to your location with respect to moving, rotating, and overhead parts. Personnel shall not wear loose clothing, badge lanyards, or jewelry around rotating parts and long hair shall be pulled back. Approach the drill rig only after making eye contact with the operator and then only when necessary. Reciprocating, rotating, or other moving parts shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> The dust suppression system shall be operational during air rotary drilling. Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed 2mg/m³, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to volatile organic compounds (VOCs)	<ul style="list-style-type: none"> Monitor for VOCs during the initial penetration of the asphalt. Periodically monitor downhole and in breathing zones when drilling. If breathing zone levels exceed 1 part-per-million, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when drilling. Noise dosimetry shall be conducted. If noise levels exceed >82 dB(A) for an 8 hr TWA, a Hearing Conservation Program shall be instituted. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
	Shoveling cuttings	Back injury	<ul style="list-style-type: none"> Avoid excessive bending at the waist. Take turns shoveling as needed. Personnel shall take breaks as needed to prevent overexertion. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics
	Injury from shovel getting caught in auger	<ul style="list-style-type: none"> Use caution when shoveling around turning augers. 	SSHASP ER2004-0062	Read Training

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Shoveling cuttings (cont.)	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed 2mg/m³, activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
Removing tremmie pipe, core barrels, core pipe, and casing from borehole with drill rig	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. The drill rig shall be operated in accordance with the manufacturer's specifications. Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. Wire rope shall be taken of service when: <ul style="list-style-type: none"> There are six randomly broken wires in one lay There are three broken wires in one strand in one lay Wear of one-third the original diameter of outside individual wires Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure Evidence of any heat damage from any cause A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. Hooks, slings, and rigging accessories shall not be loaded in excess on their safe working load limits. With the exception of the auger grab hook, hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training
	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training

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Removing tremmie pipe, core barrels, core pipe, and casing from borehole with drill rig (cont.)	Compressor and pneumatic tools	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the tool to the hose. Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
Cutting plastic for sealing the borehole at the end of the shift	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Use scissors Knife blades shall be retracted or sheathed when not in use. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Cutting the casing with oxy-acetylene torch	Oxy-acetylene cutting torch hazards and ignition of fires	<ul style="list-style-type: none"> • Cutting the casing shall not occur until pore gas data has been obtained and reviewed for possible flammable atmospheres. • Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any cutting operations. • At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where cutting operations occur. • A trained fire watch will be required during all cutting operations. • Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. • Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of cutting. • Gas cylinders shall be secured in the upright position. • When not in use gas cylinder valves shall be closed. • When not in use, gas shall be released from the regulator and the regulator shall be removed. • When not in use, gas cylinder valve protective caps shall be installed. • When not in use, oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour. • Perform cutting operations in well-ventilated areas. • Personnel shall wear cutting goggles that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. • At a minimum, personnel shall wear leather or equivalent work gloves and flame resistant long sleeve shirt. • Any cutting operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Core Sampling, Screening, and Logging Activities				
Opening core barrels	Personnel exposure to volatile organic compounds (VOCs)	<ul style="list-style-type: none"> Periodically monitor in worker breathing zones when opening core barrels. If breathing zone levels exceed 1 part-per-million, activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
Powering the core trailer	Electrical hazards	<ul style="list-style-type: none"> The generator shall be grounded. Generator outlets shall be GFCI protected. Cords shall be inspected by the user prior to use and protected from unnecessary damage. Cords that show signs of damage or deterioration shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training
Carrying core barrels into core trailer and placing unused core into waste containers	Back injury	<ul style="list-style-type: none"> Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Screening core for high explosives	Exposure to high explosive test kit chemicals	<ul style="list-style-type: none"> Use test kit in well ventilated area. Wear safety glasses. Personnel shall wear nitrile gloves when using high explosive test kit chemicals. Do not wear gloves containing natural rubber latex as allergic reactions may occur. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Screening core with XRF	Radiological exposure	<ul style="list-style-type: none"> Operate instrument in accordance with manufacturer's instructions. Personnel shall not service the instrument. When not in use, store the instrument in a locked case in a secure location. Notify HSR-12 for approval to bring instrument on LANL property. Notify TA-54 RCT supervision prior to bringing instrument on site. 	SSHASP ER2004-0062 LIR 402-700.01.X Occupational Radiation Protection Requirements	Read Training Mfg User Training
Separating core sections	Skin exposure to potentially contaminated core	<ul style="list-style-type: none"> Personnel shall wear nitrile gloves when handling core sections. Do not wear gloves containing natural rubber latex as allergic reactions may occur. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Separating core sections (cont.)	Cuts from hacksaw	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Core section shall be secured during cutting. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Containerizing core sections	Heat seal machine	<ul style="list-style-type: none"> Machine shall be inspected by the user prior to use. All guards shall in place and no modifications shall be made. Machine shall be plugged into GFCI protected outlets and will be UL listed with a three wire grounded plug. If the cord is not three wired, the tool shall be double insulated. Cords shall be inspected by the user prior to use and protected from unnecessary damage. If cord shows signs of damage or deterioration the machine shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training
Decontaminating core barrels and sampling equipment	Exposure to decontamination fluids	<ul style="list-style-type: none"> Personnel shall wear nitrile gloves when handling core sections. Do not wear gloves containing natural rubber latex as allergic reactions may occur. Personnel shall wear safety glasses. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Reassembling core barrels	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Loading coolers into vehicles for transport to the SMO	Back injury	<ul style="list-style-type: none"> • Do not overfill coolers. • Ensure path of travel is clear. • Use a wide balanced stance. • Keep item being lifted as close to the body as possible. • Keep lower back in normal arched position. • Keep head and shoulders up as the lifting motion begins. • Lift with legs and stand up in a smooth, even motion. • Avoid twisting at the waist. • When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Waste Management				
Sealing waste containers	Pinch points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
Moving drums manually	Back injury	<ul style="list-style-type: none"> To avoid back or other injury, the following precautions should be taken: <ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Ensure footing surfaces are free of slip hazards such as sand, snow, or ice. Ensure path of travel is clear of tripping hazards. Place hands at approximately ten and two o'clock. Slightly bend knees and keep back straight. Slowly tip the drum so that the tipping point is not exceeded. If the drum is too heavy to be easily tipped, do not tip the drum using jerking motions that could result in back injury. Slide hands along the drum ring and do not cross arms. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Pinch points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Be aware of pinch points when staging drums next to each other or next to other objects. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Moving waste containers with a forklift	Forklift hazards	<ul style="list-style-type: none"> Inspect forklift daily prior to operations. Operator shall be forklift trained and certified in accordance with 29 CFR 1910.178. Inspect path of travel for holes, soft spots, rocks and other obstacles/hazards. Operate forklift in a slow, deliberate manner. Use a spotter in areas with tight clearances. Watch for and stay clear of pinch points. Ensure forklift has the rated capacity to safely lift all loads. Secure bags of bentonite to forklift as necessary. 	SSHASP ER2004-0062 LIR 402-1110-01.X Forklifts and Powered Industrial Trucks	Read Training Forklift Operator Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Moving waste containers with a forklift (cont.)	Overhead electrical lines	<ul style="list-style-type: none"> • Conduct pre-job site walkdown to identify electrical line locations. • Maintain the following minimum distances for stationary operations, as specified in 29 CFR 1926.550(a)(15)(i) and (ii): <ul style="list-style-type: none"> - For live lines rated ≤ 50 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. - For live lines rated > 50 kV; Maintain a minimum distance of 10 ft + 0.4 inches (.033333333 feet) for each 1 kV over 50 kV or twice the length of line insulator but never less than 10 ft. Examples: voltages ≤ 50 kV: 10 ft minimum 345 kV: 20 ft minimum (10 ft + 295 x .033333333) 750 kV: 33 ft minimum (10 ft + 700 x .033333333) • Maintain the following minimum distances for transit operations, as specified in 29 CFR 2926.550(a)(15)(iii): <ul style="list-style-type: none"> - For live lines rated < 50 kV; Maintain a minimum distance of 4 ft between live lines and any part of equipment or load. - For live lines rated above 50 kV and up to and including 345 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. - For live lines rated above 345 kV and up to and including 750 kV; Maintain a minimum distance of 16 ft between live lines and any part of equipment or load. • Designate a person to observe clearances of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. 	SSHASP ER2004-0062 LIR 402-600-01.X Electrical Safety	Read Training
Storing waste containers	Leaks to the environment	<ul style="list-style-type: none"> • Ensure waste containers are sealed. • Store drums in a secondary containment. 	SSHASP ER2004-0062	Read Training
Opening waste containers	Sudden release of pressure	<ul style="list-style-type: none"> • Use drums with bungs in the open top lid. • Visually inspect drums for indication of pressurization such as bulging. • Reduce any possible pressure by slowly opening a bung on the drum lid with the drum lid and ring secured. 	SSHASP ER2004-0062	Read Training
	Hand tools	<ul style="list-style-type: none"> • Tools shall be inspected by the user prior to use. • Tools shall be utilized for their intended purpose. • Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Opening waste containers (cont.)	Pinch points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Personnel exposure to volatile organic compounds (VOCs)	<ul style="list-style-type: none"> Periodically monitor in worker breathing zones when opening waste containers. If breathing zone levels exceed 1 part-per-million, activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
Sampling waste container contents and returning samples to waste containers	Skin exposure to potentially contaminated materials	<ul style="list-style-type: none"> Personnel shall wear nitrile gloves when sampling and handling drums. Do not wear gloves containing natural rubber latex as allergic reactions may occur. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Cutting plastic bags	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Use scissors Knife blades shall be retracted or sheathed when not in use. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

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Flush Mount Borehole Completion				
Cutting the casing with oxy-acetylene torch	Oxy-acetylene cutting torch hazards and ignition of fires	<ul style="list-style-type: none"> • A plug shall be placed in the casing to prevent sparks and slag from entering the borehole. • Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any cutting operations. • At least one 10 lb. A.B:C rated fire extinguisher shall be maintained readily accessible where cutting operations occur. • A trained fire watch will be required during all cutting operations. • Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. • Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of cutting. • Gas cylinders shall be secured in the upright position. • When not in use gas cylinder valves shall be closed. • When not in use, gas shall be released from the regulator and the regulator shall be removed. • When not in use, gas cylinder valve protective caps shall be installed. • When not in use, oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour. • Perform cutting operations in well-ventilated areas. • Personnel shall wear cutting goggles that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. • At a minimum, personnel shall wear leather or equivalent work gloves and flame resistant long sleeve shirt. • Any cutting operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSIHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Grinding the casing	Rotating parts and flying debris	<ul style="list-style-type: none"> Inspect grinder prior to use. All guards shall in place and no modifications shall be made. Personnel shall wear safety glasses and face shield. Personnel shall wear long sleeved shirt. Do not mix aluminum grinding dust with iron or steel grinding dust. Such a mixture may explode. Do not exceed the maximum rated speed of grinding wheel or blade. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Ignition of fires	<ul style="list-style-type: none"> A plug shall be placed in the casing to prevent sparks and slag from entering the borehole. Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any grinding operations. At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where grinding operations occur. A trained fire watch will be required during all grinding operations. Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of grinding. Any grinding operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when grinding 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Sawing the asphalt	Rotating parts and flying debris	<ul style="list-style-type: none"> Inspect saw prior to use. All guards shall in place and no modifications shall be made. Personnel shall wear safety glasses. Do not exceed the maximum rated speed of blade. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training

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Sawing the asphalt (cont.)	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when sawing. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Jackhammering the asphalt	Back injury	<ul style="list-style-type: none"> Use a wide balanced stance. Keep jackhammer as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. Ensure path of travel is clear. Use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training
	Compressor and pneumatic systems	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the hoses to the jackhammer. Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding 1/2-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when jack hammering. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training

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Setting the vault and skirt	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Mixing, handling, and finishing concrete/grout	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Ensure path of travel is clear. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. When practicable use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Inhalation hazards	<ul style="list-style-type: none"> Cement and bentonite shall be slowly mixed to prevent the generation of dust. Personnel shall work upwind from the cement/bentonite mixing operation. If necessary, a water mist shall be used to control dust. 	SSHASP ER2004-0062	Read Training
	Cement burns to skin	<ul style="list-style-type: none"> Personnel shall wear waterproof gloves when handling or contacting wet cement. Do not wear gloves containing natural rubber latex as allergic reactions may occur. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

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Above Ground Casing Borehole Completion				
Manually moving augers	Back injury	<ul style="list-style-type: none"> • Use mechanical lift assist equipment when practicable. • Repackage to reduce weight and/or bulk. • Ensure path of travel is clear. • Use a wide balanced stance. • Keep item being lifted as close to the body as possible. • Keep lower back in normal arched position. • Keep head and shoulders up as the lifting motion begins. • Lift with legs and stand up in a smooth, even motion. • Avoid twisting at the waist. • When practicable, use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
Lifting augers with drill rig	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> • A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • The drill rig shall be operated in accordance with the manufacturer's specifications. • Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. • A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. • Wire rope shall be taken of service when: <ul style="list-style-type: none"> - There are six randomly broken wires in one lay - There are three broken wires in one strand in one lay - Wear of one-third the original diameter of outside individual wires - Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure - Evidence of any heat damage from any cause • A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • Hooks, slings, and rigging accessories shall not be loaded in excess on their safe working load limits. • Hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training

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Connecting augers	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall keep hands away from the connection point between drill rig head and the augers. Personnel shall keep hands away from the connection point between the hex rod and the core barrel. Personnel shall not position themselves under hoisted loads 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Hand tools	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool 	SSHASP ER2004-0062	Read Training
	Compressor and pneumatic tools	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the tool to the hose Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
Drilling through asphalt and overburden	Augers “walking” on the asphalt surface	<ul style="list-style-type: none"> During initial penetration of the asphalt personnel shall stay clear of the auger. 	SSHASP ER2004-0062	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training
	Drilling into waste pits, impoundments, or shafts	<ul style="list-style-type: none"> Review historical maps and geophysical surveys to locate pits, impoundments, and shafts. Locate boreholes near previously drilled boreholes that did not encounter pits, impoundments, and shafts. 	SSHASP ER2004-0062 Geophysical Investigation of Material Disposal Area L, Technical Area 54	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Drilling through asphalt and overburden (cont.)	Crushing hazards and rotating parts	<ul style="list-style-type: none"> Emergency kill switches shall be confirmed operational. Be observant as to your location with respect to moving, rotating, and overhead parts. Personnel shall not wear loose clothing, badge lanyards, or jewelry around rotating parts and long hair shall be pulled back. Approach the drill rig only after making eye contact with the operator and then only when necessary. Reciprocating, rotating, or other moving parts shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed 2mg/m³, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to volatile organic compounds (VOCs)	<ul style="list-style-type: none"> Monitor for VOCs during the initial penetration of the asphalt. Periodically monitor downhole and in breathing zones when drilling. If breathing zone levels exceed 1 part-per-million, drilling activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when drilling. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Shoveling cuttings	Back injury	<ul style="list-style-type: none"> Avoid excessive bending at the waist. Take turns shoveling as needed. Personnel shall take breaks as needed to prevent overexertion. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Injury from shovel getting caught in auger	<ul style="list-style-type: none"> Use caution when shoveling around turning augers. 	SSHASP ER2004-0062	Read Training
	Personnel exposure to nuisance dust and airborne inorganics	<ul style="list-style-type: none"> Conduct dust level monitoring in the workers breathing zones. If breathing zone dust levels exceed 2mg/m³, activities shall be suspended and engineering or administrative controls shall be implemented. 	SSHASP ER2004-0062	Read Training
Removing augers with drill rig	Pinch points and crushing hazards	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. Personnel shall not position themselves under hoisted loads. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (c.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Removing augers with drill rig (cont.)	Compressor and pneumatic tools	<ul style="list-style-type: none"> • Periodically inspect all hoses, fittings, valves, safety valve and regulators. • Caution – Compressors may start automatically. • Do not expose body parts to compressed air. • A positive means shall connect the tool to the hose. • Secure hoses to prevent whipping as necessary • Hoses shall not be used for hoisting or lowering tools. • Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
	Failure of hoisting and rigging equipment	<ul style="list-style-type: none"> • A Competent Person shall inspect the drill rig prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • The drill rig shall be operated in accordance with the manufacturer's specifications. • Special hazard warnings shall be conspicuously posted on the drill rig. The warnings shall be visible to the driller at the control platform. • A thorough, annual inspection of the drill rig hoisting machinery shall be made by a competent person. Records of the date and the results of the inspection shall be maintained. • Wire rope shall be taken of service when: <ul style="list-style-type: none"> – There are six randomly broken wires in one lay – There are three broken wires in one strand in one lay – Wear of one-third the original diameter of outside individual wires – Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure – Evidence of any heat damage from any cause • A Competent Person shall inspect hooks, slings, and rigging accessories prior to and during each use to ensure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use. • Hooks, slings, and rigging accessories shall not be loaded in excess on their safe working load limits. • With the exception of the auger grab hook, hooks shall be equipped with safety latches. 	SSHASP ER2004-0062 Manufacturer's recommendations	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Removing augers with drill rig (cont.)	Hand tools	<ul style="list-style-type: none"> • Tools shall be inspected by the user prior to use. • Tools shall be utilized for their intended purpose. • Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool. 	SSHASP ER2004-0062	Read Training
Cutting the casing with oxy-acetylene torch	Oxy-acetylene cutting torch hazards and ignition of fires	<ul style="list-style-type: none"> • A plug shall be placed in the casing to prevent sparks and slag from entering the borehole. • Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any cutting operations. • At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where cutting operations occur. • A trained fire watch will be required during all cutting operations. • Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. • Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of cutting. • Gas cylinders shall be secured in the upright position. • When not in use gas cylinder valves shall be closed. • When not in use, gas shall be released from the regulator and the regulator shall be removed. • When not in use, gas cylinder valve protective caps shall be installed. • When not in use, oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour. • Perform cutting operations in well-ventilated areas. • Personnel shall wear cutting goggles that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. • At a minimum, personnel shall wear leather or equivalent work gloves and flame resistant long sleeve shirt. • Any cutting operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Grinding the casing	Rotating parts and flying debris	<ul style="list-style-type: none"> Inspect grinder prior to use. All guards shall in place and no modifications shall be made. Personnel shall wear safety glasses and face shield. Personnel shall wear long sleeved shirt. Do not mix aluminum grinding dust with iron or steel grinding dust. Such a mixture may explode. Do not exceed the maximum rated speed of grinding wheel or blade. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Ignition of fires	<ul style="list-style-type: none"> A plug shall be placed in the casing to prevent sparks and slag from entering the borehole. Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any grinding operations. At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where grinding operations occur. A trained fire watch will be required during all grinding operations. Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of grinding. Any grinding operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when grinding 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Installing the casing lid	Improper hand tool use	<ul style="list-style-type: none"> Tools shall be inspected by the user prior to use. Tools shall be utilized for their intended purpose. All guards shall in place and no modifications shall be made. Portable power tools shall be plugged into GFCI protected outlets and will be UL listed with a three wire grounded plug. If the cord is not three wired, the tool shall be double insulated. Cords shall be inspected by the user prior to use and protected from unnecessary damage. Any tool whose cord shows signs of damage or deterioration shall be immediately removed from service. 	SSHASP ER2004-0062	Read Training

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Sawing the asphalt	Rotating parts and flying debris	<ul style="list-style-type: none"> Inspect saw prior to use. All guards shall in place and no modifications shall be made. Personnel shall wear safety glasses. Do not exceed the maximum rated speed of blade. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when sawing. 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Jack hammering the asphalt	Back injury	<ul style="list-style-type: none"> Use a wide balanced stance. Keep jackhammer as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. Ensure path of travel is clear. Use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Exposure to or damage to underground utilities	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	SSHASP ER2004-0062 LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit	Read Training

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Jackhammering the asphalt (cont.)	Compressor and pneumatic systems	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the hoses to the jackhammer. Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding ½-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
	Excessive noise	<ul style="list-style-type: none"> Hearing protection will be worn when jack hammering 	SSHASP ER2004-0062 LIR 402-820-01.X Noise and Temperature Extremes	Read Training
Placing bollards into holes	Sharp edges and points	<ul style="list-style-type: none"> Personnel shall wear leather or equivalent work gloves. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
Mixing, handling, and finishing concrete/grout	Back injury	<ul style="list-style-type: none"> Use mechanical lift assist equipment when practicable. Repackage to reduce weight and/or bulk. Use a wide balanced stance. Keep item being lifted as close to the body as possible. Keep lower back in normal arched position. Keep head and shoulders up as the lifting motion begins. Lift with legs and stand up in a smooth, even motion. Avoid twisting at the waist. Ensure path of travel is clear. Use two (or more) people to lift and carry loads >50lbs. or loads that are bulky or awkward. 	SSHASP ER2004-0062 LIR 402-870-01.X Ergonomics	Read Training
	Inhalation hazards	<ul style="list-style-type: none"> Cement shall be slowly mixed to prevent the generation of dust. Personnel shall work upwind from the cement mixing operation. If necessary, a water mist shall be used to control dust. 	SSHASP ER2004-0062	Read Training
	Cement burns to skin	<ul style="list-style-type: none"> Personnel shall wear rubber gloves when handling or contacting wet cement. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training

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<i>Equipment Maintenance and Refueling</i>				
Refueling Equipment	Fire	<ul style="list-style-type: none"> Refuel when engines are cool. Ensure proper bonding and grounding when dispensing flammable liquids. 	SSHASP ER2004-0062	Read Training
Lubricating Equipment	Falls	<ul style="list-style-type: none"> Personnel shall wear full body harness with shock absorbing lanyard attached to an approved anchorage point when exposed to fall hazards greater than six feet. 	SSHASP ER2004-0062	Read Training
Grinding	Rotating parts and flying debris	<ul style="list-style-type: none"> Inspect grinder prior to use. All guards shall be in place and no modifications shall be made. Personnel shall wear safety glasses and face shield. Personnel shall wear long sleeved shirt. Do not mix aluminum grinding dust with iron or steel grinding dust. Such a mixture may explode. Do not exceed the maximum rated speed of grinding wheel or blade. 	SSHASP ER2004-0062 LIR 402-1000-01.X Personal Protective Equipment	Read Training
	Ignition of fires	<ul style="list-style-type: none"> Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any grinding operations. At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where grinding operations occur. A trained fire watch will be required during all grinding operations. Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of grinding. Any grinding operation that involves drums, barrels, tanks, pipes, or other containers, which have contained or been cleaned with flammable materials or substances which, when subjected to heat, produce flammable or toxic vapors, or flammable or explosive material will not take place without the approval of the PIC and SSO. Any grinding operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

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Welding	Welding hazards and ignition of fires	<ul style="list-style-type: none"> • Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any welding operations. • At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where welding operations occur. • A trained fire watch will be required during all welding operations. • Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. • Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of welding. • The piece being welded and the welding machine shall be grounded • Cables shall be free of repairs for 10 feet back from the electrode holder. • Splices 10 feet back from the electrode holder shall have insulating quality equal to that of the cable. • The welding machine shall be turned off when unattended • Dry gloves shall be worn to protect from electrical shock. • Perform welding operations in well ventilated areas. • Personnel shall wear welding helmets or welding hoods that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. • Personnel shall wear welding gloves and flame retardant welding jackets or capes. • When practicable, use noncombustible or flameproof screens to protect other persons in the work area from direct rays of the arc. • Any welding operation that involves drums, barrels, tanks, pipes, or other containers, which have contained or been cleaned with flammable materials or substances which, when subjected to heat, produce flammable or toxic vapors, or flammable or explosive material will not take place without the approval of the PIC. • Any welding operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LJR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LJR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Cutting with oxy-acetylene torch	Oxy-acetylene cutting torch hazards and ignition of fires	<ul style="list-style-type: none"> • Notify TA-54 Facility Duty Officer at 996-0982 prior to beginning any cutting operations. • At least one 10 lb. A:B:C rated fire extinguisher shall be maintained readily accessible where cutting operations occur. • A trained fire watch will be required during all cutting operations. • Combustible materials within 35-ft of spark/flame producing operations shall be removed, covered, or wet down. • Obtain and abide by LANL Spark or Flame Producing Operations Permit prior to start of cutting. • Gas cylinders shall be secured in the upright position. • When not in use gas cylinder valves shall be closed. • When not in use, gas shall be released from the regulator and the regulator shall be removed. • When not in use, gas cylinder valve protective caps shall be installed. • When not in use, oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire resistance rating of at least one-half hour. • Perform cutting operations in well-ventilated areas. • Personnel shall wear cutting goggles that have the appropriate shade number for the work being conducted per 29 CFR 1910.133. • At a minimum, personnel shall wear leather or equivalent work gloves and flame resistant long sleeve shirt. • Any cutting operation that involves drums, barrels, tanks, pipes, or other containers, which have contained or been cleaned with flammable materials or substances which, when subjected to heat, produce flammable or toxic vapors, or flammable or explosive material will not take place without the approval of the PIC. • Any cutting operation that involves potentially radiologically contaminated material will not take place without the approval of the PIC and RCT. 	SSHASP ER2004-0062 LANL Alerts, Fire Danger Estimates, and Fire Matrix LIR 402-840-01.X Welding, Cutting, and Other Spark-Flame Producing Operations LIR 402-1000-01.X Personal Protective Equipment	Read Training Fire Extinguisher Training
Component removal and replacement	Hand tools	<ul style="list-style-type: none"> • Tools shall be inspected by the user prior to use. • Tools shall be utilized for their intended purpose. • Wooden handles shall be free of splinters or cracks and shall be kept tight in the tool 	SSHASP ER2004-0062	Read Training

Work Tasks/Steps Identify work steps/tasks in sequence when such sequencing contributes to safety, security, and/or environmental protection.	Hazards, Concerns, and Potential Accidents or Incidents Identify both activity and work-area hazards for each task/step.	Controls, Preventive Measures, and Bounding Conditions Specify preventive measures, controls for each hazard (e.g., lockout/tagout points, specific PPE, TIDs, alarms, safes, recycle, waste minimization)	Reference Documents List permits, operating manuals, security plans, and other reference procedures.	Training List training and qualification requirements.
Component removal and replacement (cont.)	Compressor and pneumatic tools	<ul style="list-style-type: none"> Periodically inspect all hoses, fittings, valves, safety valve and regulators. Caution – Compressors may start automatically. Do not expose body parts to compressed air. A positive means shall connect the tool to the hose. Secure hoses to prevent whipping as necessary. Hoses shall not be used for hoisting or lowering tools. Hoses exceeding 1/2-inch in diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure. 	SSHASP ER2004-0062	Read Training
	Pressurized systems	<ul style="list-style-type: none"> Qualified personnel shall verify pressure has been released from systems prior to removal or repair. 	SSHASP ER2004-0062	Read Training
	Electrical shock	<ul style="list-style-type: none"> Qualified personnel shall verify that systems have been de-energized prior to removal or repair. Energized electrical work shall be conducted by a qualified electrician. 	SSHASP ER2004-0062 LIR 402-860-01.X Lockout/Tagout for Personal Safety	Read Training
The RLM approves work based upon confidence that this IWD has been properly prepared, that the work will be performed within ES&H/S&S requirements, and will be performed in accordance with this IWD.			RLM (Signature / Z# / Date) Required <i>Amir M. Deen</i> 108623 11/14/04	
<input type="checkbox"/> Moderate-hazard <input type="checkbox"/> High-hazard/complex Standing <input type="checkbox"/> Repetitive <input type="checkbox"/> Qualified Worker	Date when RLM re-approval is required _____ Other Conditions for Re-Approval _____ Name of Primary PIC: John Hopkins Name of Alternate PIC: Kevin Reid Name of Alternate PIC: Matt Hartmann Name of Alternate PIC: Dan Thompson		Any required classification review completed. Signature/Date _____	

IWD No./ WR No. ER2004-0586

Rev #: Draft 0

AR No. AR-54-03-21

IWD PART 2

RDL Requirements and Approval for Entry and Area Hazards and Controls

Non-Tenant Activity Form

RDL must determine the facility entry and coordination requirements and identify the ES&H/S&S hazards and controls associated with the activity location.

FMU: 6	TA: 54	Building: NA	Room: NA	Other Location: Los Alamos National Laboratory, Technical Area 54, Material Disposal Areas L and G	
RDL Designated Facility Point-of-Contact	Name	Office Phone	Cell Phone	Pager	Email
	Sean French	667-5953	699-0398	996-0922	sbf@lanl.gov
Entry and Coordination Requirements (Check one or more of the following)					
<input type="checkbox"/> No entry/coordination requirements		<input checked="" type="checkbox"/> RDL designated facility point-of-contact must sign IWD Part 3		<input type="checkbox"/> Security Clearance Requirements	
<input checked="" type="checkbox"/> POTD/POTW		<input type="checkbox"/> Check in at Start of Work		<input checked="" type="checkbox"/> Work-Area Training Required	
<input type="checkbox"/> Work must be scheduled		<input checked="" type="checkbox"/> Check in Daily		<input type="checkbox"/> Escort Required	
<input type="checkbox"/> Co-located Hazards/Concerns		<input type="checkbox"/> Check out at End of Work		<input type="checkbox"/> Quality Issues	
<input checked="" type="checkbox"/> Review under AB/Safety Basis/USQ		<input checked="" type="checkbox"/> Check out Daily		<input type="checkbox"/> Other Bounding Conditions _____	
Additional Comments					

Instructions: In the block below, identify work-area hazards that could potentially affect the worker(s). Specify the facility controls and preventive measures that must be implemented by the worker(s) to protect against the site hazards as well as any special training required.

ES&H/S&S WORK AREA HAZARDS & CONTROLS				
Work Area Hazards & Concerns Identify site hazards and concerns that could potentially affect the worker(s).	Work Area Hazard Present	Facility Controls/Preventive Measures/Bounding Conditions Specify preventive measures, controls and bounding conditions for each site hazard.	Reference Documents EHS permits, operating manuals, and other reference procedures	Training and Qualification List training requirements
Ionizing Radiation Work in posted radiological areas, work with radioactive materials, or work on or near radiation producing devices. Specific Hazard: Potential radiological contamination	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> At the discretion of the RCTs, equipment and materials shall be surveyed prior to entering Areas L and G. With the exception of tritium monitoring, RCT coverage shall be on an intermittent basis determined by RCT supervision utilizing best management practices, acceptable knowledge, and sound rad-con practices. A RCT shall monitor for airborne tritium during the initial penetration of the asphalt. Based on the monitoring results, further monitoring and actions may be required. Personnel shall radiologically screen the core. If levels greater than five times background are encountered, work shall be suspended and a RCT shall be notified. All personnel shall self-frisk prior to exiting Area G. At the discretion of the RCTs, equipment and materials shall be surveyed prior to leaving Areas L and G. All radiological decontamination efforts shall be directed by HSR-1 personnel. 	LIR 402-700.01 X Occupational Radiation Protection Requirements	Radiation Control Technician Qualification

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IWD PART 2

RDL Requirements and Approval for Entry and Area Hazards and Controls

Non-Tenant Activity Form

ES&H/S&S WORK AREA HAZARDS & CONTROLS				
Work Area Hazards & Concerns Identify site hazards and concerns that could potentially affect the worker(s).	Work Area Hazard Present	Facility Controls/Preventive Measures/Bounding Conditions Specify preventive measures, controls and bounding conditions for each site hazard	Reference Documents List permits, operating manuals, and other reference procedures	Training and Qualification List training requirements
Worker Exposure Working near non-ionizing radiation, beryllium, noise, chemicals, hazardous biological materials, lead, asbestos, temperature/humidity extremes, or high explosives. Specific Hazard: Underground organic vapor plume	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Periodically monitor downhole and in breathing zones for volatile organic compounds when drilling. If breathing zone levels exceed 1 part-per-million, drilling, activities shall be suspended and engineering or administrative controls shall be implemented. 	OSHA PELs ACGIH TLVs	Qualified Site Safety Officer
Energized and Operative Systems Working near energized electrical parts, pressure systems, steam lines; near unprotected belts, pulleys, chains or rotating equipment; fuel fired equipment other than vehicles; or spark or flame producing operations. Specific Hazard: Above grade utilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Maintain the following minimum distances for stationary operations, as specified in 29 CFR 1926.550(a)(15)(i) and (ii): <ul style="list-style-type: none"> For live lines rated ≤ 50 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. For live lines rated > 50 kV; Maintain a minimum distance of 10 ft + 0.4 inches (.03333333 feet) for each 1 kV over 50 kV or twice the length of line insulator but never less than 10 ft. Examples: voltages ≤ 50 kV: 10 ft minimum 345 kV: 20 ft minimum (10 ft + 295 x .03333333) 750 kV: 33 ft minimum (10 ft + 700 x .03333333) Maintain the following minimum distances for transit operations, as specified in 29 CFR 2926.550(a)(15)(iii): <ul style="list-style-type: none"> For live lines rated < 50 kV; Maintain a minimum distance of 4 ft between live lines and any part of equipment or load. For live lines rated above 50 kV and up to and including 345 kV; Maintain a minimum distance of 10 ft between live lines and any part of equipment or load. For live lines rated above 345 kV and up to and including 750 kV; Maintain a minimum distance of 16 ft between live lines and any part of equipment or load. Designate a person to observe clearances of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. 	LIR 402-600-01.X Electrical Safety	

IWD No./ WR No. ER2004-0586

Rev #: Draft 0

AR No. AR-54-03-21

IWD PART 2

RDL Requirements and Approval for Entry and Area Hazards and Controls

Non-Tenant Activity Form

ES&H/S&S WORK AREA HAZARDS & CONTROLS

Work Area Hazards & Concerns Identify site hazards and concerns that could potentially affect the worker(s).	Work Area Hazard Present	Facility Controls/Preventive Measures/Bounding Conditions Specify preventive measures, controls and bounding conditions for each site hazard	Reference Documents List permits, operating manuals, and other reference procedures	Training and Qualification List training requirements
Energized and Operative Systems Working near energized electrical parts, pressure systems, steam lines; near unprotected belts, pulleys, chains or rotating equipment; fuel fired equipment other than vehicles; or spark or flame producing operations. Specific Hazard: Below grade utilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> A visual inspection of the area shall be conducted. An excavation permit shall be obtained and a utility locate shall be conducted. Personnel shall not work outside the boundaries of the utility locate/permit. If any utility is discovered, personnel shall immediately stop all work and notify the TA-54 Facility Duty Officer at 996-0982 and then the LANL Team Leader. 	LIR 402-880-01.X Excavation/Soil Disturbance Permit Process Excavation Permit 04X-0199 SF	
Confined Spaces Entry into tanks, manholes, cooling towers, sumps, or any other area with potentially low oxygen concentration or other hazards such as toxic vapors or engulfment. Specific Hazard: Not Applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Not Applicable	Not Applicable	Not Applicable
Elevated Work Surface Unprotected structures or work surfaces elevated by more than 4 feet. Specific Hazard: Not Applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Not Applicable	Not Applicable	Not Applicable
Environmental Impact Activities conducted in areas containing potential release site, contaminated soil, sensitive species, watercourse wetlands, floodplain, historical/archeological sites, or other work area condition that can be impacted by or can impact the environment. Specific Hazard: Release of VOC contaminated soils/asphalt to water course	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Use plastic sheeting to prevent soil/asphalt contact with Area L surface. Place all cuttings/waste in containers once generated. Elevate containers using pallets or by design. 	TA-54 SWPPP Addendum	
Environmental Impact Activities conducted in areas containing potential release site, contaminated soil, sensitive species, watercourse wetlands, floodplain, historical/archeological sites, or other work area condition that can be impacted by or can impact the environment. Specific Hazard: Trespassing/damaging archaeological sites	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Do not enter/trespass on posted archaeological sites. 	PR-ID #04P-0041	

IWD No./ WR No. ER2004-0586

Rev #: ~~Draft~~ 0

AR No. AR-54-03-21

IWD PART 2

RDL Requirements and Approval for Entry and Area Hazards and Controls

Non-Tenant Activity Form

ES&H/S&S WORK AREA HAZARDS & CONTROLS

Work Area Hazards & Concerns Identify site hazards and concerns that could potentially affect the worker(s).	Work Area Hazard Present	Facility Controls/Preventive Measures/Bounding Conditions Specify preventive measures, controls and bounding conditions for each site hazard	Reference Documents List permits, operating manuals, and other reference procedures	Training and Qualification List training requirements
Security or Other Hazard Specific Hazard: Vehicle traffic	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Be observant for animals, bicyclists, joggers and other pedestrians on or near the roadway. Institute traffic controls as necessary when working on or near roadways 	LIR402-1320.01.X Vehicle and Pedestrian Safety	
Security or Other Hazard Specific Hazard: Inability to recognize or properly respond to potential and actual emergencies at TA-54.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<ul style="list-style-type: none"> Personnel are required to have current TA-54 site-specific or shall be escorted. 	TA-54 Site Specific Training (Emergency Action Plan)	TA-54 Site Specific Training (Emergency Action Plan)

I have confidence that the IWM process has been applied appropriately, and I approve this activity to be performed in my facility.

RDL or Representative Approval (Signature / Z# / Date) Required *L.O. Francis, 020524* Date Approval Expires *11-16-04* *12-16-04*

**Science and Engineering Associates Inc.
Integrated Work Document
Part 3 - Validation and Release**

IWD#: ER2004-0586 Revision: Draft Work Document #: AR-54-03-21

Pre-Job Brief Content

- What are the critical steps or phases of this activity?
- How can we make a mistake at that point?
- What is the worst thing that can go wrong?
- What controls, preventive measures, and bounding conditions are needed?
- What work permits are required and how will we meet their requirements?
- What are the handoffs and coordination requirements among workers and multiple PICs?
- Are there hold-points including those that require sign-offs?
- What are the stop work responsibilities and expectations (e.g. for unanticipated conditions or hazards)?
- How would we respond to alarms and emergencies?
- Are there lessons learned from previous similar work?
- Is other information needed to perform this activity in a safe, secure, and environmentally responsible manner?
- Does everyone agree to the work tasks/steps, hazards, and controls and commit to follow them?

PRE-JOB BRIEF ATTENDANCE ROSTER	
By signing below, I agree to the following: <ul style="list-style-type: none"> ▪ I agree to follow the work steps and implement the controls as written. ▪ I agree to stop work when conditions or hazards change or when I encounter unexpected conditions during the execution of work, or when work cannot be performed as written, or instructions become unclear during execution. ▪ I confirm that I am authorized, qualified, and, fit to perform the work. 	
Worker (Signature / Z # / Date) Required <i>[Signature]</i> 193789 11/19/04	Worker (Signature / Z # / Date) <i>[Signature]</i> 111646 11/19/04
Worker (Signature / Z # / Date) <i>[Signature]</i> 178705 11/19/04	Worker (Signature / Z # / Date) <i>[Signature]</i> 116873 12/17/04
Worker (Signature / Z # / Date) <i>[Signature]</i> 177477 11/19/04	Worker (Signature / Z # / Date) <i>[Signature]</i> 183322 / 12-10-04
Worker (Signature / Z # / Date) <i>[Signature]</i> 115286 11/19/04	Worker (Signature / Z # / Date) <i>[Signature]</i> 211967 / 12-10-04
Worker (Signature / Z # / Date) <i>[Signature]</i> 192041 11/19/04	Worker (Signature / Z # / Date)
WORK RELEASE	
By signing below, I verify this activity is compatible with current facility configuration and operating conditions RDL designated facility point of contact (Signature / Z # / Date) If required by RDL Approval of activity expires <u>31-May-2005</u> <i>[Signature]</i> , 116274, 11-22-04 Date	
By signing below, I have verified the following: <ul style="list-style-type: none"> • I have verified authorization by ensuring approval signatures of the RLM and RDL. • I have jointly conducted a walkdown with workers to confirm the IWD can be performed as written, required initial conditions and other prerequisites are in-place. • The assigned workers are authorized and are qualified to perform the work in a safe, secure, and environmentally responsible manner. • I have conducted the pre-job briefing, and all workers have been briefed. • I have ensured coordination with any required RDL work-area representatives (e.g., area work coordinators). 	
PIC (Signature / Z # / Date) Required <i>[Signature]</i> 150912 11/11/04	
Alternate PIC Signatures when PIC authority is assumed the first time (Note: alternate PICs are required to sign only once, but formal handoff and employee notification are required for each PIC change)	
Alternate PIC (Signature / Z # / Date) Required <i>[Signature]</i> 192041 11/19/04	
Alternate PIC (Signature / Z # / Date) Required <i>[Signature]</i> 111646 11/19/04	
Alternate PIC (Signature / Z # / Date) Required <i>[Signature]</i> 178705 11/19/04	

**Science and Engineering Associates Inc.
Integrated Work Document
Part 3 - Validation and Release**

IWD#: ER2004-0586 Revision: Draft Work Document #: AR-54-03-21

PRE-JOB BRIEF ATTENDANCE ROSTER (CONTINUATION)

By signing below, I agree to the following:

- I agree to follow the work steps and implement the controls as written.
- I agree to stop work when conditions or hazards change or when I encounter unexpected conditions during the execution of work, or when work cannot be performed as written, or instructions become unclear during execution.
- I confirm that I am authorized, qualified, and, fit to perform the work.

Worker (Signature / Z # / Date) Required <i>[Signature]</i> / 118012 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 199173 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 186677 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 183314 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 187676 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 69372 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 078047 / 11-19-04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 118331 / 11/19/04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 150912 / 11/19/04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 147728 / 11/19/04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 101789 / 22 Nov 04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 191891 / 12/7/04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 120261 / 12/7/04	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 1-6-05 / 145932	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 1-6-05	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date) <i>[Signature]</i> / 1-6-05 / 2# 20748	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date)	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date)	Worker (Signature / Z # / Date)
Worker (Signature / Z # / Date)	Worker (Signature / Z # / Date)

Science and Engineering Associates Inc.
Integrated Work Document
Part 4 – Post-Job Review

IWD#: ER2004-0586 Revision: Draft Work Document #: AR-54-03-21

A post-job review with the workers and PIC should include the following:

- Verify that the activity is complete and make notifications in accordance with RDL requirements;
- Ensure that follow-through actions (e.g. clean-up, recycle, waste disposal, equipment removal, and secure storage) are completed;
- Identify inefficiencies, problems during the activity, coordination issues, unanticipated conditions, and near misses; and
- Develop recommendations for improvement.

Lessons Learned; safety, security, and environmental issues; coordination issues; and unexpected conditions.

-

Suggested improvements to enter into the JHA Tool based on Lessons Learned

-

Other recommendations for Improvements

-

By signing below, I have verified that the activity scope, final worksite ES&H/S&S restoration, and cleanup are complete, and I have ensured proper notifications and turnover in accordance with RDL requirements.

PIC (Signature / Z# / Date) Required



memorandum

Facility & Waste Operations Division

To/MS: Distribution
From/MS: Tony Stanford, FWO-DO, K492
Ray Wallace, FWO-DO, K492
Phone/Fax: 7-6131/Fax 5-8777
Symbol: FWO-DO/04-105
Date: Tuesday, October 12, 2004
Subject: **FWO Division Directive**

SUBJECT: FWO DIVISION DIRECTIVE - FWO AND KSL ACTION TO IMPROVE IWM

Due to deficiencies noted in the FWO/KSL Management Self-Assessment, FWO is instituting a compensatory process to ensure the adequacy and safety of Integrated Work Documents/Work Packages and the safe execution of work in the field by FWO and KSL personnel for all work. The process involves the mandatory use of a Work Package Planning Checklist (Attachment A), a Post Job Review/Lessons Learned and Closeout Checklist (Attachment B), and over-site by division team leaders and managers.

For all work activities requiring an IWD performed by FWO and KSL, the appropriate checklist with associated reviews and signatures must be completed. Based on the checklist reviews, FWO and KSL team leaders and management shall perform field verification of jobs that include such hazards but not limited to the use of respiratory protection, use of fall protection equipment, permit-required confined space entries, energized electrical work, welding operations and excavations. Field verification by team leaders and management is to provide management over-site of work in the field and ensure safe work performance.

To help ensure the use of Facility Safety Plans in the planning process, each Facility Manager must send a copy of each Facility Safety Plan to the KSL General Manager for distribution to the KSL planners.

To ensure that this compensatory process is successful, an FWO Self Assessment Team is hereby formed with the attached charter (Attachment C). This team will assess the execution of this compensatory process. It will assess how well work documents are completed, how well work is executed in the field and management over-site in the field.

This directive is effective immediately.

The KSL General Manager is directed to promulgate this requirement to the appropriate KSL staff.

TS/RW/mr

Attach: a/s

Distribution:
FWO Group Leaders and Deputies
FMU Team Leaders
E. Burckle, KSL General Manager, A199

Cy; FWO-DO File, K492

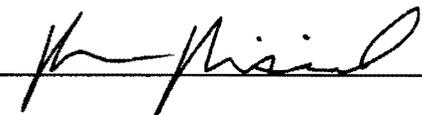
Attachment A

Work Package Planning Adequacy Checklist

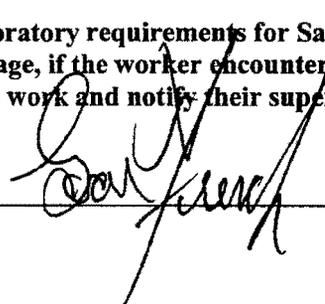
Work Package # & Task: N/A or
Work Order IWD # & Task: Characterization of m5A 2.
(AR-54-03-21)

By signing below I attest that:

- Workers have been involved in the planning of this work. Acceptable
- All hazards have been identified to the best of my knowledge and controls have been identified and analyzed for each task to the appropriate level. Acceptable
- All controls are consistent, appropriate and clearly detailed for the identified hazards. Acceptable
- IWD Activity/Task PIC is trained and qualified, has reaffirmed Roles and Responsibilities, and they are consistent and appropriate actions to control work. Acceptable
- All work steps and activities have been identified and are at the proper level of detail to perform the work safely. Acceptable
- All Work Activity Documents (HCP, Work Instructions, RWPs, SEWPs, etc.) are current and the documents have been signed by the workers, authorizing manager, appropriate SMEs, as applicable. Acceptable
- The IWD Work Package contains a Feedback Review Record (e.g., Lessons Learned, etc.). Acceptable
- Lessons Learned and feed-back from previous work are incorporated into the IWD. Acceptable
- IWD Referenced Procedures or forms are: 1) integrated into the Work Package, 2) included in the Work Package, or 3) are available at the Work Site. Acceptable
- Waste Minimization/Potential Accumulation/Disposal requirements have been incorporated into the IWD/Work Package. Acceptable
- The work activities in the IWD/work package are within the operating envelope as stated in the Facility Safety Plan or Authorization Basis. Acceptable
- This work package is adequate for field execution. Acceptable

Planning Supervisor/Designee  11/22/04
Date

In my judgment, this work meets Laboratory requirements for Safety, Security and expected results. When following this IWD/Work Package, if the worker encounters any condition not covered by this work package, the worker should stop work and notify their supervisor to assess new conditions.

LANL Work Management Team Leader  11-22-04 Date

Attachment B

PIC Post-job Review/Lessons Learned and Closeout

- Is the activity complete?
- Were notifications done in accordance with RDL requirements?
- Were follow-through actions (e.g., cleanup, recycle, waste disposal, equipment removal, and secure storage) completed?
- Is a post-job test required? If yes, was the test completed?
- What was done well? What do we want to keep doing when performing this work activity?
Record 'keeps' here:

- What could have been done better? What do we need to work on? Record "Work-Ons" here:

- Were there inefficiencies or problems during the activity, coordination issues, unanticipated conditions, or near misses? If yes, record here:

- Develop recommendations for improvement.
- Document the post-job review in the Close-Out section of the IWD, Part 4.
- Ensure that "lessons learned" deemed to be of value in performing future similar activities are entered into the KSL Lessons Learned Database on the KSL Intranet

Person In Charge (PIC) Date

Work Management Team Leader Date

Attachment C

FWO Division Integrated Work Management (IWM) Assessment Process

Introduction

Assessing conduct of work to determine the degree of implementation of key management systems is an important, strategic tool for assuring effective and efficient mission accomplishment. Management assessment, in combination with an effective issues management program, provides the opportunity to manage proactively rather than reactively.

Due to deficiencies noted in the IWM process in the FWO/KSL Management Self-Assessment, an FWO management assessment is being instituted to ensure that work is performed safely and in accordance with IWM requirements.

Charter

The IWM assessment shall involve work activities performed by FWO and KSL to ensure that requirements and expectations in the IWM process are being effectively implemented and followed during the planning and performance of work. The assessment shall provide information that will provide continuous improvement to the IWM process for FWO and KSL. The ultimate outcome is to ensure that work is performed safely by FWO and KSL. The assessment team shall report directly to the FWO Deputy Division Leader (DDL) for Facilities Management.

Team

The team shall consist of an FWO facility management representative, an MSE representative, and the Division Safety Officer. The assessment team shall be led by the FWO Division Safety Officer. The assessment team leader should satisfy the minimum requirements identified in LIR 307-01-01.4 and must complete the *Assessor Qualification Form* (Attachment B-1).

Criteria

The assessment shall focus on the IWM process to ensure adequate management engagement, worker involvement, work definition, hazard identification, control specification and implementation, work performance, and feedback. The assessment shall consist of review of the IWD and associated work package, observations of pre- and post- job briefs, observations of work evolutions, and interviews of workers, PICs, and other involved with the IWD development. The attached "FWO and KSL Integrated Work Management Assessment Form" shall be used to document the assessment.

The assessment shall target work involving, but not limited to, the use of respiratory protection, use fall protection equipment, hoisting/rigging operations, permit-required confined space entries, energized electrical work, welding operations and excavation work. The work activities to be assessed shall be selected from the FWO Work Package Planning checklists that are to be completed for all work.

Work shall be stopped by the Team Leader for any issue that presents an imminent hazard to the workers. The Team Leader shall immediately contact the PIC, FWO Facility Manager, FWO DDL, and KSL management of any work stoppage. The completed assessment forms and a brief summary shall be submitted to the FWO DDL on a weekly basis. Based on the assessment data, the DDL shall implement actions to address any deficiencies and promote continuous improvement in the IWM process. The DDL shall be responsible for conveying the assessment data to KSL management.

RRES Remediation Services (RS) Project Document Signature Form

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(Please prefix the name of all electronic versions of this document with this number.)

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Status/Comments:

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

Reviewer (Print reviewer's name under title)	Signature	Date	Comments Attached
Author <i>Kenneth Gillespie</i>	<i>Kenneth Gillespie</i>	<i>2/15/05</i>	
Technical Reviewer			
Project Leader <i>John Hopkins</i>	<i>John Hopkins</i>	<i>2/15/05</i>	
Group Leader			
Program Manager			

Document Catalog Number ER2004-0586