

**JSA Number:** Yerington-017

**Task:** Radiological Control Area (RCA) Sampling and Excavation

<b>JSA NUMBER:</b> Yerington-017 <b>Revision No:</b> 0 <b>ORIGINAL:</b> 11/03/2006 <b>REVISION:</b>	<b>Company Performing the Job:</b> Brown and Caldwell / Subcontractors	<b>PROJECT MANAGER:</b> Chuck Zimmerman <b>SAFETY OFFICER:</b> Penny Bassett
<b>JOB TITLE OR TASK:</b> Radiological Control Area Sampling and Excavation	<b>TITLE OF PERSON(S) WHO PERFORMS JOB:</b> Site Field Manager Site Technicians or Engineers Waste removal contractor	<b>ANALYSIS BY:</b> Penny Bassett <b>REVIEWED BY:</b>
<b>REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE) AND/OR PERTINENT JOB SAFETY FORMS:</b> <i>Minimum PPE:</i> Hard hat, safety glasses, steel-toed boots, long-sleeved shirt, high visibility vest. <i>Additional PPE (as needed):</i> Leather/nitrile gloves, ½ mask respirator with P-100 cartridges, coveralls, earplugs <i>Monitoring Equipment:</i> TLD badge, gamma survey meter <i>Job Safety Form:</i> BP Authorization to Work, Ground Disturbance Permit		
SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	PREVENTIVE OR CORRECTIVE ACTION
<b>Phase 1 – Characterization Sampling</b>		
1. Perform preliminary radiometric survey to define boundary of RCA	1. External exposure to ionizing radiation 2. Internal exposure to radiation or metals through inhalation of dust.	1. Wear TLD badge when working in RCA and carry a real time survey meter to determine if any hazardous radiation levels are encountered. 2. Minimize disturbance of soils by walking slowly and carefully. Do not kick at dirt or try to move any heavy materials by hand when working in RCA. Do not work on windy days where visible dust is being picked up from the area or surrounding areas.
2. Collect soil samples using hand auger and/or spatula or shovel	1. Internal exposure to radiation, asbestos, or metals through inhalation of dust. 2. External exposure to ionizing radiation. 3. External exposure to radiochemical, metal or asbestos contaminants in soil or pipe. 4. Physical hazards including back strain, hand injury. 5. Uneven ground surface creates risk of slips and falls.	1. Wear a ½ mask respirator with P100 dust cartridges. Ensure that wearer has completed respirator fit-testing. Inspect respirator for damage and cleanliness prior to donning. Clean respirator after each use and store in a clean secure location. 2. Wear TLD badge when working in RCA and carry a real time survey meter. 3. Wear reusable or disposable coveralls (Tyvek) to protect clothing and nitrile gloves to protect hands when handling soils. Remove coveralls prior to exiting the area and complete a surface contamination survey of all people and equipment. 4. Use proper lifting and bending techniques and do not lift heavy loads without assistance. Wear leather work gloves when handling equipment or other heavy materials. Avoid putting hands near pinch points. 5. Be aware of hazards in area, place orange safety cones in areas where a person could step into a trench or other hazard if not looking. Where possible, move tripping hazards out of the way.

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<p>3. Collect sample of transite pipe material</p>	<p>1. Same as above. 2. Exposure to asbestos fibers in friable areas of pipe.</p>	<p>1. Same as above. 2. Asbestos is an inhalation hazard and should be wetted down with a spray bottle of distilled or deionized water prior to sample collection. Quality water is necessary to minimize potential sample contamination. Always wear gloves when handling pipe material and do not use any cutting or grinding tools.</p>
<p><b>Phase 3 – Excavation and Waste Removal</b></p>		
<p>4. Transfer of pipes to truck or disposal container and removal of other non-contaminated materials from area (cement blocks).</p>	<p>1. External exposure to radioactive material. 2. Airborne asbestos or radiochemicals create an inhalation hazard. Pipe may need to be broken intentionally to fit into shipping container or it may break accidentally during handling. 3. Unbalanced load could drop unexpectedly. 4. Pinch points hazards could crush or injure hands or feet when putting straps around pipes or otherwise securing the load. 5. Hazards when working around heavy equipment include:  <ul style="list-style-type: none"> <li>▪ Limited operator visibility to the rear</li> <li>▪ Difficulties in communicating, noisy environment</li> </ul> </p>	<p>1. Wear proper PPE including: coveralls, respirator, gloves, TLD badge. Monitor activity levels with real-time survey meter. 2. Wet the soil and pipe materials with water prior to any ground disturbance or movement of materials. Wear respirator. Suspend work if wind speeds are above 15 mph (sustained) or 30 mph (gusts). 3. Use a load lifting method that properly secures the pipe. Never stand underneath a suspended load 4. Wear leather gloves and steel toed boots. Be aware in advance where the pinch points are and what will happen if the load shifts. 5. Always make eye contact with the equipment operator before entering his work area. Do not stand or sit behind a piece of equipment if there is an operator in the cab. Ensure the backup alarms are operable for all equipment. Agree on hand signals before beginning work. Wear earplugs if noise levels are high. Wear high visibility reflective clothing. It is best to stay out of mobile equipment work area if you are not required to be there.</p>
<p>5. Excavation of contaminated soil and placement in stockpile or roll-off transport container</p>	<p>1. Same as above 2. Contacting unexpected underground utilities or piping. 3. Encountering an unexpected radiological contaminant or source material at depth. 4. Unstable pit walls depending on soil conditions and depth of excavation</p>	<p>1. Same as above. 2. Complete a utility location survey prior to initiating any ground disturbance. Dig cautiously even after survey complete since not all pipes may be detected during a surface survey. 3. Monitor the excavation frequently with a real-time radiation survey meter to identify any sudden changes in radiological activity levels. 4. Have a competent person on site to make decisions about sloping/shoring requirements. Use protective systems, if necessary, before entering the excavation. Do not stand inside the excavated area while the backhoe is digging.</p>
<p>6. Decontamination and final release survey of all mobile equipment, reusable tools. PPE and personnel.</p>	<p>1. Removable contamination on equipment creates a potential health and environmental hazard by spreading the contaminants around the site or off-site.</p>	<p>1. Decontaminate large equipment by power washing all exterior surfaces to remove visible dust and mud. 2. Complete contamination surveys using a frisker probe to evaluate total contamination and a swipe test to determine removable contamination. 3. Complete contamination surveys on the hands and feet of site workers before they eat or leave the site at the end of the day.</p>

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7. General activities	<ol style="list-style-type: none"><li>1. Uneven working surfaces can create tripping and falling hazards</li><li>2. Weather conditions can create heat or cold stress/exhaustion situations.</li><li>3. Biological hazards, including insects and wild animals, exist anywhere at the site.</li><li>4. Chemicals used during equipment decontamination could be a health hazard.</li></ol>	<ol style="list-style-type: none"><li>1. Be aware of the ground surface to avoid tripping hazards. Place warning cones around identified hazards.</li><li>2. Dress appropriately for the weather conditions. Monitor your self for the signs of heat stress/exhaustion or frost bite.</li><li>3. Wear insect repellent during warm weather and keep shirt tucked in at the waist. Be on the lookout for rabid or diseased animals that are exhibiting aggressive behavior.</li><li>4. Wear nitrile gloves when washing equipment. Minimize the handling of acids and ensure all containers are well labeled.</li></ol>
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<b>Phase 4 – Verification Sampling</b>		
8. Perform final radiometric survey to document the as-left condition of the RCA	<ol style="list-style-type: none"> <li>1. External exposure to ionizing radiation</li> <li>2. Internal exposure to radiation or metals through inhalation of dust.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear TLD badge when working in RCA and carry a real time survey meter to determine if any hazardous radiation levels are encountered.</li> <li>2. Minimize disturbance of soils by walking slowly and carefully. Do not kick at dirt or try to move any heavy materials by hand when working in RCA. Do not work on windy days where visible dust is being picked up from the area or surrounding areas.</li> </ol>
9. Collect soil samples using hand auger and/or spatula or shovel	<ol style="list-style-type: none"> <li>1. Internal exposure to radiation, asbestos, or metals through inhalation of dust.</li> <li>2. External exposure to ionizing radiation.</li> <li>3. External exposure to radiochemical, metal or asbestos contaminants.</li> <li>4. Physical hazards including back strain, hand injury.</li> <li>5. Uneven ground surface creates risk of slips and falls.</li> </ol>	<ol style="list-style-type: none"> <li>1. Wear a ½ mask respirator with P100 dust cartridges. Ensure that wearer has completed respirator fit-testing. Inspect respirator for damage and cleanliness prior to donning. Clean respirator after each use and store in a clean secure location.</li> <li>2. Wear TLD badge when working in RCA and carry a real time survey meter.</li> <li>3. Wear reusable or disposable coveralls (Tyvek) to protect clothing and nitrile gloves to protect hands when handling soils. Remove coveralls prior to exiting the area and complete a surface contamination survey of all people and equipment.</li> <li>4. Use proper lifting and bending techniques and do not lift heavy loads without assistance. Wear leather work gloves when handling equipment or other heavy materials. Avoid putting hands near pinch points.</li> <li>5. Be aware of hazards in area, place orange safety cones in areas where a person could step into a trench or other hazard if not looking. Where possible, move tripping hazards out of the way.</li> </ol>
10. General activities	<ol style="list-style-type: none"> <li>1. Uneven working surfaces can create tripping and falling hazards</li> <li>2. Weather conditions can create heat or cold stress/exhaustion situations.</li> <li>3. Biological hazards, including insects and wild animals, exist anywhere at the site.</li> <li>4. Chemicals used during equipment decontamination could be a health hazard.</li> </ol>	<ol style="list-style-type: none"> <li>1. Be aware of the ground surface to avoid tripping hazards. Place warning cones around identified hazards.</li> <li>2. Dress appropriately for the weather conditions. Monitor your self for the signs of heat stress/exhaustion or frost bite.</li> <li>3. Wear insect repellent during warm weather and keep shirt tucked in at the waist. Be on the lookout for rabid or diseased animals that are exhibiting aggressive behavior.</li> <li>4. Wear nitrile gloves when washing equipment. Minimize the handling of acids and ensure all containers are well labeled.</li> </ol>