

## 1.0 PURPOSE / SCOPE / DEFINITIONS

### 1.1 Purpose

This task instruction provides guidance and means for the preparation, excavation, sorting and handling contaminated soil, miscellaneous debris, and anomalous materials from the 618-10 Burial Ground.

### 1.2 Scope

**NOTE:** Stamp annotations ( **FPE**, **AB**, and **AMP** ) throughout this Task Instruction's margins, indicate special requirements from DOE/site governing documents. See Attachment 3 for full references to these special requirements.

This task instruction applies to the 618-10 Burial Grounds and covers the following activities:

- General Work Site Activities
- Stripping of the Waste Site, Overburden Removal and Surge Trench Excavation
- Excavation and Primary Sort
- Secondary Sorting of Excavated Materials
- Suspect Spent Nuclear Fuel (SSNF)
- Anomaly Handling and Packaging Responses
- Soil Samples
- Load Out of Waste Material / Debris
- Exclusion Zone Down-Grading / Down-Posting
- End of Shift / Overnight Activities

### 1.3 Definitions

Authorization Basis: Those aspects of design basis and operational requirements considered to be important to the safety of facility operations and relied on by DOE and contractor to authorized work.

Anomaly: Any item or debris that is not readily identifiable or consistent with the types of waste expected to be found during the remediation activities. Anomalies include but are not limited to drums, sealed containers/bottles, and waste forms that have not been previously encountered.

Anomalous Condition: Unexpected conditions including but not limited to odors, stained soils, flames, and smoke. Industrial Hygiene (IH) or radiological readings in excess of action levels may also be considered an anomalous condition.

Below Cleanup Level Materials: Soil and debris that has been confirmed through survey or sampling to meet the environmental cleanup criteria (chemical and radiological) and may be used as backfill on the project

Contamination Reduction Zone (CRZ): This area separates the contaminated area from the clean area and acts as a buffer to reduce contamination of the clean area.

Excavation Competent Person: A person who has completed the requisite Occupational Safety and Health Administration (OSHA) training and is knowledgeable about soil analysis, the use of protective systems, requirements and is capable of identifying existing and

predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Exclusion Zone: The Exclusion Zone is the area where chemical contamination is either known or expected to occur and where the greatest potential for exposure exists.

In Transit: Equipment that is moving under its own power or being transported by trailer, with boom or mast lowered to its lowest stowed position prior to movement and having no load, from one jobsite to another.

Performing Work: Any equipment not in the in transit configuration is considered to be performing work.

“Safe-to-Approach” Approval: Authorization given by the Resident Engineer (RE) in concurrence with the Technical Review Team for personnel to approach an anomaly for sampling. All “Safe to Approach” approvals are documented on the Anomaly Tracking Form (ATF).

“Safe-to-Move” Approval: Authorization given by the Resident Engineer (RE) in concurrence with the Technical Review Team to move an item from the burial ground. All “Safe to Move” approvals are documented on the Anomaly Tracking Form (ATF).

Spill: A spill is defined as the release of a controlled material, a regulated material, or material that has not been characterized, to the environment. If material is released in a containment area and does not reach the environment, it is not a spill.

## **2.0 PRECAUTIONS and LIMITATIONS**

### **2.1 General Precautions**

- A. Sealed anomaly containers and/or vessels have the potential to contain significant stored energy in the form of pressure.
- B. Potentially explosive environments may be encountered due to the release of flammable vapors.
- C. Pyrophoric materials may be encountered increasing the potential of explosive environments.
- D. Loose contamination could exist on internal surfaces (e.g. glove boxes, drums, tanks, duct work) which could result in airborne release of radioactive or hazardous material.
- E. Work area conditions may change due to anomalous item assessment and packaging activities.

### **2.2 Limitations**

- A. Workers shall not directly handle waste, items or objects without RadCon, Safety and IH authorization.
- B. During the excavation operations, IH Technician and Radiological Control Technician (RCT) will monitor for airborne chemical contaminations and radiation levels and will suspend the activity as necessary.

- C. The excavation is to be suspended during high wind conditions, consisting of 20 mph or greater wind that is sustained for at least 15 minutes and during any condition that the dust cannot be suppressed during operations.
- D. An Exclusion Zone will be established and posted 50 feet from excavation point and from any point where unstabilized /uncharacterized drums or materials are moved or stored.
- E. Those personnel that are required to wear full-body clothing for IH purposes will be required to shower prior to leaving the project site or at the end of the shift.
- F. No more than four drums or drum equivalents (two B-12 boxes, or one B-25 box) may be stored on the edge of the excavation.
  - 1.) During unique conditions additional B-12 and B-25 containers may be placed at the excavation edge at the discretion of the RE.
- G. During handling of uncharacterized waste containers, communications shall be available between the operator, the Site Superintendent, the PSR, and the Subcontractor Technical Representative (STR) during field operations.
- H. The Hanford Fire Department will be notified of all observed fires, flash, smoke, and deflagration events that occur within the Burial Ground or container processing/storage areas.
- I. Establish vegetation control within the fenced area and maintain an area clear of vegetation a minimum of 10 m (30 ft) from all open trenches, waste staging areas, operations areas, and facilities.
- J. No fuel fired portable heaters shall be utilized within 50 ft of the excavation operations and staging areas.
- K. No combustible materials shall be stored in the SSNF storage bunker.
- L. Plastic sheeting required in operations or staging areas (other than container liners and tarps) shall comply with test method 2 of the Standard Method of Fire Test for Flame Propagation of Textiles and Films (NFPA 701).
- M. Unless approved by the WCH fire protection engineer, utilize FM-Global specified less flammable hydraulic fluids in the excavator equipment.
- N. Mechanical excavation is prohibited within 5-feet of known buried utility locations. (Lessons Learned RCCC-08-002)
- O. This package does not authorize work on or underneath Overhead Energized Electrical Power Lines.
- P. Storage, handling, characterization, packaging and shipment of SSNF/SNF will be covered in a separate work package.
- Q. No drums of unstabilized potentially pyrophoric material (as determined by the RE) may be staged outside of the excavation off-shift.
- R. The aggregate excavator bucket size may not exceed 427 m<sup>3</sup> (558 yd<sup>3</sup>).
- S. At least 3 of the 4 near field air monitors must be operating.
- T. Four (4) Event Air Monitors must be in place and operating.

AB

FPE

FPE

FPE

FPE

FPE

FPE

FPE

AB

AMP

- U. Trained spotters are required, prior to movement, when relocating/moving an excavator from one excavation/worksite to another if the travel path goes near or under an energized overhead power line.
- V. The Wireless Remote Monitoring System (WRM2) will be used for measuring gamma radiation. However, if the WRM2 indicates elevated gamma radiation present (25 mrem/hr), the Technical Review Team may elect to use the CRATER IAW, R.C.-300-6.9 Operating CRATER System for further investigation.
- W. Non-combustible materials (e.g. metal pallets) shall be used for all drums and containers with un-characterized content.
- X. Blast shields shall be utilized for heavy equipment associated with primary and secondary excavation and sorting.
- Y. Keep material and excavator bucket below grade as much as practical. At the end of shift all materials must be below grade and covered with a fixative.
- Z. Entrance into exclusion zones set up for excavation activities require the wearing of a personal air sampler, issued by RadCon. This requirement may be relaxed once excavation activities have ceased, and the area covered with a fixative.

FPE

FPE

### 3.0 PREREQUISITES

- 3.1 Prior to new excavations not identified on the Pre-grading Checklist, the Work Supervisor, Resident Engineer (RE) and Project Health & Safety Officer shall review applicable excavation permit(s) and Geophysical data (GPR) for potential obstructions and areas of concern (i.e., buried utilities). (Lessons Learned RCCC-06-002)
  - A. Ensure the RE has documented approval on the Work Package Status Log.
  - B. Ensure the RE has completed and approved the Field Remediation Pre-Grading Checklist (WCH-FS-276).
- 3.2 The Work Supervisor shall:
  - A. Ensure approved permits and/or plans (i.e., Excavation Permit, Fire Marshal Permit, RWP, BWP, etc.) are in place.
  - B. Perform interactive Pre-Evolution Briefing and document briefing on WCH-FS-210, "Pre-Evolution Briefing Checklist", and ensure assigned personnel are trained/qualified.
  - C. Ensure an Industrial Hygiene (IH) Exposure Assessment (EA) and an associated PPE Checklist (WCH-FS-243) (Attachment 1) has been completed for each active remediation site prior to initiating intrusive work activities.
  - D. Perform Supervisor's Daily Checklist, (Attachment 2).
- 3.3 The Work Supervisor will perform a walk-down of the excavation area to identify and visibly post/mark as applicable:
  - A. Work area boundaries.
  - B. Uneven terrain (i.e., holes, drop-offs, ditches, etc.) that need to be brought to the equipment operator's attention.
  - C. Power/communication lines.

FPE

- D. Underground utilities and/or structures.
- E. Culturally sensitive areas that need to be posted to prohibit disturbing the soil in those areas.
- F. Potential contamination areas.
- G. Stained soils.
- H. Areas to stockpile removed vegetation/soil for sampling/surveys.

#### **4.0 EQUIPMENT and SUPPLIES**

The following equipment and materials will be utilized as necessary for this scope of work. This list is not all-inclusive. If additional tools or equipment are required, the Work Supervisor will be responsible to ensure that the necessary craft are properly trained to use the equipment.

- Heavy equipment and necessary attachments
- Radiological Instrumentation and Supplies
- Industrial Hygiene Instrumentation and Supplies
- Containers (i.e. drums, B-12 and B-25 boxes)
- Blast shields for heavy equipment associated with excavation and sorting and for personnel working 50 feet or closer from the live excavation edge.
- Dust suppression equipment
- Four near field air monitoring stations
- Four event response air monitors
- Non-combustible materials (e.g. metal pallets, salvage containers) shall be used for all drums and containers with un-characterized content.
- Non-combustible materials (e.g. metal pallets) shall be used for all drums and containers with un-characterized content.
- Fixative material made of non-combustible materials
- Breathing air equipment and supplies

AMP

FPE

FPE

FPE

**NOTE:** The Sections within Section 5.0 may be performed in any order, concurrently, and/or repeated per FWS direction.

#### **5.0 INSTRUCTIONS**

##### **5.1 General Work Site Activities**

**NOTE:** The following steps within Section 5.1 are general guidance steps and may be referenced throughout all phases of this work scope. The work steps within Section 5.1 may be performed in any order, concurrently, and/or repeated per FWS direction.

##### **5.1.1 Controlling Dust and Contaminated Soils**

FPE

AMP

AMP

**NOTE:** Fixative material used for stabilizing loose soils and contamination shall be composed of noncombustible materials.

- A. Apply dust suppression (water spray/mist from a fire hose, fog cannon or water truck), as required, to minimize generation of dust.
- B. Apply a fixative to the excavation dig face when periods of inactivity are expected to be longer than 24-hours or when sustained wind speeds over 20 mph are forecasted for the 300/600 areas. Fixative application will be noted in the Monthly Air Data Quality Summary Report.
- C. Each excavator will be supported by a source of dust suppression, water cannon or water truck.
- D. Areas anticipated to be worked will be watered ahead of time via a sprinkler system or water truck to soak the upper surface of the area to be excavated.

#### 5.1.2 Personal Protective Equipment (PPE)

- A. PPE, other than Level "D", shall be documented on the "Personal Protective Equipment Checklist" (WCH-FS-243) or task instructions as applicable to specific work activity and be retained in this work package.

#### 5.1.3 Controlling spills and leaks

- A. IF a spill or leak of any amount occurs, perform the SWIM (Stop, Warn, Isolate, and Minimize) process as necessary.
- B. Contact the Work Supervisor and the Subcontract Technical Representative.
  - 1.) The Work Supervisor shall make the necessary notifications in accordance with ENV-1-1.17, "Spill Prevention, Response, and Reporting Protocol".

#### 5.1.4 Controlling Potential Fires (Fire Marshall Advisory Bulletin, AB07-001)

- A. Maintain a fire break for at least 30-ft around portable equipment (e.g., light plants, generators, etc.) and open trenches, waste staging areas, operations areas and facilities.
- B. Construct a 12" high soil berm or containment barriers around portable equipment (e.g., light plants, generators, etc.) that contains combustible material.
- C. In addition to the above steps, see Fire Marshall Advisory Bulletin (AB07-001) for additional requirements for controlling potential fires.

FPE

FPE

#### 5.1.5 Controlling Excavation Work

- A. An excavation competent person shall inspect excavations prior to beginning work, after periods of inactivity (24 hrs) and after each shift or as conditions change.
  - 1.) Document daily inspections of all active excavations in the Work Package Status Log.
- B. IF any suspected cultural materials are discovered, THEN STOP work and contact the Work Supervisor.
- C. IF buried utilities are contacted, THEN STOP work and contact the Work Supervisor.
  - 1.) Exit equipment only if staying in the equipment poses imminent danger.



- D. Perform continuous field monitoring with combustible gas indicators at excavation operations.
  - 1.) IF combustible concentrations are identified in excess of 10% of the lower flammable limit, THEN activities must be halted and reevaluated to determine a safe path forward.
- E. Wheeled equipment shall stay at 6-ft. away from open trench areas.

#### 5.1.6 Controlling Heavy Equipment Operations

- A. Work Supervisor shall ensure the following controls are utilized during equipment operations.
  - 1.) Trained spotter(s) are required as necessary, per FWS direction.
  - 2.) Communication between operator and spotter(s) shall be maintained at all times. (i.e. radios, hand signals). Spotters will have no other duties while spotting.
  - 3.) Operator(s) shall stop their equipment and place it in a safe configuration when personnel need to approach the heavy equipment.
  - 4.) Heavy equipment operators shall wear seat belts at all times.
  - 5.) Hydraulic attachments shall be placed in a zero energy state prior to the operator exiting the equipment cab.
  - 6.) Personnel shall not be allowed to stand or pass under suspended loads.

#### 5.2 Stripping of the Waste Site, Overburden Removal and Surge Trench Excavation

- A. Pre-water and minimize combustibles in the work area prior to using equipment in dry conditions.
- B. Apply dust suppression to the excavation, as necessary.
- C. Ensure radiological and IH monitoring are in place.
- D. Station at least one trained waste observer while stripping materials, including plant materials/vegetation per FWS direction.
- E. Remove and stockpile material per FWS direction.
- F. IF RCT readings are above background, THEN pause and contact the Work Supervisor.
- G. IF IH readings are above action limits, THEN pause and contact the Work Supervisor.
- H. IF the Equipment Operator encounters anomalous waste within the excavation, THEN take the following actions:
  - 1.) Stop and then Notify Work Supervisor.
  - 2.) Back the excavator and any other equipment/personnel away, preferably upwind, at least 50 feet from the excavation face.
  - 3.) Suspend work in the affected area while the waste is being confirmed.
  - 4.) Use existing, or obtain sufficient, IH and RadCon readings to determine if there is any IH or Radiological hazard from the excavated item.



- 5.) Personnel are to stay 50 feet away from uncharacterized anomalous contaminated waste until a "Safe to Approach" is given by the RE.
- 6.) IF the RE determines that the item is an anomalous contaminated waste, THEN the item will be buried, and all remaining excavation will be halted.
- 7.) Log all information known about the excavated item.
- 8.) Redeploy excavation efforts to an area where, based upon site knowledge and conference with the RE, a better surge area may be found.
- I. Continue excavation until a sufficient volume of soil has been removed to support remediation efforts.

### 5.3 Excavation and Primary Sort

FPE

- A. Establish boundaries (ARA/HCA/BCA) per FWS direction with inputs from IH and RC.
- B. Ensure radiological and IH monitoring are in place and operating in accordance with latest revision of the IHEA, SRTA and applicable BWP and RWP.
- C. Excavate materials and segregate wastes such as, lead, lead batteries, and Presumed Asbestos Containing Material into stockpiles or consolidated within the trench. Minimize exposed drums to four at a time within the excavation. If additional drums are exposed use fill dirt to cover these drums. Consult with the WTS when segregating out such materials
- D. Stage authorized overpack containers near the excavation in anticipation of handling anomalies. Only containers with a PIN number assigned are authorized.
- E. Material requiring size reduction is to be stockpiled or left in place and held for future disposition.
- F. Place materials remaining from primary sort on the side of the excavation for the secondary sort and sampling.
- G. IF an anomaly is discovered, THEN go to Section 5.6.
- H. If during excavation a drum/anomaly is exposed and there is indication of visible emissions, hissing, discoloration, blistering, or smoke the following actions will be performed:
  - 1.) Personnel near the excavation area shall notify the site via the radio net and then evacuate to the upwind direction staging area or as the Building Emergency Director (BED) directs.
  - 2.) Place sand/soil (if the Equipment Operator feels safe to do so) from the excavation to cover the affected anomaly and then evacuate to a safe location.
  - 3.) Work around the affected area, which would include all possible down wind receptors, is to be suspended until a recovery plan is developed. The STR, along with concurrence with the PSR and Work Supervisor, will determine the affected areas and possible downwind receptors.

FPE



- 4.) Notify Hanford Fire Department of fire, flash, smoke or deflagration events.

#### **5.4 Secondary Sorting of Excavated Materials**

- A. Secondary sorting will be performed in an ARA/HCA/BCA.
- B. IF the WRM2 indicates elevated gamma radiation present (25 mrem/hr), the Technical Review Team may elect to use the CRATER IAW, R.C.-300-6.9 Operating CRATER System for further investigation, THEN process as an anomaly or determine the high dose rate item as follows:
  - 1.) Load the excavator bucket and prepare for radiological surveys.
  - 2.) Cascade bucket contents by gravity from the excavator bucket, while continuously watching for anomalies and other wastes that may require additional treatment or management prior to disposal. Keep the bucket below grade while cascading material.
  - 3.) Cascaded material will be radiologically surveyed using a graded approach to identify high exposure rate discrete items to be segregated for additional handling (step 5.5 or 5.6 as applicable) and/or disposition.

#### **5.5 Suspect Spent Nuclear Fuel (SSNF)**

- A. If SSNF is discovered, personnel shall perform the following:
  - 1.) SWIM
  - 2.) Contact the Work Supervisor
- B. If, upon investigation, an item is determined to have a contact dose rate of  $\geq 300$  mrem/hr and visually appears that it could be SSNF it will be segregated and handled as SSNF.
- C. IF there is any uncertainty about an individual item, THEN site personnel will either have it reviewed by the SNF Subject Matter Expert (SME), or will segregate and handle it as SSNF.

#### **5.6 Anomaly Handling and Packaging Responses**

- A. When the Equipment Operator encounters anomalous waste within the excavation or secondary sorting, take the following actions:
  - 1.) Notify the Work Supervisor who activates the processes described here, utilizes the 618-10 Tracking Anomalous Waste and Changed Conditions Administrative Procedure (FRC-100-5.1) and initiates the Anomaly Tracking Form (WCH-FS-294).
  - 2.) The Work Supervisor will suspend work in the affected area while the anomaly is being investigated.
  - 3.) Place the excavator bucket/monitoring instruments as near to the anomaly as safely possible.
  - 4.) Monitor the anomaly per the direction of the FWS with input from the RE.
- B. The RE shall convene the Technical Review Team and follow the process in the FRC-

100-5.1

- C. IF there is no indication of elevated temperature or reactivity, THEN:
- 1.) The information from the monitoring is to be relayed to the Technical Review Team.
  - 2.) The RE will enter the information on the ATF.
  - 3.) With input from IH and RC, the RE makes the determination if it is "Safe to Move".
  - 4.) IF at any time it is determined the anomaly is not "Safe to Move" or approach, the item may be reburied or even left as is per FWS direction.
- D. Once the anomaly is deemed "Safe to Move", the anomaly will be handled per FWS direction.
- 1.) IF the anomaly is an intact drum, THEN it is to be remotely packaged into the appropriate container per FWS direction.
  - 2.) Deteriorated or leaking drums shall be scooped up in the bucket and containerized as per FWS direction.
  - 3.) When the drum is properly packaged, the excavator operator is to place the package on the edge of the excavation's face.
  - 4.) IF the anomaly is a container other than an intact drum (glass bottles, or other containers), THEN gather information to determine if it is empty or not:
    - a.) The equipment operator is to gather visual information and report it to the Technical Review Team.
    - b.) IF empty, THEN the container is to be crushed or broken.
      1. The Waste Transportation Specialist is to be consulted to determine packaging.
    - c.) IF the container is not empty or if it cannot be determined whether the container is empty or not, THEN the anomaly will be monitored for a "Safe to Move" determination.
    - d.) From gathered information the RE makes a determination if further investigation is required.
      1. IF further investigation is required, THEN the anomaly is investigated in place or relocated to a designated sample/investigation area and sampled at a later time
    - e.) IF the anomalous item is not determined to be empty, THEN package the anomalous item in an appropriate container or stage in an area designated by the RE to await transfer to storage area per FWS direction.

FPE

FPE

## **5.7 Soil Samples**

- A. Set up the appropriate area to collect soil samples per FWS direction.
- B. Use appropriate methods to collect samples as needed.
- C. Survey and sample waste material from the excavation per the DOE/RL-2001-48, Rev. 3, 300 Area Remedial Action Sampling and Analysis Plan. Surveys or samples may be collected at request of the FWS.

**5.8 Load Out of Waste Material / Debris**

- A. Load out waste material/debris per FWS direction.

**CAUTION**

ERDF container payload capacities vary. To avoid equipment damage, the haul truck driver and the equipment operator must communicate, and the load must be adjusted to ensure the container capacity is not exceeded prior to leaving project.

- B. Observe the payload capacity denoted on the container
- 1.) Adjust as necessary per FWS direction.

**NOTE:** All waste must fit inside the ERDF container without wedging into the chamfered portion of the sidewalls of the container (4 ft. in width) and must be kept at least 6-inches below the sidewalls of the container.

- C. Loading ERDF container:
- 1.) Prior to loading waste debris that has the potential to penetrate the waste container, place a minimum of 6-inches of soil under the material.
  - 2.) Begin loading material from the rear of the container to the front.
  - 3.) Watch for materials that do not meet the SWAC requirements and if discovered contact Work Supervisor. (Lessons Learned RCCC-07-0007)
  - 4.) Level the load in the container.
- D. IF any portion of the excavator load (soil/rock/debris) drops out of the bucket onto the ground, outside a posted IH/radiological area, THEN stop work, contact the FWS, and continue per FWS direction.
- E. Provide sufficient information to accurately identify the material being loaded into the container and to complete the Pre-Shipment Checklist.
- F. The Teamster will provide a Pre-Shipment Checklist for each container being loaded to the Waste Transportation Specialist.
- G. Perform survey(s) of the filled ERDF container exterior(s) as necessary, per FWS direction.

**5.9 Exclusion Zone Down-Grading/Down-Posting**

- A. Down-posting of an EZ established for excavation/sorting activities shall be performed, per FWS direction, when the following minimal criteria is met:
- All intrusive activities in the area are halted.
  - There are no exposed anomalies.
  - IH conditions are acceptable per IH.
  - Radiological conditions are acceptable per RadCon.

- B. For Exclusion Zones established around the open excavation, once the excavated material has been primary sorted, secondary sorted and sampled, it may be covered with clean material approximately 18 inches thick and the Exclusion postings moved to the new edge of the open excavation.

**NOTE:** Section 5.10 shall be performed at end of shift, overnight, or any time an extended stop in work activities is foreseen, per FWS direction.

#### **5.10 End of Shift/Overnight Activities**



- A. Return any pyrophoric drum that has not been processed and stabilized to the excavation and cover with soil.



- B. All exposed surface areas of contaminated combustible materials must be covered with processed soil or other methods to preclude combustion or movement of materials outside of controlled boundaries.



- C. Apply fixatives to contaminated soil and debris that will be inactive for more than 24 hours or if sustained winds in excess of 20 mph. Applications for either case will be noted in the Monthly Air Data Quality Summary Report.