



## Department of Energy

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NOV 10 1999

Mr. James Saric, Remedial Project Manager  
U.S. Environmental Protection Agency  
Region V, SRF-5J  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

DOE-0172-00

Mr. Thomas Schneider, Project Manager  
Ohio Environmental Protection Agency  
401 East 5th Street  
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

### TRANSMITTAL OF RESPONSES TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT NON-TYPICAL WASTE MANAGEMENT PLAN FOR WASTE PITS REMEDIAL ACTION PROJECT

This letter transmits the Department of Energy, Fernald Environmental Management Project (DOE-FEMP) responses to the Ohio Environmental Protection Agency (OEPA) comments on the Draft Non-Typical Waste Management Plan, received by letter of October 7, 1999. The U. S. Environmental Protection Agency (U.S. EPA) in their October 21, 1999 approval letter, provided no document-specific comments. Since the responses to comments result in only minor changes to the document, which are spelled out in the enclosed response to comment package, a revised Non-Typical Waste Management Plan is not being submitted at this time. Rather, once the U.S. EPA and OEPA have reviewed and approved this response to comment package and the proposed document revisions, a Final Non-Typical Waste Management Plan will be developed and submitted.

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Mr. James A. Saric  
Mr. Tom Schneider

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If you have any questions or comments, please contact Dave Lojek at (513) 648-3127.

Sincerely,



Johnny W. Reising  
Fernald Remedial Action  
Project Manager

FEMP:Lojek

Enclosure

cc w/ enclosure:

N. Hallein, EM-42/CLOV  
G. Jablonowski, USEPA-V, SRF-5J  
T. Schneider, OEPA-Dayton (three copies of enclosure)  
F. Bell, ATSDR  
M. Schupe, HSI GeoTrans  
R. Vandegrift, ODH  
F. Barker, Tetra-Tech  
AR Coordinator, FDF/78

cc w/o enclosure:

A. Tanner, OH/FEMP  
J. Hall, OH/FEMP  
D. Lojek, OH/FEMP  
T. Hagen, FDF/65-2  
J. Harmon, FDF/90  
R. Heck, FDF/2  
S. Hinnefeld, FDF/31  
T. Walsh, FDF/65-2  
ECDC, FDF/52-7

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been revised, however, in an attempt to clarify the potential for finding an intact container within another container. Specifically, item 4 from the listing of potential non-typical wastes in Section 2.0, has been revised to read as follows: "Unopened, intact drums/containers, including an intact container within a drum (which, in and of itself, may not be intact)." In addition, the second sentence of Section 4.4 has been revised as follows: "Upon discovery of an unopened, intact drum/container (including an intact container within a drum [which, in and of itself, may not be intact]), work in the immediate area will be stopped, and a remote visual assesment will be performed (see Section 3.2 of this Plan)."

Commenting Organization: Ohio EPA

Commentor: DHWM

Section #: 3.4 Page #: 17 Line:

Code:

Original General Comment #: 5

Comment: Information indicates that transfer of materials from staging areas to the non-typical waste transfer area will occur when sufficient quantities of material have been staged. Depending upon the type of non-typical waste encountered, it may be prudent to move materials to a more secure area (i.e., the transfer area) sooner. In addition to DOE's material quantity considerations, Ohio EPA prefers that reasonable time limits be established for the temporary placement of non-typical material at the staging areas and the transfer area. As an alternative to time constraints, DOE may propose additional engineering controls for temporary waste management issues.

Response: DOE agrees that, in certain instances, it may be more prudent to move materials to a more secure area (i.e., the transfer area) before a "sufficient quantity of waste has been staged". The intent in waiting until a sufficient quantity of waste has been generated before moving the material, is to make the transfer process reasonable and feasible. For example, if the off-site shipping and disposal method requires a certain type of container, and material is only available to occupy a small percentage of the container volume, bringing in a container too early could be problematic in that the container would either need to be kept in the waste pit area until sufficient additional material is excavated, or a partially filled container will need to be sent to FDF Waste Management for management. In other words, by waiting for a sufficient quantity of waste to be staged, the frequency and number of containers in the waste pit area can be more reasonably managed at any point in time. Obviously, if an extended staging of any materials in the waste pit area is not prudent (e.g., it creates or exacerbates an unsafe situation, results in regulatory non-compliance, etc.), the material will be moved as soon as practical.

Although DOE will generally strive to limit the amount of time that non-typical waste material remains staged in the waste pit area, the preference is not to necessarily establish time limits, unless they are required (e.g., by law). For example, the management of RCRA waste will be undertaken such that time limits are not exceeded whereupon the waste is to be stored at an approved RCRA storage area designated as appropriate in the existing RCRA permit application.

To establish and adhere to arbitrary time limits, might result in unnecessary exposure to individuals in instances where a very minimal amount of non-typical waste is being generated. Rather, DOE plans to utilize various engineering controls, to ensure that the non-typical waste is appropriately managed. These engineering controls are described in general terms in Section 3.3 and 3.4 of this Plan, and in more specific term in Section 4 of this Plan, as the controls are necessary to

address the proper management of a specific type of non-typical waste. For example, Section 4.2 provides details regarding the use of cylinder racks and protective barriers for the management of compressed gas cylinders.

Action: The last paragraph of this section has been revised to read as follows, to clarify the movement of non-typical wastes from the interim staging area:

"Non-typical waste materials will be staged in a designated portion of the excavation or MHB until final identification, sampling and analysis, hazard stabilization, or processing is complete. In general, non-typical wastes will be staged in this interim location until there is a sufficient quantity of waste to accommodate transfer. It may, however, be necessary (e.g., to address safety concerns) to transfer waste sooner (e.g., upon generation). When transfer of the material is desired, FDF will be notified of the type of material being staged and an approximate quantity to enable them to select the appropriate containers. FDF will transfer the appropriate containers to the waste transfer station. The staged waste that is ready for transfer will be moved to the temporary storage and transfer location between Pits 4 & 6, as discussed in Section 3.5. Alternatively, a container may be taken to the staging area in the pit or the MHB, the waste loaded, and the container taken back to the temporary storage location after decontamination. This activity will be conducted such that cross-contamination does not occur."

Commenting Organization: Ohio EPA

Commentor: OFFO

Section #: 3.4 Page #: 17 Line:

Code: c

Original General Comment #: 6

Comment: We have several comments regarding the limits placed on the inventories in the staging area:

- 1) This should be identified as an interim staging area to avoid confusion.
- 2) The limit to be placed on uranium-235 is listed as 350 grams. It is not clear how the quantity of this isotope could be measured since materials are staged here prior to any sampling or analysis.
- 3) The limit to be placed on thorium is 2,000 pounds. Describe the shielding, labeling and set back restrictions that DOE places on this quantity of thorium.
- 4) 28,000 pounds seems like a very large quantity of U-238. Justify the large quantity. Short of performing an elemental analysis of the individual uranium drums, it is not clear how it could be determined that the 28,000 pound limit of U-238 was not being exceeded.

- Response:
- 1) Agree. The subject discussion will be revised to make it clear that the discussion relates to the interim staging area.
  - 2) The subject limit relates to ensuring that storage segments remain below a nuclear facility categorization per DOE-STD-EM-5502-94, "Hazard Baseline Documentation." The intent of including this limitation was to ensure that an awareness is maintained in the field. Since it is not expected that this limitation will be exceeded, based on existing knowledge, the discussion in this section will be revised to delete this specific limit from the Plan, and require notification of non-typical waste inventory changes in the interim staging areas.
  - 3) Same as response to item 2).
  - 4) Same as response to item 2).

Action: The subject paragraph has been revised to read as follows:

"FDF will be notified of inventories of non-typical waste placed in interim staging areas. These interim staging areas will be assessed, as necessary, to assure that storage segments remain below a nuclear facility categorization per DOE-STD-EM-5502-94, "Hazard Baseline Documentation."

In addition, the interim staging area will be managed to ensure that stockpiles of non-typical waste do not exceed 100 yd<sup>3</sup>. If necessary, this volume can be exceeded if IT notifies FDF prior to the pile exceeding 100 yd<sup>3</sup>."

Commenting Organization: Ohio EPA

Commentor: OFFO

Section #: 4.4 Page #: 27 Line: first complete paragraph Code: c

Original General Comment #: 7

Comment: This paragraph states that drums which are damaged and breached or do not have sufficient structural integrity to be lifted and placed into an over-pack will be considered to be typical wastes and would be processed with the rest of the waste pit contents. Using this description, a drum of thorium oxide that was partly rusted through would not be segregated and treated as non-typical. This Section should be re-written to more clearly define the considerations for deciding when a slightly damaged drum will be treated as non-typical. Our concern is that drum contents may cause failures in the TCLP analysis.

Response: DOE agrees that the subject paragraph should be rewritten to more clearly define the subset of drums that are to be managed as potentially non-typical waste. For a drum/container to be considered potentially non-typical, it must still have physical containment capability. These constitute the only category of drums/containers which will require automatic segregation as a potentially non-typical waste. Without this containment capability, it would be expected that the waste within the container would have co-mingled with the material found around the container. Therefore, unless there is some other apparent basis for determining that this waste is non-typical (e.g., it is anomalous to the material found around it), it would be considered to be typical waste. Unopened intact drums/containers, on the other hand, could contain wastes that can be distinguished from the waste around it. In the case of anomalous material, field judgements will be made to determine if segregation of any clearly anomalous material is needed so as to avoid possible Waste Acceptance Criteria (WAC) failure.

Action: The subject paragraph has been revised to read as follows: "A drum that is damaged and breached, such that it has lost its physical containment capability, or does not have sufficient structural integrity to be lifted and placed into an overpack (i.e., the drum collapses during an overpack attempt), will be considered typical waste and will be processed with the rest of the waste streams from the waste pits. Based on field judgement, however, clearly anomalous material found in and around a breached or damaged drum may be segregated out and managed as potentially non-typical waste, if this segregation is deemed necessary in order to avoid possible WAC failure."

Commenting Organization: Ohio EPA  
Section #: 4.4.1 through 4.4.4 Page #: 28 & 29 Line:  
Original General Comment #: 8

Commentor: DHWM  
Code:

Comment: These sections present a discussion of non-typical waste management procedure in the event of discovery and excavation of unopened, intact drums. Proposed procedure includes evaluating the contents of such containers as typical or non-typical waste for the purpose of subsequent WPRAP management, based upon field screening criteria or some combination of screening criteria, container markings, characterization, etc. Insufficient detail is provided with regard to determining if drummed wastes exhibit the properties of RCRA characteristics waste (e.g., TCLP, corrosivity, etc.). Under no circumstances should drummed wastes exhibiting RCRA characteristics be considered typical wastes. All such drums should be transferred to FDF Waste Management.

Response: DOE agrees. Under no circumstances will DOE consider drummed waste exhibiting RCRA characteristics to be typical waste. All such drums will be transferred to FDF Waste Management. The strategy developed for ascertaining that the wastes do or do not exhibit RCRA characteristics is a multi-step strategy which consists of the following: 1) a remote assessment of the drum/container for markings and structural integrity; 2) monitoring/screening of the drum/container; 3) a visual assessment of the contents of the drum/container; and 4) sampling and characterization, as necessary, of the drum/container contents.

As indicated in the Ohio EPA comment, the first three steps identified above are discussed in detail in Section 4.4 of the Non-Typical Waste Management Plan (as well as in Section 3.2). Although the activities performed through these initial field activities will be used to gather information to support the safe handling and management of the drum/container, information gathered through these activities will also be used to support initial decisions as to whether or not the waste material is non-typical.

As discussed in the response to Ohio EPA Comment #7, information will be gathered during these initial field activities to support a decision as to whether the drum/container is intact. If the drum/container is not intact, i.e., if it no longer has physical containment capability, the drum/container, and its contents, will be categorized as typical waste. Under this scenario, unless there is some other apparent basis for determining that this waste is non-typical (e.g., it is anomalous to the material found around it), the contents of the drum/ container will be processed with the rest of the waste pit materials. In the case of anomalous material, field judgements will be made to determine if segregation of any clearly anomalous material is needed so as to avoid possible WAC failure.

During these initial field activities, attempts will also be made to identify the drum/container through markings on the drum/container. If there are legible markings, these will be compared with records to attempt to identify the contents. If a drum/container can be identified in this manner, it can be assumed with a high level of certainty that the contents are as identified in the records. In these instances, the field screening/monitoring will be used as a verification step, as to the contents.

Finally, information will be gathered through these initial field activities, which can be used to guide any additional sampling and analysis deemed necessary. For example, the visual observations can be used to determine if the contents are a solid

or liquid, and if it is a liquid, whether it is water miscible. In addition, the PID readings can be used to determine if VOA analyses are necessary.

If the drum/container cannot be affirmatively identified as non-typical wastes through the process discuss above, it will be necessary to take samples of the contents for further characterization. As discussed in Section 4.4.1 of the Plan, these additional sampling and characterization efforts will be performed to gather information sufficient to: 1) verify the drum contents are indeed non-typical; 2) determine proper containerization of the waste; 3) determine compatibility with other stored wastes; 4) support waste treatment decisions (if necessary); and 5) support final disposal decisions.

Although there are specifics of the drum/container characterization strategy which are still being defined/refined, a general strategy has been developed. To guide the characterization efforts, the plan is to classify the material found within the drum/container as a solid/sludge, a water miscible liquid, or a water immiscible liquid. This approach supports the use of screening activities to facilitate the characterization process, with a goal of first determining if the contents of the drum/container are RCRA hazardous and/or are PCB-contaminated. The total list of constituents will be developed on a case-by-case basis, based on the results of the visual inspection, initial characterization efforts performed, and the above informational needs.

For solids/sludges, the plan is to analyze a sample for total RCRA metals. If total metals levels are greater than 20 times the TCLP limit, then the waste will be analyzed for TCLP metals. If less than 20 times the TCLP limit, it will be concluded, that the material is not RCRA hazardous for metals. In addition, if the PID readings in the field were greater than 10 ppm above background, a sample aliquot will be analyzed for TCLP VOAs. If the PID reading is less than the 10 ppm above background, it will be concluded that the material is not RCRA hazardous for volatiles. In addition, some radiological analyses could be performed to support blending/disposal decisions. Assuming that it was concluded, through the process described above, that the material does not exhibit any RCRA hazardous characteristics, the material would be considered typical and would be blended with the other pit wastes. Other analyses may be performed to provide needed information in support of storage, treatment, and/or disposal decisions.

For a water miscible liquid, the same process used above on solids/sludges would be used, with the exception of screening for metals. No metals screening would be performed; rather, the material will be analyzed for RCRA metals.

For water immiscible liquids (i.e., oily liquids), the process would be modified to first determine if the material is PCB-contaminated (through screening and/or quantitative analysis). If this material is PCB-contaminated, it will need to be disposed of off-site as such. If through the analysis process, it is concluded that the material is not PCB-contaminated, it will be further characterized in the same manner as a water miscible liquid.

Action: No change is necessary to the Non-Typical Waste Management Plan.

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**ATTACHMENT A**

**Job Safety Analysis and Activity Hazard Analysis  
for the Management of Non-Typical Waste**

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**JOB SAFETY ANALYSIS - JSA 05.090**  
**MANAGING NON-TYPICAL WASTE**

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**DESCRIPTION OF JOB TASK**

Certain of the wastes that may be encountered during the excavation of waste pit materials will be classified as non-typical waste. Non-typical wastes are wastes that do not meet the Commercial Disposal Facility (CDF) Waste Acceptance Criteria (WAC). Non-typical wastes have been categorized as follows:

- Pyrophoric materials
- Transformers
- PCB wastes
- Asbestos
- Large debris
- Compressed gas cylinders
- Unopened intact drums
- Thorium metal/oxides
- Small explosive devices
- RCRA characteristic hazardous waste

When uncovered during excavation or identified through waste segregation at the waste pits or within the Material Handling Building (MHB), some of these non-typical wastes may present specific safety hazards (e.g., chemical, radiological, and physical) while they are being managed for final disposition. To ensure that personnel involved with managing non-typical waste are protected from safety hazards to the fullest extent practicable, an effective mechanism for conveying important and relevant safe handling instructions is required. Accordingly, Operations Procedure OPS 05.090, "Managing Non-Typical Waste", has been developed to fulfill this requirement and this JSA is provided as supporting safety documentation for OPS 05.090.

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**SECTION 1 - Initial Hazard Assessment:**

Managing non-typical waste involves the following hazardous activities:

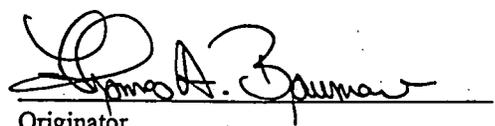
1. Handling compressed gas cylinders,
2. Handling intact drums,
3. Handling bulging drums,
4. Handling large debris (e.g., mechanical equipment or reinforced concrete),
5. Handling pyrophoric materials,
6. Handling transformers,
7. Handling PCB wastes,
8. Handling small explosive devices,
9. Handling asbestos containing materials,
10. Handling thorium metal/oxide wastes,
11. Performing work in excavations,
12. Operating heavy equipment and working in proximity to heavy equipment,
13. Refueling equipment,
14. Working in radiological contamination areas, high contamination areas and airborne contamination areas,
15. Working with hazardous chemicals,
16. Handling RCRA hazardous waste, and
17. General site hazards (adverse weather conditions and biological hazards).
18. Working Level B respiratory protection

**Note:** If a new hazardous activity is identified as work is progressing, or if the scope of work, as described in OPS 05.090 changes, an amendment to JSA 05.090 may be required. All amendments to JSA 05.090 shall be approved by the IT Site Safety Manager or his designee. The Safety Manager shall document approval by recording his signature in the space provided in Section 5 of the JSA.

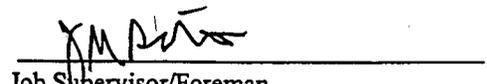
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**SECTION 2 - Activity Hazard Assessment:**

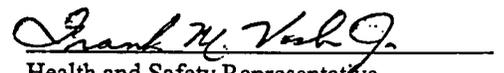
Activity Hazard Analyses (AHAs) have been prepared for the hazardous activities listed in Section 1. These Activity Hazard Analyses are provided with this JSA.

  
Originator

Date: 11 Aug. 99

  
Job Supervisor/Foreman

Date: 11 Aug, 99

  
Health and Safety Representative

Date: 8-11-1999

**SECTION 3 - Pre-Work Requirements, Personal Protective Equipment Requirements and Training Requirements:**

Pre-work requirements are specified in Section 3.0 and Section 4.0 of the Operations Safe Work Plan. Personal Protective Equipment requirements are specified in Section 3.0 and Section 4.0 of the Operations Safe Work Plan and in the AHAs provided with this JSA. Anti-contamination clothing requirements are specified in the FDF Radiological Work Permit(s) written for the applicable waste pit and material handling activities.

Training requirements are specified in Section 3.0 and Section 4.0 of the Operations Safe Work Plan and in the AHAs provided with this JSA.

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**SECTION 4 - JSA and AHA Review (Worker's Signatures):**

I, the undersigned, have been briefed on the hazards associated with managing non-typical waste as described in JSA 05.090 and referenced documents and I will comply with the requirements of the aforementioned documents:

Name: \_\_\_\_\_ Clock #: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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(Attach additional signature pages as necessary)

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**SECTION 5 – Follow up Assessment - New Hazards:**

\_\_\_\_\_  
Originator Date: \_\_\_\_\_

\_\_\_\_\_  
Job Supervisor/Foreman Date: \_\_\_\_\_

\_\_\_\_\_  
Health and Safety Representative Date: \_\_\_\_\_

\_\_\_\_\_  
Safety Manager or Designee Date: \_\_\_\_\_

**SECTION 6. New Hazard Review**

Name: \_\_\_\_\_ Clock #: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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ACTIVITY HAZARD ANALYSIS  
 FOR TRENCHING, EXCAVATIONS, & BACKFILLING

TASK / ACTIVITY	HAZARDS	MITIGATORS / CONTROLS	PPE REQUIREMENTS	REQUIRED TRAINING	PERMITS/PLANS
Managing Non-Typical Waste	<p>Physical Hazards <i>Use caution, excavation is recognized as one of the most hazardous construction activities)</i></p> <p>Open excavations and trenches present the potential for cave-ins</p> <p>Open excavations and trenches present fall hazards ranging from falls at the same level to falls to a lower level</p> <p>Excavations and trenches greater than 4 feet in depth present a confined space hazard.</p> <p>Free-standing water in open excavations and trenches presents a drowning hazard and a an electrical shock hazard.</p> <p>Excavation and trenching involves the use of heavy equipment which presents traffic hazards, pedestrian hazards, vehicle refueling hazards and possible noise hazards. The use of gasoline powered equipment in or near trenches or excavations may cause a hazardous atmosphere in the trench or excavation.</p>	<p>•All unattended trenches and excavations shall be identified by postings such as "DANGER Open Trench" or "DANGER Open Pit" and by barriers such as hazard rope or hazard tape.</p> <p>•Employees in excavations must be protected from cave-ins except when the excavation is less than 5 feet in depth and a competent person provides no evidence that a cave-in should be inspected. Protection may include, but not be limited to: use of sloping / benching methods, shields / trench boxes, and shoring. Protection will be selected designed and maintained in accordance with the requirements of 29 CFR 1926, Subpart P</p> <p>•Information necessary for the safe installation, placement, use and removal of any trench support system will be available at the work site at all times.</p> <p>• Material or equipment which might fall into an excavation must be kept at least 2 feet from the edge of the excavation, or have retaining devices to prevent it from falling into the excavation.</p> <p>•The IT Safety &amp; Health Representative will monitor for hazardous atmospheres in excavations and trenches &gt;4 feet in depth and will implement the IT WPRAP Permit Required Confined Space Entry Program as necessary to protect the health &amp; safety of the workers.</p> <p>•Excavations shall be inspected by a competent person prior to beginning work each day and as conditions change, after every measurable rain or other hazard increasing occurrence such as freezing and thawing.</p> <p>• Free-standing water shall be removed from the trench by portable pumps and hoses.</p> <p>• Personnel shall wear traffic safety vests when in areas where heavy equipment is being operated.</p> <p>•Mechanized equipment and machinery shall be inspected by a competent mechanic or operator prior to placing it into service and at the beginning of each shift thereafter. Defective equipment shall not be used at the WPRAP.</p> <p>•A warning system for mobile equipment, such as barricades, hand or radio signals, or stop logs must be functional and used when personnel are working in the trench.</p>	<p>Hard hat</p> <p>Safety glasses with side shields</p> <p>Steel toed Safety boots</p> <p>Fluorescent traffic safety vests or clothing is required when working around heavy equipment such as excavators</p> <p>Hearing protection is required in areas where the noise levels exceed 85 dBA</p> <p>Hand protection shall be worn as specified by the IT Safety and Health Representative, by Material Safety Data Sheets, or by applicable permits and plans</p> <p>Additional PPE requirements will be specified in applicable RWP's, procedures, or plans.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP)</p> <p>RAD Worker II</p> <p>Orientation on the applicable FDF Radiological Work Permits</p> <p>General Employee Training</p> <p>HAZWOPER / FDF Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on the Operations Safe Work Plan (OSWP)</p> <p>Orientation on Operations Procedure OPS 05.090.</p> <p>OSHA supervised field experience (24 hours of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Personnel in the vicinity of excavations and trenching activities or where such activities have occurred for this project shall be trained in the recognition of anomalies in the soil that suggests that radiological contamination may be present (typically stains or colors in the soil or on debris that has been uncovered.</p> <p>Personnel in the vicinity of excavation and trenching activities shall be trained in the recognition of items in the soil that could suggest the presence of Asbestos.</p>	<p>FDF Radiological Work Permits</p> <p>IT WPRAP Operations Safe Work Plan (OSWP)</p> <p>IT WPRAP Remedial Action Health and Safety Plan "(RAHASP)</p> <p>A Confined Space Entry Permit may be required as determined by the IT Safety and Health Representative in accordance with the IT WPRAP Permit Required Confined Space Entry Program.</p> <p>Operations Procedure OPS 05.090.</p>

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ACTIVITY HAZARD ANALYSIS  
 FOR CHEMICAL HAZARDS

TASK/ACTIVITY	HAZARDS	MITIGATORS / CONTROLS	PPE REQUIREMENTS	REQUIRED TRAINING	PERMITS / PLANS
Managing Non-Typical Waste	<p>Chemical Hazards associated with the following:</p> <ul style="list-style-type: none"> <li>Compressed gas cylinders may present a fire/explosive hazard or toxic hazard as well as the potential for becoming a projectile.</li> <li>Intact drums with known contents present chemical hazards associated with the contents.</li> <li>Intact drums with unknown contents can present serious safety concerns (e.g., shock sensitive waste).</li> <li>Bulging drums with known or unknown contents present the potential for fire and/or explosion.</li> <li>Asbestos can present a severe respiratory hazard with long term effects.</li> <li>PCBs can present a skin contact and/or respiratory hazard with long term effects.</li> <li>Small explosive devices present an obvious explosion hazard as well as the potential for personal injury from flying debris.</li> </ul> <p>Pyrophoric materials present a fire hazard as they can spontaneously ignite when exposed to air.</p> <p>Large debris, such as reinforced concrete and mechanical equipment, may present a chemical hazard when in the process of being reduced in size.</p> <p>RCRA characteristic waste may be encountered in the waste pits or in the railcar loadout bins</p>	<p>Nontypical waste drums and cylinders will be handled remotely in accordance with OPS 05.090 "Managing Non-Typical Waste".</p> <p>Compressed gas cylinders will be evaluated by the cylinder specialist and will be managed on a case by case basis in accordance with OPS 05.090.</p> <p>All non-typical waste will be managed in accordance with OPS 05.090.</p> <p>Extra precautions are required when managing bulging (pressurized) drums and intact drums with unknown contents. Spark proof tools will be used to relieve pressure from bulging drums in accordance with methodology described in OPS 05.090.</p> <p>OPS 05.090 provides guidance for handling drums with unknown contents.</p> <p>OPS 05.090 provides guidance for handling explosive or shock-sensitive waste.</p> <p>Drums, transformers or other containers suspected to contain PCBs will be handled in accordance with OPS 05.090.</p> <p>Containers shall be visually assessed (typically from a remote location using binoculars) to determine contents and structural integrity in accordance with OPS 05.090</p> <p>Should asbestos be encountered, it will be wetted and double bagged/wrapped in 6 mil poly in accordance with OPS 05.090. Only qualified personnel will perform this activity.</p> <p>The IT Field Engineer will evaluate the condition of small explosive devices and will provide direction for handling in accordance with OPS 05.090.</p> <p>In accordance with OPS 05.090, pyrophoric wastes will be packed in containers provided by FDF using heavy equipment with the appropriate attachments to ensure remote handling.</p> <p>Large debris will be sized reduced in accordance with OPS 05.090 and IT Hot Work Permits.</p> <p>RCRA characteristic waste will be managed in accordance with OPS 05.090. The hazards associated with RCRA waste are: Corrosivity, Ignitability, Toxicity, and Reactivity</p>	<p>Hard hat</p> <p>Safety Glasses with side shields or full face respiratory protection.</p> <p>Steel toed safety boots</p> <p>Additional PPE requirements are specified in applicable RWP's, hot work permits, procedures, plans, or material safety data sheets (MSDS)</p> <p>Level B protection (SCBA, impermeable ensemble) required when field sampling or closer inspection of unopened intact drums with unknown contents and compressed gas cylinders with unknown contents or toxic gases.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP)</p> <p>RAD Worker II</p> <p>FDF General Employee Training (GET)</p> <p>HAZWOPER / Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on Operations Procedure OPS 05.090.</p> <p>Orientation on applicable Material Safety Data Sheets (MSDS) in accordance with the IT WPRAP Hazard Communication Plan.</p> <p>OSHA supervised Field Experience (24 hours of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Orientation on the Operations Safe Work Plan.</p> <p>Asbestos worker training is not a prerequisite training requirement but may be necessary should abatement quantities of asbestos be encountered.</p> <p>Training as specified in the IT Training Qualification Program Description (TQPD)</p>	<p>FDF Radiological Work Permits</p> <p>IT Hot Work Permits</p> <p>Remedial Action Health and Safety Plan (RAHASP)</p> <p>Operations Safe Work Plan (OSWP)</p> <p>Ops. Procedure OPS 05.090 "Managing Non-Typical Waste"</p> <p>Non-Typical Waste Materials Handling Plan</p>

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**ACTIVITY HAZARD ANALYSIS  
 FOR HEAVY EQUIPMENT OPERATION**

Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
Managing Non-Typical Waste	Physical Hazards	All equipment operator are required to observe the site speed limit of 15 miles per hour at all times	Hard hat	Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP):	FDF Radiological Work Permits
	Excessive speed	Regularly inspect equipment before operating. Defective equipment shall be removed from service until properly repaired and reinspected.	Safety glasses/ side shields or full-face respiratory protection	Rad Worker II	Operating Procedure OPS 05.090
	Defective/damaged equipment	Perform proper mechanical maintenance in accordance with the manufacturer's instructions.	Steel toed safety boots	Orientation on applicable FDF Radiological Work Permits.	IT WPRAP Remedial Action Health and Safety Plan (RAHASP)
	Restricted vision	Horns, flasher lights, and other warning devices shall be used to warn pedestrians and other vehicles/equipment of intended movement.	Fluorescent safety vests are required when working around heavy equipment such as tracked excavators.	General Employee Training	Operations Safe Work Plan (OSWP)
		Personnel working in the vicinity of heavy equipment shall make visual or radio contact with the operator prior to entering the danger zone (e.g. vehicle roadway and crane swing radius).	Hearing protection is required in areas where the noise levels exceed 85 dBA.	HAZWOPER/FDF Site Worker	Orientation on the Remedial Action Health and Safety Plan (RAHASP)
	Accidents (e.g. collision with other equipment, a pedestrian, or an inanimate object.	All equipment must be parked in authorized areas only. There will be no passing of other equipment where there are narrow roads or short sight distances.	Additional PPE requirements will be specified in applicable RWFs. Procedures, or plans.	Orientation on the Operations Safe Work Plan (OSWP)	Orientation on Operations Procedure OPS 05.090.
		Seat belts shall be worn at all times when operating the equipment.		OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)	
Noise	Personnel shall wear traffic safety vests when in areas where heavy equipment is being operated.	Noise measurements whenever excessive noise levels are suspected. If noise levels exceed 85 dBA, the equipment or equipment operating area will be posted as applicable and hearing protection will be required.	Morning, post lunch, and change in work scope safety briefings.		
Carbon monoxide	Vehicle exhausts shall be directed away from confined spaces, including trenches.		Heavy equipment operator qualification records shall be provided to IT for approval and retention for FDF review.		
			Prior to beginning work on site, heavy equipment operators shall become familiar with the specific equipment they will be operating by reviewing the manufacturer's operating manual and by physically operating the equipment.		

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ACTIVITY HAZARD ANALYSIS  
FOR RADIOLOGICAL HAZARDS

Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
<p>Managing Non-Typical Waste</p> <p>Handling thorium metal/oxide waste within radiological contamination areas.</p>	<p>Radiological hazards</p> <p>Radiological contamination may be encountered anywhere within the Controlled Area of the site. The controlling nuclide is Thorium-230. Uranium-238 is also present.</p> <p>Radioactive contamination may be present in air, liquid, soils, or as contamination on materials and equipment.</p> <p>Radon progeny is also a radiological hazard that may be encountered anywhere on the site but particularly in the waste pits themselves and in the material handling building.</p> <p>Equipment such as surveyors tripods may become contaminated through contact with subsurface contamination</p> <p>Use of torches or other hot work tools on contaminated items could lead to airborne contamination.</p> <p>The use of hand and portable power tools on contaminated surfaces can lead to generation of airborne contamination.</p>	<p>Worker exposure to external radiation is monitored using thermoluminescent dosimeters (TLDs) which are provided by and analyzed by the FDF Dosimetry Department. All personnel are required to wear the TLD when on the site.</p> <p>All personnel are required to perform a whole body frisk for radioactive contamination prior to exiting Controlled Areas.</p> <p>Personnel are required to wear personal air sampling devices such as breathing zone air samplers as determined by FDF Radiological Control.</p> <p>Personnel are required to participate in the FDF Internal Dosimetry Program by submitting urine samples at specified frequencies and by having a "baseline "lung count" examination prior to working on the site and at least annually thereafter while working at the site. Urine sampling and lung counts may be required following personal contamination events, suspect internal exposure to airborne radioactive material or as otherwise determined by the FDF Dosimetry and Bioassay Programs.</p> <p>Personnel are required to receive a briefing on FDF Radiological Work Permits (RWP) and to acknowledge the briefing by signing the RWP. Personnel are required to sign in on the RWP daily and cannot be signed in on more than one RWP at a time.</p> <p>In accordance with FDF Subcontract 98SC000001, an FDF Radiological Work Permit is required for all excavation or trenching work.</p> <p>Tripods shall have plastic wrappings over the bottoms of their legs or replaceable caps to prevent their legs from sinking into the ground.</p> <p>Refueling hoses may be run across a controlled / contamination area boundary, but the hose must be fixed/fastened at the boundary to ensure that portion of the hose in the contamination area cannot come back out. A radiological survey of the hose in the contamination area must be performed before it can be released. Also, steps must be taken to ensure that contamination does not get inside the hose. When the hose is not in use, that end in the contamination area must be wrapped and capped to ensure contamination cannot enter.</p> <p>Workers shall be instructed to recognize new (clean) equipment versus potentially contaminated equipment and ensure that hot work is not performed on potentially contaminated surfaces without first having a FDF Radiological Control Technician survey the surface. No work shall be performed on a surface with the potential to have fixed contamination without first alerting FDF Radiological Control.</p>	<p>Personnel shall wear personal protective equipment (PPE) for protection against radioactive contamination or radiation in accordance with the requirements specified in FDF Radiological Work Permits and the IT Remedial Action Health and Safety Plan (RAHASP).</p> <p>Whenever respiratory protection is required and unless otherwise specified by FDF Radiological Control, a Powered Air Purifying Respirator (PAPR) shall be worn when working in areas where thorium is the predominant radionuclide.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP):</p> <p>Rad Worker II</p> <p>FDF General Employee Training (GET)</p> <p>HAZWOPER/FDF Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on the Operations Safe Work Plan (OSWP)</p> <p>Orientation on Operations Procedure OPS 05.090.</p> <p>OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Personnel in the vicinity of excavation and trenching activities or where such activities have occurred for this project shall be trained in the recognition of anomalies in the soil that suggests that radiological contamination may be present (typically, stains or colors in the soil or debris that has been uncovered).</p> <p>Personnel shall be informed of the potential for radioactive contamination on items that have been on site for a considerable period of time. Personnel shall be instructed to contact a FDF Radiological Control Technician before work on or with these items.</p> <p>Workers shall be instructed in approved methods of lifting objects while in contaminated areas (e.g., requesting pre-lift surveys from FDF Radiological Control Technicians and wrapping the object prior to lifting)</p>	<p>FDF Radiological Work Permits</p> <p>Remedial Action Health and Safety Plan (RAHASP).</p> <p>Operations Safe Work Plan (OSWP).</p> <p>Operating Procedures (OPS 05.090)</p>

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**ACTIVITY HAZARD ANALYSIS  
 FOR EQUIPMENT REFUELING**

Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
Managing Non-Typical Waste	<p>Physical hazards</p> <p>Fire</p> <p>Spills or leaks</p> <p>Heavy equipment operation</p>	<p>Sources of ignition will be excluded from areas where flammable materials are present.</p> <p>Refueling will be done only in approved areas. These areas will be posted in accordance with 29 CFR 1926.52(e).</p> <p>Equipment will be bonded and grounded, spark proof and explosion resistant as appropriate. Particular attention to bonding and grounding shall be given to the transfer of flammable/combustible liquids.</p> <p>Smoking is strictly prohibited within 50 feet of any refueling areas.</p> <p>Fire extinguishers will be kept in sufficient numbers to allow personnel to extinguish incipient stage fires</p> <p>The motors of all equipment being fueled will be shut off during refueling.</p> <p>Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely in accordance with applicable disposal criteria.</p> <p>Personnel working in the vicinity of heavy equipment shall make visual or radio contact with the operator prior to entering the danger zone (e.g. vehicle roadway or trackhoe swing radius).</p> <p>Personnel shall wear traffic safety vests when in areas where heavy equipment is being operated.</p>	<p>Hard hat</p> <p>Safety glasses/ side shields or full-face respiratory protection</p> <p>Steel toed safety boots</p> <p>Traffic safety vests are required when working around heavy equipment such as tracked excavators.</p> <p>Additional PPE requirements will be specified in applicable RWP's, procedures or plans.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP):</p> <p>Rad Worker II</p> <p>Orientation on applicable FDF Radiological Work Permits.</p> <p>General Employee Training</p> <p>HAZWOPER/FDF Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on the Operations Safe Work Plan (OSWP)</p> <p>Orientation on Operations Procedure OPS 05.090.</p> <p>OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Fire extinguisher training is required for all personnel performing refueling activities.</p>	<p>FDF Radiological Work Permit</p> <p>Operating Procedures (OP 05.090)</p> <p>IT WPRAP Remedial</p> <p>Action Health and Safety Plan (RAHASP)</p> <p>Operations Safe Work Plan (OSWP)</p>

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ACTIVITY HAZARD ANALYSIS  
FOR PRESSURE WASHING

Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
<p>Managing Non-Typical Waste</p> <p>Using a Hotsy pressure washing system for decontamination of materials and containers</p>	<p>Electrical shock</p> <p>Mechanical malfunction</p> <p>Fire</p> <p>Personal injuries</p>	<p>The system must be protected by a ground fault circuit interrupter.</p> <p>Never stand in water while connecting and disconnecting the electrical supply.</p> <p>Use only UL grounded receptacles and extension cords of proper voltages and amperage rating at all times.</p> <p>Keep all electrical components dry.</p> <p>Disconnect the power supply prior to performing any maintenance.</p> <p>Check hoses, fittings, wand, trigger gun and fuel connections daily for signs of wear, cracks, and looseness. Repair/replace as necessary.</p> <p>Troubleshoot the system prior to using reset buttons. Follow the manufacturer's trouble shooting guidelines.</p> <p>Do not operate the system in areas where flammable vapors (gasoline, solvents, etc.) may be present.</p> <p>Do not store flammable liquids near the system.</p> <p>Do not point the wand or trigger gun at yourself or at any person. Body injury may result from water under high pressure.</p> <p>Do not block the trigger gun in the open position.</p> <p>Do not allow the system to run unattended.</p> <p>To prevent the possibility of severe burns, avoid contact with non-insulated areas of the system.</p> <p>Always wear the personal protective equipment specified in this Activity Hazard Analysis.</p> <p>The system produces a kickback which can cause temporary loss of balance. To prevent personal injuries from falls, assure stable footing before activating the trigger gun.</p> <p>The cleaning/decon area should be provided with adequate slopes and drainage to reduce the possibility of a fall caused by a slippery surface.</p> <p>Unauthorized system modification or use of non-approved replacement parts may cause personal injury and is prohibited.</p> <p>Use extreme caution when moving the system over uneven surfaces.</p> <p>Never remove warning or instruction decals. If they become worn or damaged, they must be replaced.</p>	<p>Hard hat</p> <p>Full-face shield or full-face respiratory protection as determined by measurement of airborne contamination levels</p> <p>Steel toed safety boots</p> <p>Shin guards</p> <p>Water resistant clothing, including gloves.</p> <p>Hearing protection if levels exceed 85 decibels averaged over 8 hours.</p> <p>Additional PPE requirements may be specified in applicable RWP's, procedures or plans.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP):</p> <p>Rad Worker II</p> <p>Orientation on applicable FDF Radiological Work Permits.</p> <p>General Employee Training</p> <p>HAZWOPER/FDF Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on the Operations Safe Work Plan (OSWP)</p> <p>Orientation on Operations Procedure OPS 05.090.</p> <p>OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Personnel shall be trained to safely operate the Hotsy Pressure washing system in accordance with OPS15.110 "Pressure Washing Operations".</p>	<p>FDF Radiological Work Permit</p> <p>Operating Procedures OPS05.090 and OPS15.110</p> <p>IT WPRAP Remedial</p> <p>Remedial Action Health and Safety Plan (RAHASP)</p> <p>Operations Safe Work Plan (OSWP)</p>

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**ACTIVITY HAZARD ANALYSIS  
FOR CRANES AND RIGGING**

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Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
<p><b>Managing Non-Typical Waste</b></p> <p><b>Use of cranes and rigging for lifting activities</b></p> <p align="center">000023</p>	<p><b>Physical Hazards</b></p> <p>The most common physical hazards which are found around movable cranes are as follows:</p> <ul style="list-style-type: none"> <li>• Power line contact</li> <li>• Overloading</li> <li>• Outrigger failure (soft ground and structural)</li> <li>• Two-blocking</li> <li>• Pinch points</li> <li>• Unguarded moving parts</li> <li>• Unsafe hooks</li> </ul>	<p>The area within a radius of ten feet in any direction from power lines is an unsafe work area and must be clearly marked off on the ground by marker tape, fences or other physical barriers. Everyone at the worksite must ensure themselves that the crane is positioned so that the boom and hoist line cannot intrude into the danger zone created by the power line.</p> <p>If the danger zone can be penetrated by a crane boom or hoist line, the electric must be de-energized in accordance with the FDF Lockout/Tagout Procedure.</p> <p>Load measuring systems shall be used to measure the actual load as related to boom angle and length, to warn the operator as rated capacity is approached and to stop further movement.</p> <p>Formal training shall be provided for all crane operators to assure competency in the use of crane load charts.</p> <p>An IT competent person in crane operations shall direct and oversee crane operational when poor supporting soil is encountered, or the outriggers have inadequate floats or pads. The competent person will ensure that: well designed blocking or cribbing is used under the outriggers to extend the base of the outrigger support; if floats are used on outriggers, they shall be securely attached; all blocking used to support outriggers shall be strong enough to prevent crushing, be free of defects, and be of sufficient width and length to prevent shifting or toppling under load.</p> <p>Load spreaders shall be used and shall be sized to provide a minimum of 400% more load bearing area than the outrigger pads.</p> <p>Anti-two blocking devices shall be standard equipment on all cranes.</p> <p>The swing area of the crane cab and the counterweight shall be barricaded in such a manner as to prevent a worker from being struck by the crane.</p> <p>Any moving parts that are accessible to people shall be equipped with guards.</p> <p>Positive type safety latches that prevent the hook from opening shall be used.</p>	<p>Hard hat</p> <p>Full-face respiratory protection or safety glasses/side shields as determined by air sampling</p> <p>Steel toed safety boots</p> <p>Orange safety vests are required when working around heavy equipment such as cranes.</p> <p>Hearing protection is required in areas where the noise levels exceed 85 dBA.</p> <p>Hand protection shall be worn as specified by the IT Safety &amp; Health Representative, by Material Safety Data Sheets, and /or by applicable RWPs</p> <p>Workers shall wear PPE as specified by the RWPs.</p>	<p>Rad Worker II</p> <p>General Employee Training</p> <p>HAZWOPER/FDF Site Worker</p> <p>Orientation on the Remedial Action Health &amp; Safety Plan.</p> <p>OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>In addition to the qualifications for level 1, 2, or 3 riggers specified in FDF Subcontract 98SC000001, riggers shall complete the FDF 8 hour rigger training requirement.</p> <p>Crane operator qualification records shall be provided to IT for approval and retention for FDF review.</p> <p>Prior to beginning work on site, the crane operators shall become familiar with the specific crane they will be operating by reviewing the manufacturer's operating manual and by physically operating the equipment.</p> <p>Briefing on the safe lift plan and ,if applicable, the critical lift plan prior to making any lift.</p>	<p>FDF Radiological Work Permit for work in a Contamination Area</p> <p>IT WPRAP Construction Safe Work Plan</p> <p>IT/FDF approved Safe Lift Plan.</p> <p>IT/FDF approved Critical Lift Plan if required.</p> <p>Note 1: Some lifts that are considered critical include: Multiple crane lifts, crane use at 70% or above the rated load chart capacity at any configuration, and lifting over a building where occupied or work is being done.</p> <p align="right">--2622</p>

**ACTIVITY HAZARD ANALYSIS  
FOR CRANES AND RIGGING**

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Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans
<p><b>Managing Non-Typical Waste</b></p> <p><b>Use of cranes and rigging for lifting activities</b></p> <p align="center">000024</p>	<p><b>Physical Hazards</b></p> <ul style="list-style-type: none"> <li>• Obstruction of vision</li> <li>• Cable kinking</li> <li>• Sheave-caused cable damage</li> <li>• Side pull</li> <li>• Access to cabs, bridges, or runways</li> <li>• Control confusion (nonuniform locations)</li> <li>• Turntable failure</li> <li>• Removable or extendable counterweight systems</li> <li>• Dropping a load</li> </ul>	<p>Eye contact shall be made with the operator prior to giving any hand signal and prior to entering the danger area. When eye contact is not possible, a two-way radio shall be used to communicate with the operator.</p> <p>The grove and cable size shall be inspected to determine if they match the grove and cable size specified by the manufacturer.</p> <p>Cable shall be inspected daily. Wire rope shall be taken out of service when six (6) randomly disturbed broken wires occur in one lay or three (3) broken wires in one strand in one lay.</p> <p>Fair leads and sheave guides shall be used to prevent a slack line from rolling out of the sheave. Wire rope with kinks or birdcages shall be removed from service and destroyed.</p> <p>Cranes shall not be used for side pulling.</p> <p>Nonslip treads and surfaces materials along with handholds shall be used to access cabs, bridges, or runways.</p> <p>Whenever possible, crane operators shall be assigned to the same crane or the same make and model to avoid having to work with dissimilar controls.</p> <p>Inspection of the turntable shall be made at least annually to determine if damage or dangerous over stressing has occurred.</p> <p>Removable counterweight systems shall be examined to identify inherent hazards associated with attachment and detachment.</p> <p>Only qualified riggers shall be permitted to perform rigging activities.</p> <p>Loads shall be balanced and attached securely.</p> <p>Pads/softeners shall be used to protect slings from sharp edges.</p> <p>Suspended loads shall be kept away from obstructions.</p> <p>A tag line shall be used to help guide the load.</p>			

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ACTIVITY HAZARD ANALYSIS  
 FOR HOT WORK

Task/Activity	Physical hazards cont.	Hazardous gases cont.	Eye hazards	Compressed gases cont.	Physical hazards cont.	
Equipment Decontamination		SI #13, cylinder valves shall be checked for leaks prior to use. These checks will be performed using liquid leak (e.g., SNOOP) or by testing with a combustible gas meter (e.g., MSA Trimonitor or MSA Passport). Defective cylinders shall be removed from service.	Cylinders shall remain upright and properly secured during use and when being transported. Oxygen cylinders shall not be stored with fuel gas cylinders or other combustible materials. Shields, such as welding screens, shall be used to protect personnel from heat radiation and flying objects.	Workers shall wear appropriate eye protection as specified in the Hot Work Permit.		
Task/Activity	Hazards	Mitigators/Controls	PPE Requirements	Required Training	Permits/Plans	

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ACTIVITY HAZARD ANALYSIS FOR MANUAL LIFTING

Task/Activity	Hazards	Measures/Controls	PPE Requirements	Required Training	Permit/Plans
Typical Waste Managing Non-Manual Lifting	Physical hazards Back injury Pinch points/sharp edges Overhead hazards Excessive weight/Awkward loads Slip, trip, and fall (to same level) Obstructed vision	Workers shall use proper lifting techniques in accordance with IT WPRAP Safety Instruction SI #14 "Manual Lifting". Workers shall inspect the load for sharp edges and shall use appropriate precautions, such as hand protection and buffers, to protect them from the sharp edge. Workers shall survey the pathway to be taken with the load and subsequent placement of the load to protect against pinch points. Workers shall not manually lift loads that are above their head. Loads that are heavier than 50 pounds or are awkward in design shall not be handled by one person. These loads require team lifting or the use of a mechanical lifting device. Workers shall plan a direct, obstacle-free route.	Hard hat Safety glasses or full-face respiratory protection Steel toe safety boots Additional PPE requirements will be specified in applicable permits or plans.	Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP) and OPS05.090: Rad Worker II Orientation on applicable FDF Radiological Work Permits. General Employee Training HAZWOPER/FDF Site Worker Orientation on the Remedial Action Plan (RAHASP) Health and Safety Plan (RAHASP) Orientation on the Operations Safe Work Plan (OSWP) OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120) Morning, post lunch, and change in work scope safety briefings. Workers shall be trained on proper manual lifting techniques in accordance with IT WPRAP Safety Instruction #14 "Manual Lifting".	FDF Radiological Work Permits IT WPRAP Operations Safe Work Plan (OSWP) IT WPRAP Remedial Action Health and Safety Plan (RAHASP) Operating Procedure (OPS05.090) IT WPRAP Safety Instruction #14 "Manual Lifting".

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**ACTIVITY HAZARD ANALYSIS  
WORK IN LEVEL B PROTECTION**

Task/Activity	Hazards	Mitigations/Controls	PPE Requirements	Required Training	Permits/Plans
Managing Non-Typical Waste  Working in Level B protection	<p>TheSurvivair SCBA ensemble used for Level B respiratory protection can be bulky and weigh up to 30 pounds.</p> <p>The SCBA has finite air supply which limits work duration(typically 30 minutes).</p> <p>Increased likelihood of heat stress</p> <p>Communication problems</p> <p>Compressed gas cylinders</p>	<p>An assessment of the individual's medical condition shall be performed to determine if medical clearance for wearing an SCBA can be given. No IT personnel shall wear an SCBA unless medical clearance has been given by FDF Medical.</p> <p>Warning alarm sounds when only 20 to 25 percent of the air supply remains.</p> <p>In periods of hot weather, personnel who are wearing Level B protection, shall be closely monitored for heat stress systems in accordance with the the IT WPRAP Heat Stress Program.</p> <p>The "Buddy System" will be used at all times when working in Level B protection</p> <p>Personnel working in Level B protection shall use the IT radio as the primary means of communication but shall adopt a secondary means of communication (e.g., hand signals) to ensure effective emergency communication should use of the IT radio not be possible.</p> <p>Compressed Gas (breathing air) cylinders are managed in accordance with IT WPRAP Safety Instruction #13 and the IT WPRAP Respiratory Protection Program</p>	<p>Hard hat</p> <p>Level B respiratory protection</p> <p>Level B impermeable anti contamination clothing</p> <p>Steel toed safety boots</p> <p>Additional PPE requirements will be specified in applicable permits or plans.</p>	<p>Personnel are required to have completed the following training when performing work under the Operations Safe Work Plan (OSWP) and OPS05.090:</p> <p>Rad Worker II</p> <p>Orientation on applicable FDF Radiological Work Permits.</p> <p>General Employee Training</p> <p>HAZWOPER/FDF Site Worker</p> <p>Orientation on the Remedial Action Health and Safety Plan (RAHASP)</p> <p>Orientation on the Operations Safe Work Plan (OSWP)</p> <p>OSHA Supervised Field Experience (24 hrs of Hazardous Waste Site Supervised Experience per 29 CFR 1910.120)</p> <p>Morning, post lunch, and change in work scope safety briefings.</p> <p>Workers shall be trained on proper management of compressed gas cylinders in accordance with IT WPRAP Safety Instruction #13</p>	<p>FDF Radiological Work Permits</p> <p>IT WPRAP Operations Safe Work Plan (OSWP)</p> <p>IT WPRAP Remedial Action Health and Safety Plan (RAHASP)</p> <p>Operating Procedure (OPS05.090)</p>

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**ATTACHMENT B**

**Excerpts from IT Non-Typical Waste Management Procedure  
which demonstrate emphasis on safety**

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**1.0 PURPOSE**

To establish the guidelines for managing non-typical waste encountered during the Waste Pits Remedial Action Project (WPRAP).

**2.0 SCOPE**

This procedure contains the requirements for identifying, segregating, stabilizing, field sampling, packaging and transfer of non-typical waste.

**3.0 APPLICABILITY**

This procedure is applicable to IT Corporation employees and subcontractors handling non-typical waste at the WPRAP.

**4.0 PREREQUISITES**

**4.1 Equipment Operator Qualifications**

Prior to operating their respective equipment, each equipment operator shall provide IT Safety & Health with verifiable documentation of their qualifications for operating the equipment. Acceptable verifications can be from the equipment manufacturer, a certified trainer, the Operating-Engineer's Union, or the employer.

Prior to beginning work on site, each operator shall become familiar with the specific equipment to be operated by reviewing the manufacturer's operating manual and by physically operating the equipment. Cognizant IT Supervision shall document this familiarization and retain a copy in the jobsite files.

**4.2 Training**

Equipment operators, Field Engineers and other IT employees, who may come in contact with waste that is not managed along with the normal process waste, will be trained to identify and segregate non-typical waste. This training will consist of instruction in the recognition of non-typical waste and management of the waste in accordance with this procedure.

Equipment operators, Field Engineers, and other IT employees who will come in contact

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with non-typical waste will be provided with pictures or drawings of the non-typical wastes, as necessary, to ensure that they are familiar with the physical make up (e.g., size, shape, color, etc.) of the wastes. In addition, they will be informed of the probable location of non-typical waste.

Training includes information on the small explosive devices (Fenwal actuators and nail gun cartridges) that may be encountered in the waste pits. A drawing of the Fenwal actuator and a picture of nail gun cartridges will be kept in the cabs of excavators and other excavation equipment to provide a ready reference for the operators. Section 7.3.4 "Small Explosive Devices" will be reviewed as part of this training.

Personnel performing assessment of waste container content or integrity as described in Section 7.2.1 shall be provided training on the use of the self-contained breathing apparatus (SCBA) respiratory protection and shall have received medical clearance to wear such respiratory protection.

IT Safety & Health Representatives, performing radiological measurements with portable gamma spectroscopy instrumentation, shall receive training in the proper use of such instrumentation.

Personnel who are involved in handling pit waste shall be trained in accordance with 29 CFR 1926.1101 (k)(9)(iv)

**4.3 Review of Permits, Plans and Procedures**

Prior to beginning excavation, personnel are required to complete the following safety requirements:

- Orientation on the Remedial Action Health & Safety Plan (RAHASP)
- Briefing on the Job Safety Analysis (JSA) and Activity Hazard Analyses (AHAs) for OPS 05.090
- Briefing on applicable Radiological Work Permits (RWPs)
- All other training required by the Training Qualification Plan Description (TQPD)

**5.0 HAZARDS AND PRECAUTIONS**

There are specific hazards associated with the management of non-typical waste. To ensure that personnel are protected from these hazards to the fullest extent practicable, IT Safety & Health has performed an assessment of non-typical waste management activities and has developed a Job Safety Analysis (JSA) which identifies the hazardous activities associated with the management of non-typical wastes. Also, included in the JSA are Activity Hazard Analyses

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(AHAs) which provide information on the hazards, including mitigators/controls, PPE requirements, training requirements and any permits or plans that may be required. The JSA serves as a supporting document for this procedure and provides an effective mechanism for conveying important safety information on hazards and precautions to the users of this procedure. The JSA is provided in Attachment 1.

Additional information on hazards and precautions is provided below:

**5.1 Hazards**

Hazards Identified

Hazard Control Measure

Medical Emergencies

Normal Operating Procedure,  
Pre-job brief and appropriate PPE

Fire

Hot Work Permit or Fire Watch  
Appropriate extinguishing media

Explosive

Job Safety Analysis

Missile Hazard

Job Safety Analysis

Hazardous Chemicals

Hazards Communication Program  
and Job Safety Analysis

Radiological

RWP requirements

**5.2 Precautions**

A fire should be extinguished only when the fire is small and localized, and is clearly within the capability of the fire fighting equipment. In all other circumstances:

- Initiate the emergency notification system; and
- Evacuate the area to the designated assembly area and wait for further instructions.

Fires involving pyrophoric metals may be extinguished by covering with soil or by using other extinguishing media (e.g., magnesium fluoride). Do not use water to attempt to extinguish fires involving pyrophoric metals. Using water may generate steam and result in the spread of contamination but not extinguish the fire.

Direct contact with PCBs and other organic chemicals should be minimized to the extent practical. Skin contamination should be removed as soon as practical.

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Asbestos materials should be wetted or otherwise contained to minimize dust.

Intact compressed gas cylinders should be handled remotely. The valve stem should be protected before being transferred to the pit staging area.

Pressurized drums should be handled remotely and placed in FDF-provided containers. Pressure relief will also be done remotely with an excavator and a brass punch.

The equipment operator should remain in the cab of the equipment upon discovering non-typical waste. He should not exit the cab to take a closer look.

Tools or equipment that generate a static electric charge will not be used for handling small explosive devices.

**6.0 PERSONAL PROTECTIVE EQUIPMENT**

There is no single combination of personal protective equipment (PPE) that can guard against all hazards. Moreover, because each of the waste pits may contain different hazards and the degree of known or unknown hazards can vary, the PPE ensemble required is likely to change as the work progresses. OSHA requires that PPE be selected based on three distinct tasks:

- Conduct a hazard characterization and exposure assessment to identify actual or potential hazards and possible exposure routes;
- Organize and analyze the data and select PPE based on the type of hazard(s); and
- Make certain that the PPE fits and that it protects against the hazards and periodically reassess the hazards and PPE selection.

Another important factor in the selection of PPE is the radiological hazard. Waste pit remediation is considered a radiological activity. For radiological activities, the DOE RadCon Manual provides guidance for determining what combination of PPE is to be used. The process is analogous to that used for nonradiological hazards as described above. The Radiological Control Organization is responsible for determining PPE to be used for work performed under an RWP on a task-by-task basis.

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The PPE selected for the initial phase of waste pits remediation is as follows:

**Table 1 - Levels of Protection**

Job Task	Required PPE
Waste Pit Equipment Operator MHB/RLB Equipment Operator	<ul style="list-style-type: none"> <li>• Single layer of permeable tyvek without hood</li> <li>• Yellow overboots</li> <li>• Nitrile gloves</li> <li>• PAPR</li> </ul>
IT/FDF RadCon & Safety Personnel	<ul style="list-style-type: none"> <li>• Single layer of permeable tyvek with hood</li> <li>• Single layer of semipermeable tyvek with hood</li> <li>• Yellow overboots</li> <li>• Nitrile gloves</li> <li>• PAPR</li> </ul>
IT Field Management & Engineering	<ul style="list-style-type: none"> <li>• Single layer of permeable tyvek with hood</li> <li>• Single layer of semipermeable tyvek with hood</li> <li>• Yellow overboots</li> <li>• Nitrile gloves</li> <li>• PAPR</li> </ul>
HAZWATS	<ul style="list-style-type: none"> <li>• Single layer of permeable tyvek with hood</li> <li>• Single layer of semipermeable tyvek with hood</li> <li>• Yellow overboots</li> <li>• Nitrile gloves</li> <li>• PAPR</li> </ul>
All Others	<ul style="list-style-type: none"> <li>• Single layer of permeable tyvek with hood</li> <li>• Yellow overboots</li> <li>• Nitrile gloves</li> <li>• PAPR</li> </ul>

PPE will be upgraded in accordance with the following guidance:

- Unstable or unpredictable worksite hazards or emissions.
- Known or suspected presence of dermal (skin) hazards.
- Occurrence or likely occurrence of gas or vapor emission.
- Change in work task that increases the potential for contact with hazardous materials.

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PPE will be downgraded in accordance with the following guidance:

- New information that indicates a situation is less hazardous than originally thought.
- Hazard assessment and monitoring data show low exposure levels.
- Change in site conditions that decreases the hazard.

**7.0 PROCEDURE**

The primary method for identifying non-typical wastes shall be through visual observation. Typically, the Equipment operator (EO) will be the first to observe non-typical waste as it is exposed within the excavation. Other personnel (e.g., Field Engineer/Blending Engineer, MHB Operator, FDF) may also visually identify waste as non-typical. In any event, whenever a non-typical waste is observed, it will be managed in accordance with the following guidelines:

**7.1 Staging Area Setup**

A staging area for non-typical waste will be set up in the pits, and in the Material Handling Building (MHB). This will be the first location where the non-typical waste is placed after it is discovered. Further visual inspection, evaluation, sorting, and hazard stabilization of the waste will take place in this area. The area will typically be set up as follows:

- The Field Engineer will locate and mark the non-typical waste staging areas at the approximate locations of the WPRAP Excavation Plan phase drawings, and in a convenient location in the MHB.
- The Field Engineer will ensure that the staging area is at least 30 feet or the length of the boom from the working face, whichever is greater.
- The Equipment Operator will use excavation equipment to establish a level, solid surface in the pits that is large enough to stage the anticipated volume of non-typical waste.
- The Equipment Operator will positively identify the non-typical waste staging area with high visibility markers, such as stakes, cones, or highway drums, and boundary rope around the area. FDF will provide color coded signs to identify the contents of the particular pile.

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- The staging area may be further demarcated to identify laydown areas for incompatible waste material that is anticipated.
- The Field Engineer will ensure that material, equipment and tools are available near the staging area to handle the variety of situations that may be encountered. These items include rolls of polyethylene, poly bags, rags, drums, containers, drum punch, drum grapplers, etc.
- If the volume of non-typical materials exceeds 100 cubic yards, the Field Engineer shall notify FDF.
- The staging area will be moved as necessary to accommodate work in the pits, RLB and MHB.

## 7.2 Identifying Non-Typical Waste

Within the scope of excavating waste pit contents and blending or handling of the waste, several locations have been identified where non-typical waste may first be observed. These are as follows:

- During excavation in the waste pits.
- When loading a dump truck.
- When dumping waste material into the Material Handling Building.
- While screening waste material.
- Following analysis of a RCRA sample from a railcar loadout bin.

Certain suspect non-typical waste will require immediate attention to ensure the protection of the workers and the environment. These include unopened intact drums and compressed gas cylinders.

Upon first discovery of a suspect non-typical waste requiring immediate attention, work in the immediate area will be temporarily interrupted. Personnel will visually classify the waste material as potentially non-typical by using their knowledge obtained in training for recognition of non-typical wastes or by using visual aids such as pictures, drawings and binoculars.

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Once classified, the Excavation Manager or Field Engineer and a Safety & Health Representative will be summoned to the location via IT radio communication and will perform an assessment of the unopened intact drum or compressed gas cylinder in accordance with the following:

**7.2.1 Assessment of Waste Container Contents and Integrity**

Waste containers may be in various stages of deterioration. In some cases they may be unsafe to handle. To facilitate non-typical waste management, waste containers will be subdivided into two basic categories. These are "Restricted" and "Unrestricted".

The Restricted Category applies to containers with unknown contents, poor structural integrity, or are otherwise determined by IT to be unsafe for handling.

The Unrestricted Category applies to containers with known contents, good structural integrity, or are otherwise determined by IT to be safe for handling.

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The Field Engineer, Excavation Manager, Safety & Health Representative or other qualified individual will perform an initial remote visual assessment of non-typical waste containers to attempt to identify contents and to determine structural integrity. Specific guidance for performing the remote visual assessment of drums and compressed gas cylinders is provided in Appendix A.

If the remote visual assessment fails to provide sufficient information to positively identify contents and structural integrity, a closer assessment may be attempted. This will be accomplished as follows:

- A Level B area will be established around the suspect container. Typically, this area will be approximately 30 feet in diameter or the maximum reach of the excavator, whichever is greater.
- An Entry Team, comprised of a minimum of two (2) personnel, one of which must be a Safety & Health Representative, will be used to perform the closer assessment.
- Personnel shall be equipped with at least one IT radio and one FDF radio for communicating with IT and FDF personnel who are outside of the Exclusion Area as well as for emergency communication with the FDF Emergency Response Center. In addition, entry personnel shall establish a secondary means of

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emergency communication using universal hand signals such as the following:

- One hand holding the throat indicates a breathing problem.
  - Both hands holding the throat indicates a serious breathing air problem, such as no air, vapors getting through, etc.
  - Both hands raised above the head are indicative of some type of problem which may require exit from the area and removal of protective clothing. Once this signal is received, the problem may possibly be clarified by pointing to the affected area.
  - Slashing signal across the throat or fist in a pumping motion mean close down whatever you are doing\*- STOP.
  - Two hands clasped in a fist with the thumbs pointing up means the container has material in it.
  - Umpire signaling a runner safe means the container is empty.
- All personnel involved in the assessment will be required to upgrade their PPE to Level B protection (Self-Contained Breathing Apparatus and impermeable PPE).
  - Personnel will don and doff their PPE at the Control Point for access to the waste pits.
  - The cylinder specialist may use an Ultra Sonic Wall Thickness Indicator to determine cylinder wall or drum wall thickness.
  - The IT Safety & Health Representative will perform real-time air sampling using Photo Ionization Detectors (PIDs), combustible gas meters and oxygen monitors.
  - In addition, the IT Safety & Health Representative will perform a radiological survey of the container using portable gamma spectroscopy. The purpose of this survey is to identify the presence of radioactive material, specifically, thorium at 2.6 MeV.

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- Real-time air sampling results, radiological survey results and container assessments may be provided via radio or after the assessment team has exited from the Level B area.
- The entry will not be conducted as a typical Level B activity involving an entry team, a decontamination team, and a rescue team since there is no intent to breach containment or to physically handle the container and real-time environmental sampling is taking place as the container is being approached and during the assessment.

**7.2.2 Unopened Intact Drums**

Whenever an unopened intact drum is encountered, an assessment of the contents and structural integrity must be made to ensure that any further handling will not result in an unwanted release of the contents. The following guidance will be used to perform the assessment:

Identification of Contents

- A. Check the drum for labels or other markings that might identify the contents.
- B. Observe the design, construction material, and condition. This may be helpful in identifying the physical form of the contents. For example:
  - Metal or plastic closed top drums with bungs usually contain a liquid.
  - Metal or plastic open top drums usually contain a solid.
  - Fiber drums should have open tops and should contain solids.
  - Metal drums with plastic liners should contain liquids.
  - A bulging drum is an indication that the drum may be under pressure.

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### 7.3.1 Intact Bulging Drums, Intact Drums and Transformers

Whenever an intact drum or other suspect material is encountered during the excavation, the Equipment Operator or other cognizant personnel will notify the Field Engineer of the potential non-typical waste find and the location within the excavation where the waste is located.

#### 7.3.1.1 Intact Bulging Drums

Prior to removing an intact bulging drum from the excavation area, the Equipment Operator, using an excavator and a brass drum punch, will puncture the drum to relieve the pressure and to provide an access for field screening or sampling.

After the pressure has been relieved and if the container contents are unknown, the Safety & Health Representative and an assistant will don Level B PPE (SCBA and impermeable clothing) and will perform field screening of the container. Field screening is performed as follows:

- Safety Precaution: If one or more of the following action levels are exceeded at any time during the field screening, the safety representative and assistant will discontinue the approach and immediately report the field screening findings to the Field Engineer:
  - PID results indicating 10 parts per million (ppm) above background.
- Explosive meter reading greater than 10% Lower Explosive Level (LEL)
- Count rate greater than 10 times the instrument background.
- Field Screening

Step 1 The safety representative and assistant will cautiously approach the drum while using a photionization detector to test for organic vapors, an explosive meter to test for combustible gas, and a portable gamma spectrometer to monitor for radiation or radioactivity.

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Step 2 Once at the drum, the safety representative and assistant will perform additional field screening by using a flashlight to visually inspect the drum contents through the opening created with the drum punch and by using litmus paper to test the contents for corrosivity.

Step 3 The safety representative's assistant will record the results of the field screen in a field log for subsequent transferral to the Field Engineer.

Step 4 If the drum contains a liquid, the opening that was created for sampling will be plugged with a wooden dowel or other appropriate material prior to transporting to the staging area. If the drum contains a solid the opening will not be plugged.

The Safety & Health representative will provide field screening results to the Field Engineer. The Field Engineer will use the screening results to determine if: the container contents are non-typical waste or if further characterization is required.

If, after reviewing the field screening results, the Field Engineer determines that the waste is non-typical, the equipment operator will transfer the waste to the staging area using a forklift or an excavator equipped with a grapppler. At the staging area, the drum will be placed in an FDF provided container that has been staged on a level surface within the radius of the excavator or within unimpeded access for the forklift.

The Field Engineer will provide a copy of the field screening results to FDF.

If the Field Engineer determines that further characterization is required, sampling of the drum contents will be performed in accordance with the WPRAP Sampling Plan For Non-Typical Waste.

Sampled drums will also be transferred to the staging area in the manner previously described. However, these drums will not be placed in an FDF provided container unless sample results confirm that the contents are non-typical waste.

The Field Engineer will provide a copy of the sample results to FDF.

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**7.3.1.2 Unopened Intact Drums with Unknown Contents**

Prior to removing an intact drum with unknown contents from the excavation area, the Equipment Operator, using an excavator and a brass drum punch, will puncture the drum to provide an access for field screening or sampling.

After the drum has been punctured, the Safety & Health Representative and an assistant will don Level B PPE (SCBA and impermeable clothing) and will perform field screening of the container. Field screening is performed as follows:

- Safety Precaution: If one or more of the following action levels are exceeded at any time during the field screening, the safety representative and assistant will discontinue the approach and immediately report the field screening findings to the Field Engineer:

- PID results indicating 10 parts per million (ppm) above background.
- Explosive meter reading greater than 10% Lower Explosive Level (LEL)
- Count rate greater than 10 times the instrument background.

• Field Screening

**Step 1** The safety representative and assistant will cautiously approach the drum while using a photionization detector to test for organic vapors, an explosive meter to test for combustible gas, and a portable gamma spectrometer to monitor for radiation or radioactivity.

**Step 2** Once at the drum, the safety representative and assistant will perform additional field screening by using a flashlight to visually inspect the drum contents through the opening created with the drum punch and by using litmus paper to test the contents for corrosivity.

**Step 3** The safety representative's assistant will record the results of the field screen in a field log for subsequent transferral to the Field Engineer. 000042

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Step 4 If the drum contains a liquid, the opening that was created for sampling will be plugged with a wooden dowel or other appropriate material prior to transporting to the staging area. If the drum contains a solid the opening will not be plugged.

The Safety & Health representative will provide field screening results to the Field Engineer. The Field Engineer will use the screening results to determine if the container contents are non-typical waste or if the contents must be further characterized through sampling and analysis in accordance with the WPRAP Sampling Plan For Non-Typical Waste.

If, after having reviewed the field screening results, the Field Engineer determines that the waste is non-typical, the equipment operator will transfer the waste to the staging area using a forklift or an excavator equipped with a grappler. At the staging area, the drum will be placed in an FDF provided container that has been staged on a level surface within the radius of the excavator or within unimpeded access for the forklift.

The Field Engineer will provide a copy of the field screening results to FDF.

If the Field Engineer determines that further characterization is required, sampling of the drum contents will be performed in accordance with the WPRAP Sampling Plan For Non-Typical Waste.

Sampled drums will also be transferred to the staging area in the manner previously described. However, these drums will not be placed in an FDF provided container unless sample results confirm that the contents are non-typical waste.

The Field Engineer will provide a copy of the sample results to FDF.

**7.3.1.3 Unopened Intact Drums with Known Contents**

Prior to removing an intact drum with known contents from the excavation, the Field Engineer will determine if the contents are non-typical waste.

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If the Field Engineer determines that the waste is non-typical, the equipment operator will transfer the waste to the staging area using a forklift or an excavator equipped with a grappler. At the staging area, the

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- The equipment operator will use an excavator with a grappler attachment or a forklift to relocate all transformers, including leaking transformers and any soil/waste material that has been contaminated by the leak, to the staging area where it will be placed on a polyethylene mat and subsequently into an FDF provided container that has been staged on a level surface within the radius of the excavator or within unimpeded access for the forklift.
- The transformer or capacitor will be stored in the staging area pending transport to the transfer area as directed by FDF.

**7.3.2 Compressed Gas Cylinders**

Once the cylinder has been classified as "Unrestricted" by the cylinder specialist, the Equipment Operator will use an excavator equipped with a grappler attachment to remove the cylinder from the area where it was found.

The cylinder will be placed upright in a cylinder rack in the staging area. A protective boundary will be constructed around the cylinder rack to protect personnel from injury should a cylinder burst. The protective boundary may be constructed of sand bags or equivalent material. Placing the cylinder in an FDF provided container is also considered an effective boundary.

Unrestricted cylinders with contents that cannot be released to the atmosphere (e.g., toxic gas) will be stabilized by placing it in a safe configuration such as described above and further managed in accordance with a plan of action developed by FDF and IT.

The Field Engineer will provide FDF with documentation verifying that the cylinder has been safely stabilized including how the stabilization was accomplished.

If a cylinder has been classified as "Restricted" by the cylinder specialist, the cylinder will be protected from further damage by using sand bags or equivalent media. The area will

be surrounded by a protective boundary and IT will select one of the following available options:

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Option 1 - If the cylinder contents are known and it is determined that the contents can be released to the atmosphere, the following action will be

<p align="center"><b>Managing Non-Typical Waste</b></p> <p>COMPLIANCE WITH THIS PROCEDURE IS MANDATORY WHILE PERFORMING THE ACTIVITIES DESCRIBED IN THIS PROCEDURE</p>	<p><b>DOCUMENT NO: OPS 05.090</b></p> <p>Revised per DCN 392</p>	
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taken:

- IT Safety & Health will determine the level of PPE required to perform the cylinder venting activity. The PPE requirements will be based on the cylinders contents.
- The area around the cylinder will be positively identified using high visibility markers, placed a safe distance from the cylinder, and access will be limited to those personnel who are directly involved with the cylinder venting activity (e.g., Equipment Operator, Cylinder Specialist, and Health & Safety Representative).
- The cylinder will be secured in a cylinder venting apparatus (e.g. cylinder coffin) to prevent the cylinder from becoming a "missile" when the containment is breached.
- Under the direction of the cylinder specialist, the Equipment Operator will use the excavator to install the cylinder venting apparatus. The venting apparatus will be placed such that the valve is left uncovered.
- The cylinder will be breached by using the excavator to break off the valve stem, thereby releasing the contents to atmosphere.
- Once the pressure/contents have been released, the cylinder may be processed through the normal waste stream.

Option 2 - If the cylinder contents are unknown or if the contents cannot be released to the atmosphere (e.g., chlorine gas), outside assistance will be required. A cylinder remediation company, or other appropriate resources, will be available to come onsite and remediate the cylinder. Interim action will include:

- Work will be stopped in the immediate area of the cylinder.
- A restricted area, around the cylinder, will be established by the cylinder specialist using high visibility markers, placed a safe distance from the cylinder. No work will be performed within the restricted area unless authorized by the cylinder specialist.

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- IT will make notification to FDF Project Management and