

**ADDENDUM #1  
TO THE  
"VISUAL INSPECTION AND SAMPLING PLAN FOR THE  
UNDERGROUND RADIUM AND STRONTIUM TREATMENT TANKS AT THE  
LEHR FACILITY,"  
UC DAVIS, CALIFORNIA**

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## **1.0 Introduction**

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The purpose of this addendum is to outline the procedures to be followed in order to inventory and characterize the contents of the "Red B-25 box."

## **2.0 Historical Background**

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It is believed that the B-25 box contains sludge and wood as well as mastic that was removed from the Ra- Sr Tanks during initial investigation and clean-out of tanks. Based on a Waste Inventory Log-sheet attached to the box, the container I.D. number is listed as 1020. The Article Description lists contents as "Wood impregnated with creosote" with the following:

NOTE: The suspected contents of this container were generated by a previous contractor; therefore, the actual volume, contents and packaging configuration is unknown.

The Estimated Volume Percent is listed as 100%. The Date is listed as 11-4-92. The Verification Signature appears to be "Bert Brooks."

Based on the above information, a *Preliminary Investigation* was performed on October 2, 1997 by IT Corporation. The "Preliminary Investigation" was purely non-intrusive, in that the box was opened, air monitoring performed, a visual inspection performed, and radiological data was acquired. The above-mentioned activities were performed without moving the contents of the box. The following is a brief list of findings noted:

- The only contents that could be seen were 2x6 wooden planks, covered with sludge and giving off an apparent "Creosote" odor.
- Radiation levels noted are as follows:
  - On-contact with wood, 0.3 mr/hr gamma,
  - On-contact with wood, 120 mrad/hr beta,
  - @ 30cm 0.2 mr/hr gamma, and
  - @ 30 cm 7 mrad/hr beta.

No mastic material was observed to be present from the surface of the box.

### **3.0 Characterization and Inventory of B-25 Box Contents\_\_\_\_\_**

#### **3.1 Perform Radiation/Contamination Survey on Exterior of B-25 Box**

- An exterior dose rate survey will encompass all sides of box as well as top and bottom. A contact and 30 cm dose rate on the areas with the highest dose rate identified will be recorded on a survey form. This information will be included on the HWP.
- Smear swipes will also be taken on all sides of the box and the results will be recorded on the survey form and included on the HWP.

#### **3.2 Prepare Work/Laydown Area for Activities**

- A laydown area will be prepared to control work activities and to assist in minimizing the potential for the spread of contamination. This area will be staged in the eastern part of Geriatrics-1 as this is the only location available for performing this type of activity, and has been used similarly in the past.
- The work area will be covered with poly sheeting to mitigate possible contamination of floors and will be posted: "Caution, Contamination Area, TLD, and HWP Required." A step off pad shall be erected at entrance and shall be posted: "Caution, Radiological Buffer Area, No Eating, Drinking or Smoking."
- All tools, equipment, supplies and instrumentation shall be staged at the work area prior to the start of any inspection activities. All instrumentation shall be verified to be in current calibration, and shall have had daily checks performed and documented as appropriate.

#### **3.3 Prepare a Hazardous Work Permit (HWP) and a Activity Hazards Analysis**

- A HWP shall be generated to control work activities, identify hazardous or potentially hazardous conditions, provide radiological conditions information, identify required PPE, dosimetry, training requirements, monitoring and special or additional instructions. All personnel are required to read, understand, and sign the HWP.
- The HWP will reflect current radiological conditions based on the most recent survey data, and the requirements will be based both on current radiological data and past history experience and expected conditions.

- The Project Health and Safety Manager and Radiological Controls Manager shall review and approve the HWP prior to start of any work.
- In conjunction with the HWP, an Activity Hazards Analysis (AHA) outlining potential hazards that may be encountered as part of the inspection, is attached as part of this Task Plan. The AHA will identify all potential hazards and will list recommended controls for mitigating these hazards.
- The HWP and AHA are included in this Task Plan as Attachments 1 and 2 respectively.

### ***3.4 Move B-25 Box to Laydown Area***

- Currently the B-25 box is stored at the northwest corner of Geriatrics - 1 building. The box is to be moved to laydown area utilizing a fork lift, an operator and spotter. Operator shall have been trained in the use of a fork lift and this training shall be current and on file in contractor's records.

### ***3.5 Inspection of Work Area***

- The QAPP requires a Preparatory Phase Inspection prior to commencing work to verify compliance with all associated documentation (i.e., HWP, Tailgate Safety Meetings, AHAs etc.). This inspection is performed to identify any concerns or discrepancies for resolution. This inspection will be performed by the Site Health and Safety Officer (SHSO), and work will not commence until approval is given.
- If there are any findings or concerns by the SHSO that previously were not identified, and can be resolved simply through conference with the Health and Safety Coordinator/Radiation Safety Officer (RSO), this concurrence shall be documented and work may then commence.
- If these concerns cannot be resolved in the above manner, work will be stopped and the PHSM shall be contacted for resolution.

### **3.6 Open, Inspect, and Survey Contents of B-25 Box**

- All work is to be performed in accordance with the approved HWP (Attachment 1) and the AHA (Attachment 2).
- Prior to opening the box, an air sampler shall be staged in the worker's breathing zone.
- Upon breach of the box lid, personnel will remove themselves as far as possible from the box to allow it to vent for a reasonable period of time as determined by RSO.
- After venting, the air sample will be collected for analysis and PID monitoring (PID equipped with the appropriate lamp based on known contaminants) shall be performed. If the results of airborne radioactivity or PID monitoring are equal to or greater than those listed in Table 1, "Atmospheric Monitoring and Action Levels," work will be stopped and personnel shall exit the area. If results of monitoring are less than the levels listed in Table 1, work may continue.
- After pre-monitoring is complete, a radiation survey shall be performed at the surface of the contents in box before any inspection activities. This survey is cursory in nature and is not intended to provide dose rate information for any particular items. The purpose is for verifying radiological conditions in support of inspection only.
- Any un-bagged, exposed material will be smear swiped for gathering information on contamination status for possible future plans.
- After the above tasks are completed, the inventory/sampling may take place.
- All waste generated in association with the inspection (i.e., PPE, poly, etc.) shall be segregated, containerized, labeled and managed in accordance with the provisions as outlined in the project's Waste Management Plan.

### **3.7 Inventory Waste Streams Contained in the B-25 Box**

All wastes contained inside the B-25 box will be removed and placed on poly sheeting. During this process, the contents will be inventoried and sampled in order to fully characterize all waste streams present. During the inventory, photographs may be taken for materials that were not previously known to be present from earlier inspections. Once all waste has been removed from the original B-25 box, it will be visually inspected in order to ensure that the integrity meets all applicable Department of Transportation (DOT) requirements for future use as a packaging. A new, empty B-25 with a liner should be on hand in the event that the integrity of the used B-25

box is found to be unsatisfactory. The contents will then be transferred into the appropriate lined B-25 box.

### **3.8 Sample Waste Streams Contained In the B-25 Box**

#### **3.8.1 Waste Sampling**

One composite and one QA/QC duplicate sample of each waste form (wood, mastic, etc.) will be collected for analysis. Table 2 of this plan summarizes the chemical and radiological analyses that will be performed on the samples of waste media collected from the B-25 box. In addition, Table 2 summarizes the required sample containers and quantities for the indicated test parameters and parameter suites. The laboratory reporting detection limit and holding time for analyses listed in Table 2 are presented in Table 3 of this plan.

A description of the waste materials in the box will be recorded in the Field Coordinator's log book that will include (at a minimum) references to color, consistency, odor, and quantity.

#### **3.8.2 Equipment Rinsate Blank**

One equipment rinsate blank will be collected for sampling equipment associated with each waste form sampled to assess whether the sampling equipment or supplies are causing cross contamination of samples. At this time, due to the uncertainty of the contents of the box, the minimum waste forms expected are the wood and mastic. Sample collection equipment and supplies will be rinsed with deionized/organic-free water (WA, 1997c) and collected in laboratory supplied sample containers.

Table 2 of this plan summarizes the chemical and radiological analyses that will be performed on the equipment rinsate blanks collected in association with the B-25 box. In addition, Table 2 summarizes the required sample containers and quantities for the indicated test parameters and parameter suites. The laboratory reporting detection limit and holding time for analyses listed in Table 2 are presented in Table 3.

#### **3.8.3 Sample Information Documentation**

Sample information documentation will be performed as applicable according to Section 8.2.1 of the QAPP (WA, 1997c).

### **3.8.4 Sample Handling Procedures**

Sample Handling Procedures will be performed as applicable according to Section 8.5 of the QAPP (WA, 1997c).

### **3.9 Post Survey of B-25 Box and Laydown Area**

- After reinstalling the lid, the RP tech will perform a smear survey on all box surfaces and the surrounding laydown area to verify no cross contamination. If the integrity of the red box is found to be acceptable for reuse, the survey will be an external survey of the red box. If the materials need to be transferred to a replacement box, then the replacement box will be externally surveyed and the empty red box will be surveyed inside and out. This survey shall be documented and the results reviewed by RSO.
- All survey documentation shall be stored in project files for easy access and retrievableness.

## **4.0 Quality Assurance**

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See Section 4.0, *Quality Assurance*, of the main body of this plan.

## **5.0 Data Management**

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See Section 5.0, *Data Management*, of the main body of this plan.

## **6.0 Investigation Derived Wastes**

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See Section 6.0, *Investigation Derived Wastes*, of the main body of this plan.

## **7.0 Health and Safety**

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See Section 7.0, *Health and Safety*, of the main body of this plan.

## **8.0 References**

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See Section 8.0, *References*, of the main body of this plan.

**ATTACHMENT 1**  
**ACTIVITY HAZARDS ANALYSIS**

### ACTIVITY HAZARDS ANALYSIS

Procedure Step	Activity	Associated Hazard	Hazard Control Method
3.1	Perform radiological surveys on exterior of B-25 box	1. Heat Stress	1. Conduct standard heat stress monitoring and ensure appropriate work/rest cycles are adhered to.
3.2	Prepare work/laydown area for inspection activities	1. Heat Stress  2. Slip, trip, fall hazards	1. Conduct standard heat stress monitoring and ensure appropriate work/rest cycles are adhered to.  2. Employee awareness, good housekeeping practices, and use of a technician as a spotter.
3.4	Move B-25 box to laydown area	1. Heat Stress  2. Slip, trip, fall hazards  3. Equipment operations (fork-truck)	1. Conduct standard heat stress monitoring and ensure appropriate work/rest cycles are adhered to.  2. Employee awareness, good housekeeping practices, and use of a technician as a spotter.  3. Use only qualified/trained operators. Perform all required inspections on equipment. Use of a spotter during transport.

**ACTIVITY HAZARDS ANALYSIS**  
(Continued)

Procedure Step	Activity	Associated Hazard	Hazard Control Method
3.6	Open, inspect, and survey contents of B-25 box	<ol style="list-style-type: none"> <li>1. Heat Stress</li> <li>2. Slip, trip, fall hazards</li> <li>3. Exposure to chemical hazards.</li> <li>4. Spread of radioactive contamination.</li> <li>5. Airborne radioactivity.</li> </ol>	<ol style="list-style-type: none"> <li>1. Conduct standard heat stress monitoring and ensure appropriate work/rest cycles are adhered to.</li> <li>2. Employee awareness, good housekeeping practices, and use of a technician as a spotter.</li> <li>3. Perform appropriate IH monitoring and use of PPE as prescribed in the HWP.</li> <li>4,5. a. Continuous job coverage (air monitoring and radiological surveys) by a qualified RCT,</li> <li>b. Application of standard ALARA and Health physics practices.</li> <li>c. All workers involved will be currently qualified as RW II.</li> <li>d. If needed, use appropriate dust controls (i.e., water mist) to limit airborne dust hazards.</li> </ol>

**ACTIVITY HAZARDS ANALYSIS**  
(Continued)

Procedure Step	Activity	Associated Hazard	Hazard Control Method
3.7, 3.8	Inventory/Sample Waste Streams Contained in the B-25 Box	<ol style="list-style-type: none"> <li>1. Heat Stress</li> <li>2. Slip, trip, fall hazards</li> <li>3. Exposure to chemical hazards.</li> <li>4. Spread of radioactive contamination.</li> <li>5. Airborne radioactivity</li> </ol>	<ol style="list-style-type: none"> <li>1. Conduct standard heat stress monitoring and ensure appropriate work/rest cycles are adhered to.</li> <li>2. Employee awareness, good housekeeping practices, and use of a technician as a spotter.</li> <li>3. Perform appropriate IH monitoring and use of PPE as prescribed in the HWP.</li> <li>4,5.               <ol style="list-style-type: none"> <li>a. Continuous job coverage (air monitoring and radiological surveys) by a qualified RCT,</li> <li>b. Application of standard ALARA and Health physics practices.</li> <li>c. All workers involved will be currently qualified as RW II.</li> <li>d. If needed, use appropriate dust (water mist) controls to limit airborne dust hazards.</li> </ol> </li> </ol>