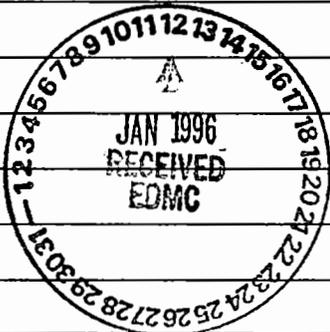


ERC CONTROLLED MANUAL TRANSMITTAL	Date Prepared: 12/06/95
ISOM, DA 013 H4-79 H6-08	Transmittal Number: BHI-OP-00074-TR99 Document Number: BHI-OP-00074 Title: 100 AREA ROCK SCREENING STUDY OPERATING PROCEDURES

Instructions: (1) Remove and/or insert indicated procedure/section into manual as shown.
 (2) Sign this form and return it to Procedures Coordination **within 10 working days of receipt.**

Procedure/Section Numbers and Titles	Remove		Insert	
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Errors and omissions are not the responsibility of Procedures Coordination. Questions concerning format/contents of this document should be referred to R. D. Belden at 375-9601.

Receipt Acknowledgment

I have complied with the above instructions for this manual.

<div style="border-bottom: 1px solid black; margin-bottom: 5px;"> Debra A. Isom </div> Signature	<div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 1/12/96 </div> Date
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APPROVAL PAGE

Title of Document: 100 Area Rock Screening Study Operating Procedures

Author: R. D. Belden

Approval: R. D. Belden, Author

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11/28/95
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G. E. Van Sickle
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11/29/95
Date

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BHI-OP-00074
Rev. 0

**ROCK SCREENING
OPERATING PROCEDURES**

November 28, 1995

1.0 INTRODUCTION

These operating procedures are provided to guide the work for the 100 Area Rock Screening study. They are to be used in conjunction with all applicable ERC procedures and are not intended to replace any ERC procedures. In addition, applicable documents from the 100-B/C Excavation Demonstration Project will provide guidance.

Other applicable procedures include but are not limited to:

Environmental Investigation Procedures (EIP)

- 1.5 Field Logbooks
- 4.0 Soil and Sediment Sampling
- 6.4 Control and Storage of Radioactive Material and Equipment

Engineering Department Project Instructions (EDPI)

- 4.29-01 Pre-Task Safety Assessment and Pre-Task Action Plan
- 4.30-01 Safety Analysis Documentation
- 4.31-01 ALARA Review

A Pre-Task Safety Assessment Need Evaluation was performed for this project and is included as an attachment to this document.

2.0 SAMPLE LOCATIONS

Sample locations will be identified according to the following steps.

- 1.0 All samples will be taken from the stockpile of contaminated soils excavated from the 116-C-1 Trench. The stockpile is currently located in the 116-B-11 Trenches.
2. The stockpiled material will be surveyed using a handheld Geiger Mueller (GM) detector to find potentially suitable soils. Potential locations will be marked by a lathe with the counts/minute (cpm) recorded on it. Potential soils are those with readings between 300 and 1000 cpm.
3. If a method for counting potential soils using gamma ray spectroscopy is available in the field, small samples will be counted to better define contaminant levels. Samples should range between 50 and 150 pCi/g of ^{137}Cs . This step will be dependent on the availability of BHI equipment.
4. One final test to help focus in on the ideal sample will be to look at the contamination of

individual rocks. Rocks with approximate diameters between 50 and 100 mm (2 and 4 inches) will be removed from the pile and tested with the handheld GM. It may be necessary to walk away from the stockpile to an area with a lower background. If the rocks are clean, an area with higher readings should be tested. If the rocks are contaminated (anything above background can be detected), an area with lower readings should be tested. By testing several locations, it should be possible to find soils that are just below the level where the rocks are contaminated.

5. Three sample locations are required. Each location should be large enough to remove approximately 49 L (13 cubic feet) of soils. This is a volume slightly larger than 60 cm wide x 91 cm long x 60 cm deep (2'W x 3'L x 2'D). An area approximately 60 cm by 91 cm (2' by 3') will be marked off with stakes to identify the sample location. Areas where substantial amounts of crusting agent have been applied will be avoided and/or crusting agents removed prior to sampling.
6. All information about each sample location (cpm, pCi/g ^{137}Cs , rough soil composition, approximate moisture content, etc.) will be recorded in the field logbook per EIP 1.5. Attempts will be made, using daily work records kept by field services, to estimate the location of the material in 116-C-1 prior to excavation.

3.0 SAMPLING

All sampling will be done in accordance with established procedures (EIP 4.0) and by qualified personnel. The following information provides the details necessary to complete the sampling.

1. Three samples will be taken.
2. Samples will be dug using a shovel and will be placed in 19 L (5 gallon) buckets.
3. Each sample will consist of twenty (20), 5 gallon buckets. Each bucket will be labeled with a unique number (non HEIS) which will allow it to be tracked back to the other 19 buckets in that sample. This unique number will be recorded on the Sample Tracker form (attached) in column one (1).
4. Each 5 gallon bucket will be lined with a plastic bag to prevent contamination of the bucket, help prevent spread of contamination, and retain the natural moisture content.
5. When excavating a sample, everything within the 60 cm by 91 cm (2' by 3') area to a depth of 60 cm (2') will be removed and placed in buckets. Surface soils coated with a crusting agent may be avoided and/or removed. Every effort will be made to get the buckets full

and to take as representative a sample as possible. Rocks too large for the bucket are considered to be outliers (non-representative particle size) and will not be included in the sample. If such a rock is encountered the sample site will be enlarged slightly in order to fill twenty (20) buckets. In this case, it is extremely important the level of contamination in the sample remains approximately the same.

6. As each bucket is filled, the plastic liner will be sealed (twisted and taped) and the lid to the bucket securely fastened.

4.0 SAMPLE TRANSPORTATION

All buckets will be transported according to established procedures. A chain of custody will not be used as these samples will not change custody. The samples will remain in control of the sampler until disposal.

1. All buckets will be surveyed and released for transportation by the Health Physics Technician.
2. The buckets will be loaded into a pickup or other truck and transported to the sieving location inside the soil washing tents at 100-D, approximately 14 kilometers (9 miles) from 116-C-1.
3. All buckets will be unloaded and stored in a Radioactive Materials Storage Area (RMSA) inside the tents awaiting analysis in accordance with EIP 6.4.

5.0 SIEVING UNIT SETUP

A Gilson Model TS-1 Test Screen will be used for sieving the samples. The unit will be setup according to the following information.

1. A location within the soil washing tents will be identified.
2. Two 4x4 anchor boards, approximately 1.2 m (4') long, will be imbedded into the ground at a spacing that will allow the legs of the sieving unit to be centered over them. Soils will be packed around the anchor boards to help secure them.
3. A piece of 50 mil PVC liner will be placed over the top of the anchor boards. The liner will measure approximately 3 m x 4.6 m (10' x 15') and will catch any contaminated material spilled during the sieving process. Berms for this liner will be formed by additional 4x4s or pvc pipe.

4. The sieving unit will be positioned over the anchor boards and on top of the liner. Lag bolts will secure the sieving unit to the anchor boards.
5. Power (110V) for the unit will be supplied by an extension cord from the generator.

6.0 ANALYSIS OF UNPROCESSED SAMPLES

After transportation of the buckets of unprocessed soils to the sieving location at 100-D, each bucket will be weighed and analyzed. The following steps will be used to perform this analysis.

1. Each bucket will be weighed using a platform scale. All weights will be recorded on the Sample Tracker form in column two (2).
2. Each bucket will then be weighed to the nearest 0.1 kg and assayed using gamma ray spectroscopy by a subcontractor at the sieving site. The analysis will report all gamma emitting radionuclides and will meet the following detection limits:

^{137}Cs	1 pCi/g
^{60}Co	1 pCi/g
^{152}Eu	7 pCi/g
^{154}Eu	12 pCi/g

The subcontractor will record all information and will report that information in a letter report after completion of the project.

3. Each group of twenty (20) buckets will be completed before another group of twenty (20) is started.
4. All unprocessed soil buckets will be weighed and assayed by the subcontractor before any processed soils are weighed and analyzed.

7.0 DRY SIEVING OPERATIONS

Clean soils will be used during an initial test of the sieving unit. It is estimated that 5 gallons of clean soils will be sufficient to familiarize personnel with the equipments operation. Dust is not anticipated to be a problem, but this test will also be used to verify that dust is contained. Dry sieving of clean soils will follow the same procedures detailed below for the contaminated soils.

Once a sample (20 buckets) has been completely weighed and assayed, the sample will be split in half: two sets of 10 buckets each. Each set of 10 buckets will be processed separately and

completely before another set is started. Each set of 10 buckets will then be dry sieved.

7.1 Dry Sieving

1. Insert the following screen sizes into the Gilson sieving unit starting at the top with the largest screen size and progressing down:
 - 100 mm (4")
 - 50 mm (2")
 - 25 mm (1")
 - 12.5 mm (1/2")
 - Dust pan

Note: if the 2" to 4" material overloads the system, a 75 mm (3") screen will be inserted to separate this material into two sizes. It will be recombined after sieving as it is removed from the screening unit.

2. Tighten the screens up using the hydraulic tightener.
3. Pour approximately 25% of a bucket onto the top screen. The actual volume the unit can handle will be determined by trial and error. If no overloading occurs in any particular size fraction, the volume can be increased slightly. When a particular size fraction overloads, the volume must be reduced until overloading no longer occurs.
4. Place the cover on the unit. The top of the cover may not fit flush until the material shakes down. Set the timer for 15 seconds and start the unit.
5. When the unit shuts off, remove the cover and loosen the screens by releasing the hydraulic tightener.
6. Remove each screen individually, starting at the top with the largest screen and working down. Empty the oversize material retained on the screen into a 5 gallon bucket with a plastic liner (a separate bucket for each size fraction). Replace each screen after emptying it. Do not brush the screen until all 10 buckets have been dry sieved.
7. Go to Step 2 and repeat the process.
8. When a bucket of unprocessed soils is emptied, remove the liner, turn it inside out and brush it clean. The plastic liner will then be discarded appropriately (per the Waste Control Plan) and the bucket reused for the processed soils.

9. Repeat the process until all 10 buckets in a set have been processed. After emptying each screen, the screen will be brushed clean (the fines removed should be brushed into the bucket the screen was emptied into).
10. Seal all processed soil buckets as before (twist and tape the plastic liner and securely fasten the lid) and survey the buckets out of the Radiologically Controlled Area (RCA). Each bucket will be weighed using the platform scale and stored in the RMSA (EIP 6.4) awaiting analysis by a subcontractor.
11. Go to Step 2 and repeat the entire process for the next set of 10 buckets.

7.2 Data Recording

1. The unique number (non HEIS) on each bucket for each group of 10 unprocessed soils will be recorded in column three (3) of the Sample Tracker form (attached). This traces how the original set of 20 buckets was divided into two groups. One way to make this split is to use the division automatically provided by the form, but this is not required. Column 3 is simply the record of which buckets are in each split.
2. Each size fraction created from the dry sieving will be collected in a separate 5 gallon bucket. Each bucket will have a unique number (non HEIS) which will be recorded on the Sample Tracker form in column four (4). The size fraction of that bucket will be recorded in column five (5). When a bucket is full, the plastic liner will be twisted and the lid securely fastened. A new bucket with a unique number will then be started.
3. Each bucket of processed soils will be surveyed out of the RCA and weighed using the platform scale. This weight will be recorded in column six (6) of the Sample Tracker form.

8.0 ANALYSIS OF PROCESSED SAMPLES

After processed soil buckets have been released from the RCA they will be ready for weighing and analysis by a subcontractor. Essentially the same procedure will be followed by the subcontractor for the processed soil buckets.

1. All unprocessed soil buckets will be completed by the subcontractor before any processed soil buckets are started.
2. The subcontractor will weigh and analyze each bucket using gamma ray spectroscopy at the site. The subcontractor will record all information and will report that information in a letter report after completion of the project.

3. After each bucket has been analyzed, it will be returned to the RMSA to await disposal.

9.0 SAMPLE DISPOSAL

After all buckets have been analyzed, processed and reanalyzed, they will be returned to the 116-C-1 contaminated soils stockpile for disposal. The buckets will be transported according to procedure (Section 4.0) and will be emptied onto the existing stockpile. The plastic liners will be disposed of appropriately (per the Waste Control Plan) and the buckets will be surveyed for unrestricted release.

10.0 EQUIPMENT DECONTAMINATION

The Gilson Test Screen will be cleaned until free of all residual soils using brushes and a shop-vac with a HEPA filter. All residual soils will also be removed from the liner area around the screening unit in the same manner. It is intended to keep the screening equipment for future use. Therefore, it will not be decontaminated for release. The sieving unit and any buckets not released will be stored in the RMSA at the soil washing site per EIP 6.4.

The platform scale and the bucket analyzer will not come into contact with contamination and should not require decontamination for release but may be checked by Health Physics Technicians as a precaution.

11.0 FIELD LOGBOOK

A field logbook will be maintained for this project. It will be used in accordance with EIP 1.5 and will become part of the project file.

The following information (at a minimum) will be recorded for every workday in the field:

- Arrival and departure times.
- Temperature and weather conditions (significant changes will be recorded).
- Personnel at the site.
- Site visitors.
- Work performed.
- Meetings and surveillances held at the site.
- Any activities of note or any unusual occurrences.



Hanford ERC
Job 22192

PTSA# 0100B-PTSA-V0001

PRE-TASK SAFETY ASSESSMENT (PTSA) NEED EVALUATION

Site Identification 100 Area Rock Screening Study

Field Activity Description:

Collect samples in 5 gallon buckets from the 116-C-1 contaminated soils stockpile. Transport the samples to 100-D soil washing tents. Assay each bucket using gamma ray spectroscopy. Dry sieve the samples and assay the different size fractions. Return the samples to the 116-C-1 stockpile for disposal.

Justification that PTSA is not applicable for this work activity:

1. The rock screening study is being perform to evaluate volume reduction applicability as provided for in the 100-B/C Excavation Demonstration Work Plan.
2. 100-B/C Demonstration Project has a PTSA which covers the sampling activities.
3. 100-B/C Demonstration Project has a Safety Assessment, a Hazard Classification, and an Activities Hazard Assessment (AHA) which also covers this work.
4. A separate AHA will be prepared for the dry sieving operations.
5. All items addressed by the PTSA are addressed in other documentation for the rock screening study or the 100-B/C Demonstration Project.

	Originator	Concurrence QS&H
Sign	<i>Ron Belden</i>	<i>Judy Vaughan</i>
Date	<i>11/20/95</i>	<i>11-20-95</i>

Look good
P.R. Kern
372-9179