

Rocky Flats Environmental Technology Site

PRO-536-BCPR

BERYLLIUM CHARACTERIZATION PROCEDURE

REVISION 0

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USE CATEGORY 3

This procedure is performed as written and need not be in hand for the performance of the described tasks. The procedure SHALL be available at a known location for reference.

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1.0 PURPOSE

This procedure describes the collection of beryllium (Be) surface samples and is specifically designed to provide waste management and occupational hazard assessment information in support of decommissioning activities. In some cases, the results may be used to support a final status survey.

2.0 SCOPE

This procedure applies to characterization of surface beryllium contamination in support of decommissioning activities at the Rocky Flats Environmental Technology Site (RFETS). The Data Quality Objectives (DQOs) and sampling plans given in the Reconnaissance Level Characterization Plan (RLCP) SHALL determine the number, location, and type of samples collected. Sampling needs that are not specifically addressed here (i.e., sampling beneath the surface of a material) SHALL be addressed individually by a separate procedure appropriate for the specific application.

3.0 DEFINITIONS

Beryllium Operations Area: An area where beryllium compounds are used or beryllium contamination exists and operations which have the potential to generate a beryllium particulate are conducted. For the purpose of decontamination and decommissioning (D&D) work, a beryllium operations area is an area where general room surface contamination levels are equal to or above $0.2 \mu\text{g}/100 \text{ cm}^2$ but below $2.5 \mu\text{g}/100 \text{ cm}^2$. A Beryllium Operations Area can be downgraded to a **Non-Beryllium Operations Area** when operational specific breathing zone air sampling can show that potential exposures do not exceed $0.5 \mu\text{g}/\text{m}^3$, regardless of surface contamination levels.

Limited Access Beryllium Operations Area: An area where personnel access is limited physically or through administrative controls due to potential beryllium exposures above that of a beryllium operations area. Examples of these areas include contaminated gloveboxes, fume hoods, ductwork, areas where the potential airborne beryllium concentration has the potential to exceed $0.5 \mu\text{g}/\text{m}^3$, or areas with surface contamination levels equal to or greater than $2.5 \mu\text{g}/100 \text{ cm}^2$.

Non-Beryllium Operations Area is an area that contains less than $0.2 \mu\text{g}/100 \text{ cm}^2$ of Be contamination, or when operational specific breathing zone air sampling can show that potential exposures do not exceed $0.5 \mu\text{g}/\text{m}^3$, regardless of surface contamination levels.

4.0 LIMITATIONS AND PRECAUTIONS

- Areas SHALL initially be placed in one of the above categories based upon a review of historical and current data and interviews with personnel familiar with the work activities in the building (e.g., past and present facility managers). Additional information on building status is provided in the RFETS *Site Beryllium Characterization Report* (September 1997) and the RFETS *Location of Known Beryllium Areas (Historical and Present)*. The initial classification may change as additional information and surface sample sampling results become available. The area designations provided in Section 3 are established as a guideline to aid in monitoring worker health and safety and waste management.

- All requirements and controls provided in Chapter 28 of the RFETS Occupational Safety and Industrial Hygiene Program Manual, "Chronic Beryllium Disease Prevention Program" **SHALL** be followed. This may include breathing zone air sampling at the discretion of an Industrial Health and Safety (IH&S) representative, who **SHALL** assist in the operation of the air sampling equipment and the proper disposition of breathing zone air samples.
- Sampler **SHALL** have successfully completed RFETS site "Beryllium Awareness Training" (2 hours). If the sampling is to be done in a Beryllium Operations Area, the sampler **SHALL** be an Incidental Beryllium Worker at a minimum. Additionally, an Industrial Hygiene Supervisor **SHALL** review the procedure with the sampler prior to initiation of sampling.

5.0 PREREQUISITE ACTIONS

1. Develop the Work Authorization Package. Consult the IWCP Manual (MAN-071-IWCP) for guidance. The requirements may include, but are not limited to:

a) **Complete an Activity Screening Form** (available from the Project Manager),

b) **Conduct a Job Hazard Analysis.** For this activity, a walkdown of all affected buildings **SHALL** be conducted, and walkdown personnel **SHALL** include a radiological engineer, member of the sampling team, industrial hygiene representative, and the field supervisor. Other appropriate personnel required by the unique hazards of the job to assess the job hazard should also be present, but, if the area is beryllium contaminated according to the CBDPP, their number should be minimized. This walkdown should also include activities listed in step 2 below,

c) **Ensure that an Activity Hazard Analysis and a Health and Safety Plan are completed** by the appropriate industrial health and safety (IH&S) representative, field supervisor, or other qualified personnel as determined by the Project Manager. These documents **SHALL** include required controls and requirements for PPE use and safety equipment (*including safety shoes, safety glasses, and bump caps or hard hats*) for each sampling activity to be performed.

Decisions **SHALL** be based on the known history of the area under characterization, surface contamination level, airborne levels as available, the specific activity to be performed, and an evaluation by the IH&S representative. Controls and PPE **SHALL** be specified in the Job Hazard Assessment (JHA), Beryllium Exposure Assessment Plan (BEAP) (if required by IH&S), and the Radiological Work Permit (RWP) (if required by Radiological Operations).

IMPORTANT: The Work Authorization Package must be approved and signed by all required personnel prior to initiation of sampling activities.

2. Perform a building walkdown. This is the appropriate time to begin to carry out the following:

a) **Begin the Job Hazard Analysis** as described above,

b) **Assess locations of samples** based upon the sampling map provided by the field.

supervisor, or if precise sampling locations are not yet determined, designate them in cooperation with the field manager to be consistent with the Data Quality Objectives (DQOs) given in the Reconnaissance Level Characterization Plan (RLCP) and the Decontamination and Decommissioning Characterization Protocol (DDCP),

c) **Determine whether any impediments to easy access exist**, such as radiation contamination areas, equipment location and storage, personal protective equipment requirements, Radiological Work Permit (RWP) requirements, etc., and decide how to proceed (i.e., choose alternate sample location, obtain required permits, etc.),

d) Ensure that the sampler, industrial hygiene representative, radiological engineer, field manager, and other appropriate personnel understand and agree to sample locations and manner in which the samples are to be collected

3. Assign a unique sample number for each location. Prelabel the glassine bags into which the filters will be placed with this number

The sample number consists of Building number - Month, Day, Year (4 digit) - Industrial Hygienist number - Sequence number. Sequence numbers will be sequential regardless of sample type (i.e., smear or settled dust)

For example, a sample which was taken in Building 779 on April 1, 1999, by an I H technician with an I D number of 34, and which was number 1 in a sequence of samples, would have sample number 779-04011999-34-001

4. Obtain written Plan of the Day (POD) authorization from building management.

5. Obtain all required permits and complete all required forms. This includes

- **Job Hazard Assessment (JHA) and Activity Hazard Assessment (AHA)** (available from IWCP coordinator),
- **Activity Screening Form** (available from IH&S),
- **Beryllium Exposure Assessment Plan (BEAP) and Self-Audit Checklist** if required by IH&S, as directed in Appendix 1 and 3 of Chapter 28 of the RFETS Occupational Safety and Industrial Hygiene Program Manual, "Chronic Beryllium Disease Prevention Program",
- **Radiological Work Permit (RWP)**, if required by Radiological Operations,
- **Property Release Evaluation (PRE) Form (RSFORMS-09 01-01)**, completed in accordance with 3-PRO-141-RSP-09 01, *Unrestricted Release of Property, Material, Equipment, and Waste*

Consult with Industrial Hygiene, the Chronic Beryllium Disease Prevention Program, and Radiological Operations to determine any other permits or notifications required

6. Submit a completed Sample Analysis Request Form (SARF) to Analytical Services Division (ASD) ASD will then assign Report Identification Numbers (RIN) to the samples. Since these are considered Industrial Hygiene samples by ASD, they will *not* provide sample labels

7. Note the RIN number for the set of samples in the Beryllium Sample Log (see Appendix A)

8 Obtain a Safety and Hygiene Chain of Custody Record and Analysis Request form (RFP F 3791.32, 7/95) from IH&S. Complete this form, noting unique sample number, type of analysis (i.e., beryllium), volume and sample time for air samples, media, and any notes about the sample location or collection

9 Arrange for a Radiological Control Technician to assess radiological contamination of samples per 3-PRO-165-RSP 07 02, *Contamination Monitoring Requirements*, before they are removed from the sampling area if this is deemed necessary by Radiological Operations or Radiological Engineering. In some cases, Radiological Operations or Radiological Engineering may require a pre-sampling radiological survey of the sampling location

10. Sampling SHALL be conducted by an industrial hygiene technician who has been trained by IH&S on beryllium sampling

6.0 MATERIALS AND EQUIPMENT

6.1 Beryllium Surface Sampling

- Whatman 41, 4.7 cm filter papers or equivalent
- Glassine Bags
- Template that sequesters a 100 cm² pattern
- Beryllium Sample Log
- Safety and Hygiene Chain of Custody Record and Analysis Request form (RFP F 3791.32, 7/95)
- Tamper proof seals
- Sharpie or other marking pen
- Disposable gloves
- Tweezers
- Map of area
- List of predetermined sampling locations
- Tape measure or laser measuring device
- Personal breathing zone air monitoring equipment if required by IH&S (consult with IH&S for equipment and assistance)
- Camera, photo identification card, and camera pass, if photos are required

6.2 Settled Dust Sampling (Porous Surfaces)

- Vacuum sample pump calibrated at 1 to 4 liters per minute (lpm)
- Template that sequesters a 100 cm² pattern
- 25 mm mixed cellulose ester filter cassette attached to the sampler pump
- A one inch section of tygon tubing
- Beryllium Sample Log
- Safety and Hygiene Chain of Custody Record and Analysis Request form (RFP F 3791.32, 7/95)
- Tamper proof seals
- Sharpie or other marking pen
- Disposable gloves
- Tweezers

- Map of area
- List of predetermined sampling locations
- Tape measure or laser measuring device
- Personal breathing zone air monitoring equipment if required by IH&S (consult with IH&S for equipment and assistance)
- Camera, photo identification card, and camera pass, if photos are required

7.0 INSTRUCTIONS

7.1 Beryllium Surface Sampling

7.1.1 Sampling

NOTE Sampling **SHALL** be conducted by an industrial hygiene technician who has been trained by IH&S on beryllium sampling

Sampler

1 Ensure that all required materials listed in Section 6.1, including a list of predetermined sampling areas, are in hand before proceeding to the survey area, as well as any required PPE, safety shoes, safety glasses, bump cap, hard hat, or breathing zone air sampling equipment (consult with IH&S for assistance with air sampling equipment)

NOTE Don disposable gloves before initiation of sampling. If at any time a glove comes in contact with the surface being sampled, dispose of it in accordance with section 7.1.4 below, and don a fresh glove.

2 If sampling locations are given as randomly generated coordinates on a grid, locate the corner that has been defined as coordinate (0,0), usually the southwest corner but sometimes the northeast corner. Using the list of predetermined sampling coordinates, locate each coordinate. If sampling locations are given as biased locations, locate each as directed on the sampling map.

3 Confirm that the unique sample number for each sampling location is properly written on each individual glassine bag.

4 Use the 100 cm² template to define the sampling area at each location, but **do not allow the template to touch the surface, since this will contaminate the template and result in cross-contamination of samples**.

5 Dry wipe the **entire area** bounded by the template once, using a Whatman 41 filter paper or equivalent, and immediately place the filter in the appropriate glassine bag. **It is important to that the filter be swiped over the entire area bounded by the template, and that the wipe be carried out in a consistent manner from sample to sample. For this reason, the following wipe pattern must be followed.**

a) wipe in one direction using parallel passes ensuring that 100% of the area is wiped,

b) wipe in the perpendicular direction using parallel passes ensuring that 100% of the area is wiped,

c) wipe again in the original direction using parallel passes ensuring that 100% of the area is wiped

CAUTION Collect the sample in a manner that your gloved hands will not come in contact with the surface being sampled. If at any time a glove comes in contact with the surface being sampled, dispose of it in accordance with section 7.1.4 below, and don a fresh glove

6 **IMMEDIATELY** record the sample number and a detailed description of the sample including any problems encountered in the Beryllium Sample Log (see Appendix A). Ensure that the description is provided in sufficient detail that another individual could easily locate the sampling site at a later time

7 Photograph the sample identification area with photo identification card (*This step is optional. If photographs are required, a camera pass must first be obtained from the Photography Department, 966-2658. Alternatively, an individual already possessing a camera pass may be contacted to take the photo.*)

8 Disposition breathing zone air monitoring equipment as directed by IH&S, if such equipment was required

9 If samples must leave your direct control in order for a radiological survey to be carried out on them, surrender chain of custody of all collected samples (and the breathing zone air filter cartridges and filters as directed by IH&S, if such was required) to the RCT assigned to the job, by having the RCT sign the Safety and Hygiene Chain of Custody Record. Be certain that date and time are noted

Radiological Control Technician.

10 Don gloves and use tweezers to remove the filter from the bag, being careful not to tear it.

11 Carry out a documented survey of each filter to assess radiological contamination per 3-PRO-165-RSP 07 02, *Contamination Monitoring Requirements*, and write the data on the Radiological Survey Form. Be very careful to ensure that the proper filter is returned to the proper glassine bag

12 Carry out a documented survey of the breathing zone air monitoring equipment and filter (if such was used) as directed by IH&S to assess radiological contamination per 3-PRO-165-RSP 07 02, *Contamination Monitoring Requirements*, and write the data on the Radiological Survey Form. Be sure to obtain direct guidance from IH&S as to which filter cartridge is to be opened for radiological survey, and which is to remain sealed for beryllium analysis.

NOTE If any radiological measurement exceeds contamination limits stated in the Radiological Work Permit or in Table 2-2 in the Radiological Controls Manual, cease operations and consult with Radiological Operations and with Radiological Engineering before proceeding

Radiological Operations Supervisor

12 Review the survey package in accordance with 3-PRO-165-RSP-07 02, *Contamination Monitoring Requirements*, and 3-PRO-141-RSP-09 01, *Unrestricted Release of Property, Material, Equipment, and Waste*. Provide a copy of the approved survey package to the field supervisor or project manager for sample disposition

Sampler

- 13 Accept custody of the samples from the RCT by signing the Safety and Hygiene Chain of Custody Record and writing on it the appropriate date and time
- 14 Provide the project representative with the Beryllium Sample Log, associated maps, photos, and other documentation relevant to the samples collected

Field Supervisor

- 15 Record the following information in the Project Field Logbook on a daily basis
 - Date and time of sampling
 - Name of person recording the entries
 - Field team members (including subcontractors and visitors)
 - Activity description (including building number, sampling locations)
 - PPE Level
 - Instruments including serial numbers and calibration data (unless recorded in separate log)
 - Weather conditions (if applicable)
 - Any deviations or special considerations

Reference the sample collection forms that are specified within the procedure (i.e. Beryllium Sample Log, etc.)

- 19 Review Beryllium Sample Log, Chain of Custody, and other documentation for completeness and accuracy. Record any deviations or special considerations in the Project Field Log.

7.1.2 Packaging

Sampler

- 1 Place the glassine bags inside of a ziplock bag, and place a tamper proof custody seal over the ziplock bag opening such that the seal or bag will be broken to gain access to the sample. Bag the breathing zone air sample cassette in the same manner. Sign and date the tamper-proof seal.
- 2 Complete the specific packaging requirements specified in 1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Materials Manual*, and 1-T97-Traffic-112, *Sample Packaging and Transfer*.
- 3 Complete the chain of custody form.

NOTE: If samples are to be transported to the laboratory by someone other than the sampler, then the sampler must relinquish the samples by signing the chain of custody form and the person receiving the samples must sign for the samples. **Samples must be under chain of custody at all times.**

7.1.3 Transfer and Shipment

Sampler

1 Transport the samples in the manner specified in 1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Materials Manual*, and 1-T97-Traffic-112, *Sample Packaging and Transfer* to Site Building T891R and transfer custody of the samples to the Commodore Advanced Sciences (CAS) representative

2 Have the CAS representative sign the Safety and Hygiene Chain of Custody Record Retain the Safety and Hygiene Chain of Custody Record

NOTE If samples are to be transported by someone other than the sampler, then the sampler must relinquish the samples by signing the chain of custody form and the person receiving the samples must sign for the samples **Samples must be under chain of custody at all times**

3 Give copies of the completed Radiological Survey Form and Property Release Evaluation form to the CAS representative

4 Advise the CAS representative of the analytical laboratory to which the samples are to be shipped

NOTE Johns Manville Industrial Hygiene Laboratories has both AIHA certification and a license to handle radioactive material, and is the facility to which beryllium samples are generally sent.

NOTE. Breathing zone air sampling cartridges **SHALL** be analyzed by an AIHA certified laboratory

7.1.4 Investigation-derived Waste

Filters are destroyed by the analysis procedure All PPE will be disposed of or laundered as per the requirements of the area under survey, in accordance with any applicable RWP's or other requirements In Beryllium Areas, PPE will be placed in PPE receptacles labeled Beryllium Waste Outside beryllium areas, PPE will be disposed of in PPE receptacles

7.2 Settled dust sampling

NOTE No NIOSH-approved procedure exists for settled dust sampling

7.2.1 Sampling

NOTE Sampling **SHALL** be conducted by an IH technician who has been trained by IH&S on the procedure

Sampler

1 Ensure that all required materials listed in Section 6.2, including a list of predetermined sampling areas, are in hand before proceeding to the survey area, as well as any required PPE, safety shoes, safety glasses, bump cap, hard hat, or breathing zone air sampling equipment (consult with IH&S for assistance with air sampling equipment)

NOTE: Don disposable gloves before initiation of sampling If at any time a glove comes in

contact with the surface being sampled, dispose of it in accordance with section 7 2.4 below, and don a fresh glove

2 If sampling locations are given as randomly generated coordinates on a grid, locate the corner that has been defined as coordinate (0,0), usually the southwest corner but sometimes the northeast corner Using the list of predetermined sampling coordinates, locate each coordinate If sampling locations are given as biased locations, locate each as directed on the sampling map

3 Write the unique sample number for the sampling location on the air sampling cassette with a Sharpie and insert into the vacuum sampler unit

4 Use the 100 cm² template to define the sampling area at each location, but do not allow the template to touch the surface, since this will contaminate the template and result in cross-contamination of samples

Radiological Control Technician

5 Once the template has been placed, the radiological control technician **SHALL** survey the area using an NE Electra DP-6 and/or equivalent instrumentation to assess radiological contamination

NOTE If any radiological measurement exceeds contamination limits stated in the Radiological Work Permit or in Table 2-2 in the Radiological Controls Manual, cease operations and consult with Radiological Operations and with Radiological Engineering before proceeding

Sampler

6 Slowly vacuum all surface areas inside template with the Tygon tubing, which is attached to the vacuum sampler It is important to that the *entire area* bounded by the template be vacuumed, and that the vacuuming be carried out in a consistent manner from sample to sample. For this reason, the following pattern should be followed:

- a) vacuum in one direction using parallel passes ensuring that 100% of the area is vacuumed,
- b) vacuum in the perpendicular direction using parallel passes ensuring that 100% of the area is vacuumed,
- c) vacuum again in the original direction using parallel passes ensuring that 100% of the area is vacuumed

In a situation where following this pattern will cause an excessive amount of dust to accumulate on the filter, a lower flow rate must be used, and this must be noted in the Beryllium Sample Log

CAUTION: Collect the sample in a manner that your gloved hands will not come in contact with the surface being sampled If at any time a glove comes in contact with the surface being sampled, dispose of it in accordance with section 7.4 below, and don a fresh glove

7 **IMMEDIATELY** record the sample number and a detailed description of the sample including any problems encountered in the Beryllium Sample Log (see Appendix A) Ensure that the description is provided in sufficient detail that another individual could easily locate the sampling

site at a later time

8 Photograph the sample identification area with photo identification card (*This step is optional. If photographs are required, a camera pass must first be obtained from the Photography Department, 966-2658. Alternatively, an individual already possessing a camera pass may be contacted to take the photo.*)

9 Change tubing and remove filter cassette from the vacuum sampler unit. Insert a new cassette for the next sample.

10 Continue to carry out sampling. Disposition breathing zone air monitoring equipment as directed by IH&S, if such equipment was required.

11 When ready for an RCT to survey the filters from settled dust sampling, remove the mixed cellulose ester filter from the cassette containing the beryllium sample. Removal of the filter will require breaking the seal on the plastic cassette and carefully removing the filter by grasping the filter edge while wearing disposable gloves. **Do not remove the filter from the breathing zone air monitoring equipment.**

12 If samples must leave your direct control in order for a radiological survey to be carried out on them, surrender chain of custody of all collected samples (and the breathing zone air filter cartridges and filters as directed by IH&S, if such was required) to the RCT assigned to the job, by having the RCT sign the Safety and Hygiene Chain of Custody Record. Be certain that date and time are noted.

Radiological Control Technician.

13 Don gloves and use tweezers to remove the filter from the cassette used for settled dust sampling, being careful not to tear it.

NOTE: This does not apply to filters from breathing zone air monitoring equipment. Do not remove the filter from any breathing zone air monitoring equipment.

12 Carry out a documented survey of each filter to assess radiological contamination per 3-PRO-165-RSP 07 02, *Contamination Monitoring Requirements*, and write the data on the Radiological Survey Form. **Be very careful to ensure that the proper filter is returned to the proper cassette after survey.**

13 Carry out a documented survey of the breathing zone air monitoring equipment and filter (if such was used) as directed by IH&S to assess radiological contamination per 3-PRO-165-RSP 07 02, *Contamination Monitoring Requirements*, and write the data on the Radiological Survey Form. **Be sure to obtain direct guidance from IH&S as to which filter cartridge is to be opened for radiological survey, and which is to remain sealed for beryllium analysis.**

NOTE: If any radiological measurement exceeds contamination limits stated in the Radiological Work Permit or in Table 2-2 in the Radiological Controls Manual, **cease operations** and consult with Radiological Operations and with Radiological Engineering before proceeding.

Radiological Operations Supervisor

14 Review the survey package in accordance with 3-PRO-165-RSP-07 02, *Contamination Monitoring Requirements*, and 3-PRO-141-RSP-09 01, *Unrestricted Release of Property*,

Matenal, Equipment, and Waste Provide a copy of the approved survey package to the field supervisor or project manager for sample disposition

Sampler

- 15 Accept custody of the samples from the RCT by signing the Safety and Hygiene Chain of Custody Record and writing on it the appropriate date and time
- 16 Provide the project representative with the Beryllium Sample Log, associated maps, photos, and other documentation relevant to the samples collected

Field Supervisor

17 Record the following information in the Project Field Logbook on a daily basis

- Date and time of sampling
- Name of person recording the entnes
- Field team members (including subcontractors and visitors)
- Activity description (including building number, sampling locatons)
- PPE Level
- Instruments including senal numbers and calibration data (unless recorded in separate log)
- Weather conditions (if applicable)
- Any deviations or special considerations

Reference the sample collection forms that are specified within the procedure (i e Beryllium Sample Log, etc)

18 Review Beryllium Sample Log, Chain of Custody, and other documentation for completeness and accuracy Record any deviations or special considerations in the Project Field Log

7 2 2 Packaging

Sampler

- 1 Place the cassettes inside of a ziplock bag, and place a tamper proof custody seal over the ziplock bag opening such that the seal or bag will be broken to gain access to the sample Bag the breathing zone air sample cassette in the same manner Sign and date the tamper-proof seal
- 2 Complete the specific packaging requirements specified in 1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Matenals Manual*, and 1-T97-Traffic-112, *Sample Packaging and Transfer*
- 3 Complete the chain of custody form

NOTE: If samples are to be transported to the laboratory by someone other than the sampler, then the sampler must relinquish the samples by signing the chain of custody form and the person receiving the samples must sign for the samples **Samples must be under chain of custody at all times.**

7 2 3 Transfer and Shipment

Sampler

1 Transport the samples in the manner specified in 1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Materials Manual*, and 1-T97-Traffic-112, *Sample Packaging and Transfer* to Site Building T891R and transfer custody of the samples to the Commodore Advanced Sciences (CAS) representative

2 Have the CAS representative sign the Safety and Hygiene Chain of Custody Record Retain the Safety and Hygiene Chain of Custody Record

NOTE: If samples are to be transported by someone other than the sampler, then the sampler must relinquish the samples by signing the chain of custody form and the person receiving the samples must sign for the samples **Samples must be under chain of custody at all times**

3 Give copies of the completed Radiological Survey Form and Property Release Evaluation form to the CAS representative

4 Advise the CAS representative of the analytical laboratory to which the samples are to be shipped

NOTE Johns Manville Industrial Hygiene Laboratories has both AIHA certification and a license to handle radioactive material, and is the facility to which beryllium samples are generally sent

NOTE Breathing zone air sampling cartridges **SHALL** be analyzed by an AIHA certified laboratory

7 2 4 Investigation-derived Waste

Filters are destroyed by the analysis procedure All PPE will be disposed of or laundered as per the requirements of the area under survey, in accordance with any applicable RWP's or other requirements In Beryllium Areas, PPE will be placed in PPE receptacles labelled Beryllium Waste Outside beryllium areas, PPE will be disposed of in PPE receptacles

8.0 ANALYTICAL REQUIREMENTS

Samples will be analyzed pursuant to general ASD requirements by EPA SW-846 methods or equivalent, such as OSHA Method ID-121 for flame atomic absorption spectroscopy, or OSHA Method 125-G for inductively coupled plasma spectroscopy, and will be reported in tabular form in units of micrograms The practical limit of quantification will be less than or equal to 0.1 µg/ filter for surface samples and 0.01 µg/ filter for air samples

Breathing zone air samples **SHALL** be analyzed by an AIHA certified laboratory according to NIOSH 7300

Johns Manville Industrial Hygiene Laboratories has both AIHA certification and a license to handle radioactive material, and is the facility to which beryllium samples are generally sent.

9 0 REPORTING

The number of measurements and the applicable statistical distribution will be presented in tabular form, with additional graphical representation if applicable, to the Project Manager. A copy of the results will be distributed to the Director of the Chronic Beryllium Disease Prevention Program.

Statistical analysis of the data will be carried out as described in the Reconnaissance Level Characterization Plan (RLCP).

Beryllium areas will be categorized according to the beryllium sampling data according to the designations outlined in Section 3 0 of this Procedure.

10.0 DISPOSITION OF RECORDS

The following records are generated as a result of the implementation of this procedure:

- Beryllium Sample Log (sample page shown in Appendix A)
- Property Release Evaluation Form (PRE) (sample shown in Appendix B)
- Sampling and Analysis Request Form (SARF)
- Project Field Logbook

The Beryllium Sample Log and the Project Field Logbook **SHALL** each be assigned a unique document control number and be treated as a controlled document. Specifically, the Beryllium Sample Log and the Project Field Logbook **SHALL** each be considered an In-process Quality Assurance (QA) Document until the corresponding project is completed, at which point they each **SHALL** be handled and controlled as a QA Record (Non-WIPP/LL/LLM), in accordance with 1-V41-RM-001, Records Management Guidance for Records Sources, and 1-F78-ER-ARP 001, CERCLA Administrative Record Program. The PRE **SHALL** be handled and controlled as a QA Record (Non-WIPP/LL/LLM), and the SARF **SHALL** be handled and controlled as a Non-QA Record (Non-WIPP/LL/LLM).

These records shall be managed in accordance with 1-V41-RM-001, Records Management Guidance for Records Sources and 1-F78-ER-ARP 001, CERCLA Administrative Record Program.

Sampling data will be entered into the RFETS Soil and Water Database (SWD) utilizing the FieldCap menu, following the procedure in Sections 2, 3, and 4 of "SWD As-Built Detailed Design," RF/RMRS-98-203, Rev 2 1, Draft A, pp 4-13.

Sampling data will also be entered into the site Industrial Hygiene Information System.

11.0 REQUIREMENTS

All work **SHALL** be performed in accordance with:

- MAN-071-IWCP, *RFETS IWCP Manual*
- PADC-96-00042, *RFETS Quality Assurance Manual*

- MAN-066-COOP, *RFETS Conduct of Operations Manual*
- Occupational Safety and Industrial Hygiene Program Manual (OS&IHPM)
- Radiological Safety Practices Manual (RSP 1 0)
- RFETS Radiological Controls Manual
- 94-ALARA-PLAN-0003, *RFETS ALARA Program Plan*

All workers **SHALL** be trained in accordance with

- PADC-1991-00793, *RFETS Training Users' Manual*

All records **SHALL** be managed in accordance with

- 1-V41-RM-001, *Records Management Guidance for Records Sources*
- 1-F78-ER-ARP 001, *CERCLA Administrative Record Program (40 CFR 800-825)*
- Kaiser-Hill Team Quality Assurance Program

All sample transportation, transfer, and packaging **SHALL** be in accordance with

- 1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Materials Manual*
- 1-T97-Traffic-112, *Sample Packaging and Transfer*

Documentation that each of these requirements has been met **SHALL** be included in the Project File

Minor deviations from this procedure that do not impact the regulations noted above are subject to the approval of the project manager and will be recorded on the sample log without modification to the procedure. The ARAR process will select those requirements which are either applicable or appropriate and relevant, or alternatively, administrative versus substantive

12.0 REFERENCES

CBDPP Beryllium Characterization Plan

EPA, June 1997 Test Methods for Evaluating Solid Waste, Laboratory Manual, SW-846, 3rd Edition, Update III

RFETS Integrated Work Control Package Manual, MAN-071-IWCP

RFETS Location of Known Beryllium Areas, Historical and Present (LKBA)

RFETS Occupational Safety and Industrial Hygiene Program Manual, Chapter 28, "Chronic Beryllium Disease Prevention Program", MAN-072-OS&IHPM

RFETS Site Beryllium Characterization Report (9/97)

RFETS SWD As-Built Detailed Design, RF/RMRS-98-203, Rev 2 1, Draft A

1-T93-Traffic-110, *On-Site Transportation of Hazardous and Radioactive Materials Manual*

1-T97-Traffic-112, *Sample Packaging and Transfer*

1-V41-RM-001, Records Management Guidance for Records Sources

1-F78-ER-ARP 001, CERCLA Administrative Record Program

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SAMPLE

RELEASE EVALUATION FORM

Page 1 of 3

Release Evaluation No REV ONE EXTENDED YES EXPIRES
Charge No _____

**PART I
ACKNOWLEDGMENT**

SENDER/CUSTODIAN

Description of Property/Waste/Sample To Be Released/Transferred LAPEL AIR SAMPLES AND SWIPES

Current Location

Destination JOHNS MANVILLE TECHNICAL CENTER, PO BOX 625005, LITTLETON, COLORADO
80162-5005

New Recipient/Custodian JOHNS MANVILLE TECHNICAL CENTER, PO BOX 625005, LITTLETON,
COLORADO 80162-5005

History/Process Knowledge THE AIR SAMPLES ARE TAKEN IN DUPLICATE, ONE OF WHICH WILL BE
SURVEYED PER RSP 7 02 AND REPRESENT THE ACTIVITY OF THE ACTUAL SAMPLE THAT WILL BE
SENT INDUSTRIAL HYGIENE WILL ENSURE THAT THE AIRFLOW OF THE DUPLICATE FILTER IS
EQUAL TO OR GREATER THAN THE ACTUAL FILTER THAT IS TO BE SENT TO AN OFF-SITE
FACILITY THE SWIPES ACTIVITY WILL BE READ PER RSP 7 02

Has the specified material ever been in an RMMA/RBA/CA or contacted DOE controlled radioactive materials?

- 1) By signing below, I certify information provided in Part I of this release evaluation to be true and accurate
- 2) By signing below, I agree to comply with the specific requirements noted in Part II of this release evaluation

Sender/Custodian Emp No Date Ext

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PART II

RADIOLOGICAL ENGINEERING

SPECIFIC REQUIREMENTS AND/OR COMMENTS

- 1 The Radiological Control Technician shall perform a survey for unrestricted release of the duplicate air sample cassette and the duplicate air filter per RSP 7.02. The RCT shall also perform a survey for unrestricted release of the external portion of the cassette that will not be opened. All surveys shall be recorded for both loose surface contamination and fixed contamination for both alpha and beta emitters. The loose surface contamination survey shall be based upon transuranic release criteria for unrestricted release. ACCEPTANCE CRITERIA SHALL BE BASED UPON WHAT TYPE OF FILTER/SWIPE MEDIA SELECTED BY INDUSTRIAL HYGIENE. ACCEPTANCE FOR EACH TYPE OF SWIPE OR FILTER SHALL BE. 37 MM POLYVINYL CHLORIDE FILTER SHALL BE 24 DPM/FILTER, 37 MM MIXED CELLULOSE ESTER SHALL BE 24 DPM/FILTER, 25 MM (ASB) MIXED CELLULOSE FILTER SHALL BE 20 DPM/FILTER, 47 MM DIAMETER SHALL BE 38.5 DPM/FILTER. INDUSTRIAL HYGIENE AND THE RCT SHALL ENSURE THAT THE FILTER TYPE IS RECORDED ON THE SURVEY
2. The sender/custodian will provide all data to radiological engineering if any filter is above criteria listed in section one above. Radiological Engineering may average the complete shipment, if the shipment average is below the criteria listed above then the radiological engineer will sign the surveys annotating that material may be shipped.
3. The sender/custodian shall retain and make available to Radiological Engineering, the chain of custody and survey records for all sample shipped under the terms and conditions of the release evaluation. The sender custodian shall provide the shipper a copy of the survey and this Release Evaluation along with the samples being sent to the analytical laboratory. This release will meet the DOT (49 CFR) requirements of less than 2 nanocuries per gram
- 4 JOHN MANVILLE TECHNICAL CENTER OPERATES UNDER COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT RADIOACTIVE MATERIAL LICENSE 131-03 THAT EXPIRES ON MAY 31, 2003
5. ASI will ensure the external shipping package contamination will be less than DOT requirements by survey or process knowledge of the packaging process in T-891R.
- 6 ASI will retain all P/WRE DATA PACKAGES FOR AUDITING PURPOSES

Evaluated _____ Emp No _____
Radiological Engineer

Date _____ Ext. _____

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APPROVAL FOR TRANSFER/SHIPMENT

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**BERYLLIUM
CHARACTERIZATION
PROCEDURE**

**PRO-536-BCPR
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Date Effective 09/01/99**

Approved _____ Emp No _____ Date _____ Ext _____
Radiological Engineer

The samples specified in Part 1 of this release evaluation are being provided with authorization for transport as non-radioactive materials in accordance with Department of Transportation (49 CFR) regulations. This authorization for shipment does not constitute an unrestricted release.

SAMPLE RELEASE 990101-00881-036 REV ONE

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