CP3-RP-1109 FRev. 14	**TITLE**: Radioactive Contamination Control and Monitoring	Page 1 of 17

DOCUMENT CATEGORY:	Administrative
LEVEL OF USE:	Information Level
FUNCTIONAL AREA: Radiation Protection **SUBJECT MATTER AREA:** Radiation Protection	**SUBJECT MATTER EXPERT**: Dan Tockstein, Radiological Engineering Manager
NUCLEAR SAFETY REVIEW DOCUMENTATION: FRNP-25-0165-S	**RESPONSIBLE MANAGER/OWNER**: Craig Nesshoefer, Radiation Protection Manager 03/24/2025
REQUIRED REVIEW DATE (or expiration date for temporary change): 03/24/2030	**EFFECTIVE DATE**: 03/25/2025

REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR0	Initial Release under FRNP.	All	10/18/2017
FR1	General revision to change job responsibilities	All	8/9/2018
FR2	Revise Section 6.5 Unrestricted Release of Equipment and Materials to meet new DOE requirements	All	11/05/2019
FR3	Remove Unrestricted Release of Material and Equipment sections to new procedure. Update to include requirements of CP2-RP-0002, FRNP RCM. Change Document Category from Technical to Administrative.	All	7/13/2020
FR4	Address daily routine surveys not tracked in database and use of RP-F-0163 form not required per CA-002915 and add removal of material and equipment from radioactive material areas.	5,9	04/15/2021
FR5	General revision. Added designated performers. Added Section regarding the use of vehicles off of improved roadways and moving railroad equipment through radiological areas.	All	8/25/2021
FR6	General revision. Additional revisions to address electronic survey database use.	All	4/27/2022

REVISION/CHANGE LOG			
Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR7	Deleted Sections that were incorporated into new procedure CP3-RP-1126, *Release of Materials and Equipment to Controlled Area*, pertaining to Release of Material and Equipment from Radiological Areas inside the Posted Radiologically Controlled Area; Release of Material and Equipment from RMAs inside the Posted RCA; and Moving Railroad Equipment through Radiological Areas. Added Step to require RADCON be contacted prior to making previously inaccessible surfaces accessible so that applicable radiological controls may be established.	All	09/22/2022
FR8	Revise section 6.4 to add survey form numbers, delete Appendix C, and attach new forms.	6, 8,10, 13	05/16/2023
FR9	Revise Section 6.7, Appendix B, and attach new forms.	12	07/26/2023
FR10	Added section 6.3.14 for RCTs performing hands only work in contamination area, and section 6.3.12 for controls for potential hair contamination.	All	09/25/2023
FR11	Deleted 6.3.21 for use of RWP to count smears/air samples, and added electronic information system records generation/exported by VSDS in section 7.1.	9, 14, 15	1/10/2024
FR12	Added Appendix C and note in section 6.4 to address terms for use regarding converter component activities per CAPA CA-005203. Remove duplicate requirements in section 6.2.2 and 6.3.16 which have same requirements in CP3-RP-1127, and additional clarifications.	All	09/12/2024
FR13	Delete section 6.7.6, 6.7.8, and 6.7.9 on how many minimum survey points. Delete forms attached in Administrative procedure. Revised section 6.3.1 and added section 6.8.3.	All	11/21/2024
FR14	Revise Appendix B for TRU, delete section 6.2 on exit control, and other minor changes.	All	03/24/2025

TABLE OF CONTENTS

1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this procedure is to define the process for compliance with the applicable regulatory requirements for radioactive contamination control and monitoring for the release of materials and equipment from radiological areas as specified in Title 10, *Code of Federal Regulations*, § 835 (10 Code of Federal Regulations [*CFR*] § 835), *Occupational Radiation Protection,* and DOE O 458.1*, Radiation Protection of the Public and the Environment.* Title 10 incorporates guidance from the U.S. Department of Energy (DOE) guide, G 441.1-1C, *Radiation Protection Program Guide for Use with Title 10, Code of Federal Regulations,* § 835, *Occupational Radiation Protection*, and conformance with mandatory contractual and administrative requirements.

1.2 Scope

This procedure applies to radioactive contamination control and monitoring conducted under the Radiological Protection Program (RPP) at the Paducah Gaseous Diffusion Plant (PGDP) by the Deactivation and Remediation (D&R) contractor. The approval authority for this document is the Radiation Protection Manager (RPM).

2.0 REFERENCES

2.1 Use References

- CP3-RP-1104, *Radiological Area Entry Control*
- CP3-RP-1108, *Posting and Labeling*
- CP3-RP-1114, *ALARA Program*
- CP3-RP-1125, *Unrestricted Release of Material and Equipment*
- CP3-RP-1505, *Radiological Notification Reporting*
- CP4-RP-1116, *Radiological Routines*
- CP4-RP-1505, *RADCON Technical Evaluation*
- CP5-RP-2016, *Radiological Protection Contamination Control and Monitoring Technical Basis Document*

2.2 Source References

- CP2-RP-0002, *Radiological Control Manual*
- CP5-RP-2022, *Radiological Protection Instrumentation Operation Technical Basis Document*
- CP2-WM-0011, *Waste Acceptance Criteria for the Treatment, Storage, and Disposal Facilities at the Paducah U.S. Department of Energy Site*
- CP3-HS-5000, *Vehicle Safety*
- CP3-SM-0019, *Electrical Safety Guidelines*
- CP3-RP-1201, *Internal Dosimetry*
- CP3-RP-1202, *External Dosimetry*
- CP3-RP-1203, *Embryo/Fetus Protection*

3.0 COMMITMENTS

None

4.0 RESPONSIBILITIES

Roles and Responsibilities are incorporated in Section **6.0.**

5.0 GENERAL INFORMATION

5.1 Processes and requirements for the free release of property, material, and equipment from the Paducah DOE reservation is found in CP3-RP-1125, *Unrestricted Release of Material and Equipment*.

5.2 Surface contaminated radiological samples (includes air samples and swipes) shall **NOT** be left unattended in a Radioactive Material Area (RMA) unless properly packaged and labeled according to CP3-RP-1108, *Posting and Labeling*.

5.3 Logbook entries shall **NOT** be considered an acceptable equivalent to radiological surveys.

NOTE:

A truck bed is **NOT** considered a hard-sided container.

5.4 Leased motor vehicles are **NOT** authorized to transport radioactive material, such as waste or sample media, unless the following conditions are met:

- Transported in hard-sided containers **or** U.S. Department of Transportation (DOT) approved soft-sided containers **and** properly tagged and/or labeled according to CP3-RP-1108

  OR

- Approved by Radiological Control (RADCON) Management **and** Fleet Management

5.5 Approved laundry carts, containing properly tagged and/or labeled contaminated anti-contamination clothing and used respirators, may be transported in leased motor vehicles with the approval of Fleet Management.

5.6 Work activities involving compliance surveys or boundary verification surveys in outdoor radiological areas must be performed according to RADCON Technical Evaluation number TE-RP-0003, *10 CFR 835 Compliance Associated Soil Contamination.*

5.7 Work activities involving intrusive work in an RMA, Radiological Buffer Area (RBA), and Soil Contamination Area (SCA) must be evaluated by RADCON prior to work **and** posting must be performed according to CP3-RP-1108.

5.8 The RPM shall approve the use of the point correction factor rather than the plane correction factor when the area of contamination is less than or equal to the detector area being used to perform the survey.

6.0 INSTRUCTIONS

6.1 Contamination Control Requirements

Radiological Control Supervisor (RCS)/Radiological Control Technician (RCT)

6.1.1 Maintain appropriate controls that prevent the inadvertent transfer of removable contamination to locations outside radiological areas under normal operating conditions.

6.1.2 Ensure that controls are effective by performing routine documented surveys.

6.1.3 **If** contamination is found outside a radiological area, **then** refer to CP3-RP-1108, and CP3-RP-1505, *Radiological Notification Reporting*.

6.1.4 Use the following measures to prevent the spread of contamination across the boundary of SCAs, contamination areas (CAs), high contamination areas (HCAs), airborne radioactivity areas (ARAs), and RBAs with the extent of these controls dependent on the levels of contamination present and the activities in and around the area:

- **If** area is a SCA, **then NO** physical barrier is required.
- **If** practicable, **then** erect barriers (for example, knee walls) to enclose each CA, HCA, ARA, **or** RBA.
- Mark **and** secure items, such as hoses or cords, which cross the boundary to prevent safety hazards and the spread of contamination.
- Markings may include radiological hazard warning labels, ribbons, **or** tape.
- **If** practicable, **then** control **and** direct air flow from areas of lesser removable contamination to areas of greater removable contamination or airborne radioactivity.
- Use engineering controls **and** containment devices, such as glove bags, glove boxes, and tents.

RCT

6.1.5 **If** the removable or fixed contamination values exceed the contamination limits in Appendix B, *Surface Contamination Values*, **then** identify **or** post the area or label the item according to CP3-RP-1108.

6.1.6 Perform daily routine surveys according to CP4-RP-1116, *Radiological Routines*.

6.1.7 Identify **and** establish controls and postings for Fixed Contamination Area (FCAs) according to CP3-RP-1104, *Radiological Area Entry Control,* and CP3-RP-1108.

6.2 Personnel Contamination Control

RCT/Work Group Supervisor

6.2.1 Require protective clothing as specified in the Radiological Work Permit (RWP) for entry into areas where removable contamination exists at levels exceeding those specified in Appendix B.

All Personnel

6.2.2 Monitor upon exiting CAs, HCAs, and RBAs established for contamination control, as appropriate, for the presence of surface contamination in excess of the total surface contamination values in Appendix B.

6.2.3 Monitor upon exiting from SCAs, at the direction of RADCON management or as required in an RWP, for the presence of surface contamination in excess of the total surface contamination values in Appendix B.

RCT

6.2.4 **When** performing job coverage in radiological areas to determine whether it is conducted in a manner that minimizes the spread of contamination to adjacent areas, **then** evaluate the following:

- Radiological work practices
- The number of individuals in and around the work area
- Impacts on the workplace atmosphere

All Personnel

6.2.5 Stop/suspend work, as necessary, to prevent inadvertent spread of contamination **and** to correct radiological problems before they escalate.

RCT

6.2.6 Provide contamination control related process improvements and feedback to workers, worker's supervisor, RCS, or other personnel as part of the continuous improvement process, as appropriate.

6.2.7 Document feedback in job coverage logs or on radiological surveys **or** discuss during pre-job briefings or post-job briefings.

6.2.8 Document deficiencies on CP3-RP-1104-F04, *Radiological Work Permit Job Coverage Log* or on radiological surveys **and** notify RCS so that the deficiency may be screened for reporting.

6.2.9 Provide oversight of workers to ensure they are implementing RWP requirements to minimize the spread of contamination according to Steps **6.2.11 through 6.2.24,** as appropriate.

6.2.10 Work with the project team to minimize the number of individuals and materials entering areas controlled for removable contamination.

All Personnel

6.2.11 Use proven work techniques (for example, fixatives, ventilation, coverings, damp mopping) to minimize contamination spread.

6.2.12 **If** there is a reasonable potential for hair, including facial hair, to become contaminated, **then** control hair appropriately.

6.2.13 Contact RADCON prior to performing any work activity on radioactive materials that may expose a previously inaccessible surface or that may impact fixed contamination (for example, caused fixed contamination to become removable) so that applicable radiological controls may be established.

RCT

6.2.14 Perform work area surveys to detect the presence of contamination.

6.2.15 Perform hands-only entry into Contamination Areas involving minimal contact with non-transuranics/thorium contaminated material (less than 10,000 dpm/100 cm^2 removable alpha and less than 50,000 dpm/100 cm^2 removable beta-gamma) without signing a radiological work permit. These activities do **NOT** involve direct contact with contaminated materials other than hands while wearing hand protection (one pair of surgeon's gloves).

6.2.16 Field-screen all radiological samples from a SCA, RBA, CA, HCA, ARA, or any uncharacterized areas or equipment for gross contamination to prevent the spread of contamination to personnel, lab counting areas, to determine if RWP limiting condition exceedances, or if posting level exceedances have occurred.

6.2.17 **If** the field screening indicates contamination levels greater than 100 times the Appendix B Surface Contamination Values (highly contaminated), **then** do **NOT** remove radiological samples from CAs, HCAs, or ARAs WITHOUT approval by the RPM or Radiation Protection Project Manager (RPPM).

NOTE:

A cooler may meet the requirements of a double-sealed package when properly closed and secured sample jars containing HCA material are placed inside it. Other examples may be permitted with RADCON management or supervision concurrence.

6.2.18 Handle radiological samples exceeding HCA limits with special precautions including double sealed packaging.

6.2.19 **Before** removing radiological samples (swipes or air samples) from a SCA, CA, HCA, ARA, RBA, or uncharacterized area or equipment, place samples in a sealed package.

6.2.20 **If** radiological samples **CANNOT** be field-screened for gross contamination due to interfering radiation, **then** contact the RCS for direction.

6.2.21 Place radiological samples exceeding HCA limits in a double-sealed package. A documented removable contamination survey of the outer package exterior must be performed when removing samples from a radiological area.

NOTE:

A Ludlum Model 2224-1 equipped with a Ludlum Model 43-10-1 probe, or other similarly equipped instrument, used inside a radiological area does **NOT** meet the requirement of a lab counting station.

6.2.22 **If** using a lab counting station (for example, Ludlum 43-10-1) or low background counter (for example, Canberra Tennelec 5XLB), **then** collect **and** count a minimum of one swipe of the sample preparation area(s) upon completion of counting activities.

6.2.23 Document this swipe result with the survey for which the swipes were collected except for Tennelec counting station preparation area. Tennelec counting stations preparation area swipes are documented on a separate survey.

6.2.24 Dispose of all radiological samples as radioactive waste.

6.3 Documenting Contamination Surveys

NOTE:

Other methods of survey documentation are acceptable only when approved by RADCON Management. CP3-RP-1109-F01, *Radiological Survey Form*, CP3-RP-1109-F02, *Radiological Survey Map Form*, CP3-RP-1109-F04, *Radiation Survey Form*, and/or CP3-RP-1109-F-05, *Neutron Radiation Survey Form* may be attached to the survey documentation software.

For documenting surveys associated with converter component activities (e.g., converter segmentation and bundle crushing), Appendix C, *Terms for Use on Converter Component Activities*, lists the words that can be used to label items surveyed. **NO** other specific description of the item or material along with the words must be used. A Derivative Classifier must be consulted prior to using terms, other than those presented in Appendix C.

RCT

6.3.1 Document contamination surveys using survey documentation software.

NOTE:

Surveys should be completed prior to leaving the site on planned Paid Time Off.

6.3.2 Document contamination surveys as soon as reasonable after the survey is completed, but **NO** later than the end of the next regular shift worked, unless awaiting laboratory results.

NOTE:

Job conditions of ongoing work should be available for turnover on subsequent shifts.

6.3.3 Document job conditions on radiological surveys, as appropriate.

6.3.4 At a minimum, include the following information on radiological survey documentation, as applicable:

- Printed name, badge number, and signature (may be electronic signature [Lead Surveyor must be the one to submit electronic survey]), or equivalent, of RCT(s) performing survey
- Date and time the survey was performed
- RWP number, if applicable
- Purpose of survey
- Location of survey
- Description of item surveyed (including unique identification number)
- Survey map, as required
- Lab results, as required
- Survey instrument model, serial number, and calibration due dates
- Survey number
- Results of the survey

NOTE:

Sufficient detail should be used when creating location identifiers that someone **NOT** familiar with the survey would know exactly where the survey points were performed.

6.3.5 Include on the contamination survey forms sufficient graphical information (for example, location identifiers or maps), as appropriate, to identify survey points.

6.4 Use and Storage of 5-Gallon Drinking Water Bottles

NOTE:

Five (5) gallon drinking water bottles are released back to the vendor without requiring release surveys to be performed on them by RADCON based on the radiological non-impacted status (**NO** reasonable potential to contain radionuclide concentration(s) or radioactivity above background) of these items.

All Personnel

6.4.1 Ensure the radiological non-impacted status remains valid, the following requirements apply to the use and storage of 5-gallon drinking water bottles:

- 5-gallon drinking water bottles may **NOT** be used in **or** stored in areas posted as radiological areas or in an RMA
- 5-gallon drinking water bottles may **NOT** be used for any purpose other than drinking water
- Any unopened 5-gallon drinking water bottles found within a radiological area, RBA, or RMA will have a contamination survey (removable and total) performed by RADCON, and if the contamination level found satisfies the release criteria, the bottles will be removed from the radiological area or RMA immediately

6.4.2 **If** any opened **or** empty 5-gallon drinking water bottle is found within a radiological area **or** RMA, **then** dispose of as waste.

6.5 Collection of Radiological Data when Performing Electrical Work in Process Buildings

NOTE:

This section applies to work performed in areas including, but **NOT** limited to: electrical cabinets, pipe chases, cable trays, and other similar areas where electrical hazards may be present.

Work Group Supervisor

6.5.1 **When** opening panels **or** performing electrical work in areas where radiological conditions are unknown, **then** contact RADCON prior to beginning work.

RCT

6.5.2 **When** providing radiological job coverage of electrical work where radiological conditions are unknown, **then** do **NOT** enter any limited approach boundaries.

Qualified Electrical Worker

6.5.3 **When** qualified electrical workers have completed activities to make an area electrically safe, **then** present tools, gloves, and any other equipment to RCTs for radiological surveying.

RCT

6.5.4 Survey the items to assess the radiological status of the tools, gloves, and equipment used to make an area electrically safe.

6.5.5 **If** the radiological status of a work area is considered suspect, **then** instruct the qualified electrical worker to smear the suspect area.

6.5.6 **If** an area is determined to be radiologically contaminated, **then** perform the following**:**

A. Notify RCS.

B. Perform a more thorough survey of the qualified electrical worker's clothing and the adjacent work area.

C. Post the area according to CP3-RP-1108.

6.5.7 Document surveys on the appropriate survey forms and ensure the identification of the panel or panels opened and entered are listed on the survey.

6.6 Survey Requirements Associated with CAs

NOTE:

Examples of inactive CAs include abandoned, unoccupied, and deactivated facilities.

RCT

6.6.1 Act as the CA posting, as needed, according to CP3-RP-1108.

6.6.2 Prior to entering any indoor inactive CA, ensure a survey of actual work locations and travel path to be entered has been performed.

6.6.3 Prior to entering any outdoor CA, ensure the routine survey has been performed **or** perform a survey of the actual locations to be entered.

6.6.4 Focus smear surveys on hard surfaces such as concrete or metal, if available, and other areas of concern.

6.6.5 **If** there are **NO** hard surfaces, or only limited hard surfaces, in an area available for survey, **then** perform the following:

- Cut a 100 cm^2 section out of a masslinn wipe to fit under the applicable probe screen size of a Ludlum 43-93 probe or equivalent.
- Place 100 cm^2 section of masslinn on the ground and step on the section of masslinn.
- Rotate your foot/masslinn 90 degrees.
- Determine the general area background per Section 5 of CP5-RP-2016, *Radiological Protection Contamination Control and Monitoring Technical Basis Document*.
- Perform a direct measurement on the dirty side of the masslinn using a handheld instrument for both alpha and beta/gamma contamination by placing the instrument probe at the appropriate distance above the dirty side of the masslinn and perform a 1-minute count.
- Determine the transferable activity by using the appropriate correction factor.
- Document results, noting on the survey form that the results are "transferable" contamination.

6.7 Vehicle Contamination Control and Use Off of Improved Roadways

All Personnel

NOTE:

For the purposes of this procedure, motor vehicles, bicycles, tricycles, side-by-side utility vehicles (for example, Gators, Mules, etc.), golf carts, tractors, heavy equipment, and other powered industrial trucks are considered vehicles.

6.7.1 Contact RADCON prior to driving **and/or** parking off of improved roadways and unimproved areas of the dust palliatives.

6.7.2 **When** work is going to be performed off of improved roadways or on unimproved areas of the dust palliatives, **then** contact RADCON Supervision prior to performing work such as soil disturbance, digging, and pole setting.

RADCON Supervision

6.7.3 **If** work is performed off of improved roadways or on unimproved areas of the dust palliatives which does not have documented radiological work screening or existing RWP, **then** contact Radiological Engineering.

Radiological Engineering

6.7.4 Conduct an evaluation **and** analysis of the work to be performed off of improved roadways to determine the need for additional sampling, radiological surveys, **and/or** an RWP.

6.7.5 Document the evaluation according to CP3-RP-1114, *ALARA Program* or CP4-RP-1505, *RADCON Technical Evaluation*.

Radiological Worker

6.7.6 **If** vehicles have been used in radiological areas, **then** coordinate maintenance activities with RADCON.

6.7.7 **If** vehicles have been used in radiological areas, **then** contact RADCON to determine if it is necessary to containerize fluids from unsealed systems of vehicles for sampling and laboratory analysis.

7.0 RECORDS

7.1 Records Generated

The following records may be generated by this procedure:

- CP3-RP-1109-F01, Radiological Survey Form
- CP3-RP-1109-F02, Radiological Survey Map Form
- CP3-RP-1109-F04, Radiation Survey Form
- CP3-RP-1109-F05, Neutron Radiation Survey Form
- Radiological surveys.
- Electronic Information System records are generated by/exported from Visual Survey Data System (VSDS) and submitted to Records Management according to the approved file plan and CP2-RD-0002, *Electronic Information System Requirements*.

Forms are to be completed according to CP3-OP-0024, *Forms Control*.

7.2 Records Disposition

The records are to be maintained according to CP3-RP-1401, *Radiation Protection Program Records,* and CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

ALARA – As Low as Reasonably Achievable

ARA – Airborne Radioactivity Area

CA – Contamination Area

CFR – Code of Federal Regulations

DPM – Disintegrations per Minute

D&R – Deactivation and Remediation

DOE – U.S. Department of Energy

DOT – U.S. Department of Transportation

FCA – Fixed Contamination Area

HCA – High Contamination Area

PGDP – Paducah Gaseous Diffusion Plant

PPE – Personal Protective Equipment

RADCON – Radiological Control

RBA – Radiological Buffer Area

RCA – Radiologically Controlled Area

RCS – Radiological Control Supervisor

RCT – Radiological Control Technician

RMA – Radioactive Material Area

RPM – Radiation Protection Manager

RPP – Radiation Protection Program

RPPM – Radiation Protection Project Manager

RWP – Radiological Work Permit

SCA – Soil Contamination Area

TRU – Transuranic

VSDS – Visual Survey Data System

Appendix A – Acronyms/Definitions (Continued)

DEFINITIONS

Improved Roadway – Concrete or asphalt surface, roadway which provides adequate drainage of water and gravel areas that are maintained.

Refer to CP2-RP-0002, *Radiological Control Manual* for additional definitions.

Appendix B – *Surface Contamination Values*[1]

Radionuclide	Removable [1,2,4]	Total (Fixed + Removable)[1,2,3]
U-nat, U-235, U-238, and associated decay products	[7]1,000	[7]5,000
Transuranics (TRU), Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	100[8]
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1,000
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above[5]	1,000	5,000
Tritium and STCs [6]	10,000	See 6
Modified Transuranics (Paducah on-site and off-site limit for alpha)[9]	200	1,000

1. The values in this Appendix, with the exception noted in footnote 6, apply to radioactive contamination deposited to, but not incorporated into the interior or matrix of, the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exist, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.
2. As used in this table, disintegrations per minute (dpm) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
3. The levels may be averaged over one square meter provided the maximum surface activity in any area of 100 cm^2 is less than three times the value specified. For purposes of averaging, any square meter of surface shall be considered to be above the surface contamination value if: (1) From measurements of a representative number of sections it is determined that the average contamination level exceeds the applicable value; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 exceeds the applicable value; or (3) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds three times the applicable value.
4. The amount of removable radioactive material per 100 cm^2 of surface area should be determined by swiping the area with dry filter or soft absorbent paper, applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. (Note – The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area shall be based on the actual area and the entire surface shall be wiped. It is not necessary to use swiping techniques to measure removable contamination levels if direct scan surveys indicated that the total residual surface contamination levels are within the limits for removable contamination.
5. This category of radionuclides includes mixed fission products, including Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where Sr-90 has been enriched.
6. Tritium contamination may diffuse into the volume or matrix of materials. Evaluation of surface contamination shall consider the extent to which such contamination may migrate to the surface in order to ensure the surface contamination value provided in this appendix is not exceeded. Once this contamination migrates to the surface, it may be removable, not fixed; therefore, a "Total" value does not apply. In certain cases, a "Total" value of 10,000 dpm/100 cm^2 may be applicable either to metals of the types from which insoluble special tritium compounds are formed, that have been exposed to tritium, or to bulk materials to which insoluble special tritium compound particles are fixed to a surface.
7. These limits apply only to the alpha emitters within the respective decay series and for soils located outside the process buildings within the Limited Area unless Contaminated Areas with transuranic (TRU) limits exists.
8. The value (500 dpm/100cm^2) shall be used when releasing personnel and hand carried items from TRU areas, and posting fixed contamination area with TRU limits.
9. Modified transuranic limit is a Paducah administrative limit based on site historical radiological isotopic data using 8% TRU and 92% Uranium mixture for alpha surface contamination. This limit is **NOT** for soils located outside process buildings within the Limited Area or for other areas for which a Technical Evaluation exists.

Appendix C – Terms for Use on Converter Component Activities

COMPONENT TERMS:

A-outlet pipe

B-outlet pipe

B outlet tube bundle transition

B-transition pipe

Bundle support

Bundle Strut

Center Core Tube Cover Plate or cover plate

Converter

Converter Endcap Bosses

Deposit or Deposit Material

Exothermic reaction

Fixed Tube Sheet

Freon nozzle

Freon pipe

Hold up

Inlet End Cap

Internal Cooler or Cooler

Keeper

Miscellaneous internal parts

Mounting Ring

Outlet End Cap

Process Gas Equipment of PGE

Segmented Components

Shell

Stiffing Ring

Tube bundle

Tube bundle debris