

Rocky Flats Plant

4-B96-ER-OPS-EMRG-03.02

REVISION 0

SURVEY REQUIREMENTS FOR CONDITIONAL AND UNRESTRICTED USE

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 DOE, Rocky Flats Office

Environmental Protection Agency Approval Required Yes No

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CONCURRENCE BY THE FOLLOWING DISCIPLINES WILL BE DOCUMENTED IN THE PROCEDURE HISTORY FILE:

- Radiological Engineering
- Facility Operations
- Environmental Restoration Records & Reporting

USE CATEGORY 3

ADMIN RECORD

ORC review not required

This procedure supersedes radiological guideline 3-21000-OPS-EMRG-3 2, Revision 0

Periodic review frequency 3 year from the effective date

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1. PURPOSE

This procedure establishes the survey, control, and documentation requirements for property/waste to be released from Radiologically Controlled Areas (RCA), Radiologically Uncontrolled Areas, and Radioactive Material Management Areas (RMMAs) on the Rocky Flats Plant (RFP) site

2. SCOPE

This Instruction specifies the radiological criteria to be used for both Conditional Release of property/waste on the RFP site and Release for Unrestricted Use of property/waste from the RFP site. The documentation requirements for radiological property control and movement are also addressed

This procedure is applicable to activities conducted by EG&G Environmental Restoration Management (ERM). The implementation of the specifics of this procedure is determined by the requirements in the applicable health and safety practices, work plan, treatability study or equivalent document, in addition to this procedure

This procedure implements the requirements of 1-16100-HSP-18 10

This procedure is a total rewrite of 1-21000-EMRG-03 02, Revision 0, and the change bars have been omitted

Appendix 6, Radiological Definitions, contains explanations of terminology and many of the acronyms used in this Environmental Management Radiological Guideline (EMRG)

3. LIMITATIONS AND PRECAUTIONS

3.1 Instrumentation

Transfer/release surveys shall be performed using the following instruments (or instruments as required by a Property/Waste Release Evaluation), or instruments of equal or greater sensitivity for the type of radiation being measured to ensure the required radiation detection sensitivity and measurement accuracy

- Total Fixed plus Removable Alpha Contamination - Bicron Frisk-Tech with A-100 detector
- Total Fixed plus Removable Beta-Gamma Contamination - Ludlum 31 with pancake probe, or Bicron Frisk-Tech with B-50 beta detector

3.1 Instrumentation (continued)

- Removable Alpha Contamination - Eberline SAC-4
- Removable Beta-Gamma Contamination - Eberline BC-4
- Gamma Exposure Rate - Victoreen 450G
- Neutron Exposure Rate - Ludlum 111 or Ludlum 2000
- Conditional Release Only - Total Fixed plus Removable Alpha Contamination - Ludlum Model 12-1A with air proportional probe, or equivalent
- Conditional Release Only - Total Fixed plus Removable Beta-Gamma Contamination - Ludlum Model 31 with GM pancake probe

Equivalent instruments may be used. The Health Physics Instrumentation Committee will determine if a given instrument is equivalent.

3.2 Radioactive Surface Contamination Limits for Unrestricted Release

Appendix 1, Radioactive Surface Contamination Limits for Unrestricted Release, contains a table of the radioactive surface contamination limits for unrestricted release. These limits are necessary to ensure compliance with DOE Order 5400.5, Radiation Protection of the Public and the Environment.

3.3 Radiation and Contamination Limits for Conditional Release/Onsite Transfer

Surface contamination limits for conditional/onsite transfer of radioactive waste or material containers, laundry bags, and sample containers are contained in Appendix 2, Radioactive Surface Contamination Limits for Conditional Release/Onsite Transfer.

Environmental and Waste Stream Residue and Identification Characteristics (WSRIC) sample containers shall be smeared for external contamination prior to shipment. The survey types shall be determined by Radiological Engineering (RE) and specified on a Property/Waste Release Evaluation (PRE).

Containers that emit gamma radiation will *indicate* direct beta-gamma contamination if a Geiger-Mueller detector is used (Ludlum Model 31). Health and Safety Officer or Radiological Engineer (RE) assistance may be required for evaluation of fixed beta/gamma contamination on containers that emit a gamma dose rate.

**3.3 Radiation and Contamination Limits for Conditional Release/Onsite Transfer
(continued)**

Radiation dose rate limits for waste and material containers are as follows

<u>Radiation</u>	<u>Contact</u>	<u>At One Meter</u>
GAMMA + NEUTRON	200 mRem/hr	10 mRem/hr

These limits are necessary to ensure compliance with DOT regulations cited in 49 CFR 173 441

3.4 RE Property/Waste Release Request

For any property/waste releases meeting the conditions noted below, RE must be consulted. If necessary, a PRE will be prepared in accordance with 4-16100-REP-1003, Radiological Evaluations for Unrestricted Release of Property/Waste

Evaluations shall be performed by RE on property/waste that

- Cannot be monitored using standard survey techniques described in this Instruction
- Is to be released offsite, has complex surfaces, and has been used in an RCA/RMMA/SCA/CA
- Has surface residues or sealants, such as oil, grease, mud, concrete, paint, which might mask the presence of contamination
- May not require a survey based on its history
- The HSS has referred to RE for evaluation
- Requires an evaluation for release or transfer
- Is a volume or bulk material, such as liquids and soils
- Originates from a building or area that is not on the current building lists for RMMAs and Non-RMMAs maintained by RE

4. PREREQUISITE ACTIONS

4.1 Planning and Coordination

Health and Safety Officer (HSO)

- [1] Assign at least one Health and Safety Specialist (HSS) to a job requiring a survey for either conditional or unrestricted use

More personnel may be assigned at the HSO's discretion, depending on the magnitude of the job

- [2] Schedule and supervise HSSs in the survey and control of property/waste in accordance to this procedure

Radiological Engineering (RE)

- [3] Establish alternate, nonroutine, and/or special methods to meet release criteria established by DOE
- [4] Perform property/waste release evaluations (PRE) when
 - Referred by the subcontractor
 - Items meeting the criteria of Section 3 4 will be released offsite from an RCA/RMMA/CA/SCA
 - Other circumstances require a PRE

Project Manager

- [5] Ensure that all personnel performing these procedures have the appropriate health and safety training as specified in the site-specific Health and Safety Plan
- [6] Ensure that personnel performing this procedure have documented training in implementing this procedure

Subcontractor's Project Manager

- [7] Document personnel qualifications related to this procedure in the subcontractor's project quality assurance (QA) files

4.2 Materials and Equipment

HSS

- [1] Obtain the following materials
 - Material Transfer - Unrestricted Release Tag (RF-47555) (as shown in Appendix 4)
 - Material Transfer - Conditional Release Only Tag (RF-47470) (as shown in Appendix 5)
 - Survey forms

- [2] Obtain the equipment necessary to complete any required surveys identified in Section 5.0 from the list below
 - Bicron Frisk-Tech Ratemeter Scaler with A-100 alpha detector
 - Ludlum Model 31 Count Rate Instrument with Geiger-Mueller (GM) pancake detector
 - Eberline SAC-4
 - Eberline BC-4
 - Victoreen 450G
 - Ludlum 111 or Ludlum 2000
 - Bicron Frisk-Tech Ratemeter with B-50 beta detector
 - Ludlum Model 12-1A Count Rate Meter with air proportional probe, or equivalent

5. INSTRUCTIONS—SAMPLE CONTAINERS AND PRESERVATIVE

NOTE *Definitions for terminology used in this procedure are included in Appendix 6*

5.1 Onsite Nonradioactive/Nonhazardous Property/Waste Transfer Procedure

HSS

[1] Conduct an onsite transfer in accordance with 1-16100-HSP-18 10, Section 2 3

[A] Establish if the property/waste meets the conditions of 1-16100-HSP-18 10, Section 2 3 for onsite transfers of nonradioactive, nonhazardous materials

[B] **IF** the property/waste does **NOT** meet the above conditions,
THEN go to Step 5 2 below

[C] **IF** the property/waste meets these conditions,
THEN transfer the property/waste onsite without

- A radiological survey
- PRE
- Documentation on Property/Waste Release Log in accordance with Appendix 3
- Any HSS/HSO signatures on the Material Transfer Tag (Appendix 4)

[D] **IF** the property/waste is nonradioactive and nonhazardous **AND** originates from an RFP onsite transfer list building/area (1-16100-HSP 18 10, Appendix 6),
THEN:

[a] Contact the sender and notify them that no further action by the HSS/HSO is required

[b] If needed, transfer the property/waste onsite by the originator completing sections A, B, and F of the Material Transfer Tag (as shown in Appendix 4) (Exception Hand-carried items that meet the criteria generally need no Material Transfer Tag for onsite transfer)

5.2 Initial Property/Waste Release Evaluation

HSS

- [1] Visually inspect the property/waste and ask the sender for the specific history of the property
- [2] Document the history on the Property/Waste Release Log (Appendix 3), or ask the sender to document the history on the Property/Waste Release Log (Appendix 3)
- [3] **IF** the property/waste meets any of the criteria in Sections 3 4,
THEN refer the property/waste release to RE and notify the property sender/custodian that RE assistance is required
- [4] **IF** the property/waste does **NOT** meet the criteria in Section 3 4,
THEN go to Section 5 3

5.3 Non-RMMA Transfers/Release

NOTE *A radiological survey may not be required for either an onsite transfer or an offsite transfer/release based on the item's history and radiological evaluation*

HSS

- [1] **IF** the material is being transferred from a Non-RMMA building or area (listed in HSP 18 10 Appendix 2), and does not require any radiological surveys,
THEN
 - [A] Sign the Exempted Property Transfer Approval, Section "C" of the Material Transfer Tag's (specifically RF-47555) center white portion authorizing the property/waste release (Appendix 4)
 - [B] Fill in the appropriate information on the Property/Waste Release Log (Appendix 3)

5.4 RMMA Transfer/Release

HSS

- [1] **IF** the material is being transferred from an RMMA building or area (listed in HSP 18 10, Appendix 1),
THEN perform a detailed representative radiological survey for alpha **AND/OR** beta/gamma for either an onsite transfer or an offsite transfer/release.

- [2] Miscellaneous hand-carried item(s) routinely taken into the RCA (such as clipboards, pagers, rings, TLDs, glasses, radios, paperwork, and security weapons) are subject to the same controls as personnel monitoring (in accordance with HSP 18 02)

Recording all hand-carried item(s) on the Property/Waste Release Log (Appendix 3) is not required

5.5 Surveyed Property/Waste Release

HSS

- [1] **WHEN** surveys are completed,
THEN document on the Property/Waste Release Log (Appendix 3) and on a contamination survey form in accordance with EMRG 3 1

- [2] **IF** the survey results are below the limits listed in Appendix 1,
THEN sign Section D, Surveyed Property Release Approval, of the Material Transfer Tag (RF-47555) (Appendix 4)

- [3] Record the item control number from the Property/Waste Release Log (Appendix 3) in the space provided on the Material Transfer Tag (RF-47555)

- [4] **IF** the surveys are required by a PRE
AND they meet the release criteria of the PRE,
THEN ensure that an RE signs Section E, Evaluated Property Release Approval, of the Material Transfer Tag (RF-47555)

- [5] **IF** the survey results are above the limits listed in Appendix 1,
THEN perform the following
 - [A] Notify HSO, RE, and the sender of the results, and document in accordance with EMRG 3 1

5.5 Surveyed Property/Waste Release (continued)

HSS (continued)

- [B] Temporarily isolate and post the item, and/or perform decontamination.

- [C] Save for further analysis any smears found to be above the limits listed in Appendix 1 or 2

5.6 Conditional Property/Waste Release/Transfer

HSS

- [1] **IF** the property/waste is being conditionally released or transferred onsite,
THEN contact the HSS/HSO

- [2] **WHEN** the HSS/HSO have been contacted,
THEN perform an Initial Property Release Evaluation (IPRE).
 - [A] Visually inspect the property

 - [B] Ask the sender for the specific history of the property

 - [C] Fill in the information on the Property/Waste Release Log

- [3] Perform one of the following, using the instrumentation required in Section 3 1
 - A detailed representative survey
 - A representative survey
 - A random survey
 - Other surveys as appropriate

HSO/HSS

- [4] **IF** the survey demonstrates the property exterior surfaces are below the surface contamination limits contained in Appendix 2, Radioactive Surface Contamination Limits for Conditional Release/Onsite Transfer,
THEN complete the *Material Transfer - Conditional Release Only* tag (RF-47470) as follows
 - [A] Complete Radiological Hazards, Section E, on the reverse side of the tag and sign where indicated

5.6 Conditional Property/Waste Release/Transfer (continued)

HSO/HSS (continued)

- [B] Complete Radiological Controls, Section F, on the reverse side of the tag (RF-47470)
 - [C] Complete sections A and D and sign Section D, indicating that the item is approved for controlled transfer
 - [D] Complete entering all information on the Property/Waste Release Log, as noted in Section 5.8
- [5] IF the survey demonstrates that the property exterior surface contamination exceeds the limits listed in Appendix 2,
THEN contain the item in accordance with the following guidance
- [A] IF the items have sharp edges or projections,
THEN apply tape to these edges or projections
 - [B] IF additional protection is required to ensure package integrity,
THEN wrap the items in plastic or place in a container
 - [C] IF the items have removable or potentially removable contamination levels in excess of 100 times Appendix 2 limits,
THEN apply additional packaging controls such as double wrapping
OR the use of plastic bags inside containers
- [6] IF the contamination levels exceed 100 times the limits listed in Appendix 2,
THEN obtain RE concurrence on containment adequacy and RE approval signature in Section G
- [7] IF an item(s) with confirmed or suspected of having contamination levels greater than Appendix 2 are being transferred outside buildings,
THEN make the transfer in accordance with requirements stated in the On-Site Transportation Manual

Hand carrying is allowed for certain items, provided they are tagged, labeled, and contained in accordance with the requirements in the On-Site Transportation Manual

5.7 Laundry and Personnel Protective Equipment

HSS

- [1] Survey soiled protective clothing and respirators in accordance with EMRG 2.1 and EMRG 3 1
- [2] **IF** the clothing or respirator meets the requirements in Section 3 3,
THEN transfer the item conditionally to the laundry,
OR stored items in a laundry bag until full
- [3] **WHEN** the laundry bags are full,
THEN survey only the exterior surfaces of the laundry bags for Total (Fixed + Removable) and Removable contamination
- [4] **IF** laundry bags meet the limits contained in Appendix 2,
THEN complete the *Material Transfer - Conditional Release Only* tag (RF-47470) and allow transfer
- [5] Handle used disposable Personnel Protective Equipment (PPE) in accordance with 5-21000-OPS-FO 06, Handling of Personnel Protective Equipment

5.8 Documentation of Release Evaluations/Surveys

NOTE *Subcontractors are required to maintain a separate Property/Waste Release Log (Appendix 3) specific to each project*

HSS

- [1] Assign item control numbers to each item evaluated/surveyed for release, except Radioactive Waste and Material containers as specified below
 - Item control numbers are a 12-digit numeral, sequentially assigned by Building/Area/Individual Hazardous Substance Site (IHSS)/Operable Unit (OU) and year
 - The first five digits denote the Building/Area/IHSS/OU from which the property/waste is being transferred
 - The sixth and seventh digits denote the year of the survey
 - The last five numbers are the sequential numbers by item for the specific project
 - Each number group is separated by a dash (-)

5.8 Documentation of Release Evaluations/Surveys (continued)

- [2] Make an entry for each item of property/waste that is evaluated/surveyed for release or transfer in accordance with this Instruction, onto the Property/Waste Release Log (Appendix 3)
- [3] Complete (or have the Sender complete) the property/waste description, user name, destination, and recipient name on Property/Waste Release Log (Appendix 3)
- [4] Enter the history of the property/waste (for example, RCA, non-RCA, or unknown) onto the Property/Waste Release Log (Appendix 3)
 - [A] Also include specific locations or areas in this column
- [5] Indicate if the results of the evaluation/survey performed on the property/waste meet the appropriate criteria onto the Property/Waste Release Log (Appendix 3)
- [6] Indicate the type of release that is approved for the property/waste (for example, *CR*, *UR*, or not approved) onto the Property/Waste Release Log (Appendix 3)
- [7] Enter the instruments used, the identification numbers, and the backgrounds at the bottom of the Property/Waste Release Log
 - [A] Indicate for each entry on the release log which instruments are used for that particular survey
- [8] Sign the Property/Waste Release Log (Appendix 3) and enter HSS identification number, the date, and the time

6. POST-PERFORMANCE ACTIVITY

HSS, HSO, and RE

- [1] Maintain records, excluding labels and tags which must remain with items for release, generated during the performance of this Instruction in accordance with 4-11000-OPS-FO 02, Transmittal of Field QA Records, or 3-11000-ER-ADM-17 01, Quality Assurance Records Management.

7. REFERENCES

DOE Order 5400 5, Radiation Protection of the Public and the Environment

DOE Order 5480 11, Radiation Protection for Occupational Workers

DOE N 5480 6, U S DOE Radiological Control Manual

Environmental Restoration Inter-Agency Agreement

On-Site Transportation Manual

Rocky Flats Policy 13-3, Property Removal Permit

EMRG 1 1, Gamma Radiation Surveys

EMRG 3 1, Performance of Surface Contamination Surveys

**EMRG 6 01, Performance Test and Operational Checks for Ludlum Models 12-1A and 31
Survey Instruments**

EMRG 6 05, Use of the Bicron Frisk-Tech with the A-100 and B-50 Detectors

1-16100-HSP-18 10, Release of Property/Waste for Conditional and for Unrestricted Use

3-11000-ER-ADM-17 01, Quality Assurance Records Management

4-11000-OPS-FO 02, Transmittal of Field QA Records

4-16100-REP-1003, Radiological Evaluation for Unrestricted Release of Property/Waste

4-16100-REP-1108, Radiological Evaluation of Areas, Rooms, and Buildings

APPENDIX 1

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**RADIOACTIVE SURFACE CONTAMINATION LIMITS
 FOR UNRESTRICTED RELEASE ⁽⁷⁾**

Radionuclides ⁽²⁾	Average Total ^(3,4) (Fixed + Removable) (dpm/100 cm ²) ⁽¹⁾	Maximum Total ^(4,5) (Fixed + Removable) (dpm/100 cm ²) ⁽¹⁾	Removable ^(4,6) (dpm/100cm ²) ⁽¹⁾
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	100 ⁽⁸⁾	300	20
Th-Natural, Sr-90, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay product, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous Fission) except Sr-90 and others noted above ⁽⁷⁾	5,000	15,000	1,000

APPENDIX 1

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Notes

- 1) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- 2) Where surface contamination by both alpha and beta-gamma emitting radionuclides exists, the limits established for alpha and beta-gamma-emitting radionuclides should apply independently
- 3) Measurements of average contamination should not be averaged over an area of more than 1 m². For objects of less surface area, the average should be derived for each object
- 4) The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h respectively, at 1 cm
- 5) The maximum contamination level applies to an area of not more than 100 cm²
- 6) The amount of removable material per 100 cm² of surface area should be determined by wiping an area of that size with a dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

APPENDIX 1

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- 7) This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from other fission products or mixtures where the Sr-90 has been enriched.
- 8) Average total alpha is obtained by dividing the sums of dpm/100cm² of all 1-minute counts by "N", the number of 1-minute readings taken. If all of the 1-minute readings were less than 100 dpm/100 cm², then averaging is not required.
- 9) These limits are promulgated by DOE 5400.5, Table IV-1, and NRC Regulatory Guide 1.86. In certain cases, the limits established for unrestricted release are above the conditional release limits in Appendix 2. However, it should be understood that the limits in Appendix 1 are upper limits, and to which the ALARA process is also applied prior to the unrestricted release of any item.

APPENDIX 2

Page 1 of 1

**RADIOACTIVE SURFACE CONTAMINATION LIMITS FOR CONDITIONAL
 RELEASE/ONSITE TRANSFER**

Radioactivity Type	Removable dpm/100 cm ²	Total (Fixed + Removable) dpm/100 cm ² ⁽¹⁾
Transuranic Alpha	20	833 ⁽²⁾
Uranium Alpha	1,000 Alpha	5,000 Alpha
Tritium (HT and HTO)	10,000	10,000
Beta Gamma Emitters	1,000 Beta Gamma	1894 ⁽³⁾ Beta Gamma

Notes (1) This table does not reference the "Maximum Total (Fixed + Removable)" as in Appendix 1 The Radiological Control Manual (from which this table originates) does not give limits for "Maximum Total (Fixed + Removable) " For controlled transfers onsite, the item must meet the limits in this table or be approximately contained For unrestricted releases, the limits of Appendix 1 apply, and these limits allow for some small areas (≤ 100 cm²) to have a Maximum Total (Fixed + Removable) for U-Natural, U-235, U-238, etc , and other beta emitters as listed in the appendix up to 15,000 dpm/100 cm², as long as the average does not exceed 5,000 dpm/100 cm²

(2) 250 counts per minute (cpm) with a Ludlum 12-1A is approximately equal to 833 dpm/100 cm² total alpha {250 cpm X 100} - {0.5 Geometry & Efficiency Factor X 60 cm² Active Probe Area} = 833 dpm/100 cm² Use 250 cpm for the conditional release limit pending full implementation of DOE Radcon Manual

(3) Radioactive material containers which emit gamma radiation will give false indications of beta-gamma contamination using a GM detector 100 cpm above background (cpm) with a Ludlum Model 31 Count Rate Meter and a pancake GM probe is approximately equal to 1894 dpm/100 cm² {100 cpm X 100} - {0.33 Geometry & Efficiency Factor X 16 cm² Active Probe Area} = 1894 dpm/100 cm²

APPENDIX 4

Page 1 of 1

MATERIAL TRANSFER - UNRESTRICTED RELEASE TAG (RF-47555)

Material Transfer
PLEASE PRINT UNLESS SIGNATURE INDICATED

ITEM(S) _____
TRANSFER TO _____
Quantity & Description
NAME
Organization Bldg. & Room Extension

TRANSFER FROM _____
NAME
Organization Bldg. & Room Extension

PRECAUTIONS related to transporting the item(s) described above
 NONE YES (describe below)

EXEMPTED PROPERTY TRANSFER APPROVAL
 The above described item(s) is exempt from
radiological survey in accordance with HSP 18 10
Authorized Signature _____ Employee # _____ Date _____

SURVEYED PROPERTY RELEASE APPROVAL
 The above described item(s) has been surveyed
in accordance with 101-202 and was approved for
unrestricted release.
RPT Signature _____ Employee # _____ Date _____
Item No. (from Survey Record) _____

EVALUATED PROPERTY RELEASE APPROVAL
 The above described item(s) has been evaluated
in accordance with RE-1003 and was approved for
unrestricted release.
Radiological Engineer _____ Employee # _____ Date _____

Full Signature of Sender _____ Employee # _____
Extension _____ Building _____ Date _____

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APPENDIX 5

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MATERIAL TRANSFER - CONDITIONAL RELEASE TAG (RF-47470)

MATERIAL TRANSFER
CONDITIONAL RELEASE ONLY

ITEM(S) _____

Quantity and Description _____

TRANSFER

Name _____

Organization _____ **Building & Room** _____ **Extension** _____

TRANSFER FROM

Name _____

Organization _____ **Building & Room** _____ **Extension** _____

The above described item(s) was approved for noncontrolled transfer on the Rocky Flats Plant site only, in accordance with HSP 18 10

Approval Signature of Radiation Protection _____ Employee _____ Date _____

NOTE. Recipient May Remove Tag Upon Receipt.

The above described item(s) was approved for controlled transfer on the Rocky Flats Plant site only in accord with HSP 18 10

Approval Signature of Radiation Protection _____ Employee _____ Date _____

RADIOLOGICAL HAZARDS
AND
 RADIOLOGICAL CONTROLS

are listed on the reverse of this tag

Maintaining Control of the Above Described Item(s) is the Responsibility of the Custodian.

Signature of Custodian _____ Employee _____ Date _____

RF-47470 (Rev 9/91) Supersedes Previous Issue

A {
B {
C {
D {

APPENDIX 5

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RADIOLOGICAL HAZARDS

Survey Record Item No _____

Removable Contamination α _____ dpm/100 cm²
 β - γ _____ dpm/100 cm²

Fixed & Removable Contamination α _____ dpm/100 cm²
 β - γ _____ dpm/100 cm²

Gamma Dose Rate @ 30 cm _____ mR/hr
Neutron Dose Rate @ 30 cm _____ mrem/hr

RPT _____ Employee# _____ Date _____

RADIOLOGICAL CONTROLS

Controlled Use in RCA (HSP 18 10)

Control Procedure Accepted (HSP 18 10)
Procedure No _____

Daily Survey Required (ROI 3 02)

Transfer Between Radiological Areas (HSP 18 10)

Containment Accepted (HSP 18 10)

Controlled Unable to Survey (HSP 18 10)

Containment Accepted (HSP 18 10)

Control Procedure Accepted (HSP 18 10)
Procedure No _____

Daily Survey Required (ROI 3 02)

Radiological Engineering Concurrence

Radiological Engineer Signature _____ Employee# _____ Date _____

Comments _____

E {

F {

G {

APPENDIX 6

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RADIOLOGICAL DEFINITIONS

- 1 **Conditional Release** - The controlled transfer of property/waste from a Radiologically Controlled Area (RCA) through uncontrolled areas

- 2 **Contamination** - Deposition or presence of unwanted/undesirable radioactive material on the surfaces of structures, areas, objects, or personnel. Radioactive material (contamination) can also be contained within the matrix of a material (i.e., liquids, soils), or within activated materials

- 3 **Contamination Area (CA)** - Areas which have, or could cause, surface contamination > 1 but ≤ 100 times the DOE N 5480 6 Table 2-2 values

- 4 **High Contamination Area (HCA)** - Areas which have, or could cause, surface contamination > 100 times the DOE N 5480 6 Table 2-2 values

- 5 **Detailed Representative Survey** - Is a radiological survey performed on property/waste that has a real possibility of contact with unconfined or unencapsulated radioactive materials. This is defined as a survey for both removable and fixed radioactive contamination. For an item of 4 m² surface area, this would require approximately 10-30 smears and a combination of a direct frisk and/or PAT surveys over the accessible surfaces. *For unrestricted release only*, as a minimum, required PAT surveys for total alpha would include at least six 1-minute PATS and approximately ten 6 second PATS. The average of the six 1-minute PATS must be less than 100 dpm/100 cm², and all 6-second PATS must be less than 300 dpm/100 cm² to meet Appendix 1 criteria for average total and maximum total transuranic alpha. If the item has inaccessible surfaces that have some possibility of contact with unconfined or unencapsulated radioactive materials, the Health and Safety Specialist (HSS) shall refer the Release/Transfer to RE

- 6 **Exempted Property Transfer** - An unrestricted transfer/release of property/waste from a Non-Radioactive Material Management Area (Non-RMMA) to anywhere onsite or offsite. This is performed by Radiological Engineering supervision or a Radiological Engineering in accordance with Section 5.3 of this Instruction (and Section 5.1.2 of 1-16100-HSP-18.10). This is not an on-site transfer performed in accordance with Section 5.1 of this Instruction

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- 7 **Inaccessible Surfaces** - Surfaces that are not accessible for measurement using standard survey techniques
- 8 **Initial Property/Waste Release Evaluation** - Initial evaluation performed by a HSS when an individual or their respective subcontractor firm requests property/waste to be transferred or released
- 9 **Material Transfer Tag (RF-47555)** - Denotes approval for the unrestricted release of property/waste from anywhere on-site without restriction on future movement or disposal (see Appendix 4 of HSP 18 10 for flow diagram)
- 10 **Material Transfer - Conditional Release Only Tag (RF-47470)** - Denotes approval for the conditional transfer of property/waste, which is contaminated or potentially contaminated, from an RCA The Conditional Release Tag specifies requirements for handling, use, storage, etc , as well as the type and degree of radioactive hazard and safety requirements, as appropriate (see Appendix 5 of HSP 18 10 for flow diagram) This tag is only to be used for radioactive or potentially radioactive material Non-radioactive material is transferred using a Material Transfer Tag (RF-47555)
- 11 **Offsite** - Buildings or areas that do not meet the definition of "Onsite", e g McIntyre Facility, Denver West, etc.
- 12 **Onsite** - As defined by the Onsite Transportation Manual, "Onsite" is all buildings or areas between Guard Post 920 on the East Access Road (off Indiana Avenue) and Guard Post 120 on the West Access Road (off Colorado Highway 93) Buildings 250, 060, 061, and the Buffer Zone are also considered onsite per the Onsite Transportation Manual Property destined for Property Utilization and Disposal (PU&D) is handled as an offsite release per this Instruction The terms "onsite" and "within the Rocky Flats Plant Boundary" are synonymously used in this practice
- 13 **Property** - All items, materials, instrumentation, and equipment which are government, Company, or subcontractor owned, leased, or operated, and are used or have been used within the Rocky Flats Plant boundary Property, as customarily defined, does not include administrative materials such as pens, papers, notebooks, etc See Appendix 3, 1-16100-HSP-18 10 for specific exclusions to this definition

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- 14 **Radioactive Material Management Area (RMMA)** - A RMMA is an area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material, or beams of radiation that could cause activation of property. RMMA's are areas where waste and property is controlled as radioactive until proven otherwise. Implicitly, all CAs, SCAs, and HCAs are also RMMA's. RMMA's will be classified by Radiological Engineering in accordance with 4-16100-REP-1108 "Radiological Evaluation of Areas, Rooms, and Buildings". RE maintains the current lists of RMMA's and Non-RMMA's, an initial list of RMMA's and Non-RMMA's is given in Appendixes 1 and 2 of 1-16100-HSP-18 10. Radiological Areas or RCAs as defined below are not necessarily RMMA's.
- 15 **Radiological Area** - Any area within a RCA where an individual can receive a dose equivalent greater than 5 mrem in 1 hour at 30 cm from the radiation source or from any surface through which the radiation penetrates, or where airborne radioactive material concentrations greater than 1/10 of the derived air concentrations are present (or are likely to be), or where surface contamination levels greater than those specified in Appendix 1 are present.
- 16 **Radiologically Controlled Area (RCA)** - Any area to which access is controlled in order to protect individuals from exposure to radiation and/or radioactive materials. The RCA is normally a transition area between the RA and an uncontrolled area. The boundary of the RCA and RA can be the same, and in this case the controls and requirements for the RA shall apply. RCAs are established to control personnel access to occupational radiological hazards.
- 17 **Random Survey** - Is a radiological survey performed on property/waste that has very little or no possibility of contact with unconfined or unencapsulated radioactive materials. This is defined as a survey for both removable and fixed radioactive contamination. For an item of 4 m² surface area, this would require approximately 3-6 smears and a combination of a direct frisk and/or PAT surveys over the suspect areas. *For unrestricted release only*, as a minimum, required PAT surveys for total alpha would include at least two 1-minute PATS and approximately four 6-second PATS. The average of the two 1-minute PATS must be less than 100 dpm/100 cm², and all 6-second PATS must be less than 300 dpm/100 cm² to meet Appendix 1 criteria for average total and maximum total transuranic alpha.

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- 18 **RE Property/Waste Release Evaluation** - Evaluation performed by Radiological Engineering (RE) on property/waste that cannot be monitored using standard survey techniques required by this Instruction or may not require a survey based on its history (see Section 3.4, Limitations and Precautions, for further details)
- 19 **Representative Survey** - A radiological survey performed on property/waste that has little possibility of contact with unconfined or unencapsulated radioactive materials. This is defined as a survey for both removable and fixed radioactive contamination. For an item of 4 m² surface area, this would require approximately 5-15 smears and a combination of a direct frisk and/or PAT surveys over the suspect areas. *For unrestricted release only*, as a minimum, the required PAT surveys for total alpha would include at least three 1-minute PATS and approximately six 6-second PATS. The average of the three 1-minute PATS must be less than 100 dpm/100 cm², and all 6-second PATS must be less than 300 dpm/100 cm² to meet Appendix 1 criteria for average total and maximum total transuranic alpha.
- 20 **Radiologically Uncontrolled Area or Non-RCA** - Any area that does not meet the definition of an RCA.
- 21 **Soil Contamination Area (SCA)** - Contaminated soil not releasable in accordance with DOE Order 5400.5 and any area determined to be contaminated or suspected to have been contaminated due to past activities.
- 22 **Unrestricted Release** - Release of property/waste from anywhere within the Plant Boundary without restriction on future movement or disposal, in accordance with guidelines and requirements of DOE Order 5400.5, the DOE Radiological Control Manual, and this practice.
- 23 **Waste** - Waste is any material that meets the definition of a "solid waste" in accordance with 40 CFR 261, or any material (regulated or unregulated) that is destined for a landfill, off-site disposal or treatment prior to disposal. Contact Waste Area Engineering for determination of a "Waste" as necessary.

U S DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE

RF REVIEW COMMENT RECORD		Page <u>1</u> of <u>1</u>
<p>2 Document Reviewed (Title, Number, Revision and Date) "Survey Requirements for Conditional and Unrestricted Use" Procedure # 4 B96-ER-OPS-EMRG-03 02 Revision 0 ERM Effective date TBD (9/8/93)</p>	<p>3 Reviewer Signature and Date <u>D. George</u> <u>11/14/93</u> Organization <u>D George DOE-ERD (BOR)</u> Location and Phone No <u>Bld T117</u> <u>966-5669</u></p>	<p>4 Agreement with dispositions Date _____ Reviewer _____ Document Preparer _____</p>
<p>5 Comment No</p>	<p>6 Comment Type</p>	<p>7 Comments (include suggested changes)</p>
1	S	See attached
2	S	See attached
3	S	Done
4	S	Done
5	S	Done
6	S	Done
		8 Disposition

Comment Type

E—Essential comment (agreement must be documented for other than verbatim incorporation) S—Suggested comment NON-C—Nonconformance, based upon the following comment

Comments submitted by the Department of Energy/Rocky Flats Office to Procedure # 4-B96-ER-OPS-EMRG-03.02, "Survey Requirements for Conditional and Unrestricted Release".

Response submitted by Keith D. Anderson, Environmental Operations Management, Subject Matter Expert

Comment No. 1: It appears that this procedure may already be incorporated into existing RFP procedures. Why are we rewriting new procedures instead of using existing plant procedures?

Response: The Environmental Restoration Management Radiological Guidelines (EMRG) Manual is provided for subcontractors performing multi-task health and safety monitoring for their employees. These procedures ensure that consistent radiological monitoring requirements are communicated to subcontractors. The subcontractor Health and Safety personnel do not provide monitoring services to EG&G personnel.

Comment No. 2: Page 5, 5th paragraph. If this is a rewrite of the existing procedure, why is this still revision #1, even though the nomenclature is slightly different?

Response: According the EG&G Procedure Performance Group (PPG), a complete revision and reformat of a procedure requires new procedure numbers and is designated revision 0.

Comment No 3 Page 5, last paragraph, Spell out EMRG the first done.

Response: EMRG will be spelled out the first time.

Comment No. 4 Page 7, 3rd paragraph, Spell out RE the first time.

Response. RE will be spelled out the first time.

Comment No. 5 Appendix 4 and 5, Provide better copies of the Material Transfer Tags.

Response: Efforts will be made to obtain best available copy.

Comment No. 6 Include the new signature cover sheet (Optional).

Response: The revised comment sheet will be added to the cover page.