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Division of Fuel Cycle Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555

**DECOMMISSIONING SURVEY REPORT FOR PPL'S
FORMER CORPORATE DOSIMETRY
LABORATORY LOCATION
PLA-5774**

The purpose of this letter is to transmit for NRC review and concurrence the Decommissioning Survey Report for the former PPL Corporate Dosimetry Laboratory at 13-21 North Tenth Street, Allentown, Pennsylvania so that this facility can be released for unrestricted use. This report was developed to comply with guidelines in the document titled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993. The former Corporate Dosimetry Laboratory will be released for unrestricted use on August 1, 2004.

If you any questions, please contact Mr. Stephen Ingram at (570) 542-3245.

Sincerely,

B. L. Shriver

Enclosure: Decommissioning Survey for CERML and Associated Facilities
Attachment 1 to Enclosure: CERML Radioactive Materials List
Attachment 2 to Enclosure: Contamination Survey Levels

cc: NRC Region I
Mr. A. J. Blamey, NRC Sr. Resident Inspector
Mr. R. V. Guzman, NRC Project Manager
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U. S. Nuclear Regulatory Commission
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DECOMMISSIONING SURVEY FOR CERML AND ASSOCIATED FACILITIES

Purpose

To demonstrate compliance with NRC, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material, April 1993.

Scope

This survey includes the CERML Lab (CL), adjacent storage room (CSR), waste storage closet (CWC) and TLD irradiator room (ISR). The survey included alpha, beta and gamma surveys for removable and fixed contamination and general area beta and gamma dose rate surveys.

Background

The CERML Lab (Corporate Environmental Radiation Monitoring Lab) and the PPL Dosimetry Lab were located on the third floor of PPL's corporate Annex 9 (address: 13 - 21 North Tenth Street, Allentown, PA). This facility was used for approximately 10 years.

The CERML Lab was used to perform measurements of environmental samples including samples spiked with radioisotopes. These measurements included gamma spectroscopy, liquid scintillation counting and gas flow proportional counting. The spiked samples, typically in pico-Curie/l quantities, were handled minimally. Many of the samples came in stabilized media and were analyzed in the sample containers in which they were received (e.g., marinelli beakers, plated on planchettes). Some of the liquid samples were decanted into other containers for analysis. All handling and analysis was performed in the CERML Lab. Three other rooms were used only for storage of samples. After completion of analysis the spiked samples and any non-spiked environmental samples with levels of radioactive material detectable above normal environmental levels were also stored for later disposal.

The CERML Lab ceased operation in the fall of 2002. The remaining byproduct material was packaged for shipping in April and shipped in May 2004.

The Dosimetry Lab was used for TLD processing and had one Cs-137 ~ 2 Ci sealed source in a TLD irradiator. The irradiator was relocated in March 2004 to a new facility. During relocation the source was temporarily removed from its shield. The inside of the shield was leak tested before relocation and was found to have < 0.005 uCi of residual contamination.

Remaining PPL personnel and equipment are scheduled to be removed from the building by the end of June 2004 with turn over of the building to the owner in the summer of 2004. (All remaining personnel are non-nuclear and no work with radioactive materials has been conducted since the Dosimetry Lab and CERML labs were relocated [March 2004] and/or decommissioned [May 2004]).

Radioactive Source Material

A listing of the radioactive material present at the time the CERML Lab ceased operation has been included as Attachment 1. The spiked samples were acquired from 2000 to 2002. The sources, primarily calibration and check sources, had been acquired over the life of the facility. Only two alpha emitters were present with a total activity of less than 1 uCi.

Equipment/Supplies

Alpha Contamination Survey Meter:

Fixed, ASP-1 with AC3 alpha probe (Inst. # HP-387A Cal. Due Date 8/10/2004)

Removable, Alpha counting of smears

Beta / Gamma Contamination Survey Meter:

Fixed, Ludlum-3 with frisker probe (Inst. # HP-2677 Cal. Due Date 1/13/2005)

Removable, beta / gamma counting of smears

Beta Gamma Dose Rate Survey Meter:

Ludlum-3 with frisker probe (Inst. # HP-2677 Cal. Due Date 1/13/2005)

Fixed, dose rate survey

Will assume detectable activity is all from gamma ~3600 cpm/mrad/hr (Note: This is a conservative assumption since the beta efficiency for the detector is significantly higher than the gamma efficiency). If any activity above background is detected additional surveys will be conducted with a uR meter.

Smears

Container for smears (small zip bags)

Masslin

Area Preparation

1. Mark out all surfaces to be surveyed in grids of not more than 1m².
2. Assign grid numbers.
3. Masslin all areas to remove any loose contamination.
4. Shutdown and de-energize CERML HVAC.

Survey

1. Smear survey each grid section, identifying each smear with a corresponding grid #. Include a background survey for reference.
2. Count smears with frisker probe for beta and gamma contamination and record in corresponding section of survey data sheet. (Note: Retain smears for later alpha evaluation).
3. Alpha contamination survey each grid section entering the average and maximum readings on the survey data sheet.
4. Beta and gamma contamination survey each grid section entering the average and maximum readings on the survey data sheet.
5. Beta and gamma dose rate survey each grid section using frisker.
6. Divide frisker cpm by 3600 cpm/mrad/hr to get dose rate and record as maximum and average on survey data form.

Post Survey Evaluation

1. Alpha count smears for Am-241 to determine DPM quantities and record on survey data form.
2. Evaluate all survey results against NRC standard, document and submit results to NRC for approval to decommission facility.

Results

A summary of survey results have been included as Attachment 2

Analysis

Alpha

One transuranic (Am-241) was included in the source inventory

Fixed Contamination Level:

Instrument AC3

Probe area = 70 cm^2

Detector efficiency = 15%

Background = 5 cpm

Activity assuming background equals activity = $48 \text{ dpm}/100 \text{ cm}^2$

If we conservatively assume background is detectable activity $48 \text{ dpm}/100 \text{ cm}^2$ is less than half of the acceptable surface contamination level for alpha.

Removable Contamination Level:

Alpha counting instrument performance check:

Date: 5/6/2004

Instrument Type: Ludlum - L2000 Number: HP-L200-002

LLD = 6 dpm (additional supporting data available on request)

Detectable activity levels (LLD) are well below those required to demonstrate compliance with NRC limits.

Beta/Gamma

Fixed Contamination Level:

Instrument Ludlum 3 with frisker probe

Probe area = 20 cm^2

Detector efficiency = 10%

Background = 30 cpm

Activity assuming background equals activity = $1500 \text{ dpm}/100 \text{ cm}^2$

Removable Contamination Level:

Beta counting instrument performance check:

Date: 5/6/04

Instrument Type: BC4 Number: BC4/0005

LLD = 43 dpm (additional supporting data available on request)

Detectable activity levels (LLD) are well below those required to demonstrate compliance with NRC limits.

Evaluation and Recommendations

All measurements demonstrated compliance with limits in Guidelines for Decontamination of Facilities and Equipment Prior to release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material, April 1993

Table 1. With the concurrence of the NRC it is recommended that this facility be released for unrestricted use.

Report Prepared By:

Stephen Ingram
Radiation Safety Officer

CERML Radioactive Materials (Accumulated Since 2000)
Packaged for Disposal April 2004

SPIKED SAMPLES

<u>SOLIDS</u>	<u>Activity (uCi)</u>	<u>LIQUIDS</u>	<u>Activity (uCi)</u>	<u>Combined activity (uCi)</u>
Ce-141	1.36E-04	Ce-141	2.03E-07	1.36E-04
Co-58	1.18E-01	Co-58	7.07E-05	1.18E-01
Co-60	1.04E+03	Co-60	5.41E-02	1.04E+03
Cr-51	4.75E-05	Cr-51	1.77E-07	4.76E-05
Cs-134	5.12E+01	Cs-134	1.91E-02	5.12E+01
Cs-137	4.95E+02	Cs-137	6.40E-02	4.95E+02
Fe-59	4.51E-03	Fe-59	5.74E-06	4.52E-03
Mn-54	2.21E+01	Mn-54	8.92E-03	2.21E+01
Zn-65	2.21E+01	Zn-65	7.67E-03	2.21E+01
Eu-152	1.09E+02			1.09E+02
Am-241	5.68E-03			5.68E-03
Pb-210	1.05E-01			1.05E-01
Cd-109	1.87E+00			1.87E+00
Co-57	5.14E-04			5.14E-04
Ce-139	1.87E-08			1.87E-08
Hg-203	2.43E-27			2.43E-27
Sn-113	3.04E-10			3.04E-10
Y-88	9.45E-11			9.45E-11
Ba-133	2.60E-01			2.60E-01
<u>Total Activity</u>				1.74E+03

SOURCES

<u>FORM</u>	<u>Nuclide</u>	<u>Activity (uCi)</u>
Button Source	Eu-152	0.93
Button Source	Eu-152	0.93
Button Source	Co-60	0.13
Button Source	Ba-133	0.18
Button Source	Eu-152	0.91
Pipe Source	Eu-152	4.03
Plated Source	Cs-137	0.02

Total Activity **7.13**

CONTAMINATION SURVEY LEVELS

RADIATION		FIXED CONTAMINATION ¹	REMOVABLE CONTAMINATION ²	DOSE RATE SURVEY
Transuramics (alpha)	Actual	< 48 dpm/100 cm ²	< 6 dpm/100 cm ²	n/a
	Limit	100 dpm/100 cm ²	20 dpm/100 cm ²	n/a
BETA / GAMMA	Actual	< 1500 dpm/100 cm ²	< 43 dpm/100 cm ²	< 0.01 mrad/hr
	Limit	5000 dpm/100 cm ²	1000 dpm/100 cm ²	0.20 mrad/hr

NOTES:

1. Fixed contamination - No grid was found to have maximum levels of fixed contamination above background.
Alpha background = 48 dpm/100cm²
Beta / Gamma background = 1500 dpm/100 cm²
2. Removable contamination - No grid was found to have removable contamination detectable above LLD.
Alpha LLD = 6 dpm/100 cm²
Beta / Gamma LLD = 43 dpm/100 cm²
3. Dose rate survey - No grid was found to have a dose rate above 0.01 mrad/hr.

A total of 101 grids were surveyed in 4 rooms. In addition to floor areas the survey included counter tops, shelves and the Lab HVAC system.