

**Reference Document(s):**

1. "Final Decontamination and Radiological Survey of Building T029"; Rockwell International, Rocketdyne doc. number N704SRR990029.
2. Letter to Ed Bailey July 6, 1995.

**Survey Personnel:**

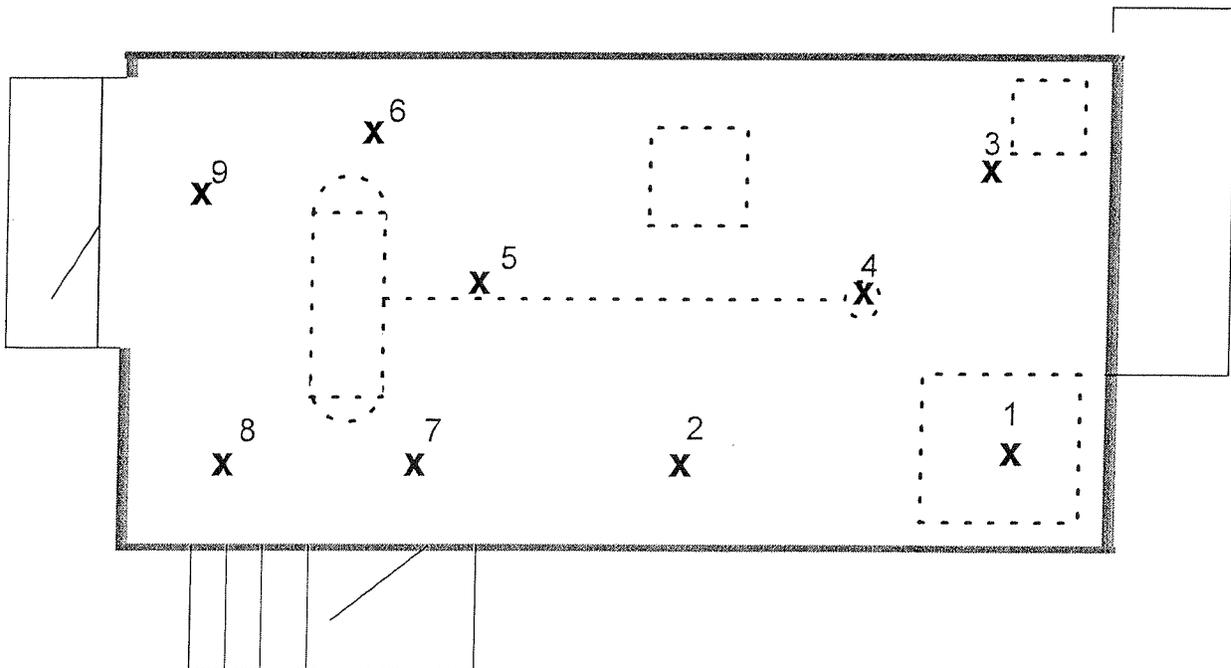
Steve Hsu, Jeff Wong, Roger Lupo, Mike Montes.

**Survey Instruments:**

1. Ludlum M-19  $\mu$ R dose rate meter s/n 42956 calibration date 12/14/94
2. Eberline ESP-2 w/ Ludlum 44-9 pancake probe s/n 00406 / 043314 calibration date 12/14/94

**Survey Report:**

Visual inspection of the site verified that the interior structures and storage vaults had been removed and the structure refurbished. Background measurements were made approximately 75 yards from the structure (see table 1). The structure was initially scanned with a Ludlum M-19  $\mu$ R dose rate meter as the survey team approached building T029, no readings exceed the established background level (14  $\mu$ R/hr). The survey continued inside the structure with a 100% scan, readings of 10  $\mu$ R/hr were obtained. Contact readings using a dose rate meter (Ludlum M-19) and a G-M pancake probe (Eberline ESP-2 w/ Ludlum 44-9 probe) were taken at nine (9) locations inside of building T029 as shown below, sample wipes were taken of the floor in the area previously occupied by the Radium-226 storage tubes and in area of the former location of the Cobalt-60 storage vault. The contact readings are listed in Table 2 and the wipe sample results are listed in Table 3. Table 4 contains the calculated results for the contact measurements in terms of disintegrations per minute per 100 square centimeter (dpm/100cm<sup>2</sup>) for comparison with the accepted release levels. The dpm/100cm<sup>2</sup> was calculated using the formula 8-1 in page 8.2 of NUREG/CR-5849 with the probe efficiency of 22% and the probe area of 15 cm<sup>2</sup>.



Plot Plan of the Radiation Measurements Facility, Building T029  
dashed lines indicate positions of structures or items removed from the building.  
X - indicate contact measurement locations

**Table 1: Background Measurements**

Meter	Reading
Ludlum M-19 Rate meter ( $\mu\text{R/hr}$ )	14 $\mu\text{R/hr}$
Eberline ESP-2 w/ Ludlum 44-9 G-M pancake probe	51 cpm

**Table 2: Contact Survey Data**

Location	cpm (ESP-2 w/ 44-9)	$\mu\text{R/hr}$ (Ludlum M-19)	Wipe ID
1	60	10	#2
2	42	10	
3	50	10	
4	67	11.5	#1
5	60	11	
6	48	10.5	
7	55	11	
8	59	12	
9	56	11.5	

**Table 3: Wipe Sample Laboratory Results:**

Sample Id	Location Description	Site Reading	Laboratory Result pCi/wipe
1- R71714	wipe - Ra-226 pit site	67 cpm / 11.5 $\mu\text{R/hr}$	no alpha, beta or gamma detected
2- R71714	wipe - Co-60 pit site	60 cpm / 10 $\mu\text{R/hr}$	no alpha, beta or gamma detected

Table 4: Contact Measurement Calculated Results (dpm/100cm<sup>2</sup>)

Location	Gross cpm (ESP-2 w/ 44-9)	Net cpm* cpm - bkgd.	Calculated* dpm/100cm <sup>2</sup>
1	60	9	272.7
2	42	-9	-1503.5
3	50	-1	-30.3
4	67	16	484.8
5	60	9	272.7
6	48	-3	-181.8
7	55	4	121.2
8	59	8	242.4
9	56	5	151.5

\* Negative values indicate calculated numbers associated with measured levels that are below the background levels for the site.

**Summary:**

The survey results were all less than twice background for the structure and surrounding area. The results of the contact measurements and the laboratory analysis of the samples collected for building T029 have activity levels below the acceptable surface contamination levels listed in DECON-1 (Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use) of 5000 dpm βγ/100cm<sup>2</sup> for surface readings and of 1000 dpm βγ/100cm<sup>2</sup> for removable activity.

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Prepared by: Roger Lupo Date: 11/20/95

**RADIOCHEMICAL ANALYSIS REPORT**  
 State of California-Department of Health Services  
 Sanitation & Radiation Laboratory  
 2151 Berkeley Way  
 Berkeley, CA 94704

Date & Time Sampled  
 September 14, 1995

Serial No.  
 R 71714

Date Received  
 September 15, 1995

Lab No.  
 9875-95

Collector's Name: Mike Montes

Send Report To: Stephen Y. Hsu

Agency Address: Radiologic Health Branch  
 601 N. 7th. Strret  
 Sacramento, CA

Agency Address: Radiologic Health Branch  
 601 N. 7th. Strret  
 Sacramento, Ca

Phone No.: 916-324-3731

Phone No.: 8-492-4797

Sampling Point: ETEC, Building #029  
 Location of Sample(s): Wipes # 1,2  
 System No. (ODW):

RHB ( )  ODW ( )  EMB ( )  RWQCB ( )  
 FDB ( )  DWR ( )  CDFG ( )  County HD  
 Other (specify):

Type of Sample

- |   |  |   |   |
|---|--|---|---|
| <input type="checkbox"/> Air Filters: Meter Date/Time | <input type="checkbox"/> Drinking Water  | <input type="checkbox"/> Sewage/Sludge        | <input type="checkbox"/> Milk             |
| Finishing: _____ / _____                              | <input type="checkbox"/> Groundwater     | <input type="checkbox"/> Sewage/Effluent      | <input type="checkbox"/> Fish/Shellfish   |
| Starting: _____ / _____                               | <input type="checkbox"/> Surface Water   | <input type="checkbox"/> Soil/Sediment        | <input type="checkbox"/> NPP Influent/Eff |
| Net (M <sup>3</sup> ): _____                          | <input type="checkbox"/> Sea Water       | <input type="checkbox"/> Vegetation           | <input type="checkbox"/> Seaweed          |
| <input type="checkbox"/> Air Charcoal Cartridge       | <input type="checkbox"/> Rain/Snow       | <input checked="" type="checkbox"/> Wipes (2) | <input type="checkbox"/> Composites       |
| <input type="checkbox"/> Radon Canister               | <input type="checkbox"/> Other (Specify) |   |   |

The analyses were performed using the referenced methods. Precision criteria for these methods were determined to be acceptable.

R No./SRL No.	Sample Identification	Analysis	Results <sup>1</sup> ± CE <sup>2</sup>	MDA <sub>95</sub> <sup>3</sup>	Units
71714/9875	ETEC, #029, #1,2	Gamma <sup>4</sup>	N. D.	-----	pCi/2 wipes <sup>5</sup>
71714/9875	ETEC, #029, #1	Gross Alpha <sup>6</sup> Gross Beta <sup>6</sup>	N. D. N. D.	0.20 0.41	pCi/wipe pCi/wipe
71714/9875	ETEC, #029, #2	Gross Alpha <sup>6</sup> Gross Beta <sup>6</sup>	N. D. N. D.	0.20 0.41	pCi/wipe pCi/wipe

- Results less than the Minimum Detectable Activity (MDA) are reported as not detected (N. D.).
- CE is the counting error at the 95% confidence level as defined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August 1980.
- MDA<sub>95</sub> is the sample specific minimum detectable activity at the 95% confidence level, which is the LLD<sub>95</sub>, divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular radionuclide. LLD<sub>95</sub> is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 18th ed., 1992, where S<sub>b</sub> is the square root of the instrument background count rate.
- HASL-300, 27th Ed., Vol. 1, Rev. 2/92, Method 4.5.2.3, Environmental Measurements Laboratory, U.S. Department of Energy, New York, NY.
- All samples (5wipes) analyzed as a single batch.
- Direct analysis using DOE RP710, DOE Methods for Evaluating Environmental and Waste Management Samples, DOE/EM-0089T, Rev 1, March 1993.

*Violeta M. Solomon*

Analyst/Radiochemist

*10-23-95*

Date

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Lead Person/Supervisor

*10/23/95*

Date