Confirmatory Survey of Building T011
Santa Susana Field Laboratory
Boeing - Rocketdyne
Ventura County, California

Prepared By
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Radiation Assessment Unit
Radiologic Health Branch

Preparation Date: 9-14-98

Reviewed by: Stephen Hsu Date: 9-17-98

Introduction:

Boeing Building T011 was used primarily for calibration of radiation detection instruments using sealed sources. Areas of the building were also used for the repair of contaminated air pumps and other equipment with low levels of internal radioactive contamination. The remaining areas were used for office space and file storage.

Reference Document(s):

1. Letter 98RC-3596; from James Barnes to Stephen Hsu; "Disposal of Building 11 Building Debris; Survey Request"; August 3, 1998.

Survey Personnel:

Roger Lupo on June 3, 1998
Roger Lupo and Xiao Song Yin on August 18, 1998

Survey Instruments:

Manufacture & Model	S/N	Probe/detector	S/N	Calibration due date
Ludlum Micro R m-19	62583	Internal NaI 1x1 scint.	NA	5/1/99
Ludlum model 3	134215	44 – 2 NaI 1x1 scint.	PR137117	11/25/98
Ludlum model 18	105775	44 – 9 G-M pancake	PR110029	11/25/98
Ludlum model 18	105775	43 – 90 100 cm^2 alpha scint.	PR106316	11/25/98
Eberline ESP - 2	00406	44 – 9 G-M Pancake	PR043314	12/3/98
Eberline ESP - 2	00406	44 – 10 NaI 2x2 scint.	PR038045	12/3/98

Survey Report:

Initial Survey: June 2, 1998

As per a verbal requested from James Barnes of Boeing Rocketdyne, Roger Lupo of the Radiologic Health Branch performed an initial survey of Building T011 interior structures prior to demolition and removal from the building. The structures to be removed included interior partitions and walls, electrical, HVAC ducting, floor surfaces, misc. piping. A 100 % gamma survey of the accessible floor area and 10% gamma survey of the walls up one meter from the floor were preformed yielded a measurement range of 2500 to 3000 counts per minute (cpm). Eight biased contact measurements were made with swipe samples collected at the measurement locations for laboratory analysis. The field measurements and corresponding laboratory analysis of the swipes are listed in Table 2 below. The locations for the direct measurements are shown in Figure 1.

Follow-up Survey: August 18, 1998

Roger Lupo and Xiao Song Yin of the RAU preformed the follow-up survey on August 18, 1998. The building interior is now striped of the interior walls and structures. The asbestos tile and mastic glue has been removed. A 100% gamma survey of the floor and a 50% gamma survey of first 1.5 meters of the lower wall surface yielded a measurement range of 2500 to 3000 counts per minute (cpm). Twelve biased contact measurements were made with swipe samples collected at the measurement locations for laboratory analysis. The field measurements and corresponding laboratory analysis for this second survey are listed in Table 4. The locations for the direct measurements are shown in Figure 1.

The five roll-off bins containing refuse from the demolition of the interior of Building T011 were surveyed. The survey consisted of; a micro R reading at the surface of each bin, a gamma scan with a 2x2 NaI detector of the bin contents top layer and a survey with a pancake GM of the bin exterior surface and the top layer of the refuse in the bins. The sixth bin is an asbestos containment unit, therefore the interior and its contents were not available for direct survey. The outside of the asbestos bin was surveyed in the same manner as the outside of the normal refuse bins. The survey measurements are listed in Table 5.

The observation is also made that the sink, the section of drain line immediately below the sink and a section of the vent stack has been removed. A survey with a GM pancake of the inside of the remaining accessable drain line indicated background levels.

Table 1: Background Measurements for Initial Survey
Measurements made at Building T487

Meter	Reading
Ludlum Micro R m-19	7 to 12 μR/hr
Ludlum model 3 w/ 1x1 NaI	2.5K to 3K cpm
Ludlum model 18 w/ ZnS 100 cm^2	0 cpm
Eberline ESP – 2 w/ 44-9 GM	20 to 60 cpm

Table 2: Field Data and Laboratory Results initial survey

Sample Identification	Pancake – GM (cpm)	Micro R μR/hr	Ludlum 18 ZnS (cpm)	Laboratory Analysis	Laboratory Results
1	47.9	11	0	Gross Alpha Gross Beta	N.D. N.D.
2	56.8	11	0	Gross Alpha Gross Beta	N.D. N.D.
3	33.9	11	0	Gross Alpha Gross Beta	N.D. N.D.
4	42.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
5	56.8	10	0	Gross Alpha Gross Beta	N.D. N.D.
6	38.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
7	39.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
8	29.9	9	0	Gross Alpha Gross Beta	N.D. N.D.
1 through 8	NA	NA	NA	Gamma	N.D.

Table 3: Background Measurements for second Survey
Measurements made at Building T487

Meter	Reading
Ludlum Micro R m-19	7.5 to 12 μR/hr
Ludlum model 3 w/ 1x1 NaI	2.5K to 3K cpm
Ludlum model 18 w/ 44 – 9 GM	20 to 60 cpm
Ludlum model 18 w/43 – 90 100 cm^2 ZnS	0 cpm
Eberline ESP – 2 w/ 44 – 9 GM	20 to 60 cpm
Eberline ESP – 2 w/ 2x2 NaI	2.5K to 3K cpm

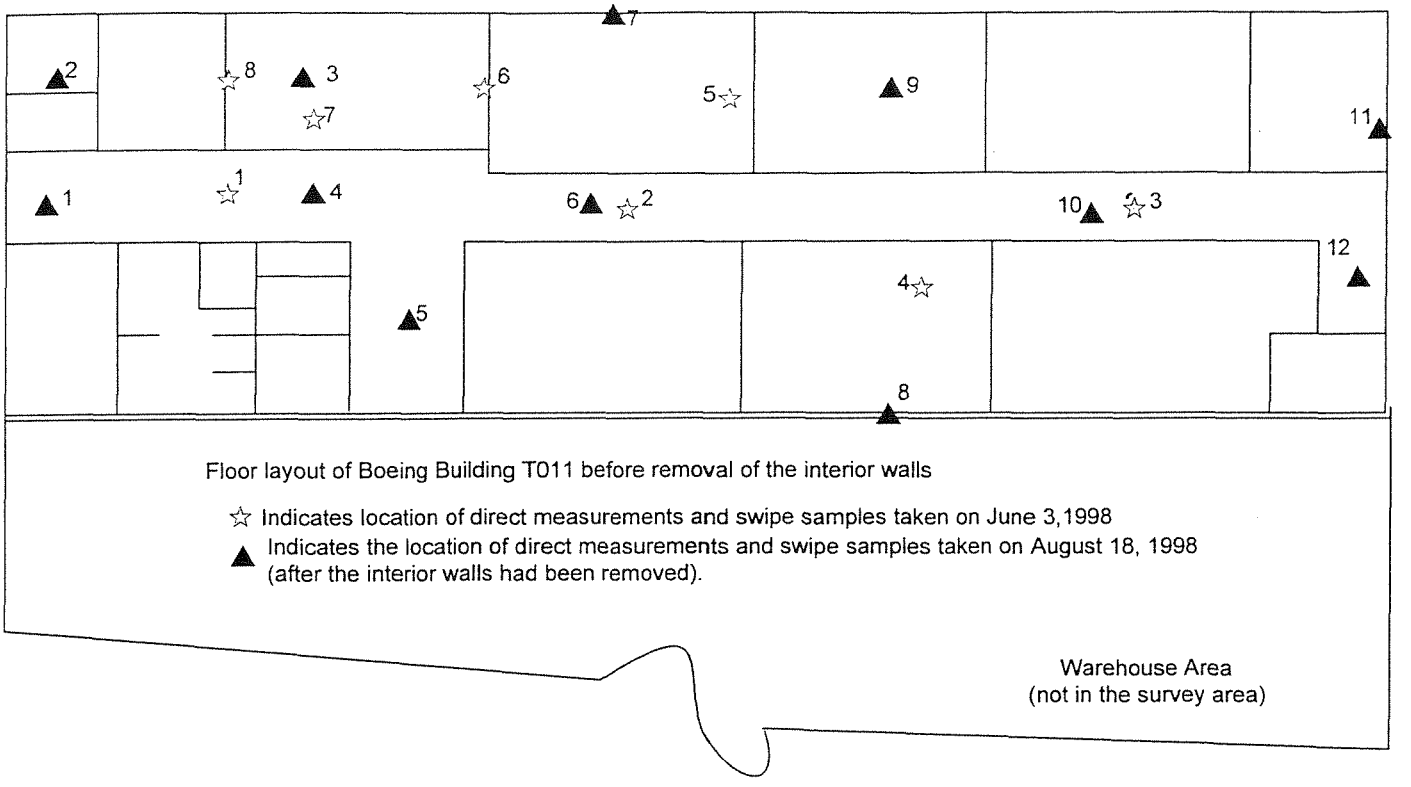
Table 4: Field Data and Laboratory results Second Survey

Sample Identification	Pancake – GM (cpm)	Micro R μR/hr	Ludlum 18 ZnS (cpm)	Laboratory Analysis	Laboratory Results
1	55.8	10	0	Gross Alpha Gross Beta	N.D. N.D.
2	58.8	11	0	Gross Alpha Gross Beta	N.D. N.D.
3	59.8	9	0	Gross Alpha Gross Beta	N.D. N.D.
4	58.8	11	0	Gross Alpha Gross Beta	N.D. N.D.
5	45.9	11	0	Gross Alpha Gross Beta	N.D. N.D.
6	66.8	11	0	Gross Alpha Gross Beta	N.D. N.D.
7	39.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
8	25.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
9	65.8	10	0	Gross Alpha Gross Beta	N.D. N.D.
10	39.9	10	0	Gross Alpha Gross Beta	N.D. N.D.
11	31.9	9	0	Gross Alpha Gross Beta	N.D. N.D.
12	58.8	10	0	Gross Alpha Gross Beta	N.D. N.D.
1 through 12	NA	NA	NA	Gamma	N.D.

Table 5: Survey Data for theRefuse Bins.

Bin Identification #	Micro R (μR/hr)	GM pancake (cpm)	2x2 NaI (cpm)
7741	10 to 15	40 to 60	2.5K to 3K
7734	10 to 15	40 to 60	2.5K to 3K
1071 (Asbestos bin)	10 to 15	40 to 60	2.5K to 3K
50-32	10 to 15	40 to 60	2.5K to 3K
7339	10 to 15	40 to 60	2.5K to 3K
8074	10 to 15	40 to 60	2.5K to 3K

Figure 1: Location of swipe samples taken June 3, 1998 and August 18, 1998



Summary:

The survey results were all at background levels for the structure and surrounding area. The results of the contact measurements and the laboratory analysis of swipe samples collected for building T011 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)

Prepared by: Rogurk Lyon Date: 9-14-98

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

Date & Time Sampled
June 3,1998 15:00-16:00

Serial No.
R73101

Date Received
June 5, 1998

Lab No.
98-1167 (1-8)

Collector's Name: Roger Lupo

Agency Address: Radiologic Health Branch
601 North 7th Street
Sacramento CA

Phone No.: (916) 324-3731

Send Report To: Steve Hsu

Agency Address: Radiologic Health Branch
601 North 7th Street
Sacramento CA

Phone No.: (916) 322-4797

Sampling Point: ETEC Building Tow
Location of Sample(s): Wipes No. 1-8
System No. (ODW):

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

Type of Sample

[ ] Air Filters:	Meter Date/Time	[ ] Drinking Water	[ ] Sewage/Sludge	[ ] Milk
Finishing:	_____ ___/___	[ ] Groundwater	[ ] Sewage/Effuent	[ ] Fish/Shellfish
Starting:	_____ ___/___	[ ] Surface Water	[ ] Soil/Sediment	[ ] NPP Influent/Eff
Net (M^3):	_____	[ ] Sea Water	[ ] Vegetation	[ ] Seaweed
[ ] Air Charcoal Cartridge		[ ] Rain/Snow	[X] Wipes	[ ] Composites
[ ] Radon Canister		[ ] Other (Specify)		

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

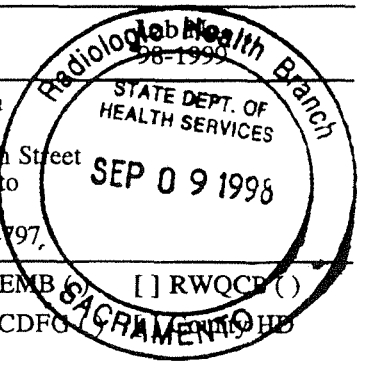
R No./SRL No.	Sample Identification	Analysis	Results[1] + CE[2]	MDA_{95}[3]	Units
73101/1167-01	Wipe No. 1	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-02	Wipe No. 2	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-03	Wipe No. 3	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-04	Wipe No. 4	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-05	Wipe No. 5	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-06	Wipe No. 6	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-07	Wipe No. 7	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167-08	Wipe No. 8	Gross Alpha[4]	N.D.	0.30	pCi/Wipe
		Gross Beta[4]	N.D.	0.41	pCi/Wipe
73101/1167	Wipe 1-8	Potassium-40[5]	N.D.	13.13	pCi/8 Wipes

1. Results less than the Minimum Detectable Activity (MDA) are reported as not detected (N. D.).
2. 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.
3. MDA_{95} is the sample specific minimum detectable activity at the 95% confidence level, which is the LLD_3 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular radionuclide. LLD_3 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 18th ed., 1992, where S_b is the square root of the instrument background count rate.
4. EPA Method 900.0, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-8-032, August 1980, modified for wipes.
5. 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.

Analyst/Radiochemist	6/16/98 Date	Lead Person/Supervisor	6/18/98 Date

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

Date & Time Sampled: August 18, 1998
Serial No.: R-73102
Date Received: August 25, 1998
Lab No.: 98-1999



Collector's Name: Roger Lupo
Agency Address: 601 N. 7th Street, Sacramento
Phone No.: 916-324-3731

Send Report To: Steve Hsu
Agency Address: 601 N. 7th Street, Sacramento
Phone No.: 916-322-4797

Sampling Point: Rocketdyne Building T011
Location of Sample(s):
System No. (ODW):

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

Type of Sample

[ ] Air Filters: Meter Date/Time	[ ] Drinking Water	[ ] Sewage/Sludge	[ ] Milk
Finishing: _____ ___/___	[ ] Groundwater	[ ] Sewage/Effuent	[ ] Fish/Shellfish
Starting: _____ ___/___	[ ] Surface Water	[ ] Soil/Sediment	[ ] NPP Influent/Eff
Net (M^3): _____	[ ] Sea Water	[ ] Vegetation	[ ] Seaweed
[ ] Air Charcoal Cartridge	[ ] Rain/Snow	[X] Wipes	[ ] Composites
[ ] Radon Canister	[ ] 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[1] + CE[2]	MDA_{95}[3]	Units
73102/98-1999-1	Wipe #1	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-2	Wipe #2	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-3	Wipe #3	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-4	Wipe #4	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-5	Wipe #5	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-6	Wipe #6	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-7	Wipe #7	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-8	Wipe #8	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-9	Wipe #9	Gross Alpha(Am-241)[4]	N.D.	0.20	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.33	pCi/Wipe
73102/98-1999-10	Wipe #10	Gross Alpha(Am-241)[4]	N.D.	0.13	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.42	pCi/Wipe
73102/98-1999-11	Wipe #11	Gross Alpha(Am-241)[4]	N.D.	0.13	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.42	pCi/Wipe
73102/98-1999-12	Wipe #12	Gross Alpha(Am-241)[4]	N.D.	0.13	pCi/Wipe
		Gross Beta(Cs-137)[5]	N.D.	0.42	pCi/Wipe

73102/98-1999	Wipes #1-12	Gamma Scan[6]	N.D.	----	pCi/12 Wipes

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3. MDA_{95} is the sample specific minimum detectable activity at the 95% confidence level, which is the LLD_5 divided by 2.22, the efficiency, and the yield, and may include factors for abundance, decay, and ingrowth, dependent on the particular radionuclide. LLD_5 is defined in section 7010G, Standard Methods for the Examination of Water and Wastewater, American Water Works Association, 18th ed., 1992, where S is the square root of the instrument background count rate.
4. EPA Method 900.0, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-8-032, August 1980, modified for wipes. Efficiency based on Am-241.
5. EPA Method 900.0, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-8-032, August 1980, modified for wipes. Efficiency based on Cs-137.
6. EPA Method 901.1, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-8-032, August 1980, modified for wipes.

Shiyanalii R. Ruben	9/2/98	Cindy Z. Wang	9/3/98
Analyst/Radiochemist	Date	Lead Person/Supervisor	Date