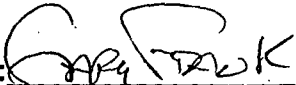
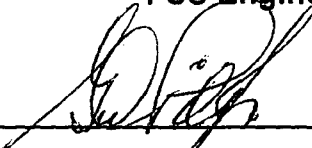


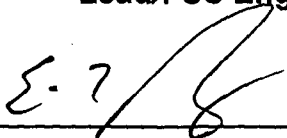
**Rancho Seco**  
**Final Status Survey Summary Report**  
**May 30, 2008**  
**Auxiliary Building 40' West Wall**  
**Survey Unit F8132141**

Prepared By:  Date: 5.30.2008

**FSS Engineer**

Reviewed By:  Date: 5/30/08

**Lead FSS Engineer**

Approved By:  Date: 7-24-08

**Dismantlement Superintendent, Radiological**

## FINAL STATUS SURVEY SUMMARY REPORT

### Survey Unit:

F8132141, Auxiliary Building 40' West Wall

### Survey Unit Description:

Operating History: The reinforced concrete structure contained the RadWaste processing and supporting systems. The building contained six main elevations. Residual radioactive material was known to be present on all levels of the interior of the building. Operating records and the HSA document several events with the potential for a release of radioactivity inside this structure. One report documented contamination of the auxiliary building roof. The roof was later replaced.

Site Characterization: Direct measurements were made of each of the interior elevation surfaces as well as the exterior surfaces of the structure. These measurements confirmed the presence of plant-derived radionuclides. Direct measurements on the -47' elevation showed a mean gross activity level of 320,071 dpm/100 cm<sup>2</sup> and a maximum value of 5,720,000 dpm/100 cm<sup>2</sup>. Direct measurements on the -29' elevation showed a mean gross activity level of 544,756 dpm/100 cm<sup>2</sup> and a maximum value of 11,370,000 dpm/100 cm<sup>2</sup>. Direct measurements on the -20' elevation showed a mean gross activity level of 247,831 dpm/100 cm<sup>2</sup> and a maximum value of 10,080,000 dpm/100 cm<sup>2</sup>. Direct measurements on the grade elevation showed a mean gross activity level of 373,758 dpm/100 cm<sup>2</sup> and a maximum value of 5,800,000 dpm/100 cm<sup>2</sup>. Direct measurements on the +20' elevation showed a mean gross activity level of 85,408 dpm/100 cm<sup>2</sup> and a maximum value of 1,900,000 dpm/100 cm<sup>2</sup>. Direct measurements on the +40' elevation showed a mean gross activity level of 3,288 dpm/100 cm<sup>2</sup> and a maximum value of 24,781 dpm/100 cm<sup>2</sup>. Direct measurements on the building exterior, including the mezzanine roof, showed a mean gross activity level of 1,897 dpm/100 cm<sup>2</sup> and a maximum value of 2,990 dpm/100 cm<sup>2</sup>. (The roof had been replaced prior to the classification survey.) Based on the classification procedure (DSIP-0020) and levels of gross activity reported, the interior of the auxiliary building was determined to be a Class 1, 2 area and the exterior was a Class 2,3.

HSA Events: HSA Report pg. 63.

### Survey Unit Design Information:

The Survey Unit Design Parameters are presented in Table 1 below. The survey unit and measurement locations are depicted on the maps in Attachment 1. Direct measurement locations were randomly determined and 265.5 m<sup>2</sup> were scanned for approximately 38% coverage. Samples of removable contamination were collected at each direct measurement location. The instrumentation used for the survey along with the MDC values are listed in Tables 2-1 and 2-2 in Attachment 2.

**Table 1. Survey Unit Design Parameters**

<b>Survey Design Parameter</b>	<b>Value</b>	<b>Comment</b>
<b>Survey Area:</b>	F813	Auxiliary Building 40' West Wall
<b>Survey Unit:</b>	2141	Structure Surface
<b>Class:</b>	3	LTP Table 5-4
<b>SU Area (m<sup>2</sup>):</b>	698.6	
<b>Evaluator:</b>	Gary Frank	
<b>DCGL (dpm/100 cm<sup>2</sup>):</b>	43000	Gross Activity DCGL
<b>Area Factor:</b>	N/A	Class 3
<b>Design DCGL<sub>emc</sub> (dpm/100 cm<sup>2</sup>):</b>	N/A	Class 3
<b>LBGR (dpm/100 cm<sup>2</sup>):</b>	21500	Default = 50% DCGL
<b>Design Sigma (dpm/100 cm<sup>2</sup>):</b>	342	
<b>Type I Error:</b>	0.05	
<b>Type II Error:</b>	0.05	
<b>Predominant Nuclide:</b>	Cs-137	
<b>Sample Area (m<sup>2</sup>):</b>	N/A	Class 3
<b>Scan Area (m<sup>2</sup>):</b>	265.5	
<b>Scan Coverage (%):</b>	38%	Class 3
<b>Z<sub>1-α</sub>:</b>	1.645	
<b>Z<sub>1-β</sub>:</b>	1.645	
<b>Sign P:</b>	0.99865	
<b>Calculated Relative Shift:</b>	62.8	
<b>Relative Shift Used:</b>	3	Uses 3.0 if Relative Shift is >3
<b>N-Value:</b>	11	
<b>Design N-Value + 20%:</b>	14	NUREG-1575 Table 5-5
<b>Design Min Samples N:</b>	14	Class 3
<b>Grid Spacing L:</b>	N/A	Class 3

### Survey Results:

A total of 14 direct measurements were made in F8132141. The results including mean, median, standard deviation and range are shown in Table 2. All direct measurements were less than the DCGL. None of the scan measurements indicated areas of elevated activity. Scan activity ranged from 5040 to 8194 dpm/100 cm<sup>2</sup>, based on a surveyor efficiency of 0.5 and no background subtracted. Samples for removable surface activity were all less than 10% of the DCGL as shown in Table 3. Removable surface activity samples were counted for alpha activity and none was detected at the MDC shown in Table 2-1 of Attachment 2.

**Table 2. Direct Measurement Results**

Measurement ID	Gross Activity (dpm/100 cm <sup>2</sup> )
F8132141-C0001BD	2521
F8132141-C0002BD	2573
F8132141-C0003BD	2708
F8132141-C0004BD	2002
F8132141-C0005BD	2526
F8132141-C0006BD	3678
F8132141-C0007BD	4020
F8132141-C0008BD	2158
F8132141-C0009BD	3605
F8132141-C0010BD	2324
F8132141-C0011BD	3055
F8132141-C0012BD	1847
F8132141-C0013BD	2760
F8132141-C0014BD	2438
Mean:	2730
Median:	2550
Standard Deviation:	646
Range:	1847 - 4020

**Table 3. Removable Surface Activity Results**

Measurement ID	Surface Beta Activity (dpm/100 cm <sup>2</sup> )
F8132141C0001SM	-0.95
F8132141C0002SM	-3.53
F8132141C0003SM	2.93
F8132141C0004SM	-3.53
F8132141C0005SM	-3.53
F8132141C0006SM	1.64
F8132141C0007SM	-0.95
F8132141C0008SM	-0.95
F8132141C0009SM	-3.53
F8132141C0010SM	4.22
F8132141C0011SM	5.51
F8132141C0012SM	1.64
F8132141C0013SM	-3.53
F8132141C0014SM	-3.53
Mean:	-0.58
Median:	-0.95
Standard Deviation:	3.22
Range:	-3.53 to 5.51

**Survey Unit Data Assessment:**

The survey design required 14 direct measurements for the Sign Test. The critical value and the results of the Sign Test are presented in Table 4. The sample mean and median values were less than the DCGL. The sample standard deviation is greater than the design standard deviation. Since both values of sigma resulted in a relative shift greater than three (3), no additional samples were required.

**Table 4. Data Assessment Results**

<b>Survey Results Parameter</b>	<b>Value</b>	<b>Comment</b>	
<b>Material Background Used</b> (dpm/100 cm <sup>2</sup> ):	N/A	Average Ambient BKG = 0	
<b>Ambient Background Used</b> (dpm/100 cm <sup>2</sup> ):	N/A		
<b>Actual Direct Measurements (N):</b>	14		
<b>Median</b> (dpm/100 cm <sup>2</sup> ):	2550		
<b>Mean</b> (dpm/100 cm <sup>2</sup> ):	2730		
<b>Direct Measurement Standard Deviation</b> (dpm/100 cm <sup>2</sup> ):	646		
<b>Total Standard Deviation</b> (dpm/100 cm <sup>2</sup> ):	646		Based on samples and backgrounds.
<b>Maximum</b> (dpm/100 cm <sup>2</sup> ):	4020		Background Subtract Not Applied
<b>Material Type:</b>	N/A		
<b>Sign Test Final N Value:</b>	14		Class 3 All Direct Measurements <0.5 DCGL
<b>S+ Value:</b>	14		
<b>Critical Value:</b>	10		
<b>Sufficient Samples Collected:</b>	Yes		
<b>Maximum Value &lt; DCGL:</b>	Yes		
<b>Median Value &lt; DCGL:</b>	Yes		
<b>Mean Value &lt; DCGL:</b>	Yes		
<b>Maximum Value &lt; DCGL<sub>mc</sub>:</b>	N/A		
<b>Total Standard Deviation &lt;= Sigma:</b>	Investigate		
<b>Pass the Sign Test?</b>	Yes		
<b>Reject the Null Hypothesis?</b>	Yes	Survey Unit Passes	
<b>Does the Survey Unit Pass All Criteria?</b>	Investigate		

### **Survey Unit Investigations and Results:**

No investigations were required for either direct or scan measurements and no investigation results are reported.

### **ALARA Statement:**

As stated in Chapter 4 of the LTP, as long as the residual activity within the survey unit is less than the DCGL, the ALARA criterion has been met.

### **Changes in Initial Survey Unit Assumptions:**

The survey unit was designed as a Class 3 structure survey and the sample results are consistent with that classification. The variability of the survey results was greater than the characterization data used for survey design. However, no additional samples were required. No potential areas of elevated activity were detected.

### **Conclusion:**

The FSS of this survey unit was properly designed as a Class 3 survey based on Table 5-4 of the LTP. The required number of direct measurements was made and the scan coverage met the requirement of Table 5-6 of the LTP. No direct measurements exceeded the DCGL of 43000 dpm/100 cm<sup>2</sup> and none of the removable surface activity measurements exceeded 10% of the DCGL. No investigations were required.

The direct measurement data support rejection of the null hypothesis, providing high confidence that the survey unit satisfied the release criteria and that the data quality objectives were met.

It is concluded that survey unit F8132141 meets the release criteria of 10CFR20.1402.

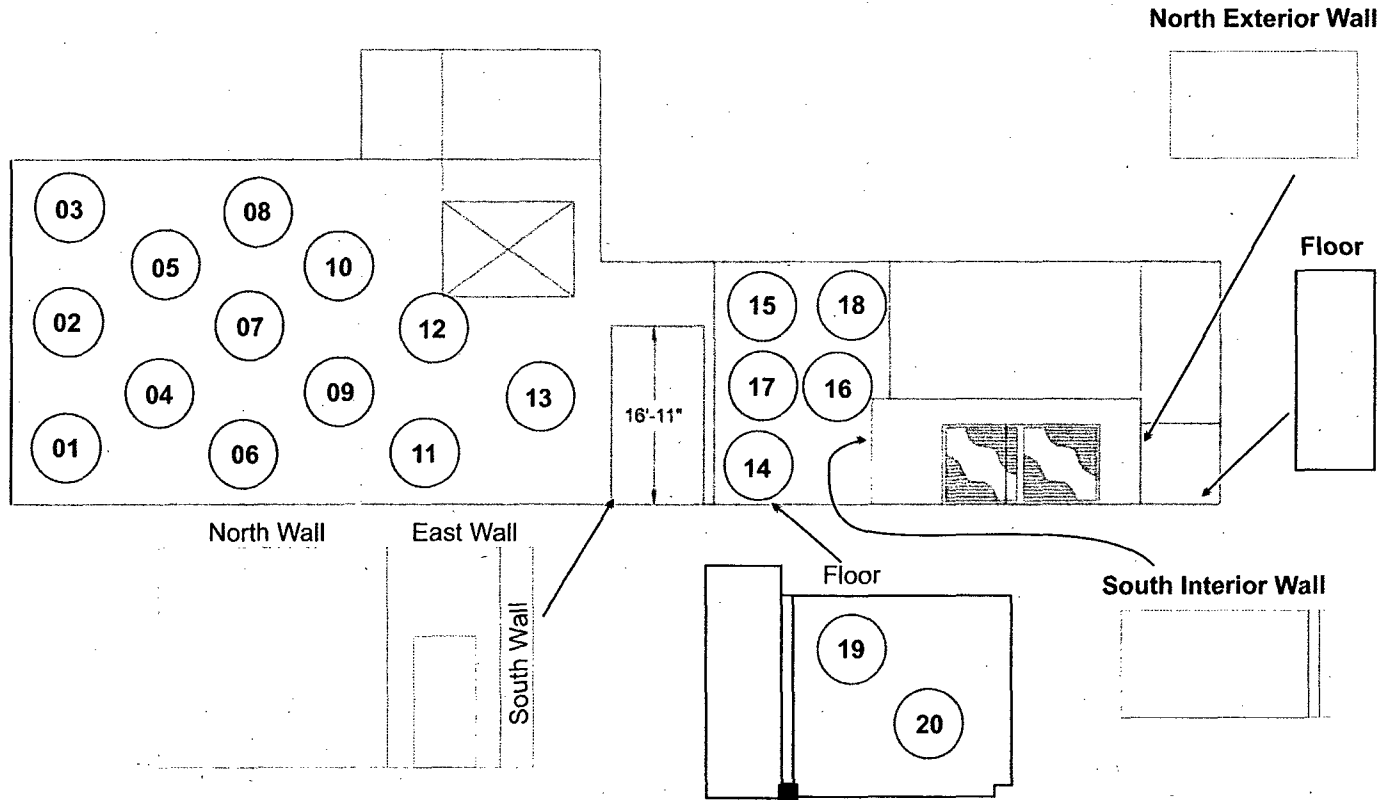


**Attachment 1**

**Maps**

**May 30, 2008**

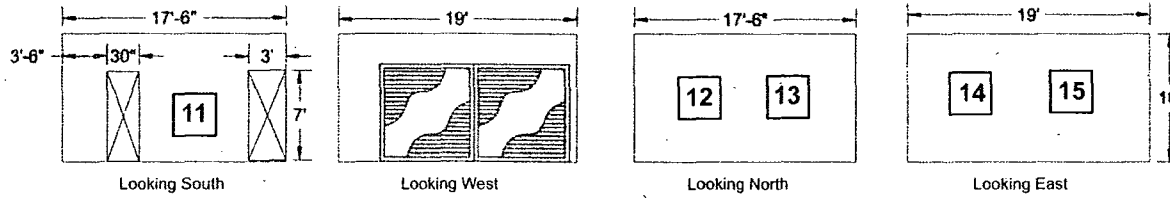
**Survey Unit F8132141**



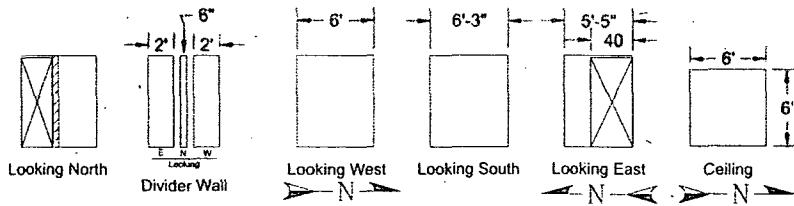
Aux Bldg. Ext. West Wall  
Looking East  
574 m<sup>2</sup>

F8132141-M1

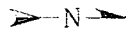
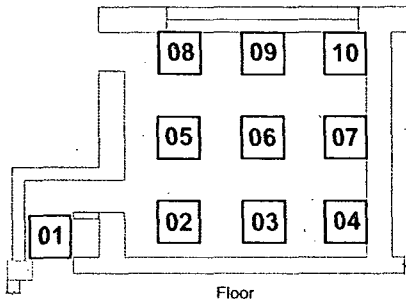
### Auxiliary Building Exterior Station Service Transformer Room Beta Scans



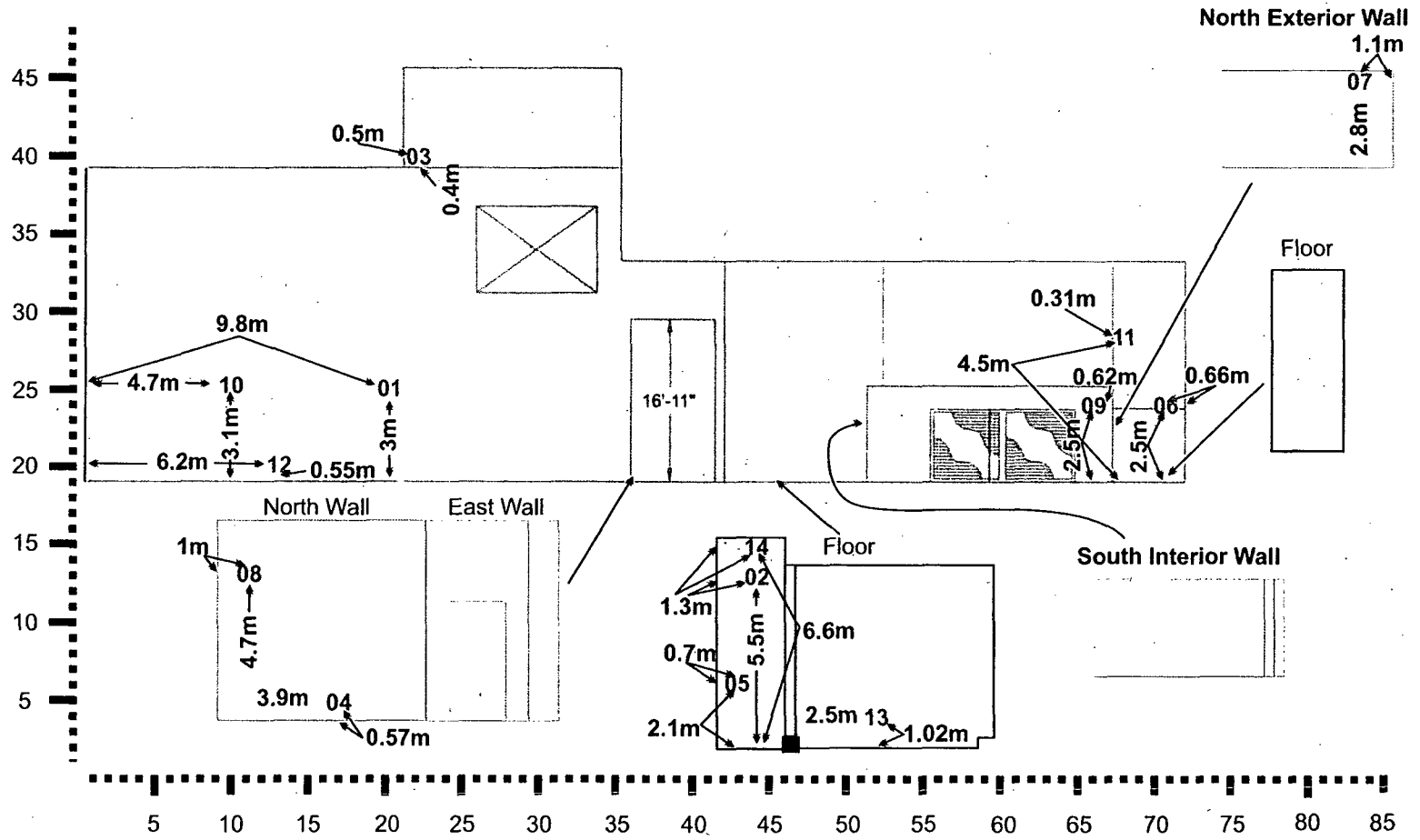
Transformer Room



Vestibule



Aux. Bldg. Ext.  
40' Elev. Station Service  
Transformer Room  
1000 ft<sup>2</sup>  
92.9 m<sup>2</sup>



Aux Bldg. Ext. West Wall  
Looking East  
574 m<sup>2</sup>

F8132141-M2

**Attachment 2**

**Instrumentation**

**May 30, 2008**

**Survey Unit F8132141**

**Table 2-1. Survey Unit Instrumentation**

<b>Instrument Model; Serial No.</b>	<b>Detector Model; Serial No.</b>	<b>MDC Static (dpm/100 cm<sup>2</sup>)</b>	<b>MDC Scan (dpm/100 cm<sup>2</sup>)</b>
M2350; 142509	43-68B; 160699	433	1033
GC4019, 1983920	N/A	N/A	672
Tennelec; 0401171	N/A	5 dpm $\alpha$ , 11 dpm $\beta$	N/A

**Table 2-2. Investigation Criteria and DCGL**

<b>Parameter</b>	<b>Value (dpm/100 cm<sup>2</sup>)</b>
Investigation Criteria - Direct	21500
Investigation Criteria – Scan	43000
DCGL <sub>w</sub>	43000
DCGL <sub>EMC</sub>	N/A

**Attachment 3**

**Investigation**

**May 30, 2008**

**Survey Unit F8132141**

**(none required)**

**Attachment 4**

**Data Assessment**

**May 30, 2008**

**Survey Unit F8132141**



