

Rancho Seco

Final Status Survey Summary Report

December 16, 2008

North Laydown Area Adjacent to Turbine Building

Survey Unit F8260251

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FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8260251, North Laydown Area Adjacent to Turbine Building

Survey Unit Description:

Operating History: The area consisted of the foundation pad for the main transformer and was adjacent to the rail spur serving the Turbine and Fuel Buildings. As such, the area was used for loading and transport of radioactive material for shipment off site. There were no specific operational surveys documenting contamination in this area.

Site Characterization: Based on the classification procedure (DSIP-0020) and the characterization survey data, the area was determined to be a Class 3 area.

Survey Area Classification

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 169 m² were scanned for approximately 25% 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

Survey Design Parameter	Value	Comment
Survey Area:	F826	North Laydown Area Adjacent to Turbine Building
Survey Unit:	0251	Structure Surface
Class:	3	LTP Table 5-4
SU Area (m²):	679	
Evaluator:	Erin L. Brown	
DCGL (dpm/100 cm²):	43000	Gross Activity DCGL
Area Factor:	N/A	Class 3
Design DCGL_{mc} (dpm/100 cm ²):	N/A	Class 3
LBGR (dpm/100 cm²):	21500	Default = 50% DCGL
Design Sigma (dpm/100 cm²):	46	
Type I Error:	0.05	
Type II Error:	0.05	
Predominant Nuclide:	Cs-137	
Sample Area (m²):	N/A	Class 3
Scan Area (m²):	169	
Scan Coverage (%):	25%	Class 3
Z_{1-α} :	1.645	
Z_{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	467.3	
Relative Shift Used:	3	Uses 3.0 if Relative Shift is >3
N-Value:	11	
Design N-Value + 20%:	14	NUREG-1575 Table 5-5
Design Min Samples N:	14	Class 3
Grid Spacing L:	N/A	Class 3

Survey Results:

A total of 14 direct measurements were made in F8260251. 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. Co-60 and Cs-137 were not identified above the MDA. 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 ²)
F8260251-C0001BD	2054
F8260251-C0002BD	1930
F8260251-C0003BD	1893
F8260251-C0004BD	1893
F8260251-C0005BD	3247
F8260251-C0006BD	2059
F8260251-C0007BD	2179
F8260251-C0008BD	2044
F8260251-C0009BD	2090
F8260251-C0010BD	1966
F8260251-C0011BD	2464
F8260251-C0012BD	2148
F8260251-C0013BD	2018
F8260251-C0014BD	2127
Mean:	2151
Median:	2057
Standard Deviation:	347
Range:	1893 - 3247

Table 3. Removable Surface Activity Results

Measurement ID	Surface Beta Activity (dpm/100 cm ²)
F8260251C0001SM	6.16
F8260251C0002SM	1
F8260251C0003SM	4.87
F8260251C0004SM	-0.29
F8260251C0005SM	1
F8260251C0006SM	-1.58
F8260251C0007SM	-2.88
F8260251C0008SM	-0.29
F8260251C0009SM	-0.29
F8260251C0010SM	2.29
F8260251C0011SM	-0.29
F8260251C0012SM	-1.58
F8260251C0013SM	1
F8260251C0014SM	2.29
Mean:	0.81
Median:	0.35
Standard Deviation:	2.47
Range:	-2.88 to 6.16

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 was greater than the design standard deviation. However, both values of sigma resulted in a relative shift greater than three so no additional samples were required.

Table 4. Data Assessment Results

Survey Results Parameter	Value	Comment	
Material Background Used (dpm/100 cm ²):	N/A	Average Ambient BKG = 0	
Ambient Background Used (dpm/100 cm ²):	N/A		
Actual Direct Measurements (N):	14		
Median (dpm/100 cm ²):	2057		
Mean (dpm/100 cm ²):	2151		
Direct Measurement Standard Deviation (dpm/100 cm ²):	347		
Total Standard Deviation (dpm/100 cm ²):	347		Based on samples and backgrounds.
Maximum (dpm/100 cm ²):	3247		Background Subtract Not Applied
Material Type:	N/A		
Sign Test Final N Value:	14		Class 3 No Additional Samples required
S+ Value:	14		
Critical Value:	10		
Sufficient Samples Collected:	Yes		
Maximum Value < DCGL:	Yes		
Median Value < DCGL:	Yes		
Mean Value < DCGL:	Yes		
Maximum Value < DCGL_{emc}:	N/A		
Total Standard Deviation <= Sigma:	No		
Pass the Sign Test?	Yes		
Reject the Null Hypothesis?	Yes		
Does the Survey Unit Pass All Criteria?	Yes		

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 (i.e. the survey unit average activity is less than the DCGL and the EMC criterion has been met), 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 cm² 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.

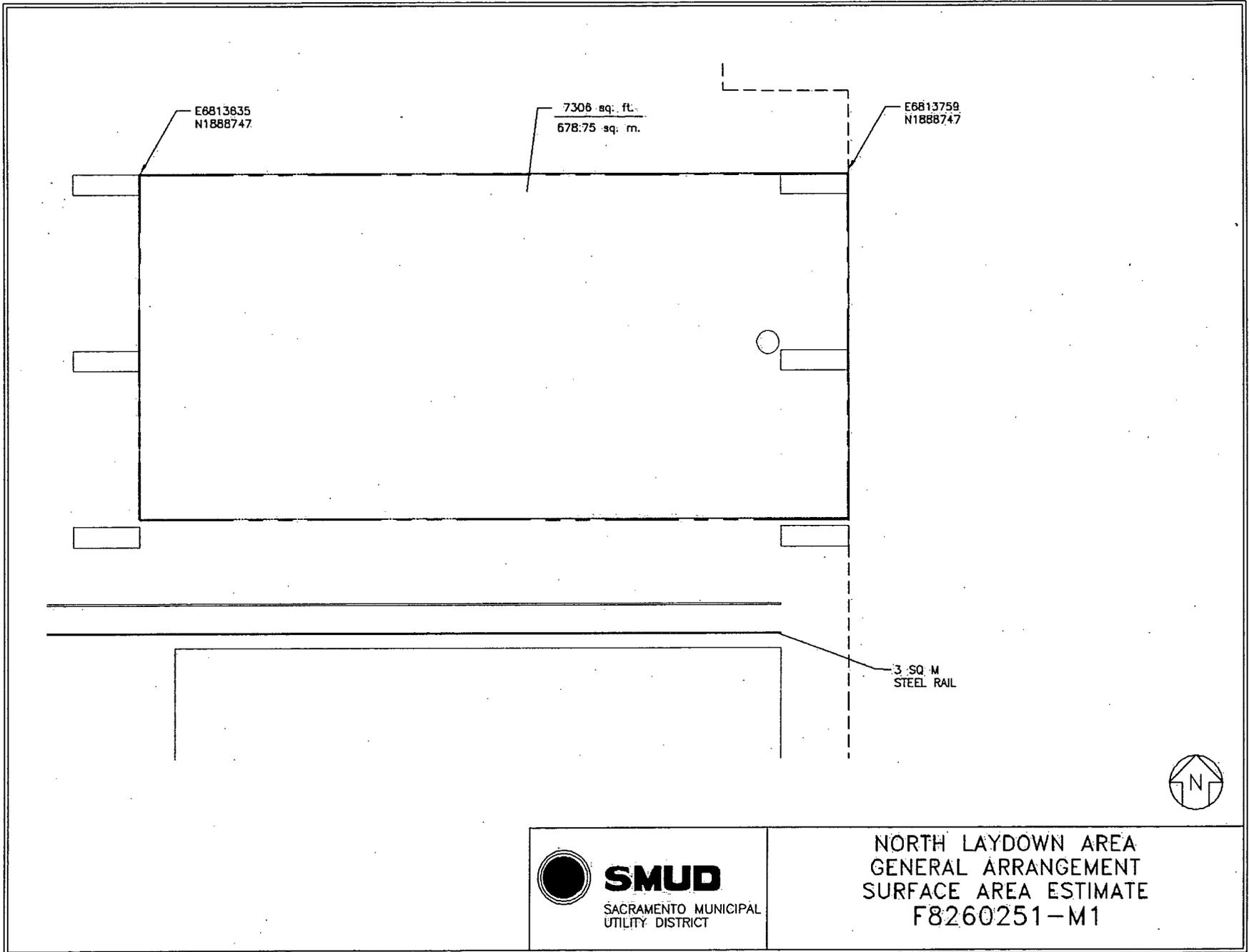
It is concluded that survey unit F8260251 meets the release criteria of 10CFR20.1402.

Attachment 1

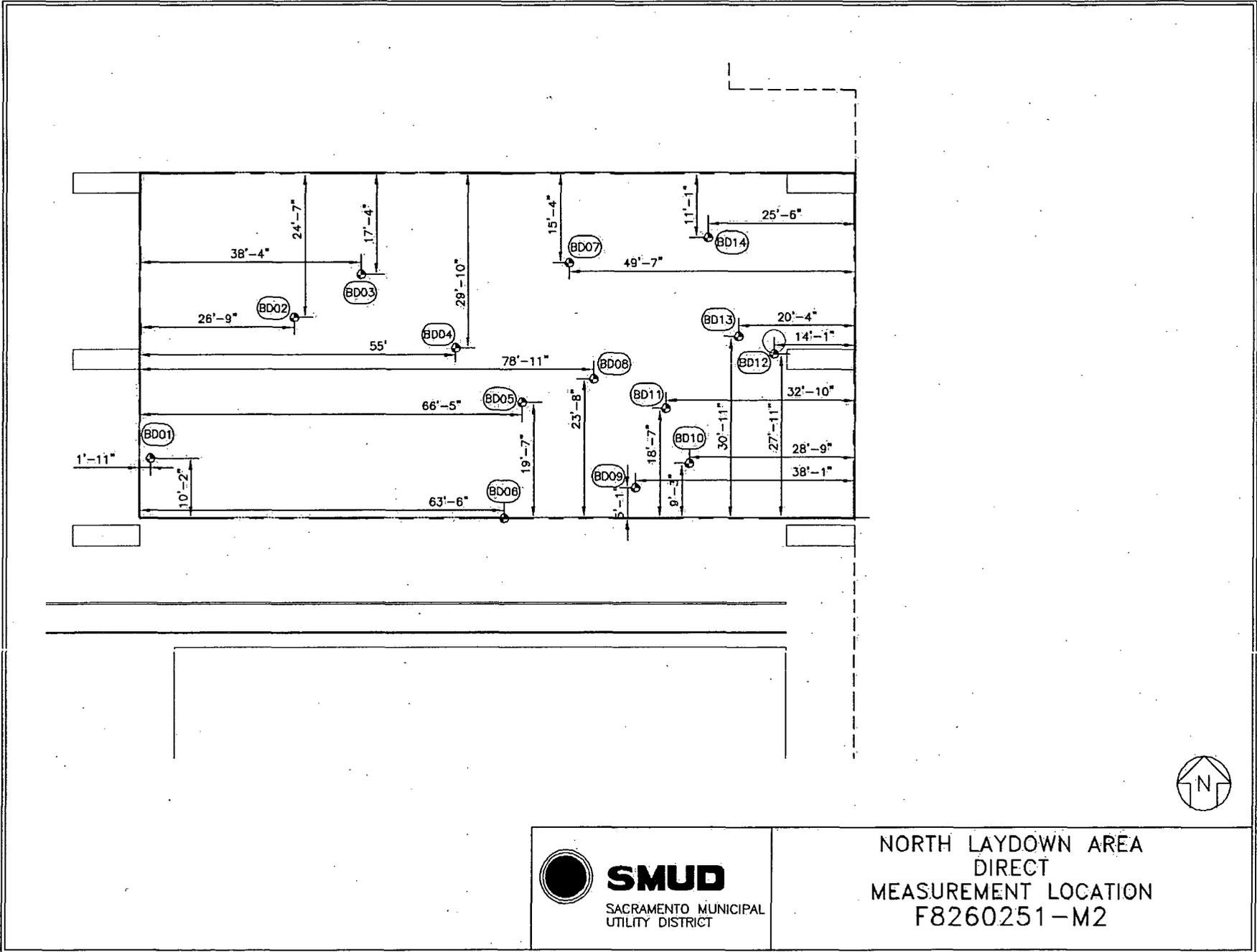
Maps

December 16, 2008

Survey Unit F8260251



NORTH LAYDOWN AREA
GENERAL ARRANGEMENT
SURFACE AREA ESTIMATE
F8260251-M1

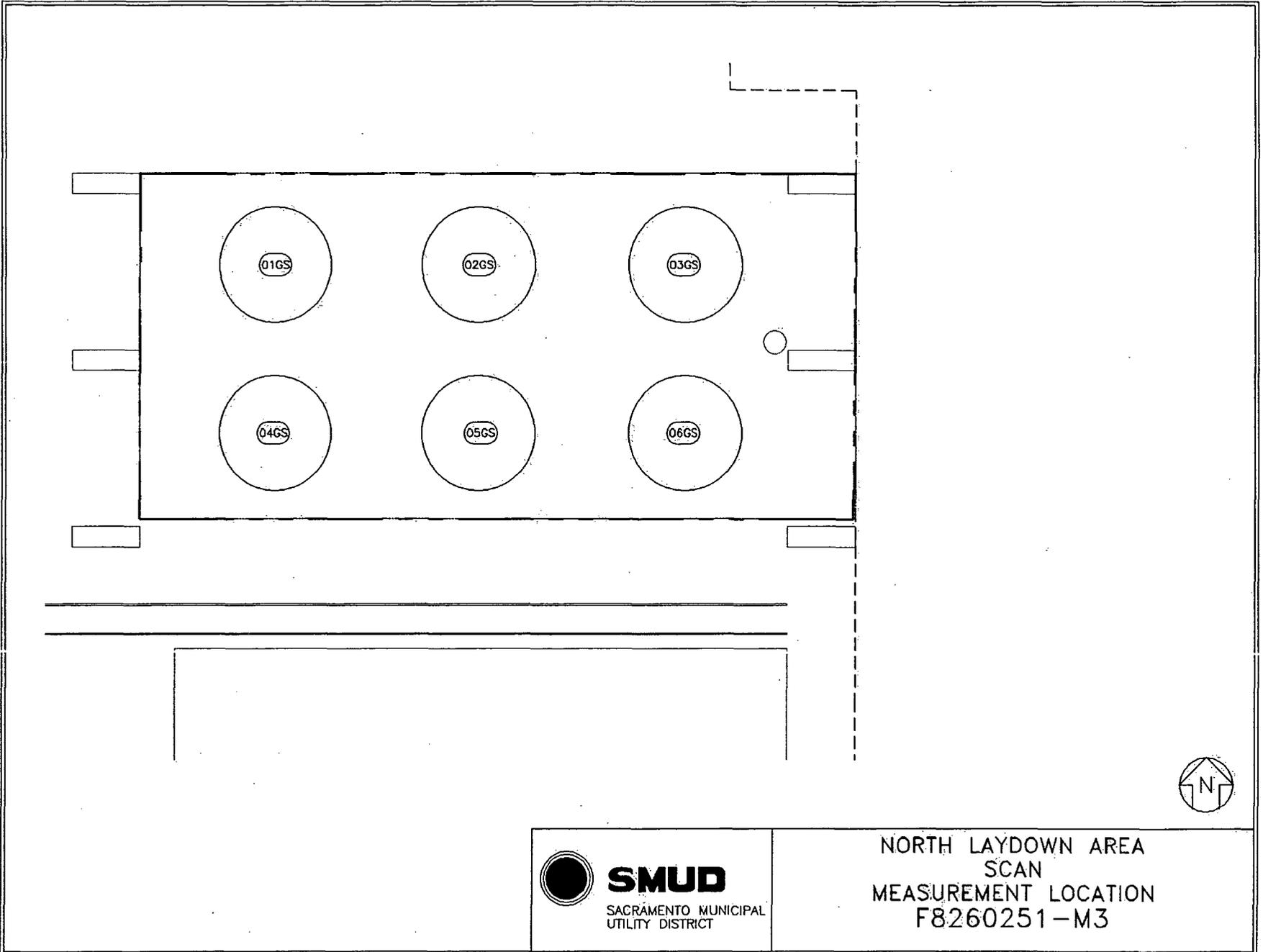


SMUD

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

NORTH LAYDOWN AREA
DIRECT
MEASUREMENT LOCATION
F8260251-M2





SMUD
SACRAMENTO MUNICIPAL
UTILITY DISTRICT

NORTH LAYDOWN AREA
SCAN
MEASUREMENT LOCATION
F8260251-M3

Attachment 2

Instrumentation

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Table 2-1. Survey Unit Instrumentation

Instrument Model; Serial No.	Detector Model; Serial No.	MDC Static (dpm/100 cm²)	MDC Scan (dpm/100 cm²)
M2350; 193700	43-68B; 190294	433	1033
Tennelec; 0401171	N/A	5 dpm α , 11 dpm β	N/A
ISOCS	1983920	N/A	Co-60 – 780 Cs-137 - 1180

Table 2-2. Investigation Criteria and DCGL

Parameter	Value (dpm/100 cm²)
Investigation Criteria - Direct	21500
Investigation Criteria – Scan	43000
DCGL _w	43000
DCGL _{EMC}	N/A

Attachment 3

Investigation

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(none required)

Attachment 4
Data Assessment
December 16, 2008
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