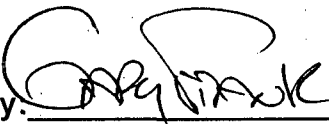
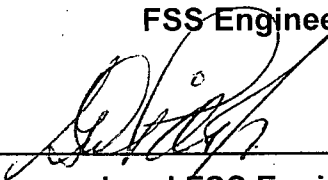
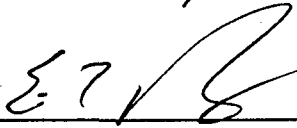


Rancho Seco
Final Status Survey Summary Report
March 25, 2008
Switch Gear Yard
Survey Unit F8510001

Prepared By:  Date: 3.25.2008
FSS Engineer

Reviewed By:  Date: 3/26/08
Lead FSS Engineer

Approved By:  Date: 5-1-08
Dismantlement Superintendent, Radiological

FINAL STATUS SURVEY SUMMARY REPORT

Survey Unit:

F8510001, Switch Gear Yard

Survey Unit Description:

Operating History: The area consisted of both paved and soil covered land. The area was located on the west side of the IA and contained the electrical switchgear for the system grid. Operating records and the HSA document the storage of radioactive material within the area.

Site Characterization: Soil samples were collected and showed Cs-137 at mean activity levels of 0.056pCi/g and a maximum activity of 0.072 pCi/g. Based on the classification procedure (DSIP-0020) and levels of activity reported, the area was determined to be a Class 3 area.

HSA Events: HSA Report pg. 64.

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 832 m² were scanned for approximately 5% coverage. Soil samples were collected at each direct measurement location and analyzed by HPGe detector. 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:	F851	Switch Gear Yard
Survey Unit:	0001	Open Land Area
Class:	3	LTP Table 5-4
SU Area (m²):	16700	
Evaluator:	Gary Frank	
DCGL Cs137 surrogate (pCi/g):	51.2	
Area Factor:	N/A	Class 3
Design DCGL_{mc} (pCi/g):	N/A	Class 3
LBGR (pCi/g):	25.6	Default = 50% DCGL
Design Sigma (pCi/g):	0.008	DTBD-06-001, Table 5-4D
Type I Error:	0.05	
Type II Error:	0.05	
Nuclide:	Cs137	
Sample Area (m²):	N/A	Class 3
Total Area Scanned (m²):	832	
Scan Coverage (%):	5%	Class 3
Z_{1-α} :	1.645	
Z_{1-β} :	1.645	
Sign P:	0.99865	
Calculated Relative Shift:	3200	
Relative Shift Used:	3	Uses 3.0 if Rel Shift >3
N-Value:	11	
Design N-Value + 20%:	14	NUREG-1575 Table 5-5
Grid Spacing L:	N/A	Class 3

Survey Results:

A total of 14 direct measurements were made in F8510001. The results including mean, median, standard deviation and range are shown in Table 2. All of the direct measurements were less than the DCGL. 90 scan measurements were performed with all below the investigation level except one. Grid 57 indicated elevated activity is documented in Attachment 3. Soil samples were counted to the MDC shown in Table 2-1 of Attachment 2.

Table 2. Direct Measurement Results
(all activity values in pCi/g)

Measurement ID	Cs137 MDA	Cs137 Activity	Uncertainty
Mean:		6.12E-02	
Median:		5.85E-02	
Standard Deviation:		1.60E-02	
Range:	3.58E-02 to 9.02E-02		
F8510001S0001SS	4.95E-02	< 4.95E-02	
F8510001S0002SS	5.46E-02	< 5.46E-02	
F8510001S0003SS	5.59E-02	< 5.59E-02	
F8510001S0004SS	4.76E-02	< 4.76E-02	
F8510001S0005SS	5.50E-02	6.92E-02	3.81E-02
F8510001S0006SS	5.23E-02	< 5.23E-02	
F8510001S0007SS	6.11E-02	< 6.11E-02	
F8510001S0008SS	5.81E-02	7.32E-02	4.06E-02
F8510001S0009SS	4.36E-02	< 4.36E-02	
F8510001S0010SS	5.67E-02	6.84E-02	3.88E-02
F8510001S0011SS	4.71E-02	9.02E-02	3.64E-02
F8510001S0012SS	3.58E-02	< 3.58E-02	
F8510001S0013SS	6.75E-02	< 6.75E-02	
F8510001S0014SS	5.82E-02	8.86E-02	4.15E-02

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 3. The sample mean and median values were less than the DCGL. The sample standard deviation was greater than the design standard deviation but no additional samples were required.

Table 3. Data Assessment Results

Survey Results Parameter	Value	Comment
Actual Direct Measurements (N):	14	
Median (pCi/g):	5.85E-02	
Mean (pCi/g):	6.12E-02	
Standard Deviation (pCi/g):	1.60E-02	
Maximum (pCi/g):	9.02E-02	
Sign Test Final N Value:	14	
S+ Value:	14	
Critical Value:	9	
Sufficient Samples Collected:	Yes	
Maximum Value < DCGL:	Yes	
Median Value < DCGL:	Yes	
Mean Value < DCGL:	Yes	
Maximum Value < DCGL_{mc}:	N/A	Class 3
Standard Deviation <= Sigma:	Investigate	Results <0.5 DCGL
Pass the Sign Test?	Yes	
Reject the Null Hypothesis?	Yes	
The survey unit passes all conditions?	Investigate	Survey Passes

Survey Unit Investigations and Results:

One investigation (scan grid 57) was required for a scan 5 cpm above the investigation level. A rescan of the grid resulted in a count rate of 7000 cpm. Three gamma direct measurements were performed with results less than MDA for both Cs-137 and Co-60 for the scan measurements and the results are reported in Attachment 3.

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 land 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. One potential area of elevated activity were detected and evaluated as shown in Attachment 3.

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. All of the direct measurements were less than the DCGL. One investigation was 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.

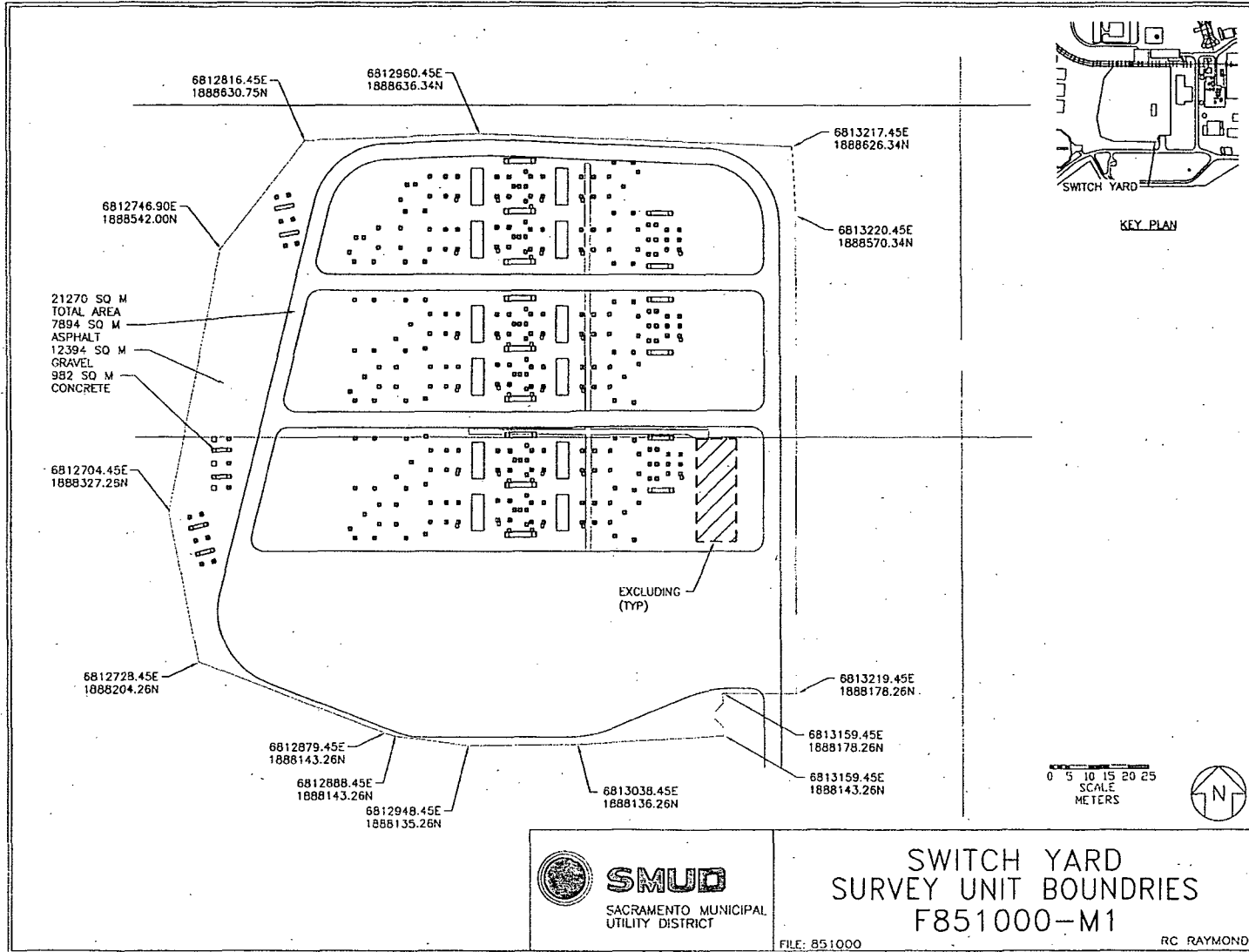
It is concluded that survey unit F8510001 meets the release criteria of 10CFR20.1402.

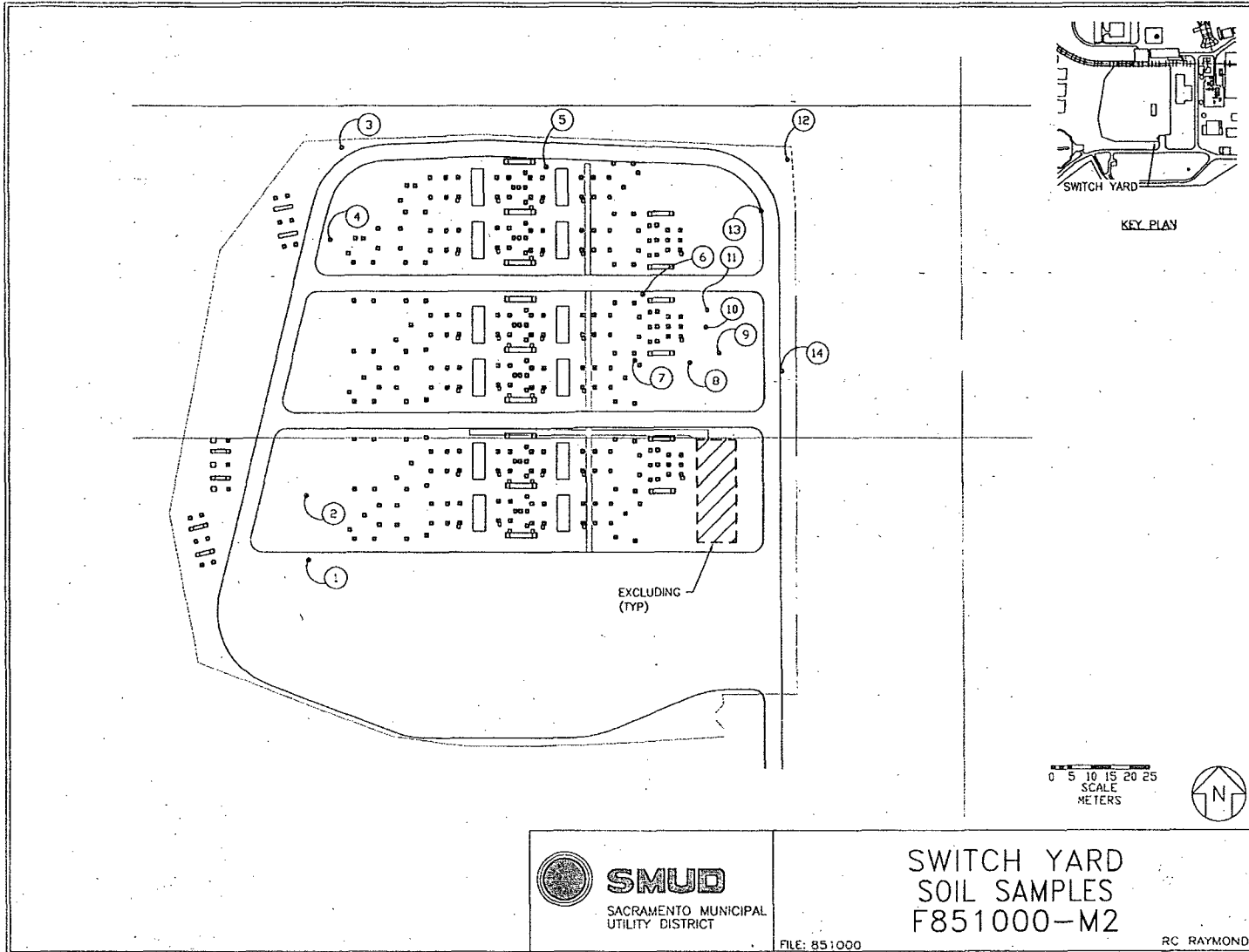
Attachment 1

Maps

March 25, 2008

Survey Unit F8510001

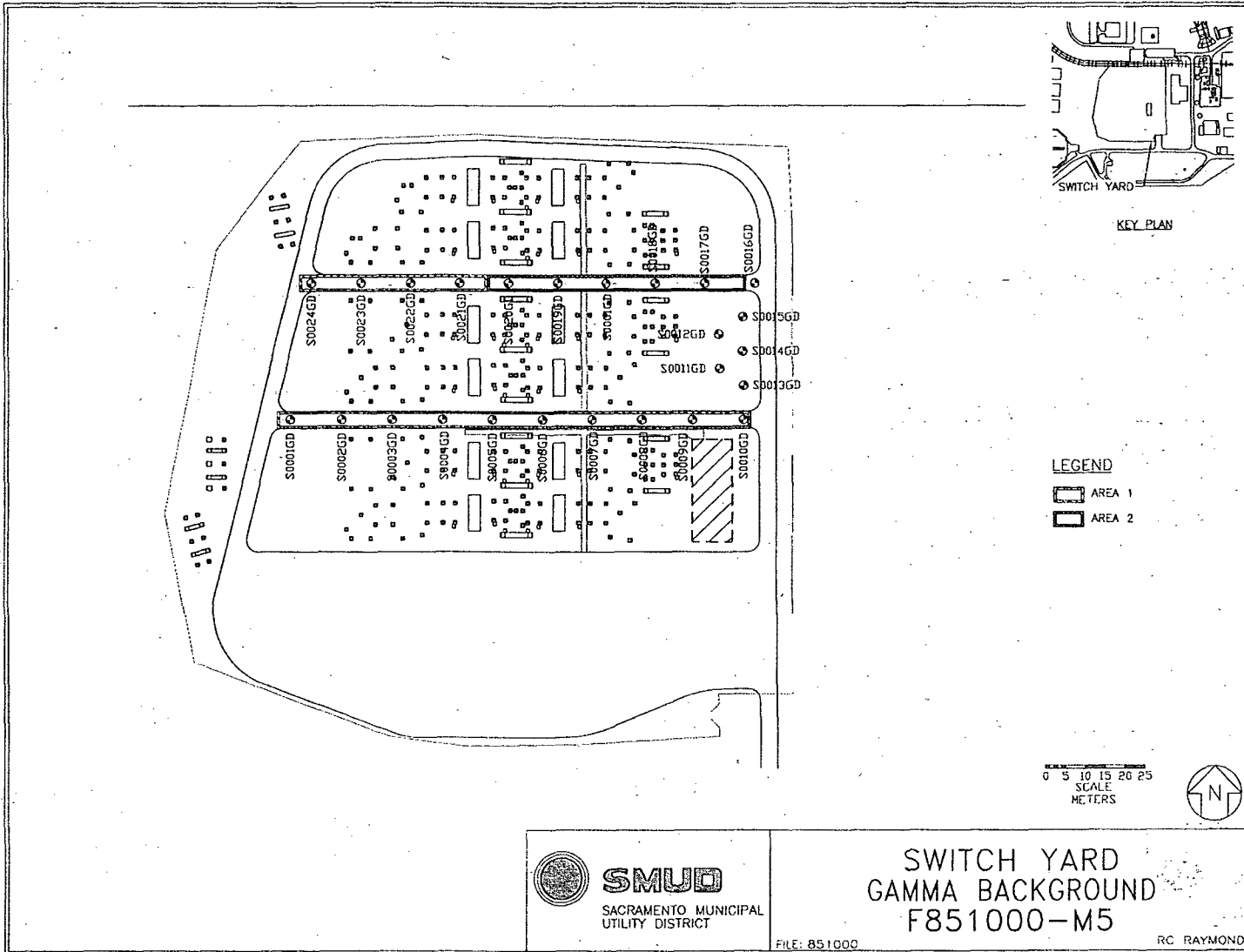




FILE: 851000

SWITCH YARD
SOIL SAMPLES
F851000-M2

RC RAYMOND

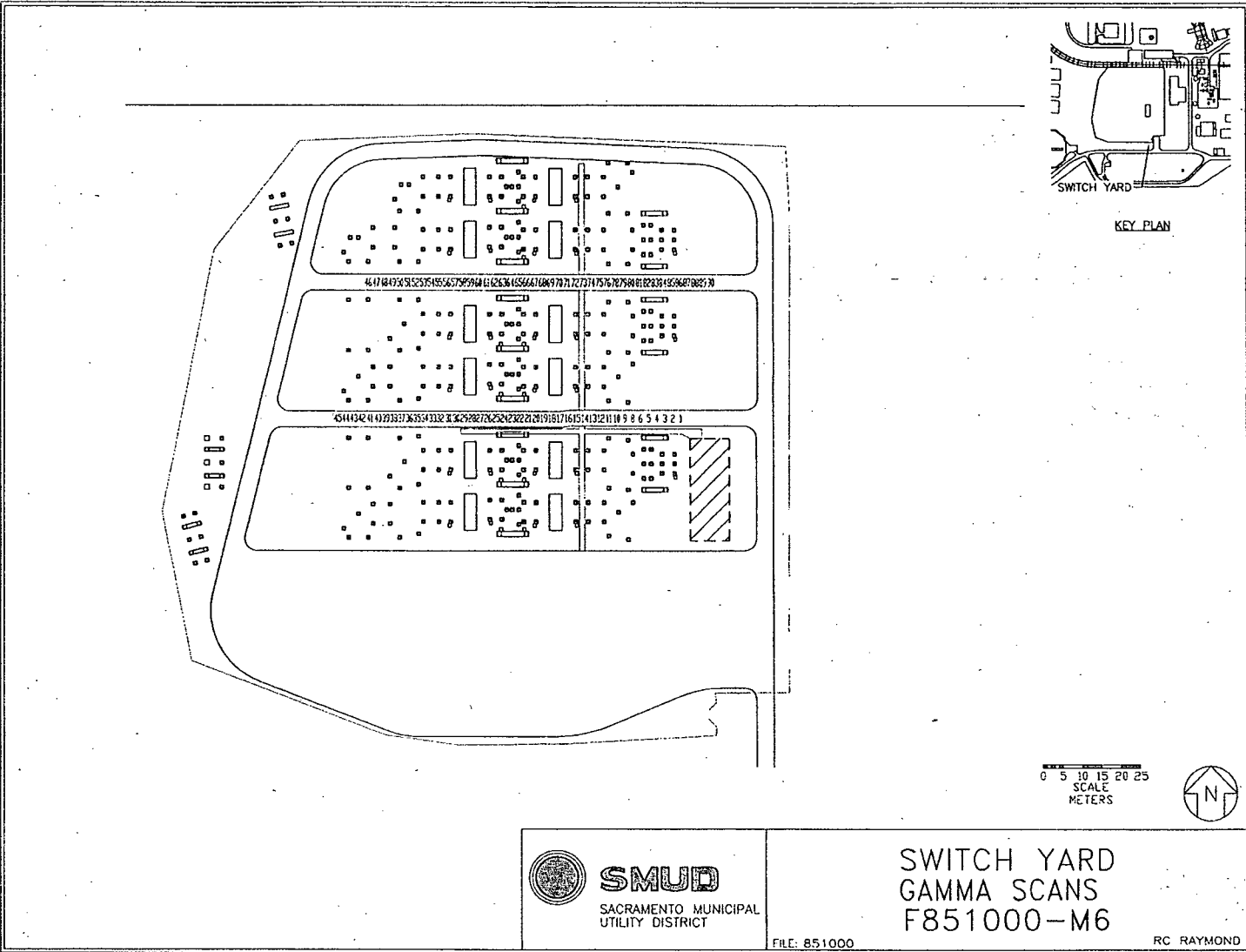



SMUD
 SACRAMENTO MUNICIPAL
 UTILITY DISTRICT

FILE: 851000

SWITCH YARD
 GAMMA BACKGROUND
 F851000-M5

RC RAYMOND

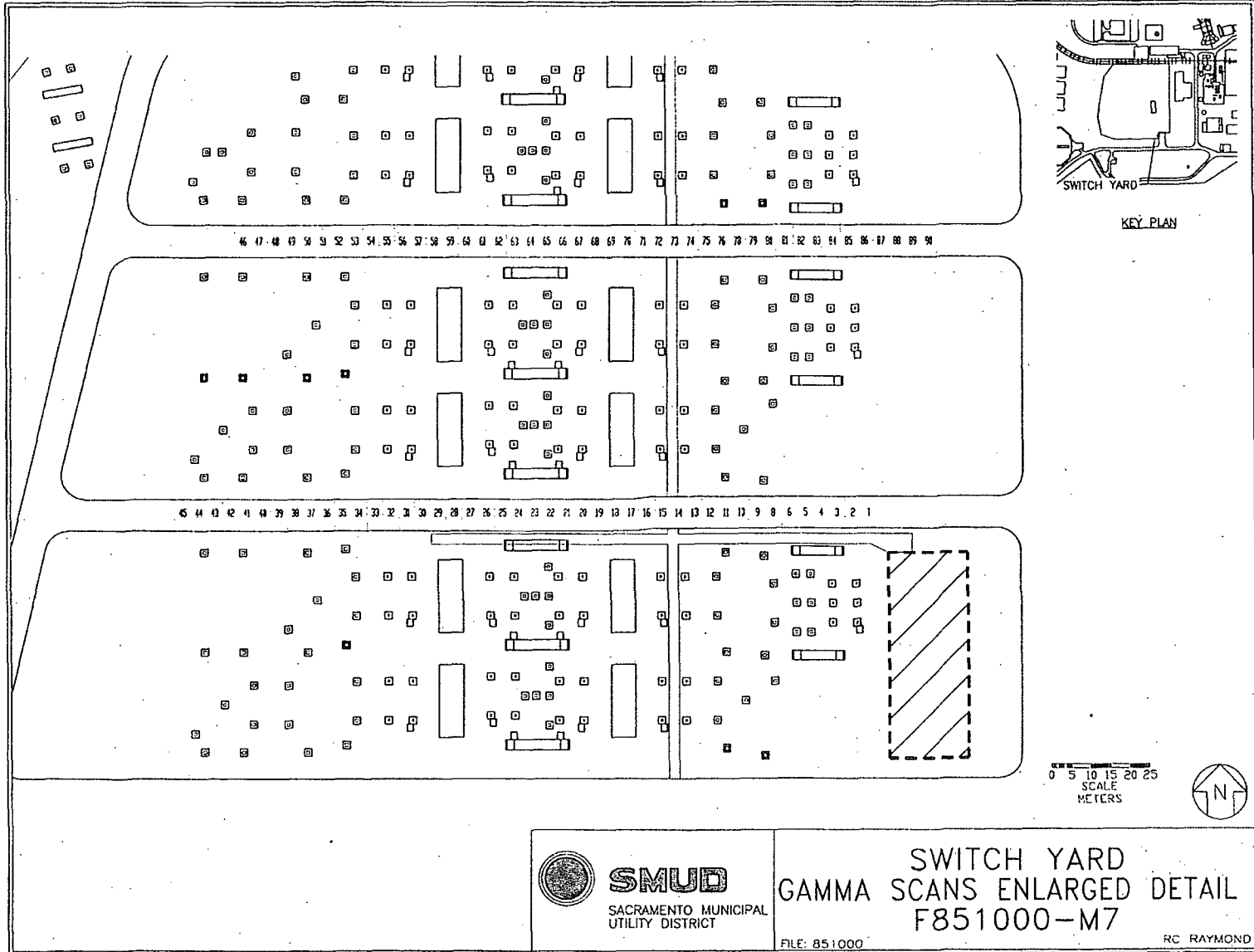


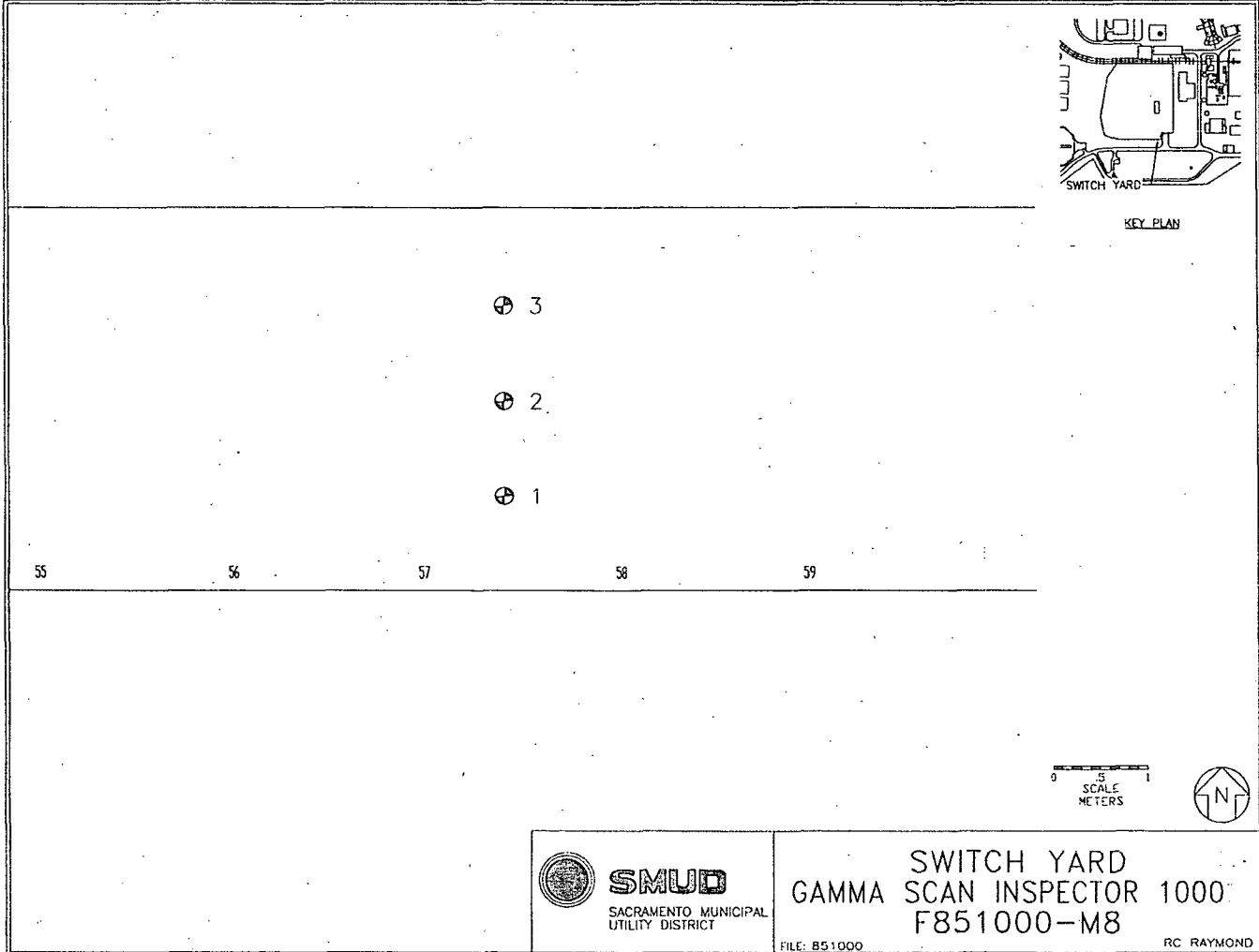

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FILE: 851000

SWITCH YARD
 GAMMA SCANS
 F851000-M6

RC RAYMOND





Attachment 2

Instrumentation

March 25, 2008

Survey Unit F8510001

Table 2-1. Survey Unit Instrumentation

Instrument	Detector Model No.	Detector Serial No.	MDC
HPGe	N/A	05047773	Soil – 0.0902 pCi/g Cs-137 Soil – 0.0624 pCi/g Co-60
InSpector	N/A	10054579	Soil – 3.6 pCi/g Cs-137 Soil – 2.68 pCi/g Co-60

Table 2-2. Investigation Criteria and DCGL

Instrument	Parameter	Value
InSpector	Investigation Criteria - Direct	Soil – 26.3 pCi/g Cs-137 Soil – 6.3 pCi/g Co-60
All	DCGL _w	51.2 Cs-137 12.6 Co-60
All	DCGL _{EMC}	N/A

Attachment 3

Investigation

March 25, 2008

Survey Unit F8510001

Table 3-1 Survey Unit Investigation

<i>Grid</i>	<i>Investigation Level (cpm)</i>	<i>Initial Value (cpm)</i>	<i>Investigation Result (cpm)</i>	<i>Elevated Area (m²)</i>	<i>Area Factor</i>	<i>DCGL_{emc}</i>	<i>Investigation Result (cpm)</i>	<i>DCGL_{emc} Unity Fraction</i>
57	8200	8205	7000	N/A	N/A	N/A	7000	N/A
Survey Unit Remainder						DCGL = 51.2	SU Mean =	
EMC Unity Sum								N/A

Grid 57 was resurveyed on 5/31/06 with 2350-1 #193700 and SPA-3 #404397 with a resulting logged value of 7000 cpm. Three InSpector 1000 direct measurements were taken in the grid (Map F8510001-M8) with results less than MDA for both Cs-137 and Co-60.

The initial scan is considered a false positive and no further actions are required.

Attachment 4

Data Assessment

March 25, 2008

Survey Unit F8510001

