3001-0605030014

Final Status Report
For
Building GW

Prepared by:	**Roderick C. Case /**	**Date:**	**July 2, 2003**
Reviewed by:	**Galen Tomlinson /**	**Date:**	7-7-03
Approved by:	**A. Stephen Collas /**	**Date:**	7-7-03

1.0 Historical Review

Building GW was constructed in 1968, as an enclosure between "G" and "W" Buildings. At the time of construction, the building contained approximately 4900 ft^2, which included one large room and two restrooms. GW Building was originally built as a warehouse and included offices and receiving/inspection area for weapons programs.

The original GW Building was constructed with a large high-bay area on its northern end. The Foundation plans indicate that part of the floor system utilized an existing 6" slab, and that there was a 12" concrete storm sewer pipe under the building site. The storm sewer appears to be located under the building, 4' to 5' foot below the ground surface. The original building also included overhead doors on both the southern and northern elevations. There were three sets of steel sash windows near the top of the building "fronts", as constructed. A parapet wall extended above the tops of the adjacent G and W Buildings, much as it does today.

A 1979 addition was constructed in the high-bay area and was constructed of pre-cast slabs set on beams resting on six interior columns. A 1980 addition also constructed in the high bay area resulted in four smaller offices and an elevator. The remodeling projects were undertaken to convert GW Building to an "Inspection Receiving" facility and by 1984, the building footage was 9,782-ft^2.

The addition included offices, an equipment room, and a conference room. The lower level is a storage area and includes a refrigerated storage area for the massive collection of Mound employee medical related x-rays, a work area, and a supervisor's office.

Building GW has been used as a support facility since construction and no research, development, or production activities using radioactive or energetic materials have occurred in the building. Storage activities have included "bonded" chemical storage and records management storage. GW Building has also housed a quality control area containing precision instrumentation that supported site advanced device production activities. Building GW is scheduled for demolition in accordance with the Miamisburg Closure Project goals.

A complete structural and operational history can be found in Reference 1.

2.0 Survey Objectives

The objective of this survey plan is to confirm the classification of Building GW as non-impacted. This is accomplished by measuring the fixed and removable contamination on building surfaces and performing isotopic analysis on any sediment found in building drains. The survey data is compared to the release criteria of DOE Order 5400.5 using methods defined in Reference 2. The specific survey objectives are outlined in each Survey Plan Form (see Enclosures).

Table 1 lists the permissible surface contamination guideline values as stated in DOE Order 4500.5. These limits are the Derived Concentration Guidelines (DCGL's) for building and structure release.

Table 1

Allowable Total Residual Surface Contamination (dpm/100cm^2)*				
Radionuclides*		**Average***	**Maximum***	**Removable***
Group 1	Transuranics, I-125, I129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	**100**	**300**	**20**
Group 2	Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232	**1,000**	**3,000**	**200**
Group 3	U-Natural, U-235, U-238 and associated decay products, alpha emitters	**5,000**	**15,000**	**1,000**
Group 4	Beta-gamma emitters (Radionuclides with decay modes other than alpha emission or spontaneous fission) except for Sr-90 and others noted above	**5,000**	**15,000**	**1,000**
Tritium		**N/A**	**N/A**	**10,000**

* Note: Refer to DOE Order 5400.5, Radiation Protection of the Public and the Environment, for specific information on surface contamination guidelines and additional notes.

The average activity levels shown in Table 1 assumes that the residual contamination is uniformly distributed across the survey unit and is the $DCGL_w$ for this survey. The maximum activity shown in Table 1 represents the Elevated Measurement Comparison ($DCGL_{emc}$) for small (<100cm^2) areas of activity that may be observed in the survey unit while scanning. Since no process activities were ever associated with Building GW, it is assumed that Pu-238 is the potential contaminant of concern and the Group 1 limits are appropriate for alpha measurements. Group 4 limits are used for beta measurements.

2.1 Survey Design

The characterization survey was designed to evaluate the building internal and external surfaces. The building was divided into survey units as follows:

Survey Unit 1 – First Floor interior surfaces

Survey Unit 2 – Second Floor interior surfaces

Survey Unit 3 – External surfaces and Penthouse

Since the variability is expected to be small within the survey unit, the Type I error chosen is $\alpha = 0.05$ and the Type II error is $\beta = 0.01$. The number of data points is determined by calculating the relative shift (Δ/σ) from the DCGL value, the lower bound of the gray region (LBGR), and the standard deviation (σ) of the contaminant in the survey unit (Δ/σ = DCGL-LBGR/σ). For this survey plan, the LBGR is set at 50% of the $DCGL_w$. The standard deviation was estimated to be 17dpm/100cm^2 based on survey results of similar building surfaces and the relative shift was calculated as 2.95. The required number of data points ($n = 20$) was obtained from Table 5.5, Reference 2.

Twenty (20) judgmental data points were placed throughout each survey unit and are broadly representative of the survey unit. Hallways and major walkways throughout the building were scanned for alpha contamination.

Ten (10) judgmental data points were placed on the roof area and ten (10) judgmental data points were located on exterior walls.

Sediment samples were collected from floor drains and ventilation units. Since no sediment was available in these areas, smear samples were obtained for analysis. Direct alpha and beta readings were taken at each sediment sample location.

Loose surface contamination was measured by smearing an area of 100cm^2 at each data point. Smears were counted for gross alpha/beta activity. Removable tritium contamination was measured on interior surfaces by liquid scintillation counting of coin smears.

Replicate surveys were performed in accordance with Reference 3.

The instruments selected for this survey were the Ludlum 2350-1 data logger with a 43-20 hand-held gas flow proportional (GFP) detector and a 43-37 GFP large area floor probe for alpha measurements. A Ludlum 2360 with an L 43-93 scintillation probe was used for beta measurements in accordance with Reference 4. Laboratory instruments used were appropriate for the analysis requested. Instrument calibration and source check data is documented in accordance with Mound procedures.

2.2 Survey Data

The gross alpha and beta fixed point measurements from each survey unit was collected and compared directly to the $DCGL_w$. One data point on the exterior wall was observed to be above the $DCGL_w$ (105 dpm/100cm^2 alpha). Two additional data points were observed to be just below the $DCGL_w$ (99 dpm/100cm^2 alpha). These elevated readings are believed to be the result of short-lived activity from Radon daughters and/or naturally occurring radioactive material known to be present in standard brick building material. NUREG 1507 reports the average background value in standard brick is six counts per minute alpha with a 126 cm^2 gas flow proportional probe. When adjusted for background and probe size, the highest observed alpha measurement is 72 dpm/100cm^2. To test this, the affected areas were re-surveyed. The re-survey results showed that no long-lived activity was present at these locations. The highest measured value was 77 dpm/100cm^2 and the average was 44 dpm/100cm^2 with no background correction. The data points in the remaining survey units were all found to be below the $DCGL_w$. A graphical representation of the average and maximum total activity for each survey unit is shown in Attachment 1.

The following table shows the net results of the maximum and average total (fixed and removable) alpha and beta activity for each area.

Total Activity Results

Area	Alpha (dpm/100cm^2)			Beta (dpm/100cm^2)		
	Max	Average	±	Max	Average	±
Survey Unit 1	39	18.5	3.6	925	200.5	98.3
Survey Unit 2	33	13.8	3.2	385	215.3	39.3
Survey Unit 3	77	44.0	10.3	1296	750.9	177.6

The results of the removable alpha and beta surface activity are shown below. All results were significantly less than the $DCGL_W$.

Removable Alpha & Beta Activity Results

Area	Alpha (dpm/100cm^2)			Beta (dpm/100cm^2)		
	Max	Average	±	Max	Average	±
Survey Unit 1	7.09	1.49	0.81	14.59	3.15	1.39
Survey Unit 2	4.37	1.1	0.58	6.85	2.40	0.82
Survey Unit 3	4.37	0.89	0.54	5.48	2.43	0.67

The highest removable tritium activity was 25.22 dpm/100cm2 (RSDS# 03-TF-0152). The average removable tritium was 5.94 dpm/100cm2 (±1.28).

The floors and major walkways throughout the building were scanned for alpha activity. No activity was observed above the instrument alarm setpoint of 75 dpm/100cm^2 (RSDS# 03-TF-0152).

2.3 Sediment Sample Data

Sediment smear samples were obtained from floor drains and ventilation units. Sediment smear samples were analyzed for gross alpha, beta and tritium activity in accordance with the survey plan (See RSDS # 03-TF-0156). No gross alpha, beta, or tritium activity was observed at any sediment sample location above background. The highest removable gross alpha was 8.74 dpm/100cm^2, 6.85 dpm/100cm^2 beta, and 6.67 dpm/100cm^2 tritium. Direct alpha and beta measurements were taken at each sample location. The highest direct activity observed was 80 dpm/100cm^2 alpha and 580 dpm/100cm^2 beta.

2.4 Quality Control

Quality control measurements were taken to ensure the quality of the data. Six data points were selected at random from the sample group of 64 data points. The highest and lowest alpha measurements and corresponding beta measurements were selected from each survey unit. Replicate measurements were taken at these locations using the same instruments and performed in the same manner as the original survey. The acceptance

criterion for fixed-point measurements is that the variance in the measurements of the original sample population is within a factor of two of the variance in the replicate samples (at 95% confidence level). Negative beta values occur when the measured value is below the instrument background level. These values are used for this analysis to show the true variability of the data set. The results of the replicate surveys are shown in the following table:

Replicate Analysis Results

Location #	Alpha (dpm/100cm^2)			Beta (dpm/100cm^2)		
	Initial	$\pm 2\sigma$	Replicate	Initial	$\pm 2\sigma$	Replicate
QC3-19	105	20.5	88	1160	68.1	1056
QC3-16	6	4.9	28	-68	16.5	-56
QC2-01	33	11.5	33	385	39.2	440
QC2-06	0	0	22	95	19.5	235
QC1-06	6	4.9	11	30	11.0	100
QC1-10	39	12.5	50	925	60.8	935
Variance (S^2)	666.8		750.3	125344		205461
Ratio			0.88			0.61
Agreement			**Yes**			**Yes**

Replicate analyses were not performed on smears or sediment samples. Quality control procedures, blanks, and spikes are a part of the laboratory quality control program at Mound. Participation in the DOE/EML inter-laboratory quality assurance program provides acceptable assurance of nuclide identification reliability and ensures a high quality of sample results. Since a relatively small number of samples were taken for this survey, additional replicate analysis was not required for this survey.

Field instrumentation is source checked each day prior to use and again at the completion of survey activities for that day. A known source is placed in a source holder to ensure a reproducible geometry is achieved. Acceptance criteria is $\pm$ 20% of the initial source response following calibration. Results are documented in accordance with Mound Radiological Control procedures. Laboratory instrumentation is source checked and documented in accordance with Mound Laboratory procedures.

2.5 Conclusion

The objective of this survey plan is to determine whether or not the residual radioactivity of the surfaces of building materials associated with Building GW satisfy the site release criteria established by DOE Order 5400.5. This is accomplished by comparing the survey data to the release criteria in accordance with the MARSSIM (Reference 2). The scanning survey found no elevated measurement areas above the $DCGL_w$. No activity was found above screening levels in sediment samples.

All of the DQO's for this survey plan have been met and no further surveys are required. Building GW meets the surface release criteria established by DOE Order 5400.5.

The following tables show the maximum fixed and removable activity on the inside and outside building surfaces.

Building GW Survey Results

TYPE	RSDS (Radiological Survey Data Sheet)	LOCATION	SURVEY RESULTS (dpm/100 cm^2)	SURFACE CONTAMINATION GUIDELINES (dpm/100 cm^2)
Highest Alpha Smearable Activity	03-TF-0152	Floor	7.09	20
Highest Alpha Fixed Activity	03-TF-0148	External Wall	77	100
Highest Beta Smearable Activity	03-TF-0152	Floor	14.59	1000
Highest Beta Fixed Activity	03-TF-0148	External Wall	1296	5000
Highest Tritium Smearable Activity	03-TF-0152	Floor	25.22	10,000

3.0 Attachments and Enclosures

Attachment 1 – Average Total Alpha and Beta Graph

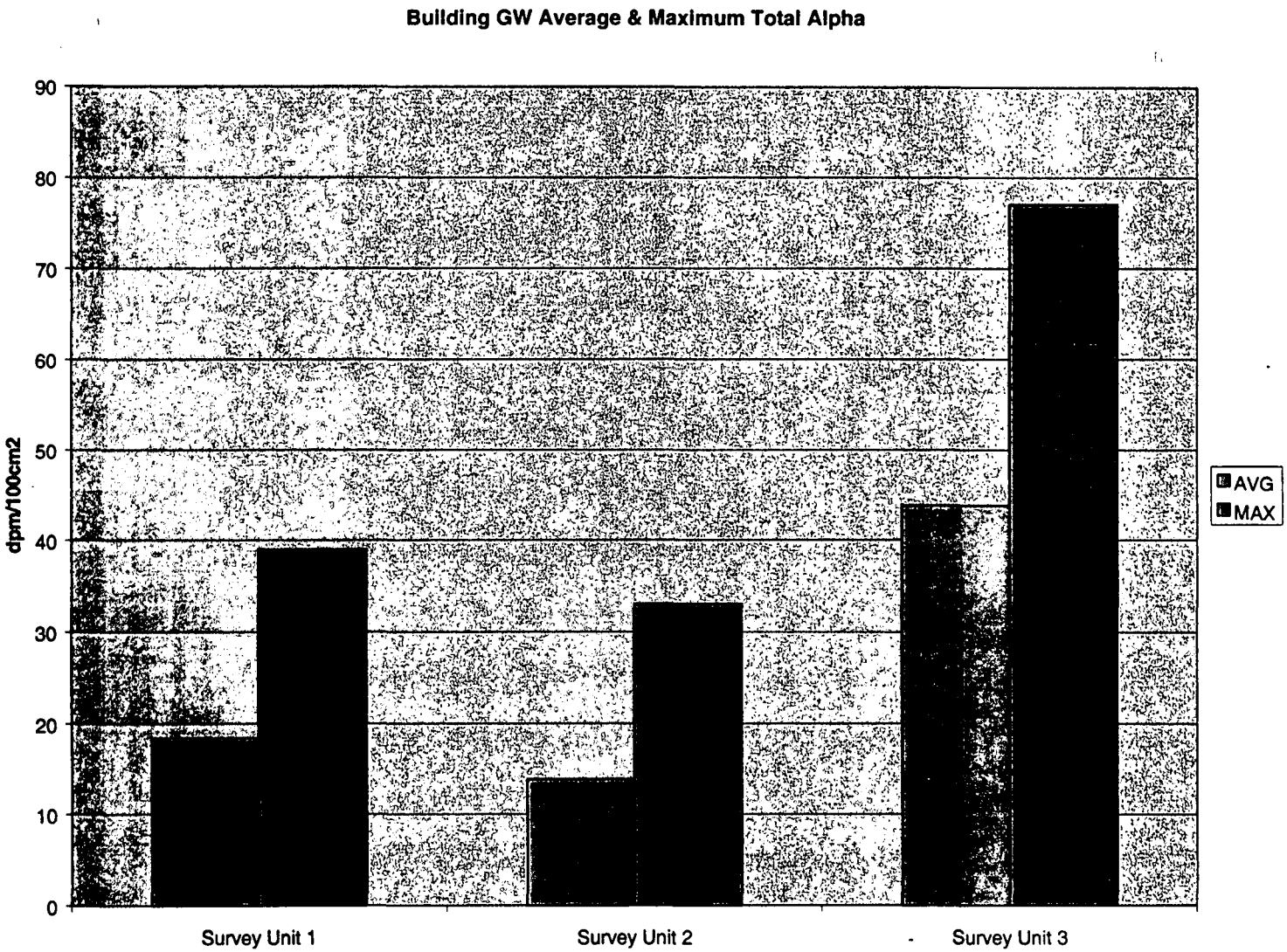
Enclosure 1 – Sample Data Analysis Worksheets

Enclosure 2 – SPF GW-01

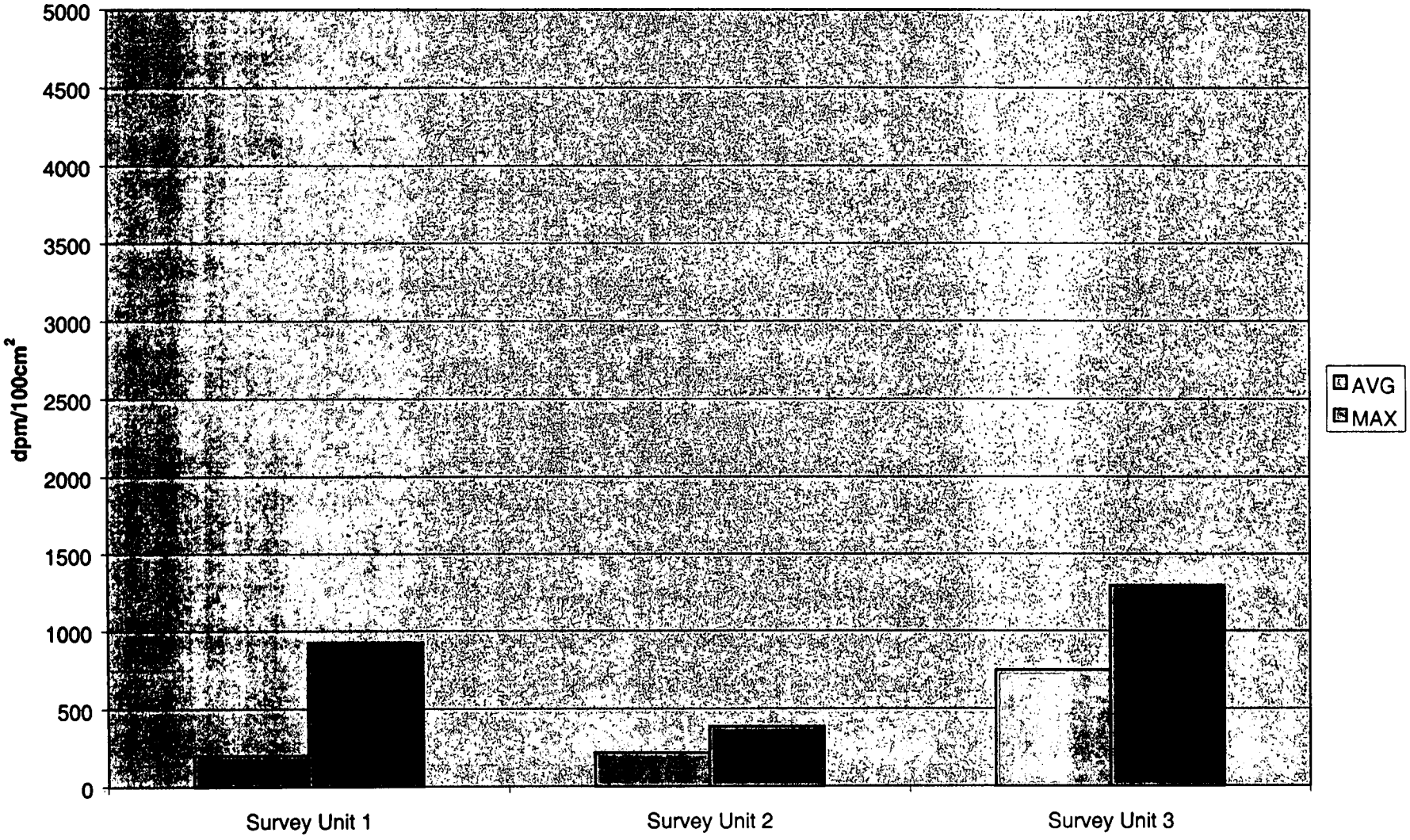
4.0 References

1. CH2MHILL Mound, Inc., EC&AS Department, White Paper: Building GW Structural History and Process History Summary Background Document, January 2003
2. NUREG 1575, Rev 1, Aug 2000, *Multi-Agency Radiation Survey and Site Investigation Manual*, (MARSSIM)
3. MARSSIM Implementing Procedures, *Field Quality Control for Building Contamination Surveys*, MD-80046, Op. 402
4. MD80036, Issue 29, Op. No. 30031,*Operation of the Ludlum 2360 Scaler/Ratemeter with Ludlum 43-93 Alpha/Beta Scintillator,* Section 6.3

Building GW Final Status Report
Attachment 1



Building GW Average and Maximum Total Beta Activity



Building GW Survey and Sample Data
Enclosure 1

Building GW Survey Data Collection Sheet

		Smearable			Fixed			
Location	RSDS#	α	β	H^3	α	- Bkg	Recount	β
SU1 01	0152	0.49	1.09	8.66	28		28	65
SU1 02	0152	1.59	0	3.36	11		11	250
SU1 03	0152	0	0	7.9	22		22	155
SU1 04	0152	0	0	14.58	22		22	175
SU1 05	0152	3.82	5.03	5.67	11		11	155
SU1 06	0152	1.09	3.24	11.14	6		6	30
SU1 07	0152	5.34	2.23	0	17		17	855
SU1 08	0152	0	0.35	5.79	11		11	65
SU1 09	0152	1.05	2.07	15.54	17		17	215
SU1 10	0152	0	3.58	5.76	39		39	925
SU1 11	0152	0	0	5.49	11		11	175
SU1 12	0152	1.36	2.55	12.37	28		28	220
SU1 13	0152	0	0	3.41	17		17	135
SU1 14	0152	2.23	5.79	11.05	11		11	90
SU1 15	0152	2.93	14.59	19.68	11		11	75
SU1 16	0152	2.99	3.5	2.95	17		17	40
SU1 17	0152	1.9	6.49	25.22	11		11	160
SU1 18	0152	7.09	5.22	3.85	33		33	110
SU1 19	0152	0	1.35	0	11		11	60
SU1 20	0152	0	5.23	0	22		22	15
SU1 21	0152	1.05	4.49	4.89	28		28	145
SU1 22	0152	0	2.47	2.97	22		22	295
SU2-01	0153	2.19	0	6.62	33		33	385
SU2-02	0153	2.19	1.21	9.08	11		11	280
SU2-03	0153	2.18	2.58	0.92	11		11	285
SU2-04	0153	0	2.74	5.11	17		17	175
SU2-05	0153	0	4.11	5.98	17		17	360
SU2-06	0153	0	4.11	3.14	0		0	95
SU2-07	0153	2.18	2.58	8.25	6		6	125
SU2-08	0153	0	6.85	0	17		17	135
SU2-09	0153	2.19	0	11.07	17		17	105
SU2-10	0153	0	2.74	0	17		17	195
SU2-11	0153	2.18	2.58	11.86	17		17	310
SU2-12	0153	0	5.48	0.91	6		6	205
SU2-13	0153	0	0	1.91	17		17	310
SU2-14	0153	2.18	3.95	3.72	22		22	105
SU2-15	0153	0	0	6.13	17		17	220
SU2-16	0153	0	1.37	10.7	6		6	180
SU2-17	0153	2.18	2.58	0.9	17		17	95
SU2-18	0153	0	2.74	0.88	6		6	265
SU2-19	0153	0	1.37	0	11		11	260
SU2-20	0153	4.37	1.06	0	11		11	215
SU3-01	0148	0	0	1.3	16		16	324
SU3-02	0148	0	4.11	8.12	32		32	376
Location	RSDS#	a	b	H^3	a		a	b
SU3-03	0148	2.19	0	4.53	24		24	380
SU3-04	0148	0	1.37	9.77	56		56	244

Building GW Survey and Sample Data Worksheets
Enclosure 1

Building GW Survey Data Collection Sheet

		Smearable			Fixed			
Location	RSDS#	α	β	H^3	α	- Bkg	Recount	β
SU1 01	0152	0.49	1.09	8.66	28		28	65
SU1 02	0152	1.59	0	3.36	11		11	250
SU1 03	0152	0	0	7.9	22		22	155
SU1 04	0152	0	0	14.58	22		22	175
SU1 05	0152	3.82	5.03	5.67	11		11	155
SU1 06	0152	1.09	3.24	11.14	6		6	30
SU1 07	0152	5.34	2.23	0	17		17	855
SU1 08	0152	0	0.35	5.79	11		11	65
SU1 09	0152	1.05	2.07	15.54	17		17	215
SU1 10	0152	0	3.58	5.76	39		39	925
SU1 11	0152	0	0	5.49	11		11	175
SU1 12	0152	1.36	2.55	12.37	28		28	220
SU1 13	0152	0	0	3.41	17		17	135
SU1 14	0152	2.23	5.79	11.05	11		11	90
SU1 15	0152	2.93	14.59	19.68	11		11	75
SU1 16	0152	2.99	3.5	2.95	17		17	40
SU1 17	0152	1.9	6.49	25.22	11		11	160
SU1 18	0152	7.09	5.22	3.85	33		33	110
SU1 19	0152	0	1.35	0	11		11	60
SU1 20	0152	0	5.23	0	22		22	15
SU1 21	0152	1.05	4.49	4.89	28		28	145
SU1 22	0152	0	2.47	2.97	22		22	295
SU2-01	0153	2.19	0	6.62	33		33	385
SU2-02	0153	2.19	1.21	9.08	11		11	280
SU2-03	0153	2.18	2.58	0.92	11		11	285
SU2-04	0153	0	2.74	5.11	17		17	175
SU2-05	0153	0	4.11	5.98	17		17	360
SU2-06	0153	0	4.11	3.14	0		0	95
SU2-07	0153	2.18	2.58	8.25	6		6	125
SU2-08	0153	0	6.85	0	17		17	135
SU2-09	0153	2.19	0	11.07	17		17	105
SU2-10	0153	0	2.74	0	17		17	195
SU2-11	0153	2.18	2.58	11.86	17		17	310
SU2-12	0153	0	5.48	0.91	6		6	205
SU2-13	0153	0	0	1.91	17		17	310
SU2-14	0153	2.18	3.95	3.72	22		22	105
SU2-15	0153	0	0	6.13	17		17	220
SU2-16	0153	0	1.37	10.7	6		6	180
SU2-17	0153	2.18	2.58	0.9	17		17	95
SU2-18	0153	0	2.74	0.88	6		6	265
SU2-19	0153	0	1.37	0	11		11	260
SU2-20	0153	4.37	1.06	0	11		11	215
SU3-01	0148	0	0	1.3	16		16	324
SU3-02	0148	0	4.11	8.12	32		32	376
Location	RSDS#	a	b	H^3	a		a	b
SU3-03	0148	2.19	0	4.53	24		24	380
SU3-04	0148	0	1.37	9.77	56		56	244

SU3-05	0148	0	0	12.95	8		8	196
SU3-06	0148	0	2.74	3.09	24		24	324
SU3-07	0148	0	2.74	7.08	48		48	452
SU3-08	0148	2.19	1.21	13.38	8		8	396
SU3-09	0148	0	2.74	6.24	16		16	716
SU3-10	0148	0	4.11	0	8		8	732
SU3-11	0148	0	1.37	0	99	66	77	1124
SU3-12	0148	0	5.48	8.27	88	55	66	1244
SU3-13	0148	0	2.74	6.21	50	17	61	1060
SU3-14	0148	0	1.37	10.04	66	33	72	1280
SU3-15	0148	4.37	5.17	5.68	33	0	66	1112
SU3-16	0148	2.18	3.95	3.5	6	-27	17	-68
SU3-17	0148	2.18	2.58	1.44	66	33	55	1044
SU3-18	0148	0	4.11	6.33	77	44	61	1100
SU3-19	0148	0	1.37	1.07	105	72	61	1160
SU3-20	0148	2.18	2.58	10.68	99	66	66	1296
SU3-21	0148	2.19	1.21	0	44	11	44	1016
SU3-22	0148	2.18	2.58	3.15	77	44	77	1012
DR-01	0156	6.55	5.01	0	30		30	580
DR-02	0156	2.19	1.21	6.67	0		0	280
DR-03	0156	0	4.11	0	40		40	410
DR-04	0156	0	4.11	0	50		50	120
DR-05	0156	6.56	2.27	0	-10		-10	195
DR-06	0156	0	4.11	4.68	60		60	425
DR-07	0156	4.37	6.54	0	20		20	225
DR-08	0156	2.18	2.58	0	80		80	245
DR-09	0156	0	6.85	0	20		20	25
DR-10	0156	2.18	3.95	0	-10		-10	80
DR-11	0156	8.74	3.49	0	80		80	255
DR-12	0156	0	1.37	0	30		30	75
DR-13	0156	4.37	2.43	2.36	10		10	155
DR-14	0156	0	1.37	0	0		0	140
DR-15	0156	2.18	2.58	0	10		10	-30
DR-16	0156	2.1/8	2.58	2.36	10		10	140
DR-17	0156	2.19	1.21	3.31	80		80	385
DR-18	0156	2.18	5.32	0	20		20	75
DR-19	0156	0	0	5.26	20		20	45
DR-20	0156	0	1.37	0.5	20		20	525

	α	β	H^3	α	α	α	β
#	83	84	84	84	12	84	84
Avg	1.42313	2.7775	4.82655	27.2857	34.3508	26.25	352.202
SD	1.90716	2.26965	5.06862	25.8222	29.8892	22.5008	354.04
Max	8.74	14.59	25.22	105	71.8508	80	1296
+/-	0.41029	0.48536	1.08392	5.52205	16.9111	4.81178	75.7112
Var				666.785			125344

Notes:

elevated measurements observed in SU# 3 Ext walls
Brick Bkg = 6 cpm = 33 dpm/100cm2 (6 / .5*.2*1.81)

Stats	
Mean	67.5
Std Error	8.62827
Median	71.5
Mode	99
Std Dev	29.8892
Variance	893.364
Kurtosis	-0.0331
Skewness	-0.68
Range	99
Minimum	6
Maximum	105
Sum	810
Count	12
CL(95.0%)	18.9907

Bin	*Freq*	*Bin*	*Freq*
6	1	More	6
39	1	72	4
72	4	6	1
More	6	39	1

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	12	810	67.5	893.364
Column 2	12	412.21	34.3508	893.364

Building GW Survey and Sample Data Worksheets
Enclosure 1

Survey Unit 1

	Smearable			Fixed	
	α	β	H^3	α	β
Number	22	22	22	22	22
Avg	1.496818	3.148636	7.74	18.45455	200.45455
SD	1.929775	3.316818	6.561949	8.633971	235.18437
Max	7.09	14.59	25.22	39	925
+/-	0.806386	1.385982	2.742009	3.607835	98.275342

Survey Unit 2

Number	20	20	20	20	20
Avg	1.092	2.4025	4.359	13.8	215.25
SD	1.325815	1.869272	4.117131	7.230054	89.581997
Max	4.37	6.85	11.86	33	385
+/-	0.581052	0.819228	1.804376	3.168648	39.260262

Survey Unit 3 Roof & Walls

						α Recount
Number	22	22	21	22	22	22
Avg	0.893636	2.433182	5.699048	47.72727	750.90909	44
SD	1.289627	1.592023	4.221943	32.8839	425.04307	24.582091
Max	4.37	5.48	13.38	105	1296	77
+/-	0.53889	0.665251	1.805719	13.74103	177.61067	10.271998

Drains and Vents

Number	19	20	21	20	20
Avg	2.299474	3.123	1.347143	28	217.5
SD	2.673484	1.864895	2.100191	28.58045	170.72215
Max	8.74	6.85	6.67	80	580
+/-	1.202121	0.81731	0.898249	12.52569	74.820796

Building GW Survey and Sample Data Worksheets
Enclosure 1

Instrument Data

	Inst	SN	CDD	RSDS	α Bkg(cpm)	β Bkg(cpm)
1	L2350	5856/5148	5/12/04	0148	2.8	
2	L2360	5775/5720	9/25/03	0148	1	139
3	L2350	5856/5148	5/12/04	0153	2.4	
4	L2360	5833/5847	3/13/04	0153		117
5	L2350	5856/5148	5/12/04	0152	2.4	
6	L2360	5833/5847	3/13/04	0152		117
7	L2360	5833/5847	3/13/04	0156	1	111

Background Correction Calc.

105dpm/100cm2 =	19 cpm
Bkg Table 5.1	6 cpm
NCPM	13 cpm

13 cpm/ 0.5*0.2*1.81 = 72 dpm/100cm2

NUREG 1507 Table 5.1 (GFP)
Background Count Rates for Various Materials (NCPM)

	Alpha	Beta
Brick	**6**	567.2
Ceramic Block	15	792
Ceramic Tile	12.6	647
Concrete Block	2.6	344
Drywall	2.6	325
Floor Tile	4	308
Linoleum	2.6	346
Carbon Steel	2.4	322.6

Replicate Fixed Point QC

	alpha (dpm/100cm2)			beta (dpm/100cm2)		
Location #	initial	2σ	replicate	initial	2σ	replicate
QC3-19	105	20.49	88	1160	68.12	1056
QC3-16	6	4.90	28	-68	16.49	-56
QC2-01	33	11.49	33	385	39.24	440
QC2-06	0	0.00	22	95	19.49	235
QC1-06	6	4.90	11	30	10.95	100
QC1-10	39	12.49	50	925	60.83	935
Variance (S2) =	666.7849		750.2667	125344.33		205461.07
Ratio			0.88873			0.6100637
Agreement			YES			YES

QC Measurements

Location	RSDS#	α	β
QC3-19	0148	88	1056
QC3-16	0148	28	-56
QC2-01	0153	33	440
QC2-06	0153	22	235
QC1-06	0152	11	100
QC1-10	0152	50	935

SURVEY PLAN FORM

SP NUMBER	GW-01	**DATE OF REQUEST**	April 30, 2003
TYPE OF SP	☐ FSS ☒ CHARACTERIZATION ☐ REFERENCE ☐ OTHER:		
AREA/LOCATION	Building GW		
PURPOSE	The purpose of this SP is to characterize Building GW to support decisions on final disposition.		
SURVEY UNIT # 1	First Floor	**SURVEY UNIT**	
SURVEY UNIT # 2	Second Floor	**SURVEY UNIT**	
SURVEY UNIT # 3	Exterior Surfaces and Penthouse	**SURVEY UNIT**	

SAMPLE TYPE

☐ **SURFACE SOIL SAMPLE:**

☐ **SUB-SURFACE SOIL SAMPLE:**

☒ **SEDIMENT SAMPLE:** See specific sediment sampling instructions on page 2.

☐ **Rubbelized Material:**

☐ **OTHER:**

SURVEY TYPE

SURFACE SCAN	☐ BETA ☐ GAMMA ☒ ALPHA	**INST. TYPE**	L-2350	**SCAN RATE & DETECTOR DISTANCE FROM SURFACE**	Scan surface at a rate of 1" per second at a distance of not more than ¼" from surface
		PROBE TYPE	43-37 Floor Probe or 43-20 Hand Probe		
STATIC MEASURE-MENT	☐ BETA ☐ GAMMA ☒ ALPHA	**INST. TYPE**	L-2350	**SCAN RATE & DETECTOR DISTANCE FROM SURFACE**	Perform 1 minute counts at specified locations not more than ¼" from surface
		PROBE TYPE	43-20 Hand Probe		
STATIC MEASURE-MENT	☒ BETA ☐ GAMMA ☐ ALPHA	**INST. TYPE**	L 2360	**COUNT TIME & DETECTOR DISTANCE FROM SURFACE**	Refer to MD-80036, Issue 29, Op. No. 30030, *Operation of the Ludlum 2360 Scaler/Ratemeter with Ludlum 43-89 Alpha/Beta Scintillator*, Section 6.3
		PROBE TYPE	L 43-89 (or equivalent)		
DOSE RATE MEASURE-MENT	☐ BETA ☐ GAMMA ☐ ALPHA	**INST. TYPE**		**DETECTOR DISTANCE FROM SURFACE**	
		PROBE TYPE			

OTHER SURVEY TYPES OR COMMENTS

All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.

Take photographs of survey units, if possible. Pay particular attention to grid markings or other identifying features. Date and label photos.

Rad Con shall document all discrepancies from the above sampling and surveying instructions on the Survey Plan Continuation Sheet.

SP NUMBER	GW-01	DATE OF REQUEST	April 30, 2003

SPECIFIC SAMPLING / SURVEY INSTRUCTIONS

Safety Considerations

1. Obtain assistance from the responsible building custodian for access to upper walls, ceilings, roof, etc. Exercise extreme caution when performing surveys from ladders or scaffolds. Follow appropriate site safety procedures when accessing areas requiring fall protection measures.
2. Ensure ventilation units are de-energized prior to attempting to collect a sample. Obtain approval and assistance from the responsible building custodian to dismantle any equipment for sample collection.

Floor Scan Measurements using a Ludlum 2350 with 43-37 alpha probe

1. Set the Ludlum 2350-1 datalogger to alarm at 75dpm/100cm^2 in the ratemeter mode.
2. Perform a floor scan of hallways and major walkways throughout the building.
3. Perform a 30 second integrated count at every location where an alarm is obtained. In addition, obtain a 30 second integrated count at any point where an audible or visual indication of elevated activity is observed at twice the background rate.
4. Record the location of the area scanned on the RSDS map and document the results of any integrated counts.

Static Measurements Using L 2350 with 43-20 (alpha) probe and L 2360 with 43-89 (beta) probe (or equivalent)

1. Perform an alpha and beta count on at least twenty (20) data points in Survey Units 1 & 2. Data points are selected by the surveyor and should be broadly representative of the entire survey unit.
2. Perform an alpha and beta measurement on at least ten (10) data points on the roof and penthouse areas. Data points are randomly selected by the surveyor and should be broadly representative of the entire survey unit.
3. Perform an alpha and beta measurement on at least ten (10) data points on the building exterior walls and exposed foundations. Data points are randomly selected by the surveyor and should be broadly representative of the entire survey unit
4. Record location, material type, and results on RSDS map in accordance with Mound Rad Con procedures.
5. Document gross activity for each location (No "<" values). Record instrument background at survey location.

Loose Surface Contamination

1. Obtain a smear of 100cm^2 at each survey point identified above.
2. Count each smear for alpha, beta, and H^3. H^3 analysis is not required for building external surfaces.
3. Record location and results on RSDS map in accordance with Mound Rad Con procedures.

Sediment Samples

1. Collect approximately 250ml of debris from each accessible ventilation unit opening, floor drain, roof gutter and any other area where debris has accumulated.
2. If insufficient material is present at these sample locations, obtain a representative smear of the location.
3. Document sample information and description of material on Attachment 1.
4. Label sample container with sample number, date and time of collection, and location in accordance with Mound procedures.
5. Show sample location on the RSDS map.
6. Submit sediment samples to laboratory for gamma spectroscopy analysis. Submit smears for gross alpha and beta analysis.
7. Additional intrusive samples may be collected in areas of elevated activity as determined by the MARSSIM Engineer.

Continued Next Page

Specific Survey and Sampling Instructions (continued)

Quality Control

1. QC measurements will be performed by re-surveying 2 data points in each survey unit. Data points selected for resurvey should include the highest and lowest readings in the survey unit.
2. Sediment samples or smears with measured activity above the MDA may be resubmitted for replicate analysis. Ensure alpha and beta smear results are obtained before performing H^3 analysis.
3. Record location, material, and results on RSDS in accordance with Mound Rad Con procedures.

APPROVAL SIGNATURES			
MARISSM Engineer	Roderick C. Case	DATE	April 30, 2003
Technical Reviewer	Gaven Tomlinson	DATE	5-28-03
Rad Con Manager	ASCollas	DATE	5-29-03
SP CLOSE-OUT SIGNATURES			
MARISSM Engineer	R.C. Case	DATE	7-2-03
Technical Reviewer	G. Tomlinson	DATE	7-6-03
Rad Con Manager	ASCollas	DATE	7-7-03

COMMENTS

Attachment 2

Sample Number	Sample Date	Sample Time	Sample Volume /Weight	Sample Description	Sampled By	Chain of Custody Relinquished to Lab			
						Date	Time	Initials	Rec'd By
GW-01-									
GW-01-									
GW-01-									
GW-01-									
GW-01-									
GW-01-									
GW-01-				N/A					
GW-01-									
GW-01-									
GW-01-									
GW-01-									
GW-01-									
GW-01-									

RADIOLOGICAL SURVEY DATA SHEET

1 of 4

LOCATION: (BLDG./AREA/ROOM) GW	SURVEY NO. 03-TF-0148
PURPOSE: MARISSM SURVEY PLAN GW-01 SURVEY UNIT 3	RWP NO. N/A
	DATE: 6-24-03
	TIME: 1530

MAP/DRAWING

SEE ATTACHED

COPY

LEGEND: # = mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or/β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360	5775/5720	9-25-03
2350	5856/5148	5-12-04
	N/A	

Completed by: (Signature) D.K. Riley	HP [redacted]	Date: 7-1-03 6-28-03
Completed by: (Print Name) DANIEL J. HARVEY DANNY RILEY		
Counted by: (Signature) SEE	HP #	Date:
Counted by: (Print Name) ATTACHED		
Reviewed/Approved by: (Signature)	HP # [redacted]	Date: 7-1-03
Reviewed/Approved by: (Print Name) R. CASE		

ML-9620 (2-98)

Survey No. 03-TF-0148

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	SEE	ATTACHED		ROOF
2	↓	↓	↓	↓
3				↓
4				ROOF DRAIN
5				ROOF
6				↓
7				↓
8				↓
9				↓
10				↓
11				OUTSIDE WALL
12				↓
13				↓
14				↓
15				↓
16				↓
17				↓
18				↓
19				↓
20				↓
21				PENTHOUSE
22	↓	↓	↓	↓
		N	A	

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
		N	A	

COMMENTS: N/A

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

GW-BLDG CHARACTERIZATION ALPHA-BETA SURVEY UNIT 3

RSDS# 03-TF-0148 RCT: [illegible] RCT: [illegible]

						BETA			ALPHA		
LOCATION	2360	RCT ID	PROBE	ITEM #	DATE	gross count	CT TIME	dpm/100cm2	gross count	CT TIME	dpm/100cm2
U-3 01	5775	[redacted]	5720	1	6/24/03	211	60	324	3	60	16
U-3 02	5775	[redacted]	5720	2	6/24/03	224	60	376	5	60	32
U-3 03	5775	[redacted]	5720	3	6/24/03	225	60	380	4	60	24
U-3 04	5775	[redacted]	5720	4	6/24/03	191	60	244	8	60	56
U-3 05	5775	[redacted]	5720	5	6/24/03	179	60	196	2	60	8
U-3 06	5775	[redacted]	5720	6	6/24/03	211	60	324	4	60	24
U-3 07	5775	[redacted]	5720	7	6/24/03	243	60	452	7	60	48
U-3 08	5775	[redacted]	5720	8	6/24/03	229	60	396	2	60	8
U-3 09	5775	[redacted]	5720	9	6/24/03	309	60	716	3	60	16
U-3 10	5775	[redacted]	5720	10	6/24/03	313	60	732	2	60	8
BETA BACKGROUND (CPM) FOR 6-24-2003 WAS---------->								130			
ALPHA BACKGROUND (CPM) FOR 6-24-2003 WAS---------->								1			

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 3

RSDS# 03-TF-0148 RCT: DGH RCT: SK

43-20 BKG:	0	EFF:	0.2	PROBE AREA:	181	cm2	Surface Eff:	0.5	Detector # :	2
[redacted]	0	[redacted]	0.2	PROBE AREA:	584	cm2	Surface Eff:	0.5	Detector # :	1

LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
SRC BKG	5856	[redacted]	5148	2		6/25/03	8:16	14	300	15
SRC CHECK	5856	[redacted]	5148	2		6/25/03	8:19	2084	60	11514
SRC CHECK	5856	[redacted]	5148	2		6/25/03	8:21	2133	60	11785
SRC CHECK	5856	[redacted]	5148	2		6/25/03	8:24	1965	60	10856
SRC CHECK	5856	[redacted]	5148	2		6/25/03	8:26	2170	60	11989
U-3 11	5856	[redacted]	5148	2	11	6/25/03	8:37	18	60	99
U-3 12	5856	[redacted]	5148	2	12	6/25/03	8:43	16	60	88
U-3 13	5856	[redacted]	5148	2	13	6/25/03	8:48	9	60	50
U-3 14	5856	[redacted]	5148	2	14	6/25/03	8:53	12	60	66
U-3 15	5856	[redacted]	5148	2	15	6/25/03	8:57	6	60	33
U-3 16	5856	[redacted]	5148	2	16	6/25/03	9:44	1	60	6
U-3 17	5856	[redacted]	5148	2	17	6/25/03	9:49	12	60	66
U-3 18	5856	[redacted]	5148	2	18	6/25/03	9:51	14	60	77
U-3 19	5856	[redacted]	5148	2	19	6/25/03	9:58	19	60	105
U-3 20	5856	[redacted]	5148	2	20	6/25/03	10:00	18	60	99
U-3 21	5856	[redacted]	5148	2	21	6/25/03	10:21	8	60	44
U-3 22	5856	[redacted]	5148	2	22	6/25/03	10:24	14	60	77
QC 19	5856	[redacted]	5148	2		6/25/03	10:32	16	60	88
QC 16	5856	[redacted]	5148	2		6/25/03	10:34	5	60	28

GW-BLDG CHARACTERIZATION BETA SURVEY UNIT 3

RSDS# 03-TF-00148 RCT: DJH RCT: SKP

LOCATION	2360	RCT ID	PROBE	ITEM #	DATE	gross count	CT TIME	dpm/100cm2
U-3 11	5775		5720	11	6/25/03	420	60	1124
U-3 12	5775		5720	12	6/25/03	450	60	1244
U-3 13	5775		5720	13	6/25/03	404	60	1060
U-3 14	5775		5720	14	6/25/03	459	60	1280
U-3 15	5775		5720	15	6/25/03	417	60	1112
U-3 16	5775		5720	16	6/25/03	122	60	-68
U-3 17	5775		5720	17	6/25/03	400	60	1044
U-3 18	5775		5720	18	6/25/03	414	60	1100
U-3 19	5775		5720	19	6/25/03	429	60	1160
U-3 20	5775		5720	20	6/25/03	463	60	1296
U-3 21	5775		5720	21	6/25/03	393	60	1016
U-3 22	5775		5720	22	6/25/03	392	60	1012
QC 19	5775		5720	14	6/25/03	403	60	1056
QC 16	5775		5720	15	6/25/03	125	60	-56
BETA BACKGROUND FOR 6-25-2003 WAS---------->								139

Alpha/Beta Analysis

Batch ID:	Smear Unit 1 - 200306261034	**Count Date:**	6/26/2003
Group:	G	**Count Minutes:**	1.5
Serial Number:	78218-1	**Count Mode:**	Simultaneous
Batch ID:	~~03-TF-0145~~ HARVEY-22 BSB 03-17-0148 Harvey 6/24/03	**Operating Volts:**	1440
Selected Geometry:	Swipe/Smear	**Cal Due Dates:**	6/19/2004

Efficiency (%)				Spillover (%)			
Alpha:	34.73	±	0.13	Alpha to Beta:	11.39	±	0.00
Beta:	46.13	●	0.13	Beta to Alpha:	0.07	±	0.00

Sample ID	Carrier ID	Alpha (dpm)	σ	Beta (dpm)	σ
1	67	0.00	0.00	0.00	0.00
2	72	0.00	0.00	4.11	2.50
3	64	2.19	1.92	0.00	0.16
4	100	0.00	0.00	1.37	1.45
5	18	0.00	0.00	0.00	0.00
6	65	0.00	0.00	2.74	2.04
7	66	0.00	0.00	2.74	2.04
8	33	2.19	1.92	1.21	1.45
9	19	0.00	0.00	2.74	2.04
10	85	0.00	0.00	4.11	2.50
11	89	0.00	0.00	1.37	1.45
12	1	0.00	0.00	5.48	2.89
13	9	0.00	0.00	2.74	2.04
14	66	0.00	0.00	1.37	1.45
15	54	4.37	2.72	5.17	2.90
16	68	2.18	1.92	3.95	2.51
17	28	2.18	1.92	2.58	2.05
18	24	0.00	0.00	4.11	2.50
19	80	0.00	0.00	1.37	1.45
20	12	2.18	1.92	2.58	2.05
21	84	2.19	1.92	1.21	1.45
22	45	2.18	1.92	2.58	2.05
		DJH		DJH	

26 Jun 2003 12:02 ALPHA/BETA - 1.09 Page #1
Protocol #: 1 PW H3 405828 User : 5268

Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5	- 18.6	0	0.0	5.75
Region B:	2.0	- 18.6	0	0.0	5.50
Region C:	40.0	- 2000	0	0.0	10.40

Quench Indicator: tSIE/AEC
~~Ext Std Terminator: Count~~
03-TF-0148 HARVEY-22 BSB
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: c:\data\PROT1.DAT
Count Data Filename: c:\data\SDATA1.DAT
Spectrum Data Drive & Path: c:\data

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2Sigma	CPMC
-1	10.00	5.75	5.50	0	B	595.55		0.00	10.40
0	2.00	200.97	190.60	0		459.89	461.50	58.50	0.10
1	2.00	0.68	0.44	0		664.42	1.30	7.39	4.28
2	2.00	4.19	4.11	0		634.99	8.12	9.16	3.10
3	2.00	2.29	2.55	0		611.49	4.53	8.49	0.00
4	2.00	3.25	3.24	20		318.06	9.77	14.86	1.59
5	2.00	5.75	5.46	9		473.17	12.95	11.38	0.10
6	2.00	1.25	0.66	29		406.13	3.09	11.74	0.10
7	2.00	3.64	3.57	0		632.31	7.08	8.94	0.10
8	2.00	6.75	5.14	0		609.36	13.38	10.40	2.60
9	2.00	3.25	3.15	0		646.16	6.24	8.67	0.00
10	2.00	0.00	0.00	0		596.56	0.00	0.00	0.00
11	2.00	0.00	0.00	0		623.02	0.00	0.00	0.60
12	2.00	4.25	3.35	0		629.23	8.27	9.23	2.60
13	2.00	3.25	3.50	0		652.74	6.21	8.63	1.60
14	2.00	5.25	4.64	0		650.82	10.04	9.47	1.27
15	2.00	2.75	2.81	0		558.00	5.68	9.10	0.00
16	2.00	1.75	2.00	0		595.98	3.50	8.34	0.00
17	2.00	0.75	1.00	0		642.27	1.44	7.54	2.10
18	2.00	3.25	3.50	0		629.14	6.33	8.80	0.00
19	2.00	0.56	0.07	0		657.21	1.07	7.36	0.60
20	2.00	5.63	5.11	0		664.79	10.68	9.53	0.00
21	2.00	0.00	0.00	0		615.86	0.00	0.00	0.00
22	2.00	1.52	1.28	0		557.56	3.15	8.50	0.60

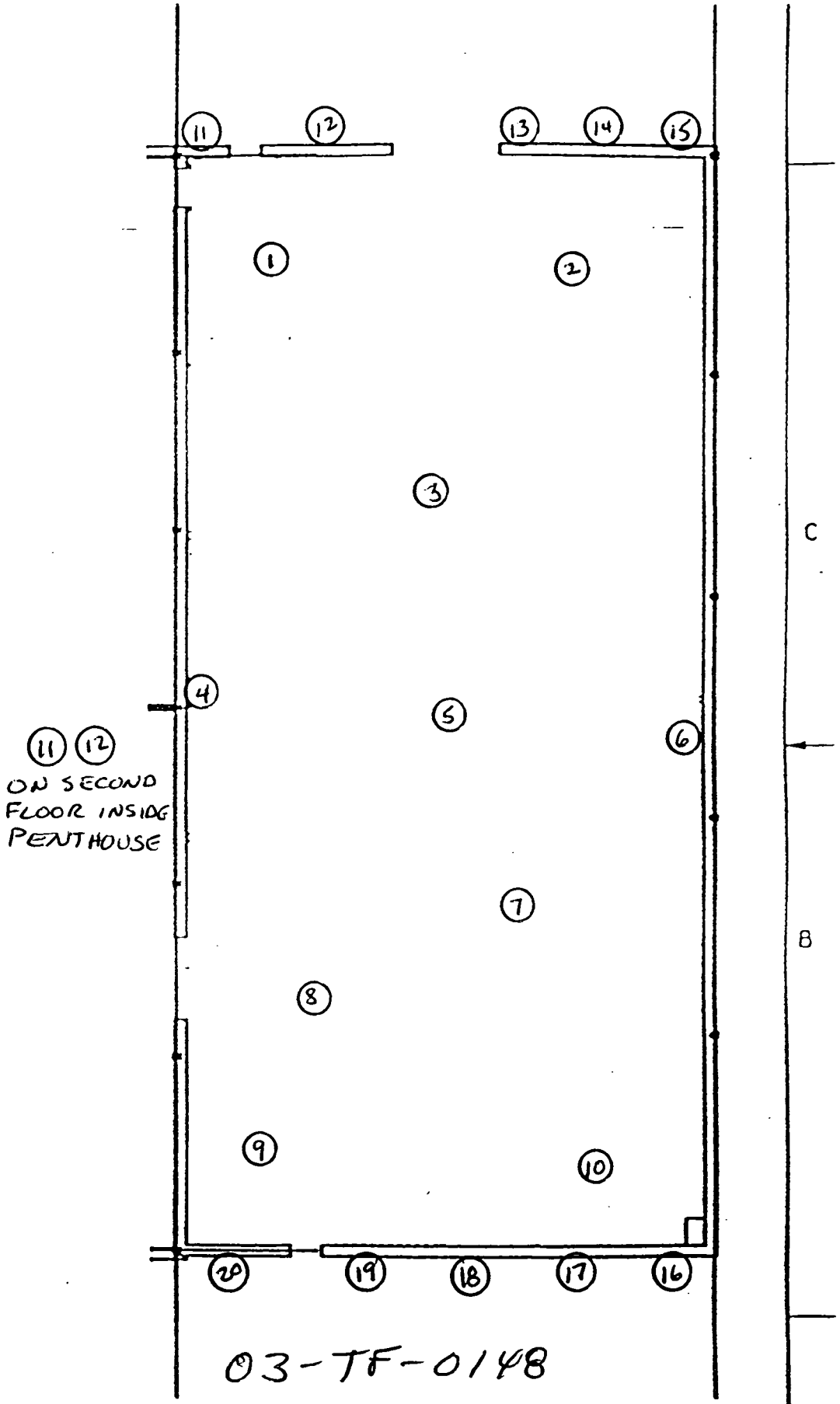
~~12 MISSING~~ TUBE(S)

~~35~~	~~2.00~~	~~0.33~~	~~0.59~~	~~0~~		~~584.48~~	~~0.68~~	~~7.70~~	~~0.00~~
~~36~~	~~2.00~~	~~333.00~~	~~314.13~~	~~0~~		~~476.82~~	~~746.86~~	~~81.50~~	~~0.10~~

Delete 6/26/03 [illegible]

[illegible] 6-30-03

7 of 9



03-TF-0148

GW BLDG
ROOF

8 of 9

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 3
FOLLOW-UP

RSDS# 03-TF-0148 RCT: [illegible] RCT:_____

43-20 BKG:	0	EFF:	0.2	PROBE AREA:	181	cm2	Surface Eff:		0.5	Detector # :	2
43-37 BKG:	0	EFF:	0.2	PROBE AREA:	584	cm2	Surface Eff:		0.5	Detector # :	1
LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2	
SRC BKG	5856	[redacted]	5148	2		6/30/03	12:33	16	300	18	
SRC CHECK	5856	[redacted]	5148	2		6/30/03	12:35	2177	60	12028	
SRC CHECK	5856	[redacted]	5148	2		6/30/03	12:36	2048	60	11315	
SRC CHECK	5856	[redacted]	5148	2		6/30/03	12:38	2005	60	11077	
SRC CHECK	5856	[redacted]	5148	2		6/30/03	12:39	2206	60	12188	
U-3 11	5856	[redacted]	5148	2		6/30/03	12:58	14	60	77	
U-3 12	5856	[redacted]	5148	2		6/30/03	12:59	12	60	66	
U-3 13	5856	[redacted]	5148	2		6/30/03	13:01	11	60	61	
U-3 14	5856	[redacted]	5148	2		6/30/03	13:02	13	60	72	
U-3 15	5856	[redacted]	5148	2		6/30/03	13:03	12	60	66	
U-3 16	5856	[redacted]	5148	2		6/30/03	13:08	3	60	17	
U-3 17	5856	[redacted]	5148	2		6/30/03	13:09	10	60	55	
U-3 18	5856	[redacted]	5148	2		6/30/03	13:10	11	60	61	
U-3 19	5856	[redacted]	5148	2		6/30/03	13:12	11	60	61	
U-3 20	5856	[redacted]	5148	2		6/30/03	13:14	12	60	66	

RADIOLOGICAL SURVEY DATA SHEET

1 of 8

LOCATION: (BLDG./AREA/ROOM) GW	SURVEY NO. 03-TF-0152
PURPOSE: MARISSM SURVEY PLAN GW-01 UNIT 1 FIRST FLOOR	RWP NO. N/A
	DATE: 6-26-03
	TIME: 1530

MAP/DRAWING

SEE ATTACHED

SURVEY ALSO INCLUDES SCANNING OF MAJOR WALK WAYS WITH ALL RESULTS < 75dpm ALARM SET POINT

COPY

LEGEND: # = mrem/hr (γ) whole body
#E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or/β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5856/5148	5-12-04
2360	5833/5847	3-13-04
	N/A	

Completed by: (Signature) Daniel J. Harvey D.K. Riley	HP # [redacted]	Date: 7-1-03
Completed by: (Print Name) DANIEL J. HARVEY DANNY RILEY		
Counted by: (Signature) SEE	HP #	Date:
Counted by: (Print Name) ATTACHED		
Reviewed/Approved by: (Signature)	HP # [redacted]	Date: 7-1-03
Reviewed/Approved by: (Print Name) R. CASE		

ML-9620 (2-98)

2 of 8

Survey No. 03-TF-0152

Page ___ of ___

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1-22	SEE	ATTACHED		UNIT 1
		N	A	

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
		N	A	

COMMENTS: N/A

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620A (4-98)

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 1

RSDS# 03-TF-0152 RCT: [illegible] RCT: [illegible]

43-20 BKG:	0	EFF:	0.2	PROBE AREA:	181	cm2	Surface Eff:			Detector # :	2
43-37 BKG:	[illegible]	EFF:	0.2	PROBE AREA:	584	cm2	Surface Eff:		[illegible]	Detector # :	1
LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2	
SRC BKG	5856	[redacted]	5148	2		6/26/03	9:07	12	300	13	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:13	2149	60	11873	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:15	2124	60	11735	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:16	2034	60	11238	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:18	2112	60	11669	
U-1 01	5856	[redacted]	5148	2	1	6/26/03	9:52	5	60	28	
U-1 02	5856	[redacted]	5148	2	2	6/26/03	9:54	2	60	11	
U-1 03	5856	[redacted]	5148	2	3	6/26/03	9:55	4	60	22	
U-1 04	5856	[redacted]	5148	2	4	6/26/03	9:57	4	60	22	
U-1 05	5856	[redacted]	5148	2	5	6/26/03	9:58	2	60	11	
U-1 06	5856	[redacted]	5148	2	6	6/26/03	9:59	1	60	6	
U-1 07	5856	[redacted]	5148	2	7	6/26/03	10:01	3	60	17	
U-1 08	5856	[redacted]	5148	2	8	6/26/03	10:03	2	60	11	
U-1 09	5856	[redacted]	5148	2	9	6/26/03	10:04	3	60	17	
U-1 10	5856	[redacted]	5148	2	10	6/26/03	10:05	7	60	39	
U-1 11	5856	[redacted]	5148	2	11	6/26/03	10:07	2	60	11	
U-1 12	5856	[redacted]	5148	2	12	6/26/03	10:08	5	60	28	
U-1 13	5856	[redacted]	5148	2	13	6/26/03	10:10	3	60	17	
U-1 14	5856	[redacted]	5148	2	14	6/26/03	10:11	2	60	11	
U-1 15	5856	[redacted]	5148	2	15	6/26/03	10:13	2	60	11	
U-1 16	5856	[redacted]	5148	2	16	6/26/03	10:14	3	60	17	
U-1 17	5856	[redacted]	5148	2	17	6/26/03	10:16	2	60	11	
U-1 18	5856	[redacted]	5148	2	18	6/26/03	10:19	6	60	33	

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 1

RSDS# 03-TF-0152 RCT: [illegible] RCT: [illegible]

LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
U-1 19	5856	[redacted]	5148	2	19	6/26/03	10:21	2	60	11
U-1 20	5856	[redacted]	5148	2	20	6/26/03	10:22	4	60	22
U-1 21	5856	[redacted]	5148	2	21	6/26/03	10:24	5	60	28
U-1 22	5856	[redacted]	5148	2	22	6/26/03	10:27	4	60	22
QCU-1 06	5856	[redacted]	5148	2		6/26/03	10:29	2	60	11
QCU-1 10	5856	[redacted]	5148	2		6/26/03	10:31	9	60	50

GW-BLDG CHARACTERIZATION BETA SURVEY UNIT 1

RSDS# 03-TF-0152 RCT: ZgH RCT: SR

LOCATION	2360	RCT ID	PROBE	ITEM #	DATE	gross count	CT TIME	dpm/100cm2
U-1 01	5833	[redacted]	5847	1	6/26/03	130	60	65
U-1 02	5833	[redacted]	5847	2	6/26/03	167	60	250
U-1 03	5833	[redacted]	5847	3	6/26/03	148	60	155
U-1 04	5833	[redacted]	5847	4	6/26/03	152	60	175
U-1 05	5833	[redacted]	5847	5	6/26/03	148	60	155
U-1 06	5833	[redacted]	5847	6	6/26/03	123	60	30
U-1 07	5833	[redacted]	5847	7	6/26/03	288	60	855
U-1 08	5833	[redacted]	5847	8	6/26/03	130	60	65
U-1 09	5833	[redacted]	5847	9	6/26/03	160	60	215
U-1 10	5833	[redacted]	5847	10	6/26/03	302	60	925
U-1 11	5833	[redacted]	5847	11	6/26/03	152	60	175
U-1 12	5833	[redacted]	5847	12	6/26/03	161	60	220
U-1 13	5833	[redacted]	5847	13	6/26/03	144	60	135
U-1 14	5833	[redacted]	5847	14	6/26/03	135	60	90
U-1 15	5833	[redacted]	5847	15	6/26/03	132	60	75
U-1 16	5833	[redacted]	5847	16	6/26/03	125	60	40
U-1 17	5833	[redacted]	5847	17	6/26/03	149	60	160
U-1 18	5833	[redacted]	5847	18	6/26/03	139	60	110
U-1 19	5833	[redacted]	5847	19	6/26/03	129	60	60
U-1 20	5833	[redacted]	5847	20	6/26/03	120	60	15
U-1 21	5833	[redacted]	5847	21	6/26/03	146	60	145
U-1 22	5833	[redacted]	5847	22	6/26/03	176	60	295
QCU-1 06	5833	[redacted]	5847		6/26/03	137	60	100
QCU-1 10	5833	[redacted]	5847		6/26/03	304	60	935
BETA BACKGROUND (CPM) FOR 6-26-2003 WAS---------->								117

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Green
Data file name: SMEAR001
Batch Ended: 6/30/03 8:26
Cal. Due Date: 5/1/05
Serial Number: 26966-3
Batch ID: 03-TF-0152 Harvey(22) 6/30/03 bob

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	σ	flags	DPM	σ	flags
A1	1	0.49	2.10		1.09	2.29	
A2	2	1.59	1.91		0.00	1.79	
A3	3	0.00	2.24		0.00	1.92	
A4	4	0.00	1.98		0.00	1.35	
B1	5	3.82	2.79		5.03	3.22	
B2	6	1.09	2.13		3.24	2.80	
B3	7	5.34	3.70		2.23	2.39	
B4	8	0.00	2.14		0.35	1.84	
C1	9	1.05	2.03		2.07	2.15	
C2	10	0.00	1.85		3.58	2.56	
C3	11	0.00	2.12		0.00	1.90	
C4	12	1.36	2.05		2.55	2.67	
D1	13	0.00	2.07		0.00	2.74	
D2	14	2.23	3.02		5.79	2.99	
D3	15	2.93	3.17		14.59	4.80	
D4	16	2.99	3.14		3.50	2.80	
B1	17	1.90	2.04		6.49	3.47	
B2	18	7.09	4.09		5.22	3.28	
B3	19	0.00	2.19		1.35	1.98	
B4	20	0.00	2.18		5.23	3.06	
C1	21	1.05	2.06		4.49	2.75	
C2	22	0.00	1.84		2.47	2.30	

DJH DJH

DJH 7-1-03

30 Jun 2003 10:50 TRI-CARB - 1.09 Page #1
Protocol #: 6 PW H3 #407906 User : 5268

Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

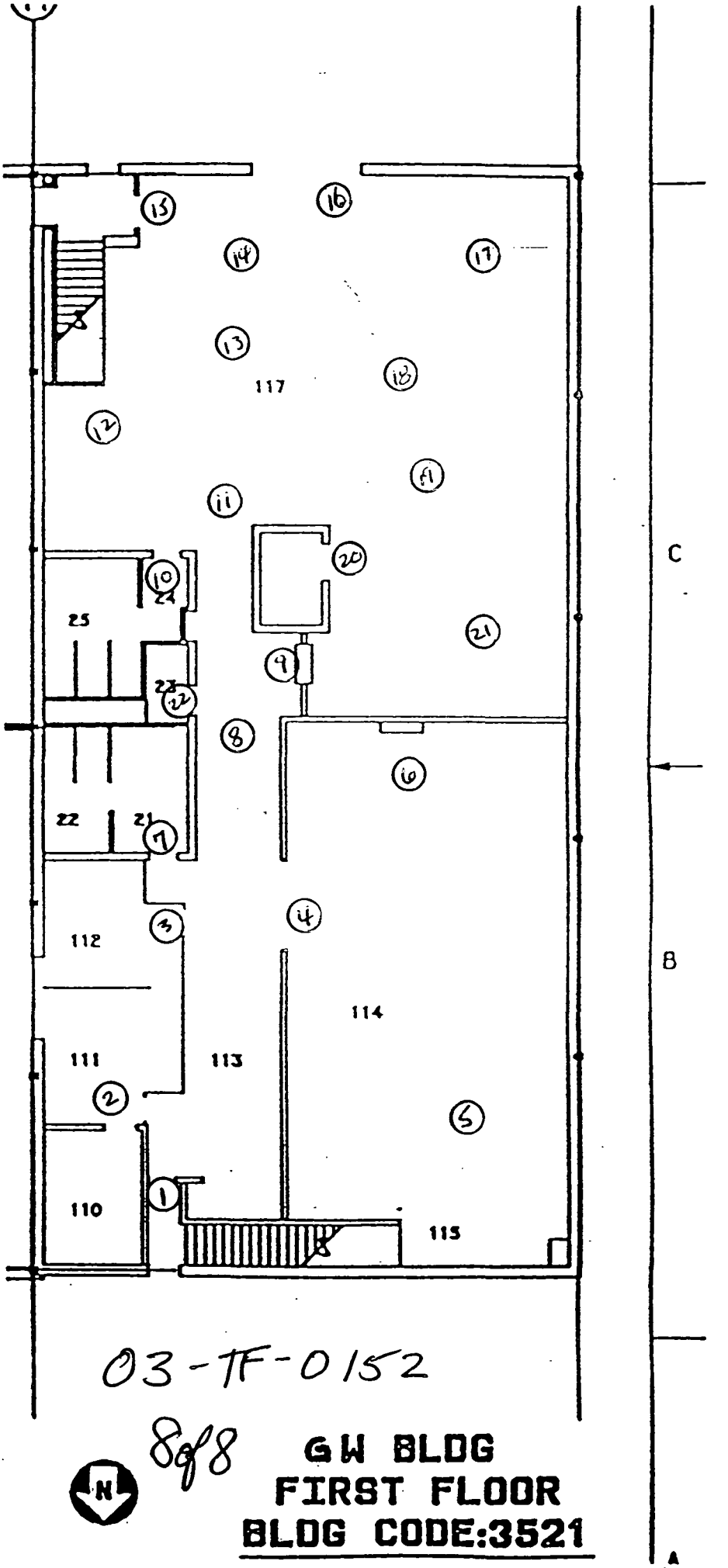
	LL	UL	LCR	2S%	BKG
Region A:	0.5	- 18.6	0	0.0	6.86
Region B:	2.0	- 18.6	0	0.0	6.55
Region C:	40.0	- 2000	0	0.0	9.30

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
03-TF-0152 HARVEY-22 BSB
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT6.dat
Count Data Filename: C:\DATA\SDATA6.DAT
Spectrum Data Drive & Path: C:\DATA

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2SIGMA	CPMC
-1	10.00	6.86	6.55	0	B	595.96		0.000	9.30
0	2.00	417.27	383.11	0		501.80	841.89	73.354	1.70
1	2.00	4.14	3.86	0		473.26	8.66	10.405	1.20
2	2.00	1.82	1.33	0		612.39	3.36	8.289	6.20
3	2.00	4.14	4.00	0		571.76	7.90	9.498	2.70
4	2.00	7.64	7.45	0		572.11	14.58	10.771	4.20
5	2.00	3.14	3.45	0		646.40	5.67	8.602	1.20
6	2.00	6.31	5.70	0		677.62	11.14	9.539	3.20
7	2.00	0.00	0.04	7		393.01	0.00	0.000	2.20
8	2.00	3.14	2.84	0		617.10	5.79	8.792	0.00
9	2.00	8.48	6.63	42		624.93	15.54	15.715	4.70
10	2.00	3.14	3.45	0		625.03	5.76	8.739	3.70
11	2.00	2.78	2.44	0		527.44	5.49	9.274	8.20
12	2.00	6.81	6.11	0		635.77	12.37	9.984	0.70
13	2.00	1.83	1.18	0		599.14	3.41	8.377	8.20
14	2.00	6.14	5.95	0		649.10	11.05	9.662	1.70
15	2.00	9.93	9.25	0		523.81	19.68	11.986	9.96
16	2.00	1.64	1.95	0		651.74	2.95	7.980	4.20
17	2.00	13.54	13.07	0		602.96	25.22	12.358	7.61
18	2.00	2.14	1.58	0		653.31	3.85	8.171	5.70
19	2.00	0.00	0.00	0		572.63	0.00	0.000	0.71
20	2.00	0.00	0.00	0		627.25	0.00	0.000	1.70
21	2.00	2.60	2.65	0		588.25	4.89	8.767	0.00
22	2.00	1.64	1.45	0		641.70	2.97	8.039	1.70

29#

BABrown



03-TF-0152

8 of 8

GW BLDG
FIRST FLOOR
BLDG CODE:3521

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) GW BUILDING	SURVEY NO. 03-TF-0153
PURPOSE: MARSSIM SURVEY PLAN GW-01 UNIT 2 (SECOND FLOOR)	RWP NO. N/A
	DATE: 06-26-03
	TIME: 1600

MAP/DRAWING

SEE ATTACHED RESULTS AND DRAWING

SURVEY ALSO INCLUDES SCANNING OF MAJOR WALKWAYS WITH ALL RESULTS < 75 dpm ALARM SETPOINT.

COPY

LEGEND:
# = mrem/hr (γ) whole body
# E = mrem/hr (β+n+γ) extremity on contact
K= factor of 1000
- - - - - - - = radiological boundary

△# = mrem/hr neutron

[#] = air sample number

(#) = swipe number

(# /α) or /β = direct contamination measurement in dpm/100cm2

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5856	5-12-04
2360/4393	5833/5847	3-13-04
	N/A	

ML-9620

Completed by: (Signature) D. Riley	HP# [redacted]	Date: 7-1-03
Completed by: (Print) D. HARVEY D. RILEY		
Counted by: (Signature)	HP#	Date:
Counted by: (Print) SEE ATTACHED		
Reviewed/Approved by: (Signature)	HP# [redacted]	Date: 7-1-03
Reviewed/Approved by: (Print) R. CASE		

RSDS# 03-TF-0153

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
1				UNIT 2
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				UNIT 2
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

See attached results

N/A

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
22				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
99				
70				

See attached results

N/A

COMMENTS:

N/A

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO count Room analysis for β/γ ,alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached , write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 2

RSDS# 03-TF-0153 RCT: [illegible] RCT: [illegible]

43-20 BKG:	0	EFF:	0.2	PROBE AREA:	181	cm2	Surface Eff:			Detector # :	2
43-37 BKG:	0	EFF:	0.2	PROBE AREA:	584	cm2	Surface Eff:			Detector # :	1
LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2	
SRC BKG	5856	[redacted]	5148	2		6/26/03	9:07	12	300	13	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:13	2149	60	11873	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:15	2124	60	11735	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:16	2034	60	11238	
SRC CHECK	5856	[redacted]	5148	2		6/26/03	9:18	2112	60	11669	
U-2 01	5856	[redacted]	5148	2	1	6/26/03	12:57	6	60	33	
U-2 02	5856	[redacted]	5148	2	2	6/26/03	12:58	2	60	11	
U-2 03	5856	[redacted]	5148	2	3	6/26/03	13:00	2	60	11	
U-2 04	5856	[redacted]	5148	2	4	6/26/03	13:01	3	60	17	
U-2 05	5856	[redacted]	5148	2	5	6/26/03	13:03	3	60	17	
U-2 06	5856	[redacted]	5148	2	6	6/26/03	13:04	0	60	0	
U-2 07	5856	[redacted]	5148	2	7	6/26/03	13:05	1	60	6	
U-2 08	5856	[redacted]	5148	2	8	6/26/03	13:07	3	60	17	
U-2 09	5856	[redacted]	5148	2	9	6/26/03	13:08	3	60	17	
U-2 10	5856	[redacted]	5148	2	10	6/26/03	13:09	3	60	17	
U-2 11	5856	[redacted]	5148	2	11	6/26/03	13:11	3	60	17	
U-2 12	5856	[redacted]	5148	2	12	6/26/03	13:12	1	60	6	
U-2 13	5856	[redacted]	5148	2	13	6/26/03	13:14	3	60	17	
U-2 14	5856	[redacted]	5148	2	14	6/26/03	13:15	4	60	22	
U-2 15	5856	[redacted]	5148	2	15	6/26/03	13:17	3	60	17	
U-2 16	5856	[redacted]	5148	2	16	6/26/03	13:18	1	60	6	
U-2 17	5856	[redacted]	5148	2	17	6/26/03	13:20	3	60	17	
U-2 18	5856	[redacted]	5148	2	18	6/26/03	13:22	1	60	6	

GW BUILDING CHARACTERIZATION ALPHA SURVEY UNIT 2

RSDS# 03-TF-0153 RCT: [illegible] RCT: [illegible]

LOCATION	2350#	RCT ID	PROBE	DET #	ITEM #	DATE	TIME	CNTS	CT TIME	dpm/100cm2
U-2 19	5856	[redacted]	5148	2	19	6/26/03	13:23	2	60	11
U-2 20	5856	[redacted]	5148	2	20	6/26/03	13:25	2	60	11
QCU-2 01	5856	[redacted]	5148	2		6/26/03	13:27	6	60	33
QCU-2 06	5856	[redacted]	5148	2		6/26/03	13:29	4	60	22

GW-BLDG CHARACTERIZATION BETA SURVEY UNIT 2

RSDS# 03-TF-0153 RCT: [illegible] RCT: [illegible]

LOCATION	2360	RCT ID	PROBE	ITEM #	DATE	gross count	CT TIME	dpm/100cm2
U-2 01	5833	[redacted]	5847	1	6/26/03	194	60	385
U-2 02	5833	[redacted]	5847	2	6/26/03	173	60	280
U-2 03	5833	[redacted]	5847	3	6/26/03	174	60	285
U-2 04	5833	[redacted]	5847	4	6/26/03	152	60	175
U-2 05	5833	[redacted]	5847	5	6/26/03	189	60	360
U-2 06	5833	[redacted]	5847	6	6/26/03	136	60	95
U-2 07	5833	[redacted]	5847	7	6/26/03	142	60	125
U-2 08	5833	[redacted]	5847	8	6/26/03	144	60	135
U-2 09	5833	[redacted]	5847	9	6/26/03	138	60	105
U-2 10	5833	[redacted]	5847	10	6/26/03	156	60	195
U-2 11	5833	[redacted]	5847	11	6/26/03	179	60	310
U-2 12	5833	[redacted]	5847	12	6/26/03	158	60	205
U-2 13	5833	[redacted]	5847	13	6/26/03	179	60	310
U-2 14	5833	[redacted]	5847	14	6/26/03	138	60	105
U-2 15	5833	[redacted]	5847	15	6/26/03	161	60	220
U-2 16	5833	[redacted]	5847	16	6/26/03	153	60	180
U-2 17	5833	[redacted]	5847	17	6/26/03	136	60	95
U-2 18	5833	[redacted]	5847	18	6/26/03	170	60	265
U-2 19	5833	[redacted]	5847	19	6/26/03	169	60	260
U-2 20	5833	[redacted]	5847	20	6/26/03	160	60	215
QCU-2 01	5833	[redacted]	5847		6/26/03	205	60	440
QCU-2 06	5833	[redacted]	5847		6/26/03	164	60	235
BETA BACKGROUND (CPM) FOR 6-26-2003 WAS---------->								117

Alpha/Beta Analysis

Batch ID:	Smear Unit 1 - 200306300722	**Count Date:**	6/30/2003
Group:	E	**Count Minutes:**	1.5
Serial Number:	78218-1	**Count Mode:**	Simultaneous
Batch ID:	03-TF-0153 HARVEY-20 BSB	**Operating Volts:**	1440
Selected Geometry:	Swipe/Smear	**Cal Due Dates:**	6/19/2004

Efficiency (%)				Spillover (%)			
Alpha:	34.73	±	0.13	Alpha to Beta:	11.39	±	0.00
Beta:	46.13	±	0.13	Beta to Alpha:	0.07	±	0.00

Sample ID	Carrier ID	Alpha (dpm)	σ	Beta (dpm)	σ
1	74	2.19	1.92	0.00	0.16
2	60	2.19	1.92	1.21	1.45
3	52	2.18	1.92	2.58	2.05
4	72	0.00	0.00	2.74	2.04
5	18	0.00	0.00	4.11	2.50
6	69	0.00	0.00	4.11	2.50
7	43	2.18	1.92	2.58	2.05
8	14	0.00	0.00	6.85	3.23
9	2	2.19	1.92	0.00	0.16
10	13	0.00	0.00	2.74	2.04
11	65	2.18	1.92	2.58	2.05
12	30	0.00	0.00	5.48	2.89
13	40	0.00	0.00	0.00	0.00
14	93	2.18	1.92	3.95	2.51
15	29	0.00	0.00	0.00	0.00
16	3	0.00	0.00	1.37	1.45
17	61	2.18	1.92	2.58	2.05
18	65	0.00	0.00	2.74	2.04
19	59	0.00	0.00	1.37	1.45
20	99	4.37	2.72	1.06	1.46

DGH DGH

BJ Brown

Batch ID: 03-TF-0153 HARVEY-20 BSB

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~~Page 1 of 1~~

DGH
7-1-03

Protocol #: 1 PW H3 #403727 User : 5268

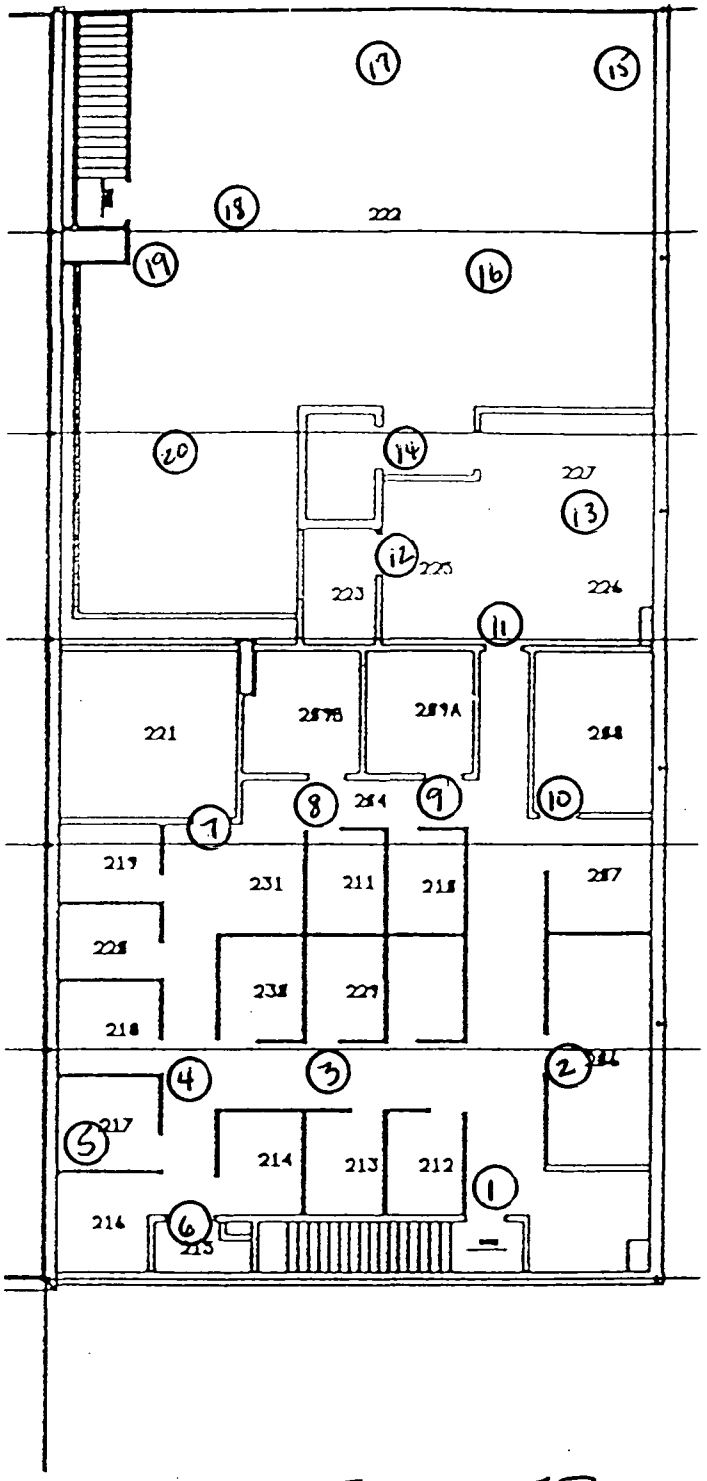
Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5	- 18.6	0	0.0	6.05
Region B:	2.0	- 18.6	0	0.0	5.97
Region C:	40.0	- 2000	0	0.0	11.24

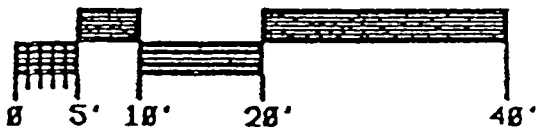
Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
03-TF-0153 HARVEY-20 BSB
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT1.DAT
Count Data Filename: C:\DATA\SDATA1.DAT

S#	TIME	CPMA	CPMB	CPMC	tSIE	LUM	FLAG	DPM1	2SIGMA
-1	10.00	6.05	5.97	11.24	652.85	2	B		0.00
0	2.00	597.53	578.51	0.00	525.17	0		1315.62	123.04
1	2.00	3.45	3.09	5.76	692.05	0		6.62	8.88
2	2.00	4.68	4.34	0.76	674.60	0		9.08	9.51
3	2.00	0.45	0.03	0.00	618.95	0		0.92	7.97
4	2.00	2.50	2.57	0.00	610.31	0		5.11	9.03
5	2.00	3.08	3.16	0.00	675.77	0		5.98	8.83
6	2.00	1.61	1.03	0.00	666.36	0		3.14	8.23
7	2.00	4.17	3.38	2.76	651.32	0		8.25	9.47
8	2.00	0.00	0.03	0.00	545.52	0		0.00	0.00
9	2.00	5.45	5.03	1.26	618.55	0		11.07	10.26
10	2.00	0.00	0.00	0.00	679.78	0		0.00	0.00
11	2.00	5.95	6.03	0.00	641.88	0		11.86	10.27
12	2.00	0.45	0.53	0.00	633.53	0		0.91	7.87
13	2.00	0.95	1.03	0.00	633.73	0		1.91	8.12
14	2.00	1.95	1.57	0.00	699.11	0		3.72	8.18
15	2.00	3.09	2.80	0.00	646.44	0		6.13	9.04
16	2.00	5.45	5.03	0.00	660.55	4		10.70	9.93
17	2.00	0.45	0.53	0.00	654.42	0		0.90	7.74
18	2.00	0.45	0.53	0.00	680.73	0		0.88	7.59
19	2.00	0.00	0.00	0.00	704.54	0		0.00	0.00
20	2.00	0.00	0.00	0.00	682.05	0		0.00	0.00

DGH



03-TF-0153



N

GW BLDG
SECOND FLOOR
BLDG CODE:352

8 of 8

DRAWING NUMBER

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) GW BUILDING	SURVEY NO. 03-TF-0156
PURPOSE: MARSSIM SURVEY VENTILATION AND DRAINS PER SURVEY PLAN GW-01	RWP NO. N/A
	DATE: 06-28-03
	TIME: 1530

MAP/DRAWING

SEE ATTACHED RESULTS AND DRAWINGS

COPY

LEGEND:

# = mrem/hr (γ) whole body
# E = mrem/hr (β+n+γ) extremity on contact
K= factor of 1000
- - - - - - - = radiological boundary

△# = mrem/hr neutron

[#] = air sample number

(#) = swipe number

(# /α) or /β = direct contamination measurement in dpm/100cm2

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360/4393	5833/5847	3-13-04

N/A

Completed by: (Signature)	HP# [redacted]	Date: 7-1-03
Completed by: (Print) D. HARVEY D. RILEY		
Counted by: (Signature)	HP#	Date:
Counted by: (Print) SEE ATTACHED		
Reviewed/Approved by: (Signature)	HP# [redacted]	Date: 7-2-03
Reviewed/Approved by: (Print)		

ML-9620

RSDS# 03-TF-0156

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
1				EXHAUST
2				SUPPLY
3				EXHAUST
4				EXHAUST
5				(CHILLER) AIR HANDLER
6				EXHAUST
7				SUPPLY
8				EXHAUST
9				SUPPLY
10				EXHAUST
11				EXHAUST
12				SUPPLY
13				EXHAUST
14				DRAIN
15				(DRAIN) SLOP SINK
16				DRAIN
17				EXHAUST
18				EXHAUST
19				CHILLER
20				SUPPLY
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

See attached results

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
22				
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56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
99				
70				

See attached results

COMMENTS: N/A

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO count Room analysis for β/γ ,alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached , write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620

GW-BLDG CHARACTERIZATION BETA and ALPHA SURVEY VENTILATION and DRAINS

RSDS# 03-TF-0156 RCT: [illegible] RCT: [illegible]

						BETA			ALPHA		
LOCATION	2360	RCT ID	PROBE	ITEM #	DATE	gross count	CT TIME	dpm/100cm2	gross count	CT TIME	dpm/100cm2
exhaust 1	5833	[redacted]	5847	1	06/28/2003	227	60	580	4	60	30
supply 2	5833	[redacted]	5847	2	06/28/2003	167	60	280	1	60	0
exhaust 3	5833	[redacted]	5847	3	06/28/2003	193	60	410	5	60	40
exhaust 4	5833	[redacted]	5847	4	06/28/2003	135	60	120	6	60	50
chiller 5	5833	[redacted]	5847	5	06/28/2003	150	60	195	0	60	-10
exhaust 6	5833	[redacted]	5847	6	06/28/2003	196	60	425	7	60	60
supply 7	5833	[redacted]	5847	7	06/28/2003	156	60	225	3	60	20
exhaust 8	5833	[redacted]	5847	8	06/28/2003	160	60	245	9	60	80
supply 9	5833	[redacted]	5847	9	06/28/2003	116	60	25	3	60	20
exhaust 10	5833	[redacted]	5847	10	06/28/2003	127	60	80	0	60	-10
exhaust 11	5833	[redacted]	5847	11	06/28/2003	162	60	255	9	60	80
supply 12	5833	[redacted]	5847	12	06/28/2003	126	60	75	4	60	30
exhaust 13	5833	[redacted]	5847	13	06/28/2003	202	60	455	2	60	10
drain 14	5833	[redacted]	5847	14	06/28/2003	139	60	140	1	60	0
slopsink15	5833	[redacted]	5847	15	06/28/2003	105	60	-30	2	60	10
drain 16	5833	[redacted]	5847	16	06/28/2003	139	60	140	2	60	10
exhaust 17	5833	[redacted]	5847	17	06/28/2003	188	60	385	9	60	80
exhaust 18	5833	[redacted]	5847	18	06/28/2003	126	60	75	3	60	20
chiller 19	5833	[redacted]	5847	19	06/28/2003	120	60	45	3	60	20
supply 20	5833	[redacted]	5847	20	06/28/2003	216	60	525	3	60	20
BETA BACKGROUND (CPM) FOR 6-28-2003 WAS---------->								111			
ALPHA BACKGROUND (CPM) FOR 6-28-2003 WAS---------->								1			

Alpha/Beta Analysis

Batch ID:	Smear Unit 1 - 200306300721	**Count Date:**	6/30/2003
Group:	H	**Count Minutes:**	1.5
Serial Number:	78218-1	**Count Mode:**	Simultaneous
Batch ID:	03-TF-0156 HARVEY-20 BSB	**Operating Volts:**	1440
Selected Geometry:	Swipe/Smear	**Cal Due Dates:**	6/19/2004

Efficiency (%)				Spillover (%)			
Alpha:	34.73	±	0.13	Alpha to Beta:	11.39	±	0.00
Beta:	46.13	±	0.13	Beta to Alpha:	0.07	±	0.00

Sample ID	Carrier ID	Alpha (dpm)	σ	Beta (dpm)	σ
1	33	6.55	3.33	5.01	2.90
2	19	2.19	1.92	1.21	1.45
3	100	0.00	0.00	4.11	2.50
4	18	0.00	0.00	4.11	2.50
5	65	6.56	3.33	2.27	2.06
6	66	0.00	0.00	4.11	2.50
7	86	4.37	2.72	6.54	3.24
8	56	2.18	1.92	2.58	2.05
9	93	0.00	0.00	6.85	3.23
10	35	2.18	1.92	3.95	2.51
11	6	8.74	3.84	3.49	2.52
12	3	0.00	0.00	1.37	1.45
13	27	4.37	2.72	2.43	2.06
14	77	0.00	0.00	1.37	1.45
15	47	2.18	1.92	2.58	2.05
16	5	2.18	1.92	2.58	2.05
17	11	2.19	1.92	1.21	1.45
18	63	2.18	1.92	5.32	2.90
19	52	0.00	0.00	0.00	0.00
20	30	0.00	0.00	1.37	1.45

DGH DGH

Time: 2.00
Data Mode: DPM Nuclide: SMGLS02 Quench Set: SMGLS02
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	6.76
Region B:	2.0 -	18.6	0	0.0	6.56
Region C:	40.0 -	2000	0	0.0	11.00

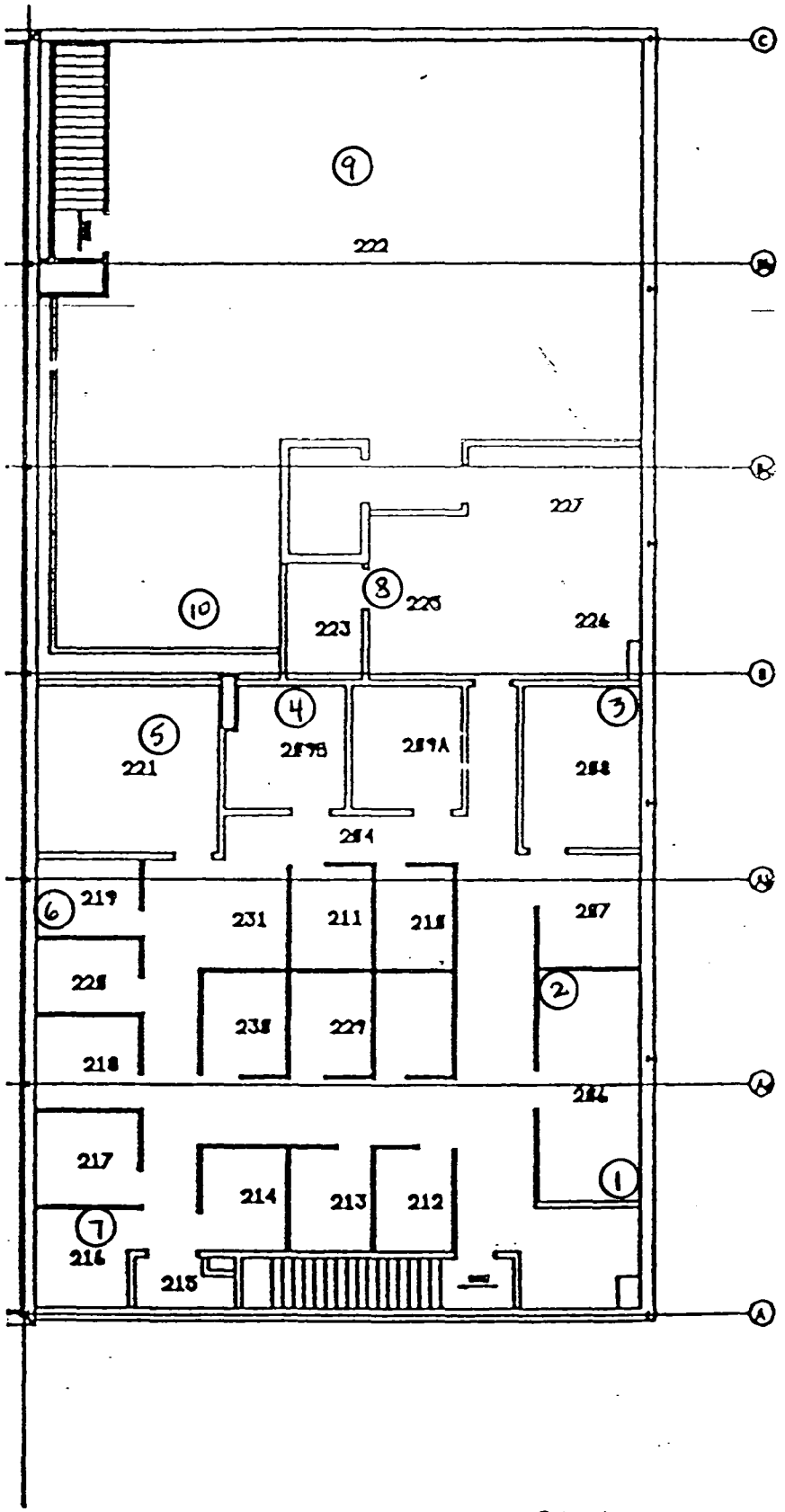
Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
~~03-TF-0156 HARVEY-20 BSB~~
~~Coincidence Time(ns): 18~~
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT2.DAT
Count Data Filename: C:\DATA\SDATA2.DAT

B J Brown

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	6.76		19.307	602.53	B
2	2.00	380.52	834.99	13.506	527.88	
3	2.00	0.00	0.00	0.000	554.58	
4	2.00	3.24	6.67	9.128	601.57	
5	2.00	0.00	0.00	0.000	499.88	
6	2.00	0.00	0.00	0.000	535.22	
7	2.00	0.00	0.00	0.000	507.11	
8	2.00	2.24	4.68	0.000	585.01	
9	2.00	0.00	0.00	0.000	602.88	
10	2.00	0.00	0.00	0.000	313.31	
11	2.00	0.00	0.00	0.000	543.45	
12	2.00	0.00	0.00	0.000	685.26	
13	2.00	0.00	0.00	0.000	424.66	
14	2.00	0.00	0.00	0.000	557.69	
15	2.00	1.24	2.36	29.692	704.50	
16	2.00	0.00	0.00	0.000	709.62	
17	2.00	0.00	0.00	0.000	708.41	
18	2.00	1.24	2.36	9.630	702.51	
19	2.00	1.74	3.31	0.000	704.95	
20	2.00	0.00	0.00	0.000	502.27	
21	2.00	2.74	5.26	26.423	691.32	
22	2.00	0.24	0.50	9.630	604.95	

Spikes Std at #3

29 #



RSDS 03-TF-0156

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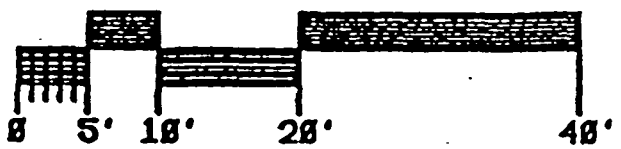
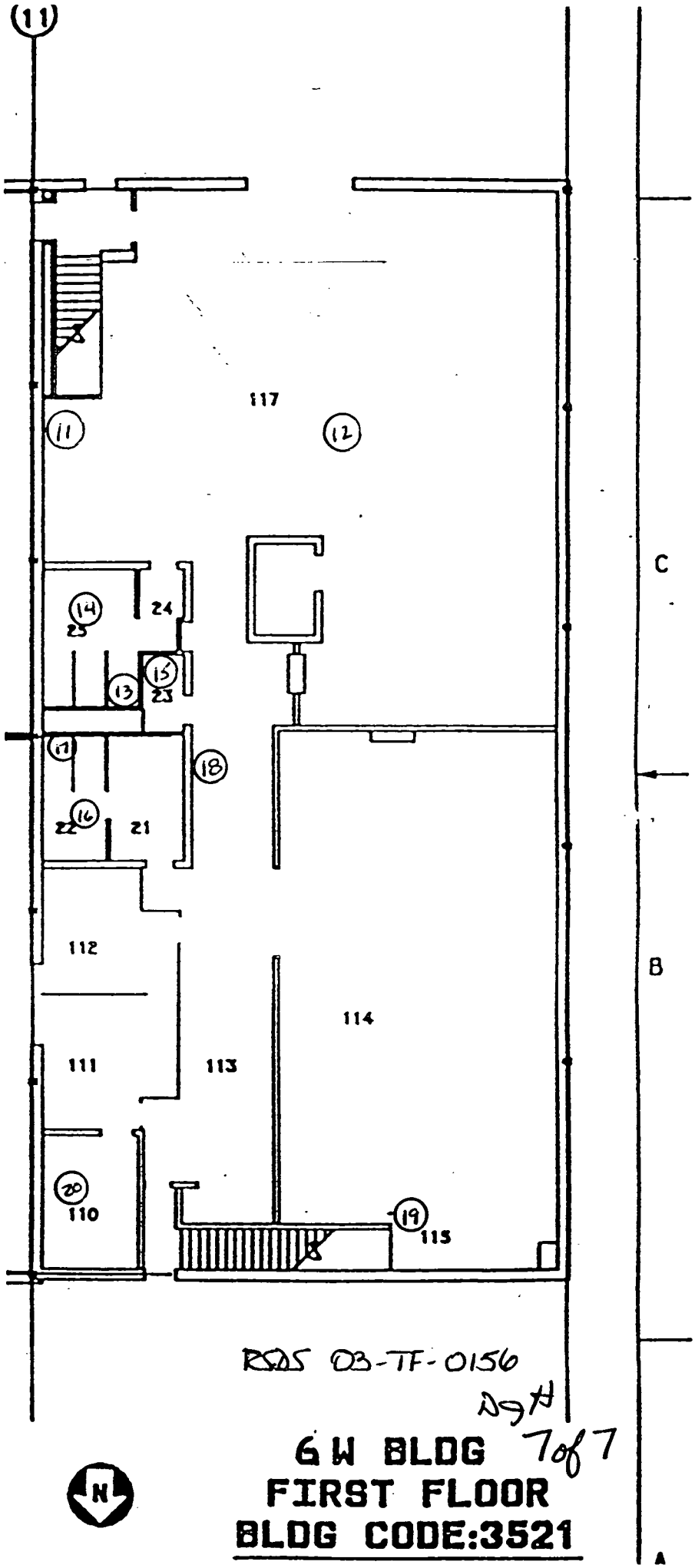


6 of 7

GW BLDG



6W BLDG 7 of 7
FIRST FLOOR
BLDG CODE:3521