

***BEST AVAILABLE COPY***



CH2M HILL Mound, Inc.

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P.O. Box 750

Miamisburg, OH 45343-0750

SMO-482/06  
August 10, 2006

Mr. Don Pfister, Director  
Miamisburg Closure Project  
U. S. Department of Energy  
175 Tri-County Parkway  
Springdale, OH 45246

ATTENTION: Paul Lucas

**SUBJECT:** Contract No. DE-AC24-03OH20152: Deliverable #36 Building Data Package; Section C.2.1.2 Facility Transfer; Final Status Report T Building Survey Units # various (see below), Final

Dear Mr. Pfister:

Attached are the following Final documents for your records:

- Final Status Report, T Building Survey Units # 1C-07, 1C-08, 1C-09, 1C-10, 1C-11, 1C-12, 1C-21, SYS-PRS 227, SYS-PRS 228, SYS-PRS 229, SYS-PRS 230, and SYS-PRS 339
- Final Status Report, T Building Survey Units # 1S-10 and SYS-PRS 340

If you or members of your staff have any questions regarding the documents, or if additional support is needed, please contact Dave Rakel at 937-865-4203.

Sincerely,

Michael D. Ebben  
Site Manager

ME/jg

## Enclosures

cc: T. Fischer, USEPA, (1) w/attachments  
B. Nickel, OEPA, (1) w/attachments  
S. Helmer, ODH, (1) w/attachments  
J. Crombie, ODH, (1) w/attachments  
M. Wojciechowski, Tetra Tech, (1) w/attachs  
G. Gorsuch, DOE/MCP, (1) w/attachments  
G. Desai, DOE/HQ, (1) w/attachments  
ER Records, CH2M Hill, (1) w/attachments  
DCC (1) w/attachments

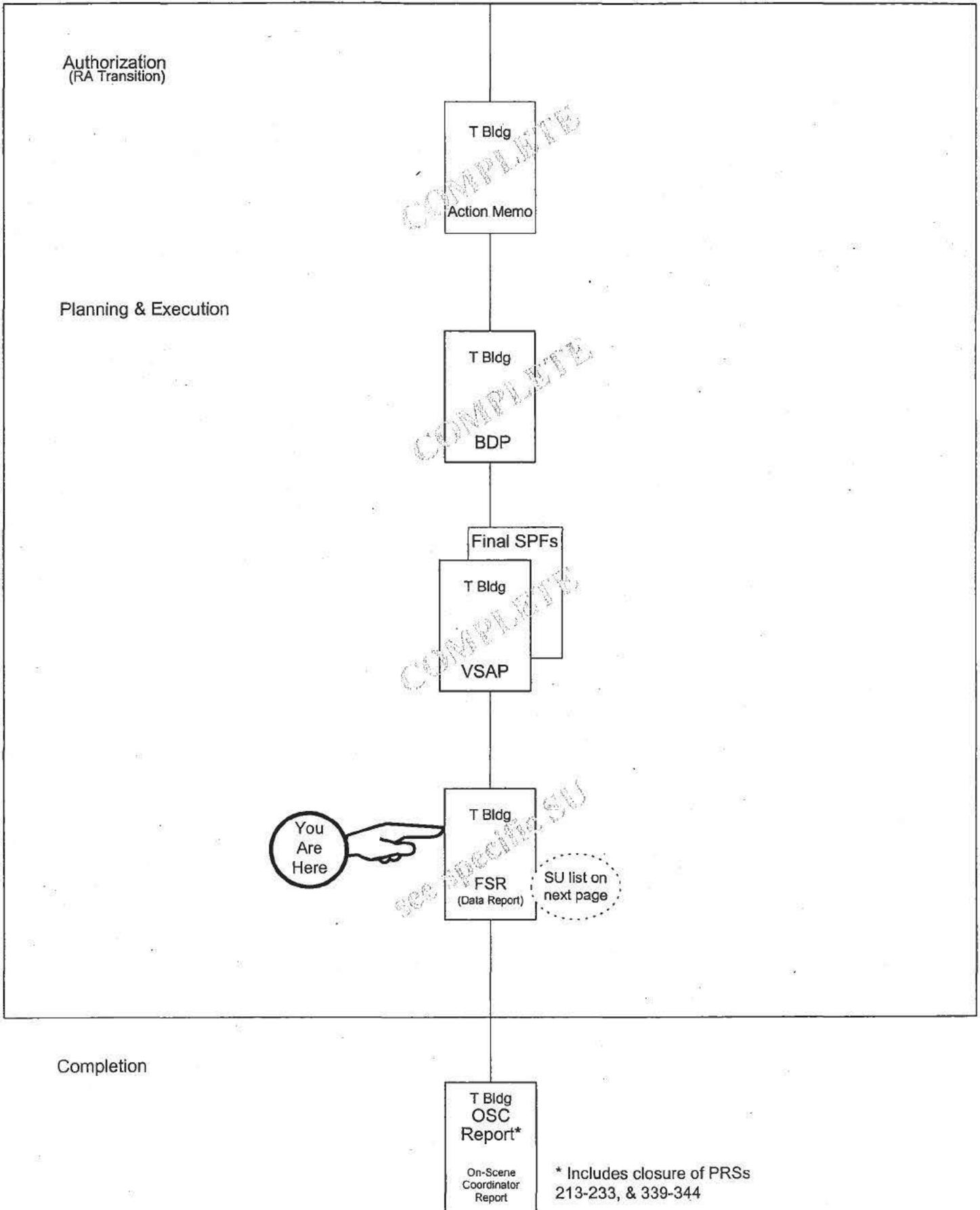
M. Ebben, CH2M Hill, w/o attachments  
K. Armstrong, CH2M Hill, w/o attachments  
D. Rakel, CH2M Hill, w/o attachments  
D. Kramer, CH2M Hill, w/o attachments  
C. Kline, CH2M Hill, w/o attachments  
S. Barr, CH2M Hill, w/o attachments  
S. Brindle, CH2M Hill, w/o attachments  
file, CH2M Hill, w/o attachments

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Final Status Survey Report  
T Building  
Survey Unit #s 1S-10 and SYS-PRS 340  
Final

Prepared by:	Mary Sizemore / <i>Mary Sizemore</i>	Date:	7-27-06
Reviewed by:	Robert Coblenz / <i>Rob Coblenz</i>	Date:	7-28-06
Approved by:	Ken Armstrong / <i>K.A.</i>	Date:	7-28-06

# T Building & PRSs 213-233, & 339-344



T Building, Final Status Report, Survey Unit - You Are Here

1C-01
1C-02
1C-03
1C-04
1C-05
1C-06
1C-07
1C-08
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- Attachment A – T Building Contaminants of Concern and Surface Release Criteria
- Attachment B – Direct and Removable Activity Graphs
- Attachment C - Retrospective Power Curves
- Attachment D - Data Analysis Worksheets
- Attachment E - Survey Plan Forms (T-01, T-05, and T-11)
- Attachment F - Summary of Attached Radiological Survey Data Sheets

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## 1.0 Historical Overview

T Building is a heavily reinforced subterranean concrete structure. Construction was completed in 1948. The two main floors are compartmentalized into three general areas (bays) by two 30-inch thick reinforced concrete firewalls. T Building contains more than 200 rooms and 20 corridors. The Core Team authorized the Removal Action via the T Building Action Memorandum (Reference 1) due to radiological contamination from various missions and projects in the building. A complete list of contaminants of concern (COCs) is provided in Attachment A.

Associated building structures include two exhaust airshafts, which each historically were attached to a two-hundred-foot tall brick and mortar exhaust stack. The exhaust stacks have been demolished. The building has three towers along the north wall, one at each end and one at the center. The end towers contain stairways, passenger elevators, airshafts for intake ventilation air, and pedestrian entrances at grade level. The middle tower was used for providing intake ventilation air.

## 1.1 Survey Unit Overview

Survey Unit 1S-10 (Rooms 16, 16A, 16B, 17, 17A and 17C) located in the South Bay on the 1<sup>st</sup> floor of T Building has residual volumetric floor contamination. SU# SYS-PRS 340 (Sump 5) was located in the northwest corner of Room 16. These rooms and the sump were used for polonium processing during the 1950's and 1960's. In the early 1970's, the area was decommissioned and decontaminated to the extent that was practical. The level of contamination has been reduced significantly in all rooms except Room 16 where, residual bulk contamination remains in the floor. The major contaminants of concern (COCs) are Bi-210m and Co-60. Other radionuclides that have been identified in the area at much lower concentrations include Bi-207, Ag-108m, and Cs-137.

Survey unit classifications are based on historical records, a survey report entitled Mound Site Radionuclides by Location (Reference 2), the T Building White Paper (Reference 3), interviews with past and present building managers, and previous and past radiological data. A table listing contaminants of concern is given in Attachment A.

SYS-PRS 340 (Sump 5) was a high-risk sump that supported the polonium operations. The sump was taken out of service, went through D&D operations and was back filled with rubble. SYS-PRS 340 (Sump 5) was emptied of fill material, and then the sump was removed along with the steel liner and disposed of as radioactive waste. The drainpipes associated with SYS-PRS 340 (Sump 5) were removed and disposed of as radioactive waste along with the fill material surrounding the drainpipes. The room surfaces were free of dirt, insulation, and loose paint at the time of survey. The rooms were completely emptied prior to final status survey, doors were locked and/or access was restricted using barricades. This Final Status Survey Report (FSSR) documents completion of the survey and evaluation of the survey data.

## 2.0 Survey Objectives

The objective of the T Building Verification Sampling and Analysis Plan (VSAP) (Reference 4) was to determine whether or not the residual radioactivity on the building surfaces in T Building meets the surface release criteria. This was to be accomplished by measuring the fixed and removable contamination on building surfaces and systems. Residual radioactivity levels were evaluated versus established release criteria provided in the Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach, Appendix A Surface and Volumetric Release Criteria for Building Disposition (hereafter referred to as 'Mound 2000', Reference 5). The survey data were compared to the release criteria of Mound 2000, using methods defined in Reference 6. The surface release criteria stated as the allowable total residual surface contamination in the Mound 2000 are the Derived Concentration Guidelines (DCGL's) for building release. The specific survey objectives were outlined on the Survey Plan Forms (SPFs) located in Attachment E.

The T Building VSAP does not specifically address treatment of volumetric contamination, since volumetric contamination was not anticipated to be present to the extent that has now been discovered. A licensed civil engineer from an approved engineering company, LBJ, Inc has determined that further removal of the existing volumetric contamination could weaken the building structure in LJB, Inc. File ID-23196 A00 (Reference 11). Treatment of volumetric contamination is addressed in Mound 2000, where radiation doses to future building occupants are restricted to the established dose limit of 15 mrem/yr, excluding naturally occurring radioactive materials (NORM). The RESRAD-Build (Reference 9, computer code has been used to compute the maximum potential doses to future building occupants using both the Building Occupancy model and the Building Renovation model as described in Appendix A of Mound 2000 (Reference 5). Potential doses have been computed based on the data collected from the verification survey and from additional volumetric sampling. The specific survey objectives were outlined on the Survey Plan Forms (T-01 and T-11) located in Attachment E.

## 2.1 Survey Design

The Type I error denoted by alpha ( $\alpha$ ) was set at 0.05 and the Type II error denoted by beta ( $\beta$ ) was set at 0.01. The number of data points was determined by calculating the relative shift, denoted by delta/sigma ( $\Delta/\sigma$ ), from the Derived Concentration Guideline Limit (DCGL) value, the lower bound of the gray region (LBGR), and the standard deviation denoted by sigma ( $\sigma$ ) of the contaminant in the survey unit ( $\Delta/\sigma = \text{DCGL} - \text{LBGR} / \sigma$ ). For this survey plan, the LBGR was set at 50% of the  $\text{DCGL}_w$  (average concentration over a wide area). The standard deviation was determined to be 17-dpm/100cm<sup>2</sup> based on previous surveys and the relative shift was calculated was 2.94. The required number of data points ( $N = 20$ ) per survey unit was obtained from Table 5.5 Reference 6.

The SU sample locations within T Building were named based on which floor elevation and bay they occupied. The designated SUs on each floor were sub-categorized into 'north', 'central', and 'south' areas, corresponding to the three bays split by the firewalls within the building. The general naming convention follows: XY-ZZ-#

where:      X      =      building floor elevation  
              Y      =      bay

ZZ = SU number  
# = floor/lower wall (1) or upper wall/ceiling (2) designator

followed by a letter designator

D = Drain  
V = Vent  
U = Utility  
J = Judgmental  
S = Static

For example:

1C-01-1S = 1<sup>st</sup> floor, center bay, SU# 1, floor & lower wall survey unit, static  
2N-05-2V = 2<sup>nd</sup> floor, north bay, SU# 5, upper wall & ceiling survey unit, vent

The numerical indices restart in each bay of each floor.

Systems within T Building were named based on the PRS number associated with them or were assigned a unique ID number. Examples are: SYS-PRS 215 (for PRS 215) and SYS-10 (Breathing Air System).

Statistical survey data point locations were selected within the survey unit using a triangular grid pattern with a randomly selected starting point. The Visual Sample Plan (VSP) computer program (Reference 7) was used for this purpose. (For any areas designated as Class 3, only judgmental survey data point locations are required.)

Professional judgment (biased) surveys were performed to supplement the statistical survey data, but were not combined with the statistical data. Judgmental survey data were compared directly to the release criteria.

## 2.2 Survey Data

The gross alpha and beta fixed-point measurements were compared to their respective guideline values. Graphical representations of the average and maximum direct and removable activity for alpha, beta, and tritium are shown in Attachment B. Retrospective power curves for direct and removable activity measurements provided in Attachment C show that the survey design had sufficient power (probability) to meet DQO's for this survey plan.

Direct alpha and beta scans were performed on 100% of the floors. Walls and ceilings were scanned in accordance with the SPF (Attachment E).

The sump was removed. Gamma scans were performed on 100% of the area previously occupied by the sump. The drains associated with Class 1 sumps were removed. Gamma scans were performed on 100% of the drain chases that previously held the drainpipes.

The ventilation systems are separate survey units, however as part the room surveys, vent covers are surveyed. Direct measurements and smears are taken directly on the vent cover. If activity on the vent cover appears to be elevated, the vent cover is removed and disposed of as radioactive waste and the interior of the immediate ventilation system is then surveyed as far as can be reached from the open vent. This survey consists of direct

measurements for gross alpha and beta activity and smears for removable alpha, beta, and tritium contamination.

The utility systems are separate survey units, however as part the room surveys, utility drops and utility systems are surveyed. The survey for utility drops consists of removing any utility drop covers to expose the interior of the utility line. This survey consists of direct measurements for alpha and beta and smears for alpha, beta, and tritium. The survey for utility systems in rooms, such as fire water systems, is performed by taking direct measurements for gross alpha and beta activity and smears for removable alpha, beta, and tritium contamination on the exterior surfaces of the utility system.

The instruments selected for this survey were gas flow proportional detectors. Alpha/beta fixed point measurements were made using the Ludlum 2350-1 data logger with a 43-68 hand-held probe. This instrument was also used for scanning walls and small areas. Large area scanning was performed using the Ludlum 2350-1 with 43-37 floor probe and/or the SHONKA Surface Contamination Monitor (SCM). The scanning instruments were set to alarm at 75% of the applicable guideline values, DCGL<sub>EMC</sub>, (elevated measurement comparison) for the most restrictive alpha emitter and most difficult to detect beta emitter. Instrument calibration and source check data were documented in accordance with Mound procedures.

Loose surface contamination was measured by smearing an area of 100 cm<sup>2</sup> at each data point. Smears were submitted to an onsite laboratory, where they were counted for tritium and gross alpha/beta activity. Removable tritium contamination was measured by liquid scintillation counting of the smears. Smear results were not combined with the statistical data but compared directly to the removable surface release criteria.

General area exposure rate measurements were performed using a Micro Rem meter to ensure that the average level of gamma radiation did not exceed the background level by more than 20 micro-R/hr.

Survey data was documented on the Radiological Survey Data Sheets (RSDS) provided in Attachment F. The RSDS maps are not engineered drawings and may not be to scale. These maps were used for general information purposes only. The dxf. file maps that were imported into VSP were engineered drawings.

Due to the presence of residual volumetric contamination in the floor in this survey unit, the RESRAD-Build computer code (Reference 9) was used to assess potential radiation dose to future building occupants. Both random and biased sample data were collected. Doses were computed using both the building occupancy scenario (office worker) and the building renovation scenario, as required in Mound 2000.

The building occupancy scenario was used to evaluate potential radiation dose to future office worker personnel that might reside in one of the rooms where residual bulk contamination is present. In this scenario, the office worker was positioned in the center of the room at a distance of 1 meter above the source (contaminated concrete floor). The exposure duration was set to 1 year, per NUREG/CR-5512 PNL-7994, Vol. 1, Residual Radioactive Contamination from Decommissioning, Technical Basis for Translating Contamination Levels to Annual Total Dose Equivalent, Final Report (Reference 10). The

input parameters and assumptions used in the RESRAD-Build computer model were reviewed and concurred upon by the regulators and are provided in Attachment D, along with a computer printout of the results.

The building renovation scenario was used to evaluate potential dose to a construction worker involved in some future building renovation. In this scenario, the source (contaminated concrete floor) was disturbed such that the worker is exposed to airborne radioactivity. The exposure duration in this scenario was only 6 months, per NUREG/CR-5512 (Reference 10). The computed dose under this scenario represents the maximum annual dose to a construction worker. The input parameters and assumptions used in the RESRAD-Build computer model were reviewed and concurred upon by the regulators and are provided in Attachment D, along with a computer printout of the results. The calculated dose is for room 16 only and does not include the dose contribution from surrounding areas or sources. The dose contribution from surrounding areas or sources is provided in Attachment D.

### **2.3 Quality Control**

Quality Control (QC) measurements will be taken in accordance with Mound procedures (Reference 8) and results evaluated and documented in the T Building Final Status Survey Report.

### **2.4 Conclusion**

The objective of the VSAP was to determine whether or not the residual radioactivity of the surfaces of building materials associated with T Building satisfy the surface release criteria established by Mound 2000 (Reference 5) and documented in the T Building VSAP (Reference 4). This is accomplished by comparing the survey data to the surface release criteria in accordance with MARSSIM (Reference 6). This objective has been met for the drains, vents, utilities, walls, ceilings, all floors (excluding the floor of Room 16), and where SYS-PRS 340 is in this survey unit.

Dose to future building occupants from residual contamination in Room 16 floor has been shown to be less than 15 mrem/yr, in accordance with Mound 2000. No contributing dose was calculated for areas that met the surface release criteria. The dose contribution from surrounding areas or sources is provided in Attachment D. The maximum dose to any future building occupant is less than 15 mrem/yr when considering the collective dose from all from surrounding areas or sources in T-Building.

### 3.0 References

1. Action Memorandum T Building Removal Action, Final CH2M Hill Mound, June 2003.
2. MD-22153, Mound Site Radionuclides by Location, March 2001.
3. CH2M Hill Mound Inc. White Paper: T Building, Structural History and Process History Summary Background Document, November 2002.
4. T Building Verification Sampling and Analysis Plan, Final, October 2004.
5. Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach, BWXT of Ohio, February 1999.
6. NUREG 1575, Rev. 1, August 2000, Multi-Agency Radiation Survey and Site Investigation Manual, (MARSSIM).
7. Visual Sample Plan, Pacific Northwest Laboratory.
8. MARSSIM Implementing Procedures, Field Quality Control for Building Contamination Surveys, MD-80046, Op. 402.
9. RESRAD-Build Computer code, Argonne National Laboratory
10. NUREG/CR-5512, PNL-7994, Vol. 1, Residual Radioactive Contamination from Decommissioning, Technical Basis for Translating Contamination Levels to Annual Total Dose Equivalent, Final Report.
11. LJB, Inc. 3100 Research Blvd. Dayton, Ohio 45420-0246, File ID -23196 A00, August 12, 2005

# Attachment A

T Building Contaminants of Concern

and

Surface Release Criteria

## Attachment A

### T Building Contaminants of Concern

Radionuclide	Name	Half Life	Principal Decay Emissions
H-3	Tritium	12.3 yr	$\beta_{\max}$ (0.0185 MeV)
Co-60	Cobalt-60	5.3 yr	$\beta_{\max}$ (0.318 MeV) $\gamma$ (1.332, 1.173 MeV)
Sr/Y-90	Strontium-90 Yttrium-90	28.8 yr 2.67d	$\beta_{\max}$ (0.546 MeV) $\beta_{\max}$ (2.281 MeV)
Ag-108m	Silver-108m (metastable)	127 yr	$\gamma$ (0.434, 0.614, 0.723 MeV)
Cs-137	Cesium-137	30.07 yr	$\beta_{\max}$ (0.514 MeV) $\gamma$ (0.662 MeV) from Ba-137m
Bi-207	Bismuth-207	33.7 yr	$\gamma$ (0.569, 1.063 MeV)
Bi-210m	Bismuth-210m	3.0E6 yr	$\alpha$ (4.910, 4.949 MeV) $\gamma$ (0.266, 0.305 MeV)
Po-209	Polonium-209	103 yr	$\alpha$ (4.866 MeV)
Ra-226	Radium-226	1599 yr	$\alpha$ (4.784, 4.602 MeV) $\gamma$ (0.1862 MeV)
Ac-227	Actinium-227	21.7 yr	$\alpha$ (several from progeny) $\beta_{\max}$ (0.043 MeV)
Th-230	Thorium-230	7.7E4 yr	$\alpha$ (4.621, 4.688 MeV)
U-234	Uranium-234	2.47E5 yr	$\alpha$ (4.77, 4.72 MeV)
U-235	Uranium-235	7.04E8 yr	$\alpha$ (4.364, 4.396 MeV) $\gamma$ (0.144, 0.184 MeV)
U-238	Uranium-238	4.47E9 yr	$\alpha$ (4.197, 4.147 MeV)
Pu-238	Plutonium-238	87.75 yr	$\alpha$ (5.456, 5.499 MeV)
Pu-239	Plutonium-239	2.41E4 yr	$\alpha$ (4.858 MeV)
Pu-240	Plutonium-240	6.58E3 yr	$\alpha$ (5.17, 5.12 MeV)
Pu-241	Plutonium-241	13.2 yr	$\beta_{\max}$ (0.021 MeV)
Pu-242	Plutonium-242	3.79E5 yr	$\alpha$ (4.90, 4.86 MeV)
Am-241	Americium-241	432.7 yr	$\alpha$ (5.486, 5.443 MeV) $\gamma$ (0.0595 MeV)

A1/2

# Attachment A

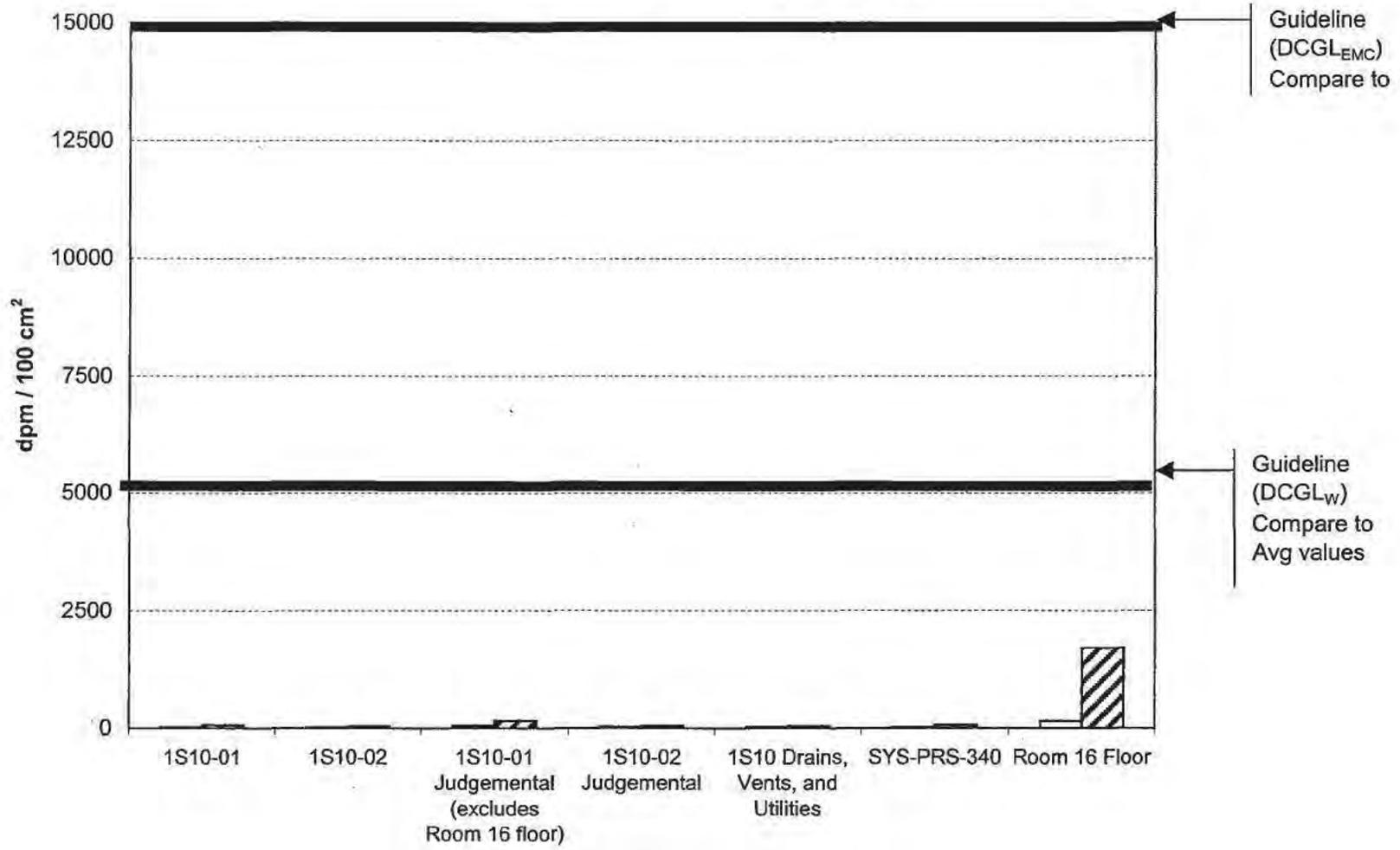
## Surface Release Criteria

Allowable Total Residual Surface Contamination (dpm/100 cm <sup>2</sup> ) <sup>(1)</sup>			
Radionuclides <sup>(2)</sup>	Average <sup>(3,4)</sup> (DCGL <sub>w</sub> )	Maximum <sup>(5,6)</sup> (DCGL <sub>EMC</sub> )	Removable <sup>(6)</sup>
<b>Group 1:</b> Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100	300	20
<b>Group 2:</b> Th-natural, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000	3,000	200
<b>Group 3:</b> U-Natural, U235, U238 and associated decay products, alpha emitters	5,000	15,000	1,000
<b>Group 4:</b> Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous <sup>(7)</sup> fission) except Sr-90 and others listed above. Includes mixed fission products containing Sr-90.	5,000	15,000	1,000
Tritium	N/A	N/A	10,000

Note: Refer to Work Plan for Environmental Restoration of the DOE Mound Site, The Mound 2000 Approach, Table 1, "Surface Contamination Guidelines", page A-3 for specific information on surface contamination guidelines and additional notes (Reference 5).

Attachment B  
Direct and Removable Activity Graphs

**Attachment B  
Mound - T Building Final Status Survey  
Alpha Activity\* (direct)**

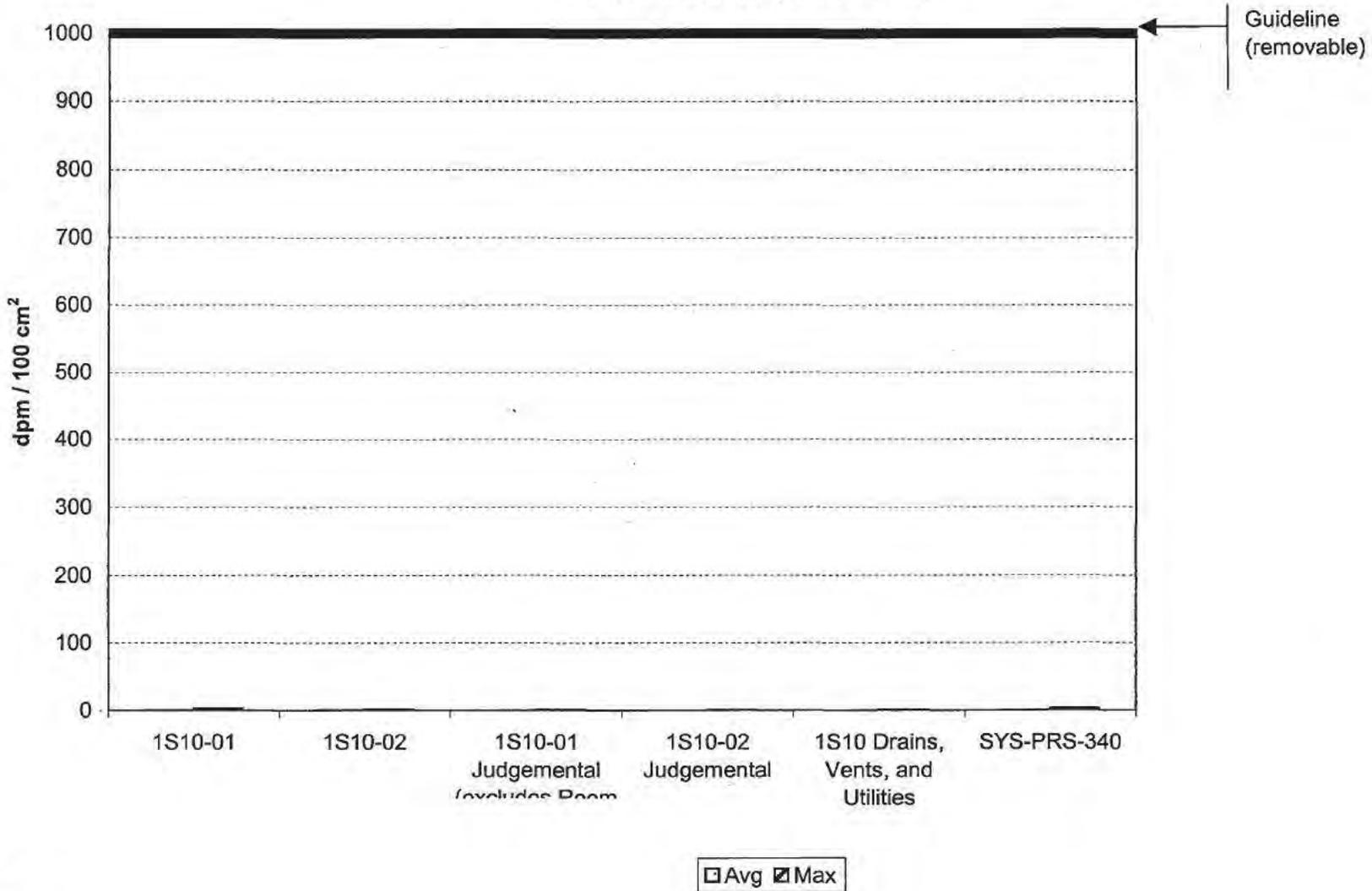


\* Readings include natural background

□ Avg    ▨ Max

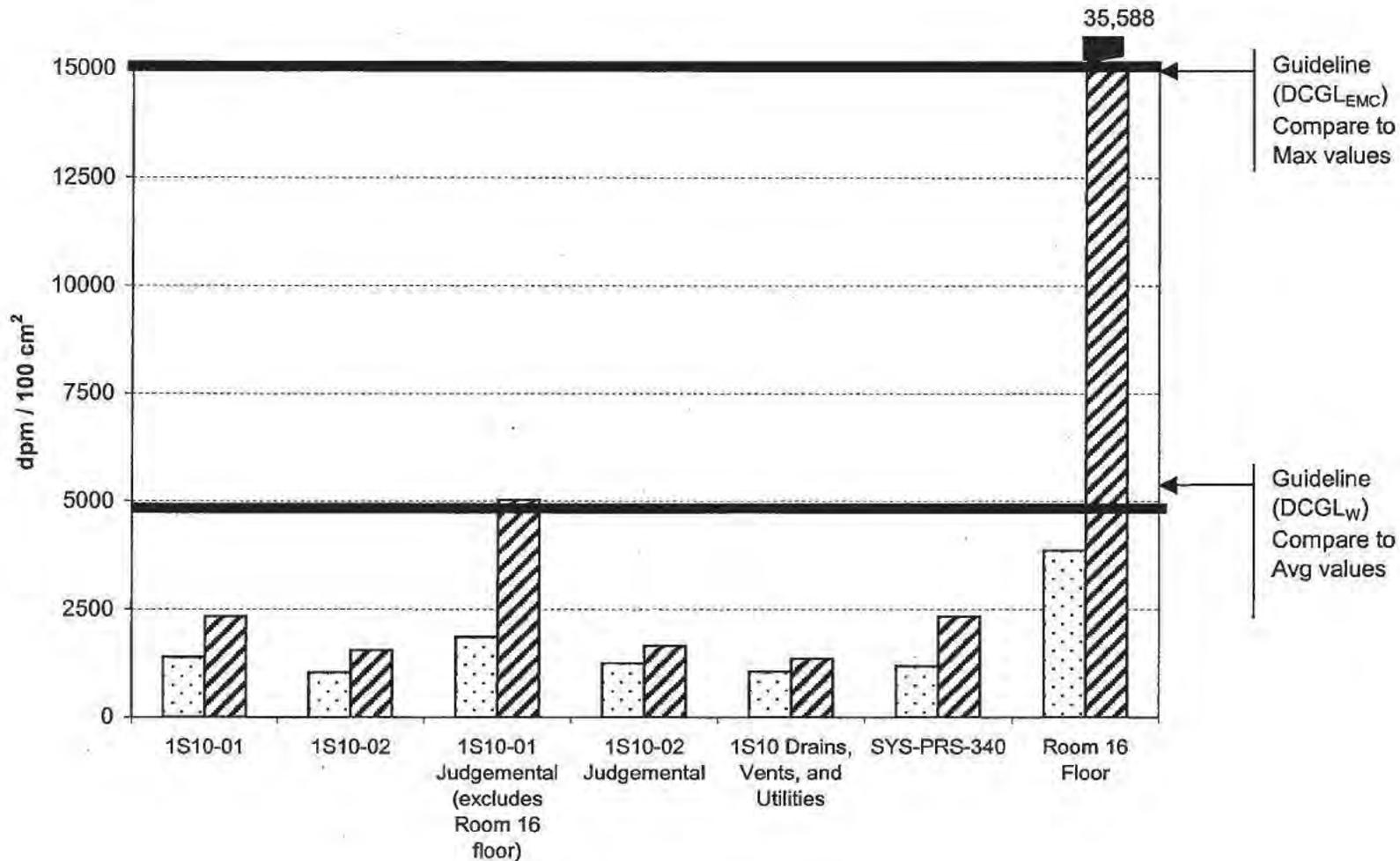
B/S

**Attachment B**  
**Mound - T Building Final Status Survey**  
**Alpha Activity (removable)**



*bars*

**Attachment B**  
**Mound - T Building Final Status Survey**  
**Beta Activity\* (direct)**

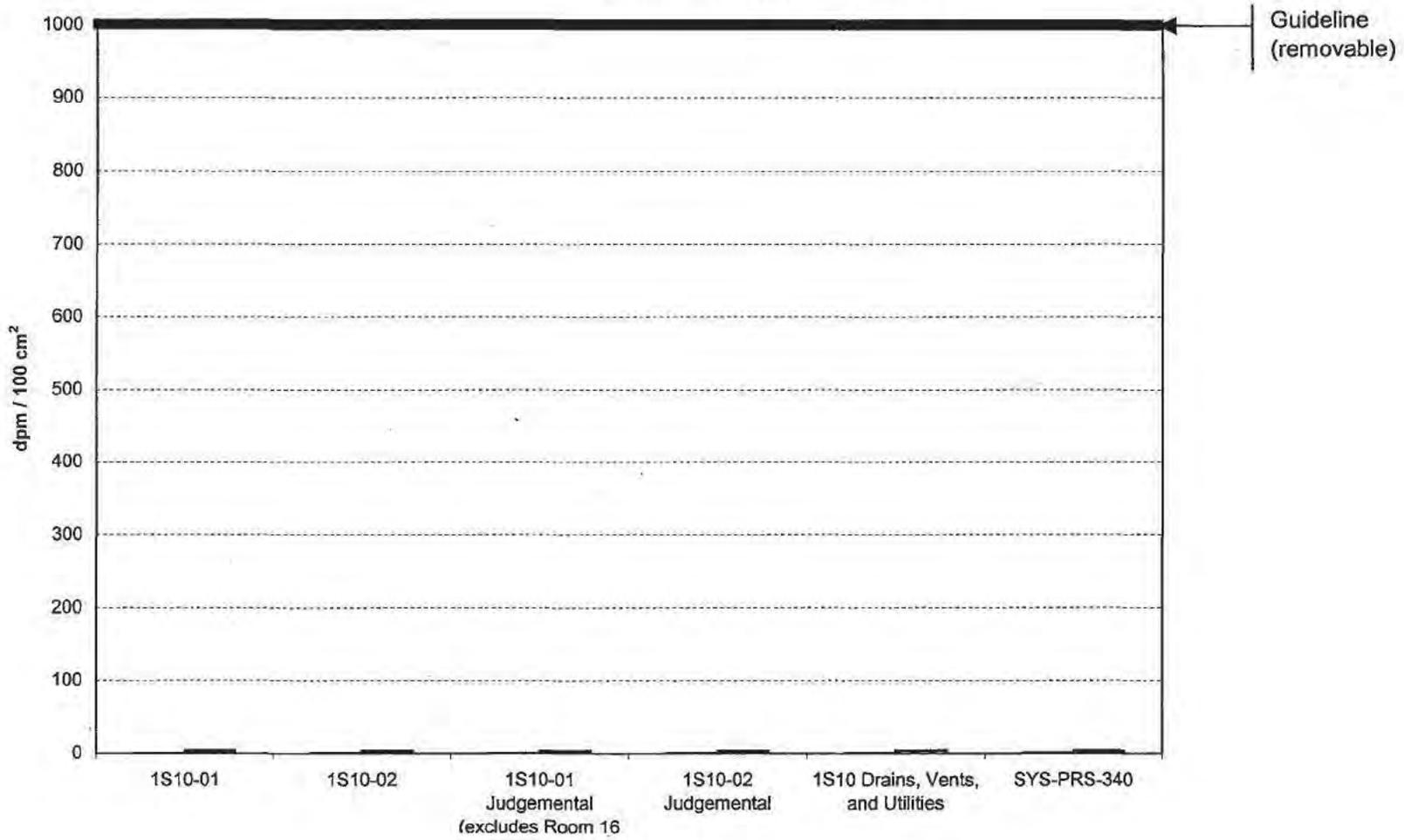


\* Readings include natural background  
 Room 16 floor evaluated using RESRAD-BUILD and is <15mrem/yr

□ Avg    ▨ Max

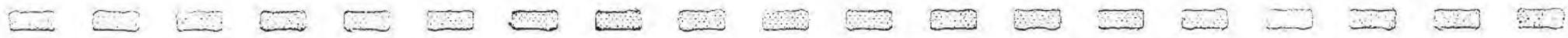
B3/S

**Attachment B**  
**Mound - T Building Final Status Survey**  
**Beta Activity (removable)**

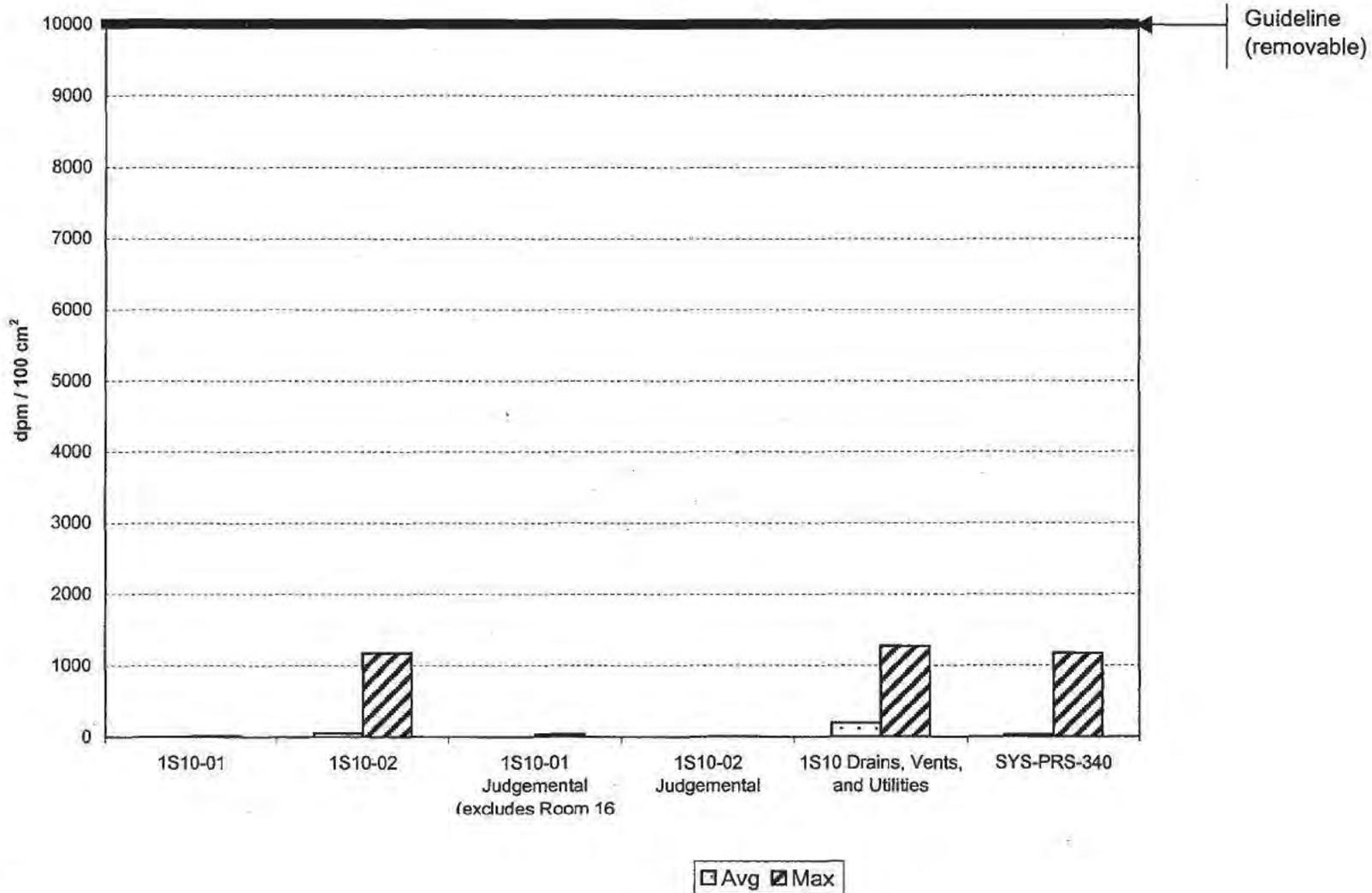


*B4/S*

□ Avg    ■ Max



**Attachment B**  
**Mound - T Building Final Status Survey**  
**Tritium Activity (removable)**

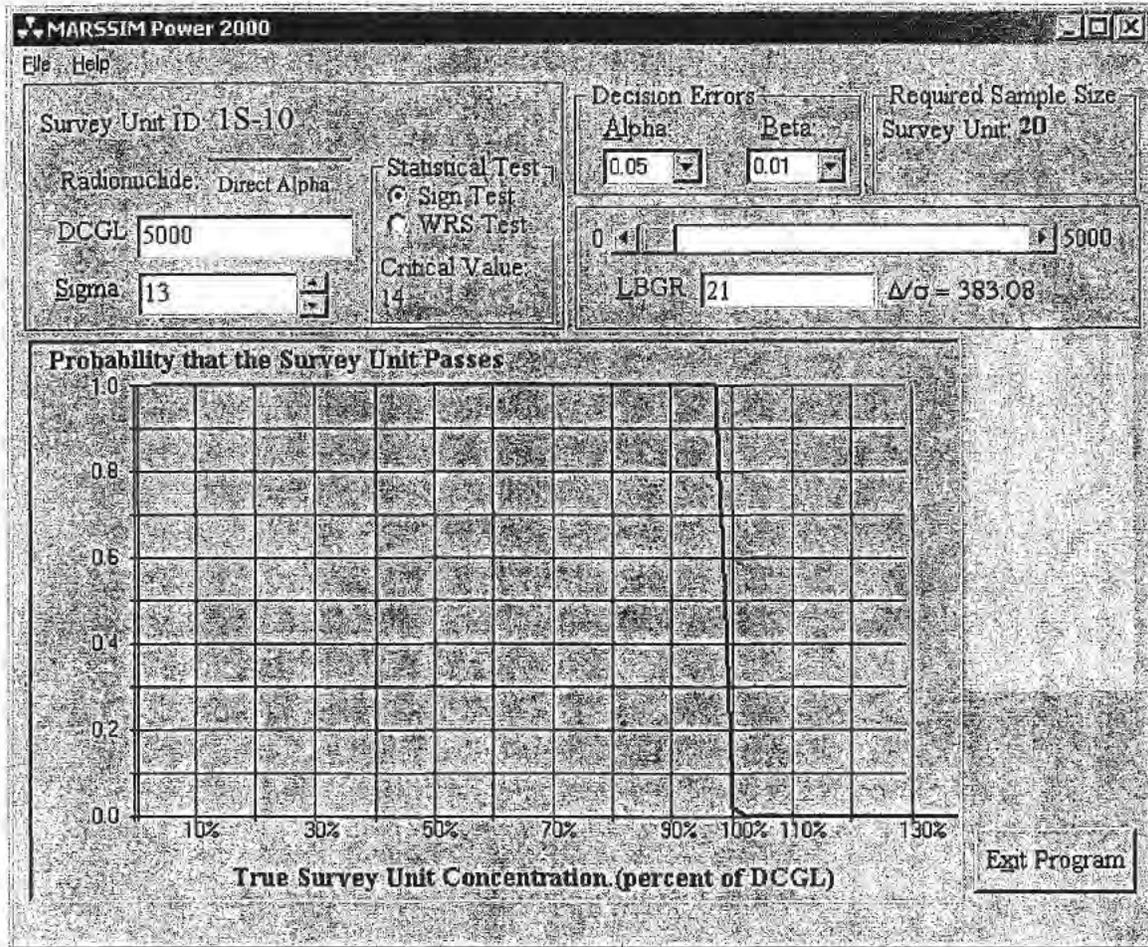


BSK

# Attachment C

## Retrospective Power Curves

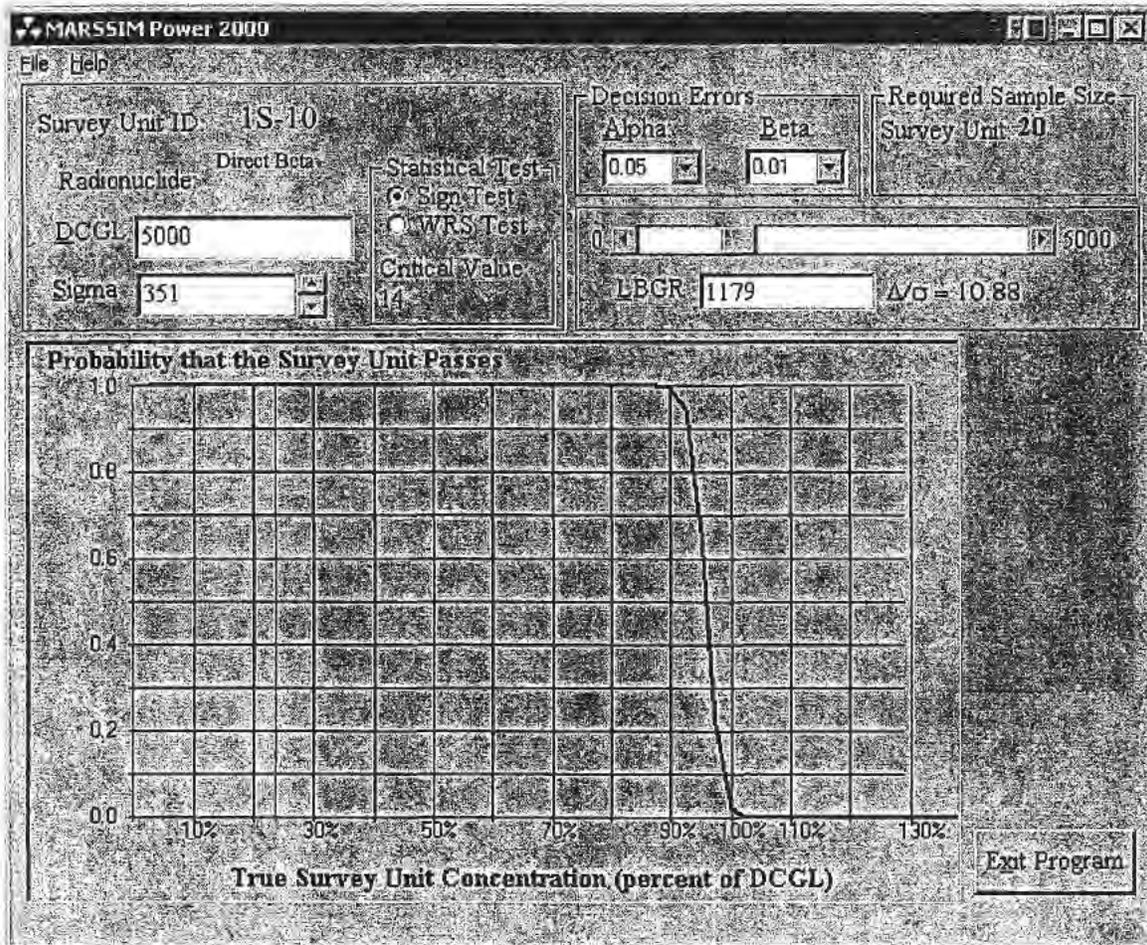
# Attachment C Retrospective Power Curve Direct Alpha



# Attachment C

## Retrospective Power Curve

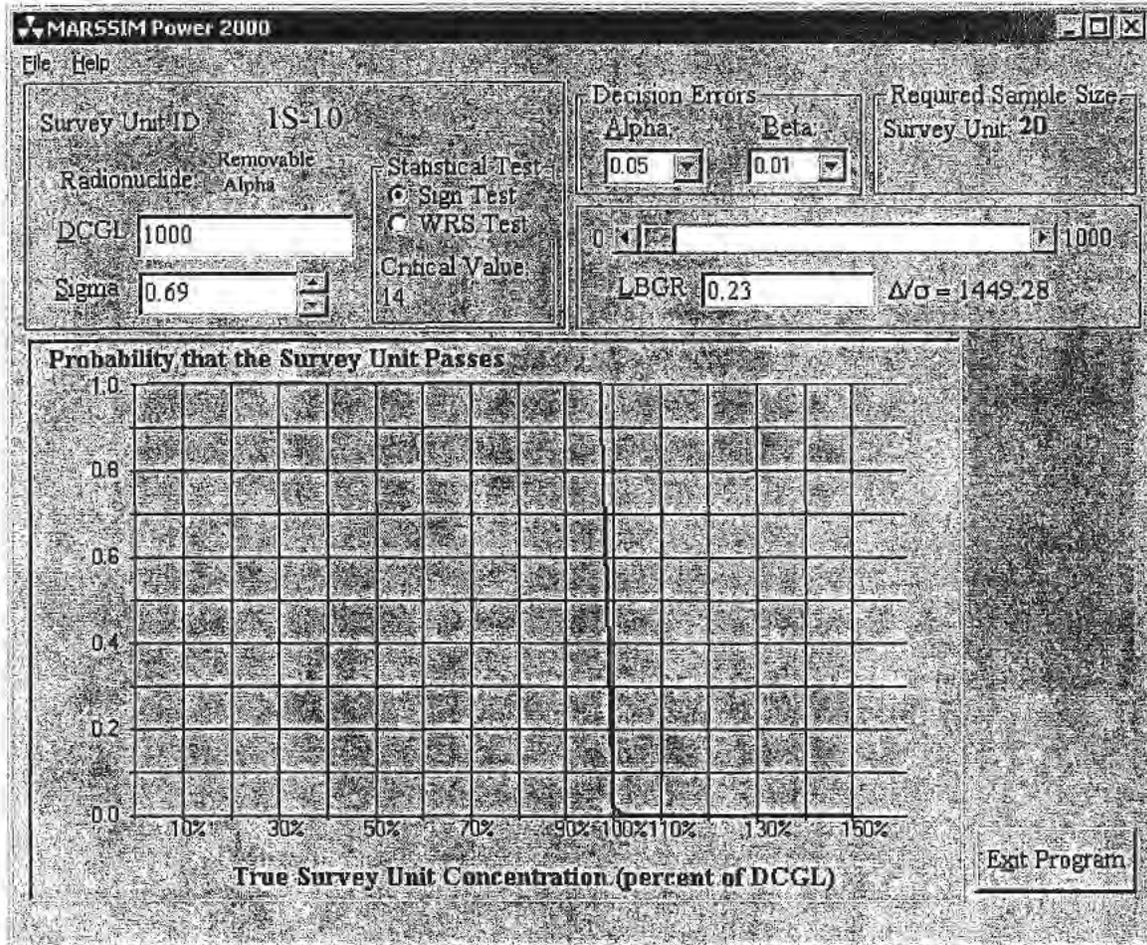
### Direct Beta



# Attachment C

## Retrospective Power Curve

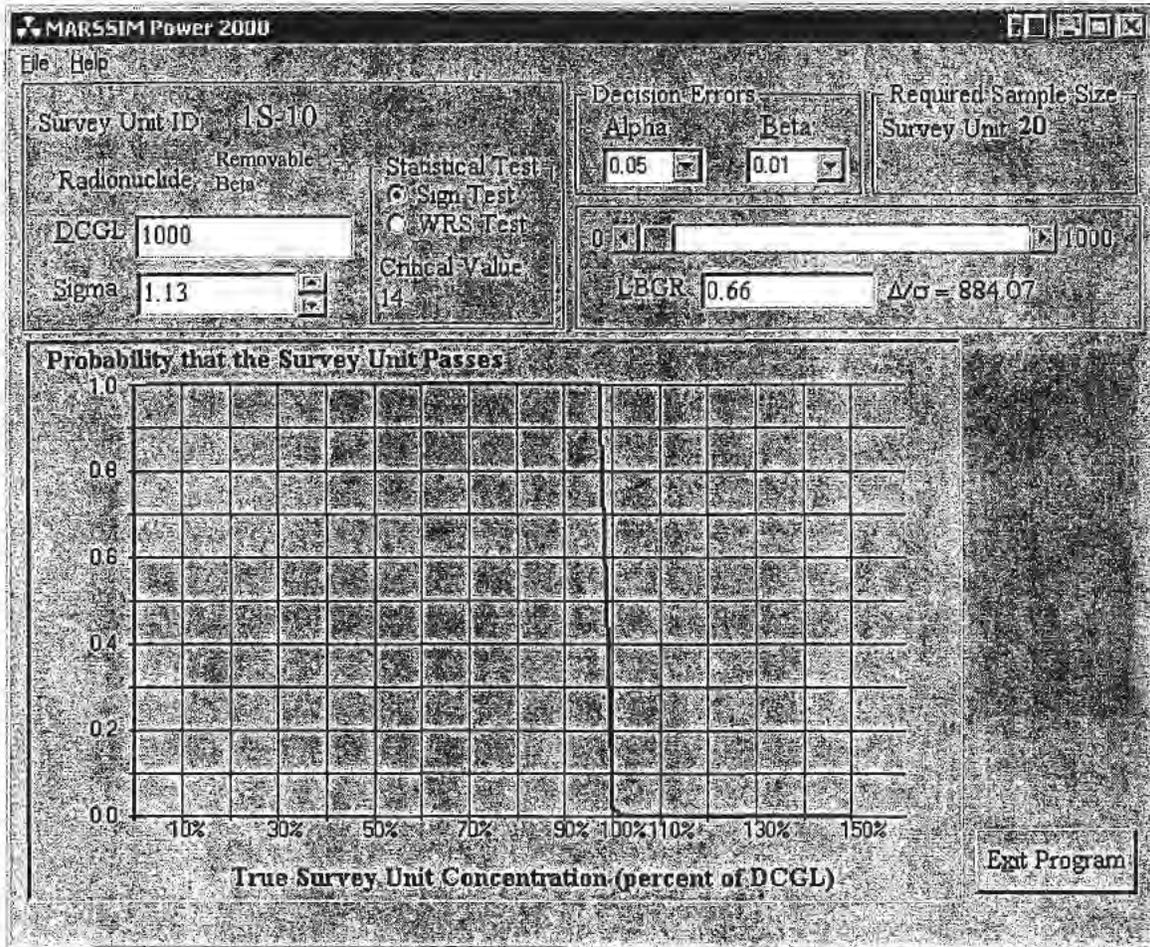
### Removable Alpha



# Attachment C

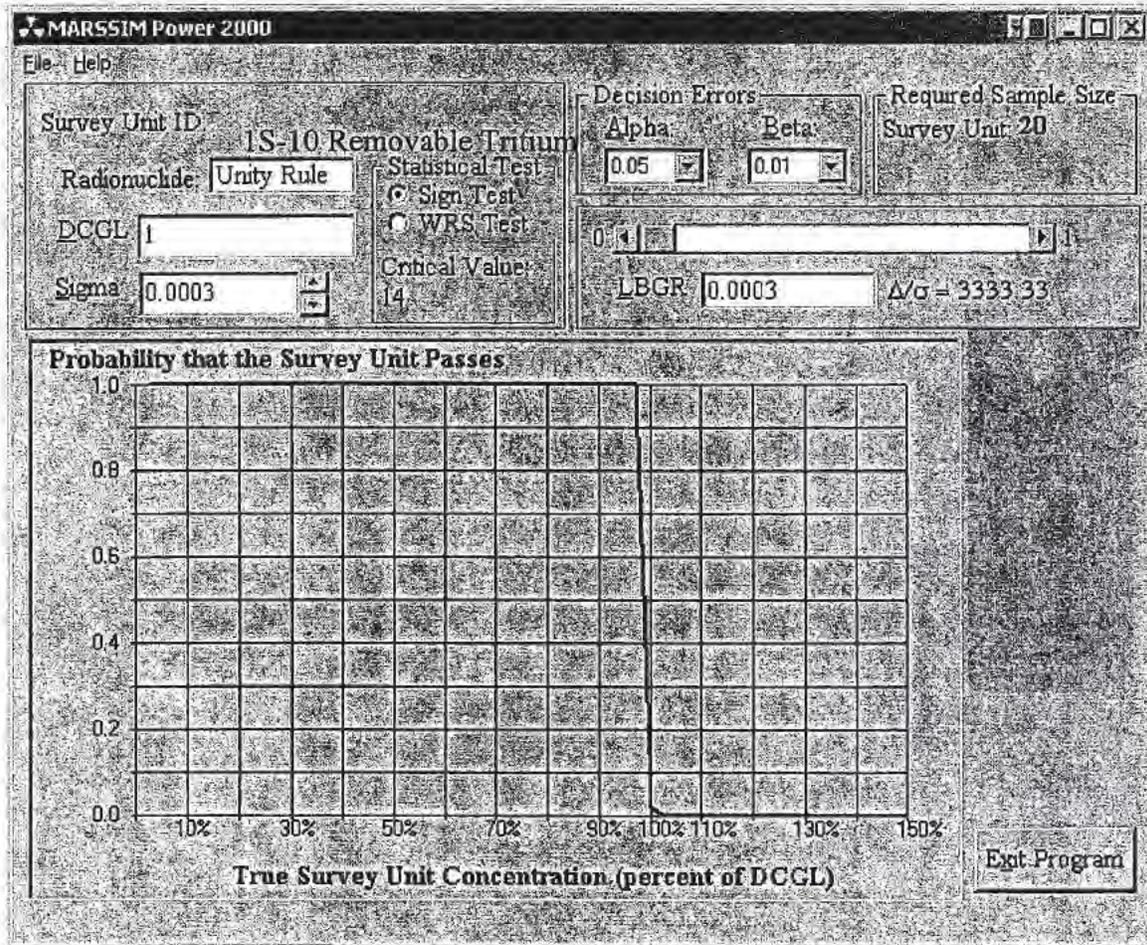
## Retrospective Power Curve

### Removable Beta



# Attachment C

## Retrospective Power Curve Removable Tritium



Note: The software program used to generate these power curves (MARSSIM Power 2000) fails to produce a legible curve when a large value, such as 10,000 is input as the DCGL. The curve depicted was generated by normalizing the LBGR and standard deviation (sigma) to the DCGL.

Attachment D  
Data Analysis Worksheets

**T Building rooms** 1S-10

**MARSSIM classification** Class 1

**Historical use** Rooms 16, 16A, 16B, 17, and 17A were part of the polonium processing area. SYS-PRS 340 (Sump 5) was high-risk sump located in room 16 and was taken out of service and later removed from the building. Residual bulk contamination remains in the concrete floor. The contaminants of concern (COCs) are Ag-108m, Bi-207, Bi-210m, Co-60, Cs-137 and Sr-90.

**Survey description summary**

**gamma scan:** drain chases - 100%

sump - 100%

**alpha and beta scan:** floor - 100%

sump - 100%

walls below 2 meters - 100%

walls above 2 meters - 25%

ceiling - approx. 1 meter area scanned around each static measurement

**static measurements:** 20 each static locations measurements on floor and walls below 2 meters

30 each static location measurements on ceiling and walls above 2 meters

74 each judgmental location measurements on floor and walls below 2 meters

10 each judgmental location measurements on ceiling and walls above 2 meters

14 each judgmental location measurements on drains, vents, and utilities and 13 each judgmental location measurements in the drain chases that previously held the drains

3 each judgmental location measurements in the hole that previously held the sump and it's steel liner

41 direct alpha and beta measurements were taken on the floor in Room 16 for RESRAD-BUILD

\* Judgmental measurements are biased measurements in locations where, in the professional judgment of the surveyor, the potential for residual contamination exists.

**removable contamination measurements:** smears were taken at each static measurement location and each was assayed for gross alpha, gross beta, and tritium

**exposure rate measurement:** 1 taken from 1 meter above floor in center of each room and 1 measurement taken at contact and from 1 meter above the floor at each of the 5 elevated areas in Room 16.

**volumetric samples:** 3 random and 9 biased concrete samples were collected from drilling 1" holes in the concrete floor and combining them into one composite sample to determine the average volumetric concentration for use in the RESRAD-Build dose models.

Composite sample from 1 inch drill depths was used in renovation scenario to represent the average volumetric contamination.

Composite sample from 15 cm drill depths was used in occupational scenario to represent the average surface contamination. The total activity to a depth of 15 cm was used to represent the surface activity in the occupational scenario.

Composite sample from surface to 15 cm and 30 cm was collected to determine the extent of contamination.

**potential radiation dose building occupancy scenario:**

In this scenario, the worker was positioned in the center of the room at a distance of 1 meter above the contaminated floor. The exposure duration was 1 year.

**potential radiation dose building renovation scenario:**

In this scenario, the contaminated concrete floor was disturbed such that the worker is exposed to airborne radioactivity. The exposure duration in this scenario was 6 months.

## Survey results summary

**gamma scan:** no activity significantly above natural background detected

**alpha and beta scan:** Areas above alarm set points\*\* were identified. See discussion below.

**static measurements:** Areas above alarm set points\*\* were identified. See discussion below.

\*\* Instruments are set to alarm at 75% of the applicable guideline values for the most restrictive alpha emitter and most difficult to detect beta emitter.

**removable contamination measurements:** all smears were below applicable guideline values

**exposure rate measurement:** less than 20  $\mu$ R/hr above natural background

**volumetric sample:** results are provided on page 10 in Attachment D

**potential radiation dose from building occupancy scenario:** 10.6 mrem/yr

**potential radiation dose from building renovation scenario:** 3.11 mrem/yr

## Treatment of elevated\*\*\* measurements

No elevated measurements were detected in the hole that previously held sump # 5 (SYS-PRS 340). No further action required.

Four elevated measurements were found on the floor in Room 16A (RSDS MT-05-1005); locations 1S10E7, 1S10E8, 1S10E10, and 1S10E11, values respectively were 128, 110, 121, 159 dpm/100  $\text{cm}^2$  alpha and 2222, 2168, 3420, and 5025 dpm/100  $\text{cm}^2$  beta. A follow-up survey (RSDS MT-05-1018) was conducted that included the original spots. Since 1S10E7 and 1S10E8 were adjacent, 8 additional static measurements were taken within a contiguous 1 $\text{m}^2$  area. The average of these 10 measurements was 69 dpm/100 $\text{cm}^2$  alpha and 2362 dpm/100 $\text{cm}^2$  beta, which meet the release criteria. Since 1S10E10 and 1S10E11 were adjacent, 8 additional static measurements were taken within a contiguous 1 $\text{m}^2$  area. The average was below the release criteria, but the decision was made to remove the concrete cap. In post-remediation survey (MT-05-1027), there were no elevated measurements. No further action is required in Room 16A.

Based on historical knowledge and analytical results, the contamination in Room 16 was identified to be from the polonium process. The contaminants of concern are Ag-108m, Bi-207, Bi-210m, Co-60, Cs-137 and Sr-90. The DCGL<sub>w</sub> for these radionuclides is 5000 dpm/100  $\text{cm}^2$  and the DCGL<sub>EMC</sub> is 15,000 dpm/100  $\text{cm}^2$ . Multiple elevated measurements were detected in the floor of Room 16, which exceed the DCGL<sub>EMC</sub> for gross beta. Samples were collected from the floor at 2.54 cm, 15 cm, and 30 cm depths to determine the extent of volumetric contamination. It was determined that

volumetric contamination exists within the top 15 cm of the concrete floor. As stated in Appendix A of the Mound 2000, in the case of the presence of volumetric contamination the RESRAD-Build computer code can be used to determine the potential radiation dose to future building occupants.

The RESRAD-Build computer code was used to assess potential radiation dose to future building occupants in Room 16. Doses were computed using both the building occupancy scenario (office worker) and the building renovation scenario (construction worker), as required in Appendix A of Mound 2000. Potential radiation dose to future workers was evaluated versus the established dose limit of 15 mrem/yr as stated in Appendix A of the Work Plan for Environmental Restoration of the DOE Mound Site, excluding naturally occurring radioactive materials (NORM). Since the potential doses from the building occupancy scenario (10.6 mrem/yr), and the building renovation scenario (3.11 mrem/yr) were all below 15 mrem/yr, excluding naturally occurring radioactive materials (NORM), no further action was required.

Calculations in the Room 16 were done independently, without any consideration for additive dose contributions from the other areas. The significance of additive dose contributions from all areas to receptors in each area modeled with RESRAD-Build is captured on pages D30 – D31.

\*\*\* defined as direct gross alpha measurement exceeding 5000 dpm/100 cm<sup>2</sup>, direct beta measurement exceeding 15000 dpm/100 cm<sup>2</sup>, removable gross alpha exceeding 1000 dpm/100 cm<sup>2</sup>, removable gross beta exceeding 1000 dpm/100 cm<sup>2</sup>, or removable tritium exceeding 10,000 dpm/100 cm<sup>2</sup>.

**Conclusion**            Survey units meet the release criteria.

Attachment D  
Mound - T Building Survey Unit 1S-10  
Data Analysis Worksheet

1S10-01 (20 samples each)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.22	0.41	2	26	1396
StDev	0.82	1.03	3	17	360
Max	3.61	3.71	14	66	2334

1S10-02 (30 samples each)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.24	0.83	50	18	1034
StDev	0.61	1.18	213	8	263
Max	1.93	3.95	1171	40	1540

1S10-01 Judgemental (87 samples each) (excluding room 16 floor)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.10	0.75	2	51	1726
StDev	0.40	1.06	5	34	767
Max	1.74	3.84	35	159	5025

1S10-02 Judgemental (10 samples each)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.08	0.61	1	28	1253
StDev	0.24	1.27	1	9	278
Max	0.77	3.95	3	46	1653

1S10 Drains, Vents, and Utilities (14 samples each)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.36	0.91	368	21	1060
StDev	0.72	1.48	340	12	176
Max	1.77	4.04	1270	49	1359

1S10 Statistical Data Points (60 samples)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.23	0.66	31	21	1179
StDev	0.69	1.13	166	13	351
Max	3.61	3.95	1171	66	2334

SYS-PRS-340 (3 samples each)					
	Removable			Direct*	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	0.00	0.21	3.33	25	2079
StDev	0.00	0.36	3.06	17	695
Max	0.00	0.62	6.00	45	2674

Room 16 Floor (41 samples) (RESBUILD Input) (Direct alpha and beta measurements)					
	Removable			Direct	
	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )	<sup>3</sup> H (dpm/100 cm <sup>2</sup> )	$\alpha$ (dpm/100 cm <sup>2</sup> )	$\beta$ (dpm/100 cm <sup>2</sup> )
Average	n/a	n/a	n/a	144	3854
StDev	n/a	n/a	n/a	318	7008
Max	n/a	n/a	n/a	1706	35588

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Attachment D  
Mound T - Building  
Survey Unit 1S-10  
Data Analysis Worksheet

	Location	RSDS	Removable (dpm/100cm <sup>2</sup> )			Direct (dpm/100cm <sup>2</sup> )	
			a	b	H	a	b
1S10-01 (20 samples each)	1S100101S	1033	0.00	0.00	2	26	1438
	1S100102S	1033	0.00	0.00	1	22	1120
	1S100103S	1033	0.00	0.00	0	7	1195
	1S100104S	1033	0.00	0.00	14	18	1223
	1S100105S	1033	0.77	0.00	1	11	1092
	1S100106S	1033	0.00	0.00	0	51	1195
	1S100107S	1033	0.00	0.31	1	66	1615
	1S100108S	1033	0.00	0.00	4	15	1821
	1S100109S	1033	0.00	0.00	0	11	1513
	1S100110S	1033	0.00	0.00	0	22	980
	1S100111S	1033	0.00	0.00	2	7	1317
	1S100112S	1033	3.61	0.00	0	18	1261
	1S100113S	1033	0.00	2.79	5	15	1662
	1S100114S	1033	0.00	0.00	5	29	1307
	1S100115S	1033	0.00	1.42	3	33	2334
	1S100116S	1033	0.00	3.71	1	44	1811
	1S100117S	1033	0.00	0.00	3	51	1587
	1S100118S	1033	0.00	0.00	0	40	1662
	1S100119S	1033	0.00	0.00	0	15	887
	1S100120S	1033	0.00	0.00	2	7	896
1S10-02 (30 samples each)	1S100201S	1043	0.00	3.60	7	15	1326
	1S100202S	1043	0.00	0.42	9	18	1027
	1S100203S	1043	0.00	0.72	9	7	943
	1S100204S	1043	0.00	0.00	0	18	840
	1S100205S	1043	0.00	1.73	67	4	1176
	1S100206S	1043	0.00	0.00	105	22	1242
	1S100207S	1043	1.93	0.00	32	26	962
	1S100208S	1043	0.00	3.95	8	22	1176
	1S100209S	1043	0.00	0.26	1171	15	1064
	1S100210S	1043	0.00	0.47	30	11	812
	1S100211S	1043	0.00	0.00	16	22	896
	1S100212S	1043	0.00	0.62	11	26	971
	1S100213S	1043	1.75	3.89	4	22	1111
	1S100214S	1043	0.00	0.00	4	18	1158
	1S100215S	1043	0.00	0.00	3	18	1055
	1S100216S	1043	0.00	1.37	0	29	1074
	1S100217S	1043	1.69	0.11	0	15	1223
	1S100218S	1043	0.00	1.59	6	4	812
	1S100219S	1043	0.00	0.00	2	26	850
	1S100220S	1043	0.00	1.74	3	18	1046
	1S100221S	1310	0.00	0.00	1	18	1540
	1S100222S	1310	0.00	0.00	0	7	1219
	1S100223S	1310	0.00	0.00	0	25	1219
	1S100224S	1310	0.00	1.60	3	40	1304
	1S100225S	1310	0.00	0.26	0	11	652
	1S100226S	1310	0.00	0.47	2	11	624
	1S100227S	1310	0.00	0.00	2	7	1238
	1S100228S	1310	1.68	0.47	0	22	1190
	1S100229S	1310	0.00	1.54	0	22	147
	1S100230S	1310	0.00	0.00	0	14	1124

\*Judgemental direct alpha and beta measurements from the floor in Room 16 were excluded from the 1S10-01 judgemental dataset and reported separately.

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Attachment D  
Mound T - Building  
Survey Unit 1S-10  
Data Analysis Worksheet

	Location	RSDS	Removable (dpm/100cm <sup>2</sup> )			Direct (dpm/100cm <sup>2</sup> )	
			a	b	H	a	b
1S10-01 Judgemental (87 samples each) (excluding room 16 floor)	1S100101J	1029	0.00	0.00	4	40	1111
	1S100102J	1029	0.00	0.00	0	29	1643
	1S100103J	1029	0.00	0.31	0	15	1074
	1S100105J	1029	0.00	1.49	35	51	1867
	1S100106J	1029	0.00	1.59	0	11	1522
	1S100107J	1029	0.00	0.00	0	33	1681
	1S100108J	1029	0.00	0.00	2	37	1671
	1S100109J	1029	0.00	2.79	0	29	1363
	1S100110J	1029	0.00	0.00	0	15	1036
	IS100101X	944	1.74	0.00	6	55	1120
	IS100102X	944	0.00	1.59	0	37	1139
	IS100103X	944	0.00	0.00	2	22	1559
	IS100104X	944	0.00	2.73	0	18	1578
	IS100105X	944	0.00	0.54	0	40	1298
	IS100106X	944	0.00	1.02	3	37	1354
	IS100107X	944	0.00	1.63	0	51	1382
	1S1010E	1005	0.00	2.30	0	121	3420
	1S1011E	1005	0.00	0.00	0	159	5025
	1S1012E	1005	0.00	0.00	2	94	1787
	1S1013E	1005	0.00	0.00	3	94	2068
	1S101E	1005	0.00	0.00	4	45	1451
	1S102E	1005	0.00	0.00	0	87	1977
	1S103E	1005	0.00	0.31	0	49	1633
	1S104E	1005	0.00	0.00	0	83	1488
	1S105E	1005	0.00	0.26	1	45	1669
	1S106E	1005	0.00	0.00	0	72	1642
	1S107E	1005	0.00	0.00	0	128	2222
	1S108E	1005	0.00	2.87	0	110	2168
	1S109E	1005	0.00	0.00	1	79	1823
	1S10801J	1018	0.00	0.00	0	99	2772
	1S10802J	1018	n/a	n/a	n/a	61	2042
	1S10803J	1018	n/a	n/a	n/a	27	1916
	1S10804J	1018	n/a	n/a	n/a	69	2266
	1S10805J	1018	1.57	0.26	0	42	2188
	1S10806J	1018	n/a	n/a	n/a	65	2188
	1S10807J	1018	n/a	n/a	n/a	57	2218
	1S10808J	1018	n/a	n/a	n/a	38	2266
	1S10809J	1018	n/a	n/a	n/a	61	3735
	1S100101Y	1027	0.00	2.30	0	55	1186
	1S100101T	1060	0.00	0.54	4	15	906
1S100102T	1060	0.00	0.00	0	40	962	
1S100103T	1060	0.00	0.00	5	26	822	
1S100104T	1060	0.00	0.00	4	22	924	
1S100105T	1060	0.00	0.26	5	29	1242	
1S100106T	1060	0.00	1.59	0	26	1074	
1S100107T	1060	0.00	2.70	0	7	1158	
1S100108T	1060	0.00	0.00	0	33	1279	

\*Judgemental direct alpha and beta measurements from the floor in Room 16 were excluded from the 1S10-01 judgemental dataset and reported separately.

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Attachment D  
Mound T - Building  
Survey Unit 1S-10  
Data Analysis Worksheet

	Location	RSDS	Removable (dpm/100cm <sup>2</sup> )			Direct (dpm/100cm <sup>2</sup> )	
			a	b	H	a	b
1S10-01 Judgemental (87 samples each) (excluding room 16 floor) (Continued)	1S100104J	1029	0.00	1.56	5	*	*
	1S100109X	944	0.00	0.00	0	*	*
	1S100110X	944	0.00	<b>3.84</b>	0	*	*
	1S100109T	1061	0.00	0.54	0	*	*
	1S100110T	1061	0.00	1.02	5	*	*
	1S100111T	1061	0.00	2.95	5	*	*
	1S100112T	1061	0.00	0.00	15	*	*
	1S100113T	1061	0.00	0.00	4	*	*
	1S100108XAE#2	1103	0.00	0.00	0	*	*
	1S100101Y	1145	n/a	n/a	n/a	*	*
	1S100102Y	1145	n/a	n/a	n/a	*	*
	1S100103Y	1145	n/a	n/a	n/a	*	*
	1S100104Y	1145	n/a	n/a	n/a	*	*
	1S100105Y	1145	n/a	n/a	n/a	*	*
	1S100106Y	1145	n/a	n/a	n/a	*	*
	1S100107Y	1145	n/a	n/a	n/a	*	*
	1S100108Y	1145	n/a	n/a	n/a	*	*
	1S100109Y	1145	n/a	n/a	n/a	*	*
	1S10RES01	1248	n/a	n/a	n/a	*	*
	1S10RES02	1248	n/a	n/a	n/a	*	*
	1S10RES03	1248	n/a	n/a	n/a	*	*
	1S10RES04	1248	n/a	n/a	n/a	*	*
	1S10RES05	1248	n/a	n/a	n/a	*	*
	1S10RES06	1248	n/a	n/a	n/a	*	*
	1S10RES07	1248	n/a	n/a	n/a	*	*
	1S10RES08	1248	n/a	n/a	n/a	*	*
	1S10RES09	1248	n/a	n/a	n/a	*	*
	1S10RES10	1248	n/a	n/a	n/a	*	*
	1S10RES11	1248	n/a	n/a	n/a	*	*
	1S10RES12	1248	n/a	n/a	n/a	*	*
	1S10RES13	1248	n/a	n/a	n/a	*	*
	1S10RES14	1248	n/a	n/a	n/a	*	*
	1S10RES15	1248	n/a	n/a	n/a	*	*
1S10RES16	1248	n/a	n/a	n/a	*	*	
1S10RES17	1248	n/a	n/a	n/a	*	*	
1S10RES18	1248	n/a	n/a	n/a	*	*	
1S10RES19	1248	n/a	n/a	n/a	*	*	
1S10RES20	1248	n/a	n/a	n/a	*	*	
1S100101X	1314	1.72	0.00	0	22	1332	
1S100102X	1314	0.00	1.51	0	11	1323	
1S10-02 Judgemental (10 samples each)	1S100201J	1029	0.00	0.00	0	18	1382
	1S100202J	1029	0.00	0.00	2	37	1401
	1S100203J	1029	<b>0.77</b>	0.00	0	26	1363
	1S100204J	1029	0.00	0.00	0	22	1176
	1S100205J	1029	0.00	0.00	0	<b>48</b>	1615
	1S100206J	1029	0.00	<b>3.95</b>	0	26	<b>1653</b>
	1S100207J	1029	0.00	1.49	0	26	1120
	1S100208J	1029	0.00	0.00	0	33	803
	1S100209J	1029	0.00	0.00	3	29	1064
	1S100210J	1029	0.00	0.62	0	18	952

\*Judgemental direct alpha and beta measurements from the floor in Room 16 were excluded from the 1S10-01 judgemental dataset and reported separately.

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Attachment D  
Mound T - Building  
Survey Unit 1S-10  
Data Analysis Worksheet

	Location	RSDS	Removable (dpm/100cm <sup>2</sup> )			Direct (dpm/100cm <sup>2</sup> )	
			a	b	H	a	b
1S10 Drains, Vents, and Utilities (14 samples each)	1S100101U	430	0.00	0.00	397	4	637
	1S100102U	430	1.57	0.26	314	19	865
	1S100103U	430	1.77	0.54	74	26	1017
	1S100104U	430	0.00	0.00	354	4	1017
	1S100105U	430	0.00	0.54	38	19	1084
	1S100201U	430	0.00	0.00	258	11	1036
	1S100202U	430	0.00	0.00	125	19	998
	1S100203U	430	0.00	0.00	880	34	1226
	1S100204U	430	1.69	0.00	530	11	1283
	1S100201V	430	0.00	3.84	271	19	1055
	1S100202V	430	0.00	0.27	1270	34	1074
	1S100203V	430	0.00	2.87	345	23	1027
	1S100204V	430	0.00	4.04	38	49	1359
	1S100205V	430	0.00	0.39	263	19	1160
SYS-PRS-340 (3 samples each)	1S100114T	1061	0.00	0.00	4	45	2874
	1S100115T	1061	0.00	0.00	6	15	1772
	1S100116T	1061	0.00	0.62	0	15	1590

\*Judgemental direct alpha and beta measurements from the floor in Room 16 were excluded from the 1S10-01 judgemental dataset and reported separately.

09/31

Attachment D  
Mound T - Building  
Survey Unit 1S-10  
Data Analysis Worksheet

	Location	RSDS	Removable (dpm/100cm <sup>2</sup> )			Direct (dpm/100cm <sup>2</sup> )	
			a	b	H	a	b
Room 16 Floor (41 samples) (RESBUILD Input)	1S100115S	1033	n/a	n/a	n/a	33	2334
	1S100116S	1033	n/a	n/a	n/a	44	1811
	1S100117S	1033	n/a	n/a	n/a	51	1587
	1S100104J	1029	n/a	n/a	n/a	33	1317
	1S100109X	944	n/a	n/a	n/a	51	2035
	1S100110X	944	n/a	n/a	n/a	48	14463
	1S100109T	1061	n/a	n/a	n/a	28	1504
	1S100110T	1061	n/a	n/a	n/a	45	2012
	1S100111T	1061	n/a	n/a	n/a	19	1772
	1S100112T	1061	n/a	n/a	n/a	30	1609
	1S100113T	1061	n/a	n/a	n/a	30	1635
	1S100108XAE#2	1103	n/a	n/a	n/a	66	4528
	1S100101Y	1145	n/a	n/a	n/a	1706	2451
	1S100102Y	1145	n/a	n/a	n/a	755	1838
	1S100103Y	1145	n/a	n/a	n/a	656	2850
	1S100104Y	1145	n/a	n/a	n/a	920	4630
	1S100105Y	1145	n/a	n/a	n/a	137	24228
	1S100106Y	1145	n/a	n/a	n/a	214	2791
	1S100107Y	1145	n/a	n/a	n/a	53	7411
	1S100108Y	1145	n/a	n/a	n/a	27	35588
	1S100109Y	1145	n/a	n/a	n/a	69	10582
	1S10RES01	1248	n/a	n/a	n/a	74	1794
	1S10RES02	1248	n/a	n/a	n/a	52	1964
	1S10RES03	1248	n/a	n/a	n/a	26	1617
	1S10RES04	1248	n/a	n/a	n/a	30	1550
	1S10RES05	1248	n/a	n/a	n/a	66	1329
	1S10RES06	1248	n/a	n/a	n/a	55	2355
	1S10RES07	1248	n/a	n/a	n/a	66	1735
	1S10RES08	1248	n/a	n/a	n/a	41	1233
	1S10RES09	1248	n/a	n/a	n/a	33	997
	1S10RES10	1248	n/a	n/a	n/a	44	1137
	1S10RES11	1248	n/a	n/a	n/a	33	975
	1S10RES12	1248	n/a	n/a	n/a	55	1373
	1S10RES13	1248	n/a	n/a	n/a	22	1196
	1S10RES14	1248	n/a	n/a	n/a	7	1477
	1S10RES15	1248	n/a	n/a	n/a	41	1624
	1S10RES16	1248	n/a	n/a	n/a	63	1174
	1S10RES17	1248	n/a	n/a	n/a	70	1395
	1S10RES18	1248	n/a	n/a	n/a	70	1447
	1S10RES19	1248	n/a	n/a	n/a	11	1292
	1S10RES20	1248	n/a	n/a	n/a	41	1358
RESBUILD input (average)						144	3854

\*Judgemental direct alpha and beta measurements from the floor in Room 16 were excluded from the 1S10-01 judgemental dataset and reported separately.

010/31

T Building, Room 16

Contaminants of Concern for Room 16 are Bi-210m, Bi-207, Cs-137, Co-60, Sr-90 and Ag-108m

	RESRAD-Build Calculations Building Occupancy Scenario (mrem/year per dpm/100 cm2)	Volumetric contamination from composite sample from surface to 15 cm results pCi/g	Average level of residual surface contamination based on 15 cm depth composite sample pCi/g normalized to the surface [dpm/100cm2]	Annual Dose based on Building Occupancy Scenario (mrem)	RESRAD-Build Calculations Building Renovation Scenario (mrem/year per pCi/g)	Volumetric contamination from 1* composite sample (pCi/g)	Annual Dose based on Building Renovation Scenario (mrem)
Pu-242	7.48E-04				1.21E+01		
Pu-241	1.40E-05				2.30E-01		
Am-241	8.21E-04				1.31E+01	< MDA <sup>c,*</sup>	
Pu-240	7.80E-04				1.27E+01		
Pu-239	7.80E-04				1.27E+01		
Pu-238	7.05E-04 <sup>a</sup>				1.15E+01	< MDA <sup>c,*</sup>	
U-238	2.25E-04				3.44E+00		
U-235	2.88E-04				3.66E+00		
U-234	2.38E-04				3.83E+00		
Th-230	5.87E-04				9.45E+00	<sup>a</sup>	
Th-228	1.72E-03				1.31E+01		
Ac-227	1.17E-02				1.88E+02	<sup>a</sup>	
Ra-226	7.20E-04				2.43E+00	< MDA <sup>b,*</sup>	
Bi-210m	1.09E-04	0.05	383	0.04	3.96E-01	0.05 <sup>b,*</sup>	0.02
Bi-207	5.62E-04	0.03	230	0.13	1.14E+00	0.04 <sup>b,*</sup>	0.05
Pb-210	6.21E-05		8	0.00	1.21E+00	< MDA <sup>b,*</sup>	
Cs-137	2.09E-04	0.45	3447	0.72	4.21E-01	1.09 <sup>a</sup>	0.46
Ag-108m	6.09E-04	0.06	460	0.28	1.20E+00	0.05 <sup>b,*</sup>	0.06
Sr-90	4.81E-06	0.45	3447	0.02	5.17E-02	1.09 <sup>d,*</sup>	0.06
Co-60	8.30E-04	1.47	11259	9.34	1.88E+00	1.47 <sup>e</sup>	2.76
H-3	3.28E-10						
		total alpha	383				
		total beta/gamma	18849				

Total dose from building occupancy scenario 10.53 mrem/yr  
 Total dose from building renovation scenario 3.40 mrem/yr

- a Naturally occurring radioactive materials (NORM) in building materials (e.g. Th-228, Th-230, Th-232, Ra-226, and Pb-210) are not used in the dose model
- b MDA values are used when COCs are reported at less than or equal to MDA.
- c MDA values are not used when non-COCs are reported less than to the MDA.
- d Sr-90 is assumed to be present at the same activity as Cs-137 in areas that were used for polonium processing. This is a conservative assumption, since both are long lived fission products which are produced and decay at similar rates.
- e Gamma spectroscopy report
- f Alpha spectroscopy report

D 11/31

**Parameters Used in the Building Occupancy Scenario**

Parameter	Value used	Remarks
Number of rooms	1	Future airflow between T Building rooms is unknown.
Air exchange rate	0.8 hr <sup>-1</sup>	RESRAD-Build default value based on studies of various residential and commercial buildings (Yu et al. 2003).
Exposure duration	365.25 days	To match occupancy period in NUREG/CR-5512 building occupancy scenario (Beyeler et al. 1999).
Indoor fraction	0.267	To match 97.5 d/yr time in building in NUREG/CR-5512 (Beyeler et al. 1999).
Receptor location	X, Y, 1 (meters)	The X and Y values are such that the receptor is located in the center of room/source at a height of 1 meter above floor.
Receptor inhalation rate	33.6 m <sup>3</sup> /d	To match the 1.4 m <sup>3</sup> /h breathing rate in NUREG/CR-5512 (Beyeler et al. 1999).
Receptor indirect ingestion rate	1.12E-4 m <sup>2</sup> /h	Mean value from the parameter distribution (Yu et al. 2003).
Source type	Area	It is assumed that contamination is only on the surface (Yu et al. 2003).
Direct ingestion rate	0	Direct ingestion of the floor is highly unlikely. Ingestion may occur indirectly as the floor erodes and small particles become available to contaminate an occupant's hands and subsequently be ingested. (Indirect ingestion is a separate parameter.)
Air release fraction	0.07	Most likely value from the parameter distribution (Yu et al. 2003).
Removable fraction	0.1	Assumes 10% of the contamination is removable (NUREG/CR-5512 default).
Time for source removal or source lifetime	10,000 days	Most likely value from parameter distribution (Yu et al. 2003).
Deposition velocity	0.01 m/s	RESRAD-Build default (Yu et al. 2003).
Resuspension rate	5E-7 s <sup>-1</sup>	RESRAD-Build default (Yu et al. 2003).
Time fraction	1	Exposed individual spends 100% of their time at the receptor location.
Radon release fraction	0.1	RESRAD-Build default (Yu et al. 2003).
Source geometry	-----	Disc source with area equal to room floor area. Receptor positioned 1 meter above center of source.

D11A/31

### Parameters Used in the Building Renovation Scenario

Parameter	Value used	Remarks
Number of rooms	1	Future airflow between T Building rooms is unknown.
Air exchange rate	0.8 h <sup>-1</sup>	RESRAD-Build default value based on studies of various residential and commercial buildings (Yu et al. 2003).
Exposure duration	179 days	To match renovation period in NUREG/CR-5512 building renovation scenario (Beyeler et al. 1999).
Indoor fraction	0.351	To match the 62.83 days spent in the building during renovation period in NUREG/CR-5512 building renovation scenario (Wernig et al. 1999).
Receptor location	X, Y, 1 (meters)	The X and Y values are such that the receptor is located in the center of room/source at a height of 1 meter above floor.
Receptor inhalation rate	38.4 m <sup>3</sup> /d	To match building renovation scenario with 1.6 m <sup>3</sup> /breathing rate of moderate activity given in the EPA Exposure Factor Handbook (US EPA 1997).
Receptor indirect ingestion rate	0	It is assumed that the ingestion is only from the direct contact with the source (Yu et al. 2003).
Source type	Volume	Contamination is assumed to be volumetric.
Direct ingestion rate	0.052 g/h	The effective transfer rate from NUREG/CR-5512 building renovation scenario for ingestion of loose dust to the hands and mouth during building renovation (Wernig et al. 1999).
Air release fraction	0.07	Most likely value from the parameter distribution (Yu et al. 2003).
Source erosion rate	4.1E-4 cm/d	It is assumed that the total source thickness of 15 cm can be removed in 100 years of building life (Yu et al. 2003).
Deposition velocity	0.01 m/s	RESRAD-Build default (Yu et al. 2003).
Resuspension rate	5E-7 s <sup>-1</sup>	RESRAD-Build default (Yu et al. 2003).
Time fraction	1	Exposed individual spends 100% of their time at the receptor location.
Source geometry	-----	Volumetric disc source, 15 cm thick, with area equal to room floor area. Receptor positioned 1 meter above center of source.

D11 B/31

Title : Mound T Building - Room 16 Building Occ

Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16\Xbld

16X

me 6-22-06

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16 X

012/31

Title : Mound T Building - Room 16 Building Occ

Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld

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=====
RESRAD-BUILD Input Parameters
=====
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```

Number of Sources : 1
Number of Receptors: 1
Total Time : 3.652500E+02 days
Fraction Inside : 2.670000E-01

```

```

===== Receptor Information =====

```

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	3.600	3.600	1.000	1.000	3.36E+01	1.12E-04

```

===== Receptor-Source Shielding Relationship =====

```

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

D13/31

===== Building Information =====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
H1: 3.000	Area 51.600	***** * * * * Room 1 <=Q01: 1.24E+02 * LAMBDA: 8.00E-01 * Q10 : 1.24E+02 * * *****

Deposition velocity: 1.00E-02 [m/s]      Resuspension Rate: 5.00E-07 [1/s]

D14/31

Title : Mound T Building - Room 16 Building Occ  
 Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld

==== Source Information ====

Source: 1

Location:: Room : 1 x: 3.60 y: 3.60 z: 0.00[m]  
 Geometry:: Type: Area Area:5.16E+01 [m2] Direction: z  
 Pathway ::  
     Direct Ingestion Rate: 0.000E+00 [1/hr]  
     Fraction released to air: 7.000E-02  
     Removable fraction: 1.000E-01  
     Time to Remove: 1.000E+04 [day]

Contamination::

	Nuclide Concentration [dpm/m2]	Dose Conversion Factor (Library: BUILD)		
		Ingestion [mrem/dpm]	Inhalation [mrem/dpm]	Submersion [mrem/yr/ (dpm/m3)]
BI-210M	3.830E+04	4.315E-05	3.419E-03	6.486E-04
BI-207	2.300E+04	2.468E-06	9.009E-06	3.973E-03
PB-210	8.000E+02	3.275E-03	1.045E-02	4.730E-06
CS-137	3.450E+05	2.252E-05	1.437E-05	1.437E-03
AG-108M	4.600E+04	3.432E-06	1.275E-04	4.117E-03
SR-90	3.450E+05	6.892E-05	5.901E-04	1.041E-05
CO-60	1.130E+06	1.212E-05	9.865E-05	6.622E-03

015/31

Title : Mound T Building - Room 16 Building Occ  
Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld  
Evaluation Time: 0.00000000E+00 years

=====

=====

=====

=====

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=====

=====

Assessment for Time: 1  
Time =0.00E+00 yr

===== Source Information =====

Source: 1

Location:: Room : 1 x: 3.60 y: 3.60 z: 0.00 [m]  
Geometry:: Type: Area Area:5.16E+01 [m2] Direction: z  
Pathway ::  
Direct Ingestion Rate: 0.000E+00 [1/hr]  
Fraction released to air: 7.000E-02  
Removable fraction: 1.000E-01  
Time to Remove: 1.000E+04 [day]

Contamination::	Nuclide	Concentration [dpm/m2]
	BI-210M	3.830E+04
	BI-207	2.300E+04
	PB-210	8.000E+02
	CS-137	3.450E+05
	AG-108M	4.600E+04
	SR-90	3.450E+05
	CO-60	1.130E+06

D16/31

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	1.06E+01	1.06E+01
Total	1.06E+01	1.06E+01

017/31

Title : Mound T Building - Room 16 Building Occ

Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld

Evaluation Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.05E+01	2.29E-03	2.28E-05	1.75E-02	0.00E+00	2.94E-03
Total	1.05E+01	2.29E-03	2.28E-05	1.75E-02	0.00E+00	2.94E-03

D18/31

Title : Mound T Building - Room 16 Building Occ

Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld

Valuation Time: 0.0000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
3I-210M		
3I-210M	4.18E-02	4.18E-02
3I-207		
3I-207	1.29E-01	1.29E-01
3I-210		
3I-210	4.97E-04	4.97E-04
137S-137		
137S-137	7.20E-01	7.20E-01
108M-108M		
108M-108M	2.80E-01	2.80E-01
90R-90		
90R-90	1.66E-02	1.66E-02
60CO-60		
60CO-60	9.38E+00	9.38E+00

D19/31

Title : Mound T Building - Room 16 Building Occ

Input File : T:\T-Marssim\RESRAD\Tbldgoccupancyroom16.bld

Full Summary

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RESRAD-BUILD Dose (Time) Tables

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Receptor Dose Received for the Exposure Duration

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(mrem)

Evaluation Time [yr]

0.00E+00

1 1.06E+01

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Receptor Dose/Yr Averaged Over Exposure Duration

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00

1 1.06E+01

020/31

Title : Mound T Building - Room 16 Building Ren

Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld

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RESRAD-BUILD Table of Contents

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Full Summary.....	9

16 x

021/31

Title : Mound T Building - Room 16 Building Ren

Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld

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RESRAD-BUILD Input Parameters

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Number of Sources : 1  
Number of Receptors: 1  
Total Time : 1.790000E+02 days  
Fraction Inside : 3.510000E-01

---

Receptor Information

---

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion (Dust) [m2/hr]
1	1	3.600	3.600	1.000	1.000	3.84E+01	0.00E+00

---

Receptor-Source Shielding Relationship

---

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
1	1	2.40E+00	0.00E+00	Concrete

D02/31

==== Building Information ====

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Area [m2]	Air Exchanges [m3/hr]
		*****
		* * *
		* * *
		* * *
H1: 3.000		* Room 1 <=Q01: 1.24E+02
		* Q10 : 1.24E+02
		* LAMBDA: 8.00E-01
Area 51.600		* * *
		*****

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

D23/31

Title : Mound T Building - Room 16 Building Ren

Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld

----- Source Information -----

Source: 1

Location:: Room : 1 x: 3.60 y: 3.60 z: 0.00[m]  
 Geometry:: Type: Volume Area:5.16E+01 [m2] Direction: z  
 Pathway ::  
 Direct Ingestion Rate: 5.200E-02 [gm/hr]  
 Fraction released to air: 7.000E-02

Containment :: Number of Regions: 1 Contaminated Region: 1  
 Region : 1  
 Thickness [cm] :1.50E+01  
 Density [g/cm3] :2.40E+00  
 Material :Concrete  
 Erosion Rate [cm/day] :4.10E-04

Contamination::  
 Nuclide Concentration Dose Conversion Factor (Library: BUILD)

	[pCi/g]	Ingestion [mrem/pCi]	Inhalation [mrem/pCi]	Submersion [mrem/yr/ (pCi/m3)]
BI-210M	5.000E-02	9.580E-05	7.590E-03	1.440E-03
BI-207	3.000E-02	5.480E-06	2.000E-05	8.820E-03
CS-137	4.500E-01	5.000E-05	3.190E-05	3.190E-03
AG-108M	6.000E-02	7.620E-06	2.830E-04	9.140E-03
SR-90	4.500E-01	1.530E-04	1.310E-03	2.310E-05
CO-60	1.470E+00	2.690E-05	2.190E-04	1.470E-02

024/31

Title : Mound T Building - Room 16 Building Ren  
Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld  
Evaluation Time: 0.00000000E+00 years

=====

Assessment for Time: 1

Time =0.00E+00 yr

=====

===== Source Information =====

Source: 1

Location:: Room : 1 x: 3.60 y: 3.60 z: 0.00 [m]

Geometry:: Type: Volume Area:5.16E+01 [m2] Direction: z

Pathway ::

Direct Ingestion Rate : 5.200E-02 [gm/hr]

Fraction released to air: 7.000E-02

Containment :: Number of Regions: 1 Contaminated Region: 1

Region : 1

Thickness [cm] :1.50E+01

Fraction Contaminated :1.00E+00

Density [g/cm3] :2.40E+00

Contamination::	Nuclide	Concentration [pCi/g]
	BI-210M	5.000E-02
	BI-207	3.000E-02
	CS-137	4.500E-01
	AG-108M	6.000E-02
	SR-90	4.500E-01
	CO-60	1.470E+00

D25/31

Title : Mound T Building - Room 16 Building Ren  
Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld  
Evaluation Time: 0.00000000E+00 years

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RESRAD-BUILDDose Tables

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Source Contributions to Receptor Doses

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[mrem]

	Source	Total
	1	
Receptor 1	3.11E+00	3.11E+00
Total	3.11E+00	3.11E+00

D26/31

Title : Mound T Building - Room 16 Building Ren

Plot File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld

Exposure Time: 0.00000000E+00 years

Pathway Detail of Doses

[mrem]

Source: 1

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.05E+00	4.33E-03	4.31E-05	3.64E-02	0.00E+00	1.05E-02
Total	3.05E+00	4.33E-03	4.31E-05	3.64E-02	0.00E+00	1.05E-02

027/31

Title : Mound T Building - Room 16 Building Ren  
Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld  
Evaluation Time: 0.00000000E+00 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor	Total
	1	
I-210M		
BI-210M	1.98E-02	1.98E-02
I-207		
BI-207	3.42E-02	3.42E-02
S-137		
CS-137	1.89E-01	1.89E-01
S-108M		
AG-108M	7.22E-02	7.22E-02
R-90		
SR-90	2.33E-02	2.33E-02
C-60		
CO-60	2.77E+00	2.77E+00

D28/31

Title : Mound T Building - Room 16 Building Ren

Input File : T:\T-Marssim\RESRAD\Tbldgrenovationroom16x.bld

Print Summary

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RESRAD-BUILD Dose (Time) Tables

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---

Receptor Dose Received for the Exposure Duration

---

(mrem)

Evaluation Time [yr]

0.00E+00

---

3.11E+00

---

Receptor Dose/Yr Averaged Over Exposure Duration

---

(mrem/yr)

Evaluation Time [yr]

0.00E+00

---

6.34E+00

029/31

## T-Building Residual Contamination

There are five rooms/areas in T-Building with residual volumetric contamination. Surveys in these areas have resulted in the identification of contamination at levels exceeding the surface release guidelines established in Mound 2000. The RESRAD-Build computer code has been used to estimate the maximum dose to any future building occupant in each of these 5 areas. Calculations in each area were done independently, without any consideration for additive dose contributions from the other areas. The purpose of this narrative is to consider the significance of additive dose contributions from all areas to receptors in each area modeled with RESRAD-Build. This is necessary to ensure that the maximum dose to future building occupants is less than 15 mrem/year from all building sources combined.

Any potential dose contributions from areas where the levels of surface contamination are below the release criteria are assumed to contribute insignificantly to the dose of future building occupants. The following quotation is from Mound 2000, Appendix A, "Surface and Volumetric Release Criteria for Building Disposition:"

*If there is no surface contamination above the surface contamination criteria (Table 1), it is reasonable to assume that there is no significant exposure due to existence of residual volumetric contamination.*

This discussion is therefore limited to the 5 areas where surface contamination is above the Mound 2000 Table 1 values. The following table summarizes the results of the independent dose calculations for each area.

Area Description	Occupancy Scenario Dose (mrem/yr)			Renovation Scenario Dose (mrem/yr)		
	External	Internal	Total	External	Internal	Total
1S-10 (Room 16)	10.5	0.02	<b>10.5</b>	3.05	0.05	<b>3.1</b>
1C-15 (Room 61)	0.12	0.76	<b>0.9</b>	0.03	1.62	<b>1.7</b>
1C-16 (Room 63)	0.13	0.74	<b>0.9</b>	0.03	1.60	<b>1.6</b>
T-Cap* (Rooms 48, 57, 58, and 59)	8.87	0.02	<b>8.9</b>	1.83	0.04	<b>1.9</b>
SYS-02A** (West Head House)	0.2	5.2	<b>5.4</b>	0.0	11.1	<b>11.1</b>

\* T Cap includes SU #s 1C-07, 1C-08, 1C-09, 1C-10, 1C-11, 1C-12, 1C-21, SYS-PRS 227, SYS-PRS 228, SYS-PRS 229, SYS-PRS 230, and SYS-PRS 339.

\*\* SYS-02A includes SU #s SYS-02A, SYS-02B, and SYS-02C

In this analysis, it is important to point out that T-Building is divided into 3 bays, each bay separated by a 3-foot thick concrete wall. Of the 5 areas listed in the above table, only 1C-15, 1C-16, and T-Cap share the same bay. Although it is possible for airborne contamination to pass freely between bays, the 3-foot thick concrete walls effectively shield the external dose between bays, i.e., reducing the dose rate by more than a factor of 1000. For simplification in this analysis, computed doses from 1C-15, 1C-16, and T-Cap will simply be combined, leaving only 3 areas to consider.

Area Description	Occupancy Scenario Dose (mrem/yr)			Renovation Scenario Dose (mrem/yr)		
	External	Internal	Total	External	Internal	Total
1S-10	10.5	0.02	<b>10.5</b>	3.05	0.05	<b>3.1</b>
1C-15, 1C-16, and T-Cap combined for simplicity	9.12	1.52	<b>10.6</b>	1.88	3.25	<b>5.1</b>
SYS-02A	0.2	5.2	<b>5.4</b>	0.05	11.02	<b>11.1</b>

Since these 3 areas are isolated from each other with regard to external dose due to the 3-foot thick concrete wall that separates them, external dose components between the different areas may be ignored. Although some small component of the computed internal doses are from direct ingestion, for the purpose of this analysis, it is assumed that internal dose is all due to airborne contamination that may pass freely throughout the building. Therefore, the internal dose component to the building as a whole from each of the affected areas can be estimated using a ratio of the air volume of the affected area to the total building air volume. The total building air volume is approximately 42,000 m<sup>3</sup>.

Area Description	Modeled room air volume (m <sup>3</sup> )	Ratio (modeled room air volume/building air volume)
1S-10	155	0.0037
1C-15, 1C-16, and T-Cap (combined for simplicity)	2480	0.059
West Head House	500	0.012

The computed internal dose from each area can then be multiplied by this ratio to estimate the internal dose component that could affect other areas. Internal dose contributions from each area to other parts of the building are given in the table below.

Area Description	Occupancy Scenario Dose (mrem/yr)	Renovation Scenario Dose (mrem/yr)
1S-10	0.00008	0.0002
1C-15, 1C-16, and T-Cap	0.09	0.192
West Head House	0.06	0.131
Total	0.15	0.32

As can be seen in the table, the total internal dose component to other parts of the building from all of the affected areas combined, including both occupancy and renovation scenarios at the same time, is less than 0.5 mrem. Therefore, since the maximum dose computed for any area independently was 10.6 mrem (1C-15, 1C-16, and T-Cap combined) and the addition of 0.5 mrem is still less than 15 mrem, it may be concluded that the maximum dose to any future building occupant will be less than 15 mrem when considering the collective dose from all 5 affected areas in T-Building.

Attachment E  
Survey Plan Form

#T-01 (Revised 7-30-05)  
# T-05 (Revised 6-01-05)  
#T-11 (10-26-05)

SURVEY PLAN FORM					
SP NUMBER	T-01		DATE OF REQUEST		
TYPE OF SP	<input checked="" type="checkbox"/> FSS <input type="checkbox"/> CHARACTERIZATION <input type="checkbox"/> REFERENCE <input type="checkbox"/> OTHER:				
AREA/LOCATION	T Building				
PURPOSE	The purpose of this SPF is to perform a final status survey in Class 1 floors and lower walls and Class 2 ceilings and upper walls in T Building to support decisions on final disposition and free release of the building.				
SURVEY UNIT # 1	See Attachment 1		SURVEY UNIT # 4		
SURVEY UNIT # 2			SURVEY UNIT # 5		
SURVEY UNIT # 3			SURVEY UNIT # 6		
SURVEY TYPE					
SURFACE SCAN	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	Shonka PSPC	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Refer to SHONKA Surface Contamination Monitor (SCM) operating procedures.
		PROBE TYPE	2 ft, 4ft, or 6 ft		
SURFACE SCAN	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2350	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Scan surface at a rate of 1/2" per second at a distance of not more than 1/4" from the surface
		PROBE TYPE	43-37 Floor Probe or 43-68 Hand Probe		
SURFACE SCAN	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2360	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Refer to MD-80036, Op 30030, Operation of Ludlum 2360 Scaler/ratemeter with Ludlum 43-89 alpha/beta scintillator
		PROBE TYPE	43-89 hand probe		
STATIC MEASUREMENT	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2350	COUNT TIME & DETECTOR DISTANCE FROM SURFACE	Perform 2 minute counts (α) and 1 minute count (β) at specified locations not more than 1/4" from the surface for hand probe (30 seconds (α) and (β) counts if using floor probe).
		PROBE TYPE	43-68 Hand Probe (or 43-37 Floor)		
STATIC MEASUREMENT	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2360	COUNT TIME & DETECTOR DISTANCE FROM SURFACE	Refer to MD-80036, Op 30030, Operation of Ludlum 2360 Scaler/ratemeter with Ludlum 43-89 alpha/beta scintillator
		PROBE TYPE	43-89 hand probe		
GENERAL AREA EXPOSURE RATE MEASUREMENT	<input type="checkbox"/> BETA <input checked="" type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE	Micro Rem meter	DETECTOR DISTANCE FROM SURFACE	Perform general area exposure rate measurements 1 meter (m) from the surface.
		PROBE TYPE			
COMMENTS AND GENERAL REQUIREMENTS	All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.  Perform scan surveys prior to fixed-point surveys.  Ensure building surfaces are clean and free of loose debris, dirt, and obstructions prior to performing surveys.  Rad Con shall document all discrepancies from the above sampling and surveying instructions on the RSDS.				

Continued next page

E1/13

**Specific Sampling and Survey Instructions Continued****Safety Considerations**

1. Obtain assistance from the responsible building custodian for access to upper walls, ceilings, roof, etc.
2. Exercise extreme caution when performing surveys from ladders, lifts, or scaffolds.
3. Follow appropriate site safety procedures when accessing areas requiring fall protection measures.
4. Ensure ventilation units are de-energized prior to attempting to collect a sample from them.
5. Obtain approval and assistance from the responsible building custodian to dismantle any equipment for sample collection.
6. Use L2360 if locations are not safely accessible using the L2350 (e.g. close tight spaces, on top roofs, etc).

**Scanning using Ludlum 2350-1 with 43-37 (floor) and 43-68 (hand) probes**

1. Verify that the rate meters are set to alarm at or below 225 dpm/100 cm<sup>2</sup> alpha and 11250 dpm/100 cm<sup>2</sup> beta. (The RPOC or Rad Engineer will provide cpm values for alarm set points).
2. Scan at a rate of ½ inch per sec at a distance of not more than ¼ " from the surface.
3. Perform a static measurement at every location where an indication of elevated activity is observed.
4. Record the locations and document the results of the area scanned on the RSDS.

**Scanning using Ludlum 2360 with 43-89 probe**

1. Scan in accordance with instrument procedures at a rate of ½ inch per sec at a distance of not more than ¼ " from the surface.
2. Perform a static measurement at every location where an indication of elevated activity is observed.
3. Record the locations and document the results of the area scanned on the RSDS.

**Scanning using SHONKA Position Sensitive Proportional Counter (PSPC) with 2', 4' and 6' probes**

1. Scan in accordance with instrument procedures at a rate of 0.4 inch per sec for alpha and 4.0 inch per sec for beta, at a distance of not more than ¼ " from the surface.
2. Perform a static measurement at every location where an indication of elevated activity is observed.
3. Record the locations and document the results of the area scanned on the RSDS.

Continued next page

E2/13

**Specific Sampling and Survey Instructions Continued****Scanning in Class 1 areas**

1. Scan 100% of the floor and walls up to 2 meters

**Scanning in Class 2 areas**

1. Scan at least 25% of walls above 2 meters using a serpentine pattern with scan paths spaced three probe widths apart.
2. On ceilings and in crawlspaces, scan an area of approximately 1 m<sup>2</sup> around each static measurement location.

**Static measurements**

1. When using hand probes, the count time is 2 min for alpha measurements and 1 min for beta measurements. When using the floor probe, the count time for alpha and beta measurements is 30 sec.
2. Perform integrated counts at all pre-designated sample location and at any elevated locations identified by scanning.
3. Perform at least 10 measurements on beams, supports, or other horizontal structural surfaces in each survey unit where, in the judgment of the surveyor, a potential exists for residual contamination.
4. Record the location and document the results on the RSDS in accordance with Mound Rad Con procedures.
5. Document the gross activity for each location (no "<" or ">" values).

**Data Point Location**

1. Locate the data points in each survey unit.
2. Mark each data point with tape or other non-permanent marking.
3. Document locations on the appropriate RSDS.

**General Area Exposure Rate Measurements**

1. Perform general area exposure rate measurement using Micro Rem survey meter in each room in the survey unit at a distance of 1 meter (m) from the floor.
2. Record reading results (microRem/hr) including background on RSDS in accordance with Mound Rad Con procedures (no "<" or ">" values).

**Loose Surface Contamination**

1. Obtain a smear of 100cm<sup>2</sup> at each pre-designated static measurement location.
2. Count each smear for alpha, beta, and <sup>3</sup>H.
3. Record location and attach results on the RSDS in accordance with Mound Rad Con procedures (no "<" or ">" values).

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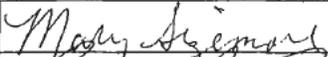
E3/13

**Specific Sampling and Survey Instructions Continued**

**Quality Control**

1. Check Configuration Index (CI) for latest revision of procedures.
2. Daily source checks will be performed at the beginning and end of each day in accordance with Mound Rad Con procedures.
3. 16 fixed measurement data points will be selected for resurvey from the pool of Class 1 areas. Data points selected for resurvey should include the highest and lowest measurement from the data pool.
4. 16 smears will be randomly selected for recount from the pool of Class 1 areas.
5. 5% of the scan measurements taken in Class 1 areas will randomly be selected for replicate scan surveys.
6. Follow Rad Con procedures for Chain of Custody requirements.
7. Ensure alpha and beta smear results are obtained before performing <sup>3</sup>H analysis.
8. Record location and results on the RSDS in accordance with Mound Rad Con procedures.

**APPROVAL SIGNATURES**

<b>Project Engineer</b>		<b>DATE</b>	7-30-05
<b>Radiological Engineer</b>		<b>DATE</b>	7/30/05
<b>Manager</b>		<b>DATE</b>	8/1/05

**SP CLOSE-OUT SIGNATURES**

<b>Project Engineer</b>		<b>DATE</b>	
<b>Radiological Engineer</b>		<b>DATE</b>	
<b>Manager</b>		<b>DATE</b>	

**COMMENTS**

E4/B

**ATTACHMENT 1: SPF T-01****Floors and walls < 2m**

1C-01-1	2C-01-1
1C-02-1	2C-02-1
1C-03-1	2C-03-1
1C-04-1	2C-04-1
1C-05-1	2C-05-1
1C-06-1	2C-06-1
1C-07-1	2C-07-1
1C-08-1	2C-08-1
1C-09-1	2C-09-1
1C-10-1	2C-10-1
1C-11-1	2C-11-1
1C-12-1	2C-12-1
1C-13-1	2C-13-1
1C-14-1	2C-14-1
1C-15-1	2C-15-1
1C-16-1	2C-16-1
1C-17-1	2C-17-1
1C-18-1	2C-18-1
1N-01-1	2C-19-1
1N-04-1	2N-06-1
1N-07-1	2N-07-1
1N-08-1	2N-08-1
1S-05-1	2S-06-1
1S-06-1	2S-07-1
1S-07-1	2S-08-1
1S-09-1	2S-09-1
1S-10-1	2S-10-1
1S-11-1	2S-12-1
1S-12-1	2S-13-1
1C-19-1	2S-14-1
1C-20-1	2S-15-1

E5/13

ATTACHMENT 1 continued: SPF T-01

**Ceilings and walls > 2m**

1C-01-2	2C-01-2
1C-02-2	2C-02-2
1C-03-2	2C-03-2
1C-04-2	2C-04-2
1C-05-2	2C-05-2
1C-06-2	2C-06-2
1C-07-2	2C-07-2
1C-08-2	2C-08-2
1C-09-2	2C-09-2
1C-10-2	2C-10-2
1C-11-2	2C-11-2
1C-12-2	2C-12-2
1C-13-2	2C-13-2
1C-14-2	2C-14-2
1C-15-2	2C-15-2
1C-16-2	2C-16-2
1C-17-2	2C-17-2
1C-18-2	2C-18-2
1N-01-2	2C-19-2
1N-04-2	2N-06-2
1N-07-2	2N-07-2
1N-08-2	2N-08-2
1S-05-2	2S-06-2
1S-06-2	2S-07-2
1S-07-2	2S-08-2
1S-09-2	2S-09-2
1S-10-2	2S-10-2
1S-11-2	2S-12-2
1S-12-2	2S-13-2
1C-19-2	2S-14-2
1C-20-2	2S-15-2

E6/B

SURVEY PLAN FORM					
SP NUMBER	T-05	DATE OF REQUEST			
TYPE OF SP	<input checked="" type="checkbox"/> FSS <input type="checkbox"/> CHARACTERIZATION <input type="checkbox"/> REFERENCE <input type="checkbox"/> OTHER:				
AREA/LOCATION	T Building				
PURPOSE	The purpose of this SPF is to perform a final status survey in Class 1 sumps and associated piping in T Building to support decisions on final disposition and free release of T Building				
SURVEY UNIT # 1	See Attachment 1	SURVEY UNIT # 4		SURVEY UNIT # 7	
SURVEY UNIT # 2		SURVEY UNIT # 5		SURVEY UNIT # 8	
SURVEY UNIT # 3		SURVEY UNIT # 6		SURVEY UNIT # 6	
SAMPLE TYPE					
<input type="checkbox"/> SCRAPING/SEDIMENT SAMPLE:					
<input type="checkbox"/> FLUID/LIQUID SAMPLE:					
<input type="checkbox"/> OTHER:					
SURVEY TYPE					
SURFACE SCAN	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2350	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Scan surface at a rate of 1/2" per second at a distance of not more than 1/4" from the surface
		PROBE TYPE	43-68 Hand Probe		
SURFACE SCAN	<input type="checkbox"/> BETA <input checked="" type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE	L-2360	SCAN RATE & DETECTOR DISTANCE FROM SURFACE	Refer to MD-80036, Op number 30040, Operation of Ludlum 2360 with Fidler probe.
		PROBE TYPE	Fidler Probe		
STATIC MEASUREMENT	<input checked="" type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input checked="" type="checkbox"/> ALPHA	INST. TYPE	L-2350	COUNT TIME & DETECTOR DISTANCE FROM SURFACE	Perform 2 minute counts (α) and 1 minute count (β) at specified locations not more than 1/4" from the surface.
		PROBE TYPE	43-68 Hand Probe		
GENERAL AREA EXPOSURE RATE MEASUREMENT	<input type="checkbox"/> BETA <input checked="" type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE	Micro Rem meter	DETECTOR DISTANCE FROM SURFACE	Perform general area exposure rate measurements 1 meter (m) from the surface.
		PROBE TYPE			
COMMENTS AND GENERAL REQUIREMENTS	Class 1 sumps and associated piping are excavated and disposed of as radioactive waste. They are not to be surveyed and released. This SPF addresses surveys performed in excavated sump pits and empty pipe chases.				
	All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.				
	Perform scan surveys prior to fixed-point surveys.				
	Rad Con shall document all discrepancies from the above sampling and surveying instructions on the RSDS.				

Continued next page

E7/13

**Safety Considerations**

1. Obtain assistance from the responsible building custodian for access to sumps.
2. Exercise extreme caution when performing surveys inside sump area.
3. Follow appropriate site safety procedures when accessing areas requiring fall protection measures.

**Scanning using Ludlum 2350-1 with 43-68 hand probe**

1. Verify that the rate meters are set to alarm at or below 225 dpm/100 cm<sup>2</sup> alpha and 11250 dpm/100 cm<sup>2</sup> beta. (The RPOC or Rad Engineer will provide cpm values for alarm set points).
2. Scan at a rate of ½ inch per sec at a distance of not more than ¼" from the surface.
3. Perform a static measurement at every location where an indication of elevated activity is observed.
4. Record the locations and document the results of the area scanned on the RSDS.
5. Use L2360 with Fidler probe if surfaces are too uneven to use L2350.

**Scanning in Class 1 areas**

Scan 100% of the sump pit and empty drain chases.

**Surface Scan Using a Ludlum 2360 with a Fidler probe**

1. Scan the sump pit and empty drain chase surfaces at a rate of 2.5" per second.
2. Record the locations of the area scanned on the RSDS and document the results in accordance with Mound Rad Con procedures (no "<" or ">" values).

**General Area Exposure Rate Measurements**

1. Perform general area exposure rate measurement using a Micro Rem survey meter for each sump at a distance of 1m from the surface.
2. Record reading results (microRem/hr) on RSDS in accordance with Mound Rad Con procedures (no "<" or ">" values).

**Data Point Location**

1. Locate the data points in each survey unit.
2. Mark each data point with tape or other non-permanent marking.
3. Document locations on the appropriate RSDS.

Continued next page

E8/13

**Specific Sampling and Survey Instructions Continued****Static measurements**

1. The count time for static measurements using the hand probe is 2 min for alpha and 1 min for beta.
2. Perform integrated counts at each sample location.
3. Record location, material type, and results on RSDS in accordance with Mound Rad Con procedures.
4. Document gross activity for each location (no "<" or ">" values).

**Loose Surface Contamination**

1. Obtain a smear of 100 cm<sup>2</sup> at each survey point identified above.
2. Count each smear for alpha, beta, and <sup>3</sup>H.
3. Record location and results on RSDS map in accordance with Mound Rad Con procedures.

Continued next page

E9/13

**Specific Sampling and Survey Instructions Continued**

**QUALITY CONTROL**

1. Check Configuration Index (CI) for latest revision of procedures.
2. Daily source checks will be performed at the beginning and end of each day in accordance with Mound Rad Con procedures.
3. 16 fixed measurement data points will be selected for resurvey from the Class 1 sumps. Data points selected for resurvey should include the highest and lowest measurement from the data pool
4. 16 smears will be randomly selected for recount from the Class 1 sumps.
5. 5% of the scan measurements taken in Class 1 sumps will randomly be selected for replicate scan surveys in accordance with MD-80046, Op 402.
6. Follow Rad Con procedures for Chain of Custody requirements.
7. Ensure alpha and beta smear results are obtained before performing <sup>3</sup>H analysis.
8. Record location, material, and results on RSDS in accordance with Mound Rad Con procedures.

**APPROVAL SIGNATURES**

Project Engineer	<i>Mary E. Higgins</i>	DATE	6-1-05
Technical Reviewer	<i>Chris P. [unclear]</i>	DATE	6/1/05
Manager	<i>Bo [unclear]</i>	DATE	6/1/05

**SP CLOSE-OUT SIGNATURES**

Project Engineer		DATE	
Technical Reviewer		DATE	
Manager		DATE	

**COMMENTS**

E10/13

**ATTACHMENT 1: SPF T-05**  
Class 1 sumps

<b>Sump #</b>	<b>Survey Unit ID#</b>	<b>Identification</b>
Sump 5	SYS-PRS 340	Waste Water Sump (Tank 251)
Sump 6	SYS-PRS 225	Beta Waste Water Sump (Tank 227)
Sump 7	SYS-PRS 227	Alpha Waste Water Sump (Tank 229)
Sump 8	SYS-PRS 228	Alpha Waste Water Sump (Tank 230)
Sump 9	SYS-PRS 339	Waste Water Sump (Tank 250)
Sump 10	SYS-PRS 229	Alpha Waste Water Sump (Tank 231)
Sump 11	SYS-PRS 230	Alpha Waste Water Sump (Tank 232)
Sump 13	SYS-PRS 233	Alpha Waste Water Sump (Tank 235)

E11/13

## SURVEY PLAN FORM

<b>SPF NUMBER</b>	T-11	<b>DATE OF REQUEST</b>	
<b>TYPE OF SPF</b>	<input type="checkbox"/> FSS <input checked="" type="checkbox"/> CHARACTERIZATION <input type="checkbox"/> REFERENCE <input type="checkbox"/> OTHER:		
<b>AREA/LOCATION</b>	T Building		
<b>PURPOSE</b>	The purpose of this SPF is to collect a concrete samples for characterization.		
<b>SURVEY UNIT #</b>	1C-15/16 (Rooms 61 and 63)	<b>SURVEY UNIT#</b>	
<b>SURVEY UNIT #</b>	2C-15 (Room 277)	<b>SURVEY UNIT #</b>	1C-11/12/21 (Rooms 57,58, and 59)
<b>SURVEY UNIT #</b>	1S-10 (Room 16)	<b>SURVEY UNIT #</b>	1C-08/09/10 (cap area Room 48)

### SAMPLE TYPE

<input type="checkbox"/> <b>SURFACE SOIL SAMPLE:</b>
<input type="checkbox"/> <b>SUB-SURFACE SOIL SAMPLE:</b>
<b>SEDIMENT SAMPLE:</b>
<input type="checkbox"/> <b>CORE SAMPLE:</b>
<input type="checkbox"/> <b>WATER SAMPLE:</b>
<input checked="" type="checkbox"/> <b>OTHER:</b> Samples of concrete as specified on page 2 of this SPF

### SURVEY TYPE

SURFACE SCAN	<input type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE		SCAN RATE & DETECTOR DISTANCE FROM SURFACE	
STATIC MEASUREMENT	<input type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE		COUNT TIME & DETECTOR DISTANCE FROM SURFACE	
		PROBE TYPE			
STATIC MEASUREMENT	<input type="checkbox"/> BETA <input type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE		COUNT TIME & DETECTOR DISTANCE FROM SURFACE	
		PROBE TYPE			
General Area Exposure Rate Measurement	<input type="checkbox"/> BETA <input checked="" type="checkbox"/> GAMMA <input type="checkbox"/> ALPHA	INST. TYPE	Bicron Micro Rem meter	DETECTOR DISTANCE FROM SURFACE	Perform general area exposure rate measurements at specified locations at 1 meter (m) from the surface

<b>COMMENTS</b>	<p>All surveys shall be performed and documented in accordance with Mound Radiological Control procedures.</p> <p>Perform fixed-point measurements surveys prior to collecting concrete sample.</p> <p>Collect same amount of sample at each location. Ensure clean sample equipment is used for each distinct sample area/room.</p> <p>Rad Con shall document all discrepancies from the above sampling and surveying instructions on the RSDS.</p>
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E12/13

## SPECIFIC SAMPLING / SURVEY INSTRUCTIONS

### Safety Considerations

1. Obtain assistance from the responsible building custodian for assistance in collecting bulk sample.
2. Exercise extreme caution when collecting bulk samples.
3. Follow appropriate site safety procedures when accessing areas with potential electrical hazards.

### **Concrete Sample: Obtain one (1) bulk sample at each static and judgmental measurement location identified on the floor. (Applies to rooms 16, 61, 63, 48, 57, 58, and 59)**

1. Composite and homogenize the samples from the drilled locations at a depth of 6" (15 cm) into one sample container per room. Composite and homogenize the samples from the area to be capped in 48 into a separate sample container. Composite and homogenize the samples from the area to be capped in Room 59 into a separate sample container.
2. Seek guidance from Radiological Engineer/RPOC with regard to type of sample container, sample mass at each location and total mass needed for each area/room composite sample.
3. Ensure each sample is labeled with date, time, room #, survey unit #, and sample ID#.
4. Record sample location on Radiological Survey Data Sheet.
5. Ensure chain of custody is maintained for all samples.
6. Process sample for gamma spectroscopy analysis in accordance with laboratory procedures.
7. Repeat process at a depth of approximately 12" (30 cm) at each of the previous locations using a smaller drill bit. Thoroughly clean the holes prior to second drilling.

### **Concrete Sample: Obtain one (1) bulk sample at each static and judgmental measurement location on the floor. (Applies to Room 277)**

1. Composite the samples from the drill samples collected at a depth of approximately 5" (13 cm) into one sample container. Adjust the drill depth so that the bit penetrates as deep as possible without going through the floor.
2. Seek guidance from Radiological Engineer/RPOC with regard to type of sample container, sample mass at each location and total mass needed for each area/room composite sample.
3. Ensure each sample is labeled with date, time, room #, survey unit #, and sample ID#.
4. Record sample location on Radiological Survey Data Sheet.
5. Ensure chain of custody is maintained for all samples.
6. Process sample for gamma spectroscopy analysis in accordance with laboratory procedures.

### General Area Exposure Rate Measurements

1. Perform general area exposure rate measurements at specified locations at 1 meter (m) from the surface.

### Quality Control (QC) Measurements

1. Field duplicate taken in every 10 or fewer field samples
2. Replicate sample taken every 20 samples of a similar matrix

### Reference Sample (obtain one bulk sample from an area that has not been impacted)

**APPROVAL SIGNATURES**

Project Engineer	<i>Mary E. Sizemore</i>	DATE	3-9-06
Radiological Engineer	<i>Robert M. Coblenz</i>	DATE	3-9-06
Project Manager	<i>Ken [unclear]</i>	DATE	3-9-06

**SP CLOSE-OUT SIGNATURES**

Project Engineer		DATE	
Radiological Engineer		DATE	
Project Manager		DATE	

**COMMENTS**

NOTE: Rad Con shall document all discrepancies from the above sampling and surveying instructions on the Radiological Survey Data Sheet.

Ensure that the mass of sample collected from each location is consistent. Composite all sample from a given room to form a single bulk room sample for each room. After sample has been homogenized sample size may be reduced if necessary as need for the gamma spec lab.

E13/13

## Attachment F Summary of Attached Radiological Survey Data Sheets

RSDS	date	su	Content
MT-05-0430	27-Jun-05	IS10	DVU (16,16a,16b,17,17a,17c)
MT-05-0944	06-Oct-05	IS10	Elevated Measurement
MT-05-1005	14-Oct-05	IS10	judgemental (16a) Elevated Measurement
MT-05-1018	18-Oct-05	IS10	scan (16a) Elevated Measurement
MT-05-1027	19-Oct-05	IS10	judgemental (01)
MT-05-1029	19-Oct-05	IS10	judgemental (01, 02) dose (16a,16,17,17a,16b,17c)
MT-05-1033	19-Oct-05	IS10	static (01)
MT-05-1043	20-Oct-05	IS10	static (02)
MT-05-1060	24-Oct-05	IS10	static (16a,16b,17,17a,17c)
MT-05-1061	24-Oct-05	IS10	static (01)
MT-05-1071	24-Oct-05	IS10	scan (16) Elevated Measurement
MT-05-1103	28-Oct-05	IS10	Elevated Measurement
MT-05-1145	04-Nov-05	IS10	Elevated Measurement
MT-05-1156	08-Nov-05	IS10	Elevated Measurement
MT-05-1248	01-Dec-05	IS10	static (01)
MT-05-1310	12-Dec-05	IS10	static
MT-05-1314	13-Dec-05	IS10	static
MT-06-0393	4/4/2006	IS10	Dose (16)

# RADIOLOGICAL SURVEY DATA SHEET

Page 1 of 10

LOCATION: (BLDG/AREA/ROOM) <b>TBLDC Rms 16, 16A, 16B, 17, 17A &amp; 17C</b>	SURVEY NO. <b>MT-05-430</b>
PURPOSE: <b>TBLDC Rms 16, 16A, 16B, 17, 17A &amp; 17C</b> <b>VENTS + UTILITIES</b> <b>1510</b>	RWP NO. <b>N/A</b>
	DATE: <b>6/27/05</b>
	TIME: <b>1355</b>

## MAP/DRAWING

*No DRAINS in Rooms 16, 16A, 16B, 17, 17A & 17C  
All Removed*

**COPY**

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
# E = mrem/hr ( $\beta + \gamma$ ) extremity on contact

= mrem/hr neutron

= swipe number

= air sample number

or  $\beta$  = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
<b>2350</b>	<b>5854/5861</b>	<b>7/20/05</b>
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>

Completed by: (Signature) <i>Wayne Jones</i>	Date: <b>6/27/05</b>
Completed by: (Print Name) <b>Wayne Jones</b>	
Counted by: (Signature) <i>Tina Robertson</i>	HP# <b>N/A</b> Date: <b>N/A</b>
Counted by: (Print Name) <b>See attached</b>	
Reviewed/Approved by: (Signature) <i>Paul H. Hall</i>	Date: <b>7-19-05</b>
Reviewed/Approved by: (Print Name) <b>J. Hollabaugh</b>	

*F1/133  
Rme*

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	B/y	Alpha	Tritium	Comments
1	See Attached			15100101U
2				15100102U
3				15100103U
4				15100104U
5				15100105U
6				15100201U
7				15100202U
8				15100203U
9				15100204U
10				15100201V
11				15100202V
12				15100203V
13				15100204V
14	✓	✓	✓	15100205V

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	B/y	Alpha	Tritium	Comments
COPY				

COMMENTS:

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for B/y, 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 needed, mark N/A.

F2/133

MT-05-50-430  
Pg 3 of 10

# Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_047  
Batch Ended: 6/27/05 15:16  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

COPY

Batch ID: MT-05-0430 (14) TR 7127 06/27/05 TAS

Detector ID	Sample ID
A1	1
A2	2
A3	3
A4	4
B1	5
B2	6
B3	7
B4	8
C1	9
C2	10
C3	11
C4	12
D1	13
D2	14 ✓

Alpha Activity		
DPM	$\sigma$	flags
0.00	2.20	
1.57	2.02	
1.77	2.28	
0.00	2.10	
0.00	1.90	
0.00	1.85	
0.00	2.18	
0.00	1.96	
1.69	2.05	
0.00	1.96	
0.00	2.07	
0.00	1.99	
0.00	2.09	
0.00	2.17	

Beta Activity		
DPM	$\sigma$	flags
0.00	1.86	
0.26	1.65	
0.54	1.78	
0.00	1.22	
0.54	1.69	
0.00	1.13	
0.00	1.34	
0.00	1.21	
0.00	1.23	
3.84	2.52	
0.27	1.72	
2.87	2.25	
4.04	2.80	
0.39	1.68	

wg

wg

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175

Ag 40710

6/27/05 6:57:52 PM

QuantaSmart (TM) - 1.31 - Serial# 423022

Protocol# 1 - MARSSIM\_Smear\_1.lsa

Page # 1 of 1  
User: 58016/28

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_1\20050627\_1806\_results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-0430.001 ✓  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

COPY

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2st  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off ✓  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Regions	Half Life	Units	Reference Date	Reference Time
A				

MT-05-430

F4/133



MARSSIM Smear Data

COPY

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPML	A:2S%	MESSAGES	P#
6/27/05	6:06:37 PM	-1		10.00	7	7	9	1	632.37	0	23.7	B	1
6/27/05	6:17:20 PM	0		2.00	657	617	0	0	555.31	1262	5.6		1
6/27/05	6:20:02 PM	1		2.00	197	185	0	0	501.88	397	10.3		1
6/27/05	6:22:45 PM	2		2.00	164	158	0	0	557.62	314	11.3		1
6/27/05	6:25:27 PM	3		2.00	37	36	5	1	514.99	74	25.6		1
6/27/05	6:28:08 PM	4		2.00	191	176	1	1	596.84	354	10.5		1
6/27/05	6:30:50 PM	5		2.00	20	18	0	2	584.95	38	37.3		1
6/27/05	6:33:32 PM	6		2.00	128	120	1	0	497.02	258	12.9		1
6/27/05	6:36:15 PM	7		2.00	63	58	0	1	512.92	125	19.0		1
6/27/05	6:38:58 PM	8		2.00	442	420	1	0	513.80	880	6.8		1
6/27/05	6:41:39 PM	9		2.00	271	250	0	0	533.02	530	8.7		1
6/27/05	6:44:21 PM	10		2.00	132	126	0	0	482.20	271	12.7		1
6/27/05	6:47:04 PM	11		2.00	627	592	0	0	494.29	1270	5.7		1
6/27/05	6:49:47 PM	12		2.00	173	164	2	0	513.27	345	11.0		1
6/27/05	6:52:30 PM	13		2.00	19	17	0	0	509.37	38	39.2		1
6/27/05	6:55:14 PM	14 ✓		2.00	127	120	2	0	472.69	263	13.0		1

WJ

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MT-05-430

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TS

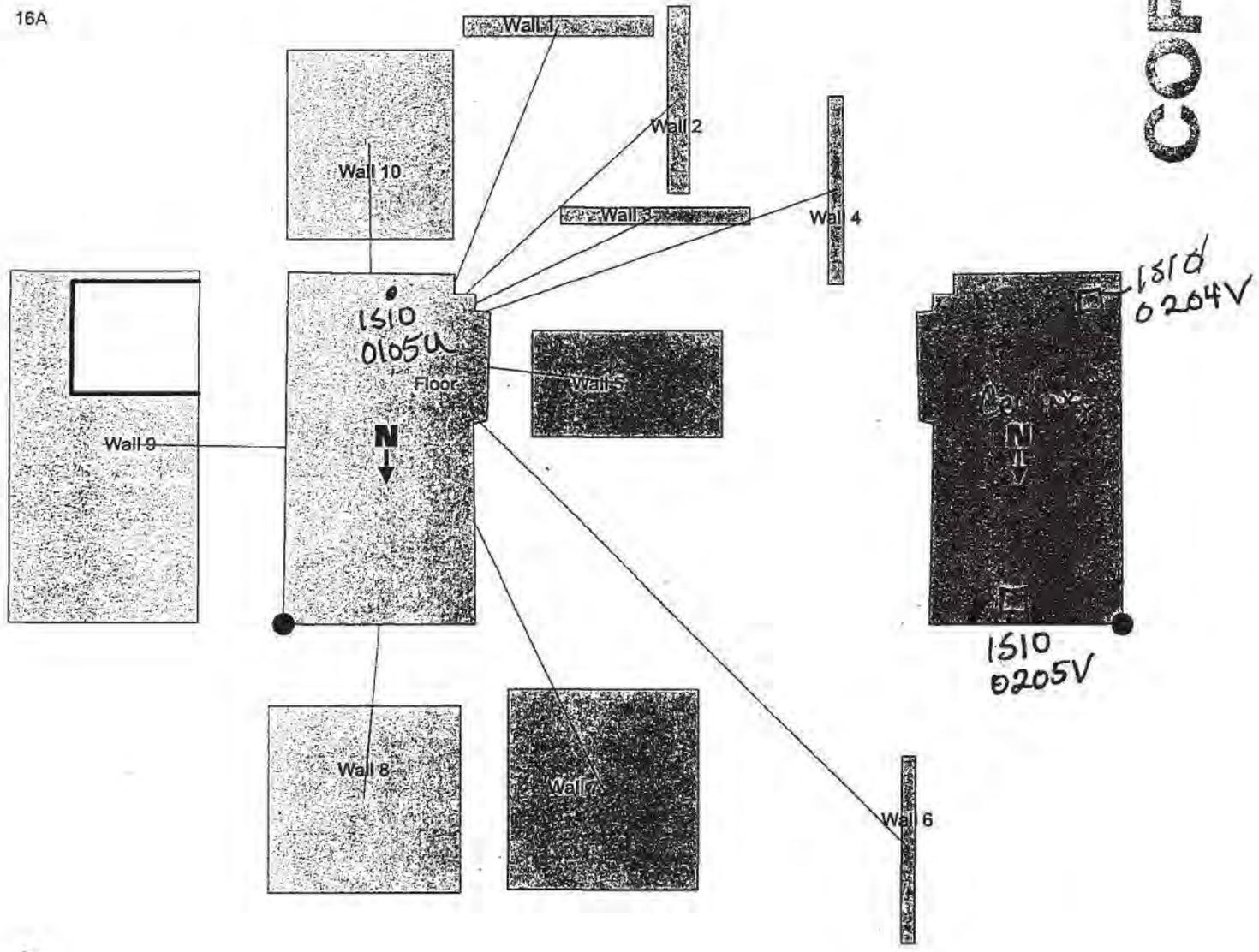
1S-10 Drains, vents, and utilities

COPY

pg 60810

MT-05-430

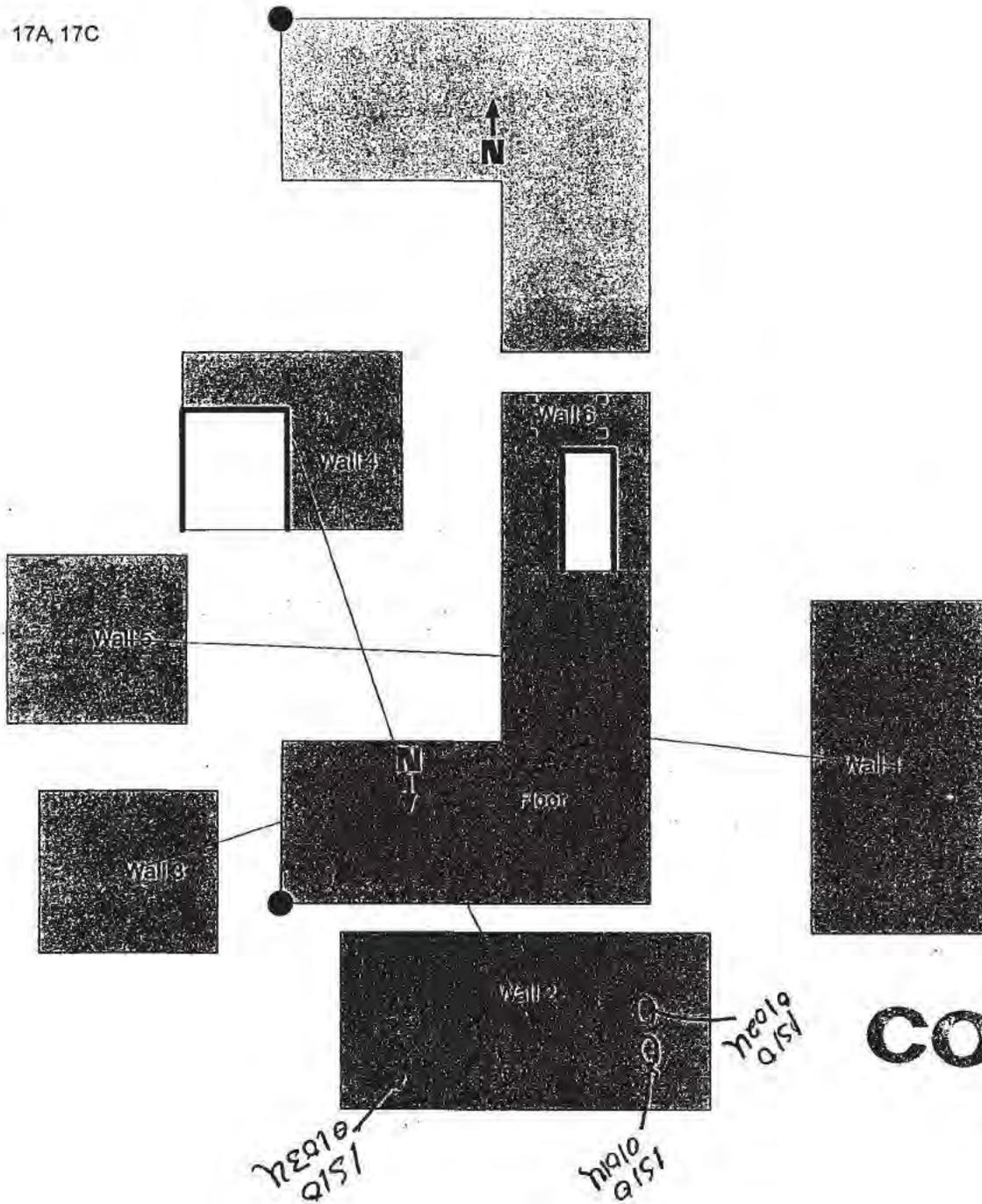
16A



F6/133

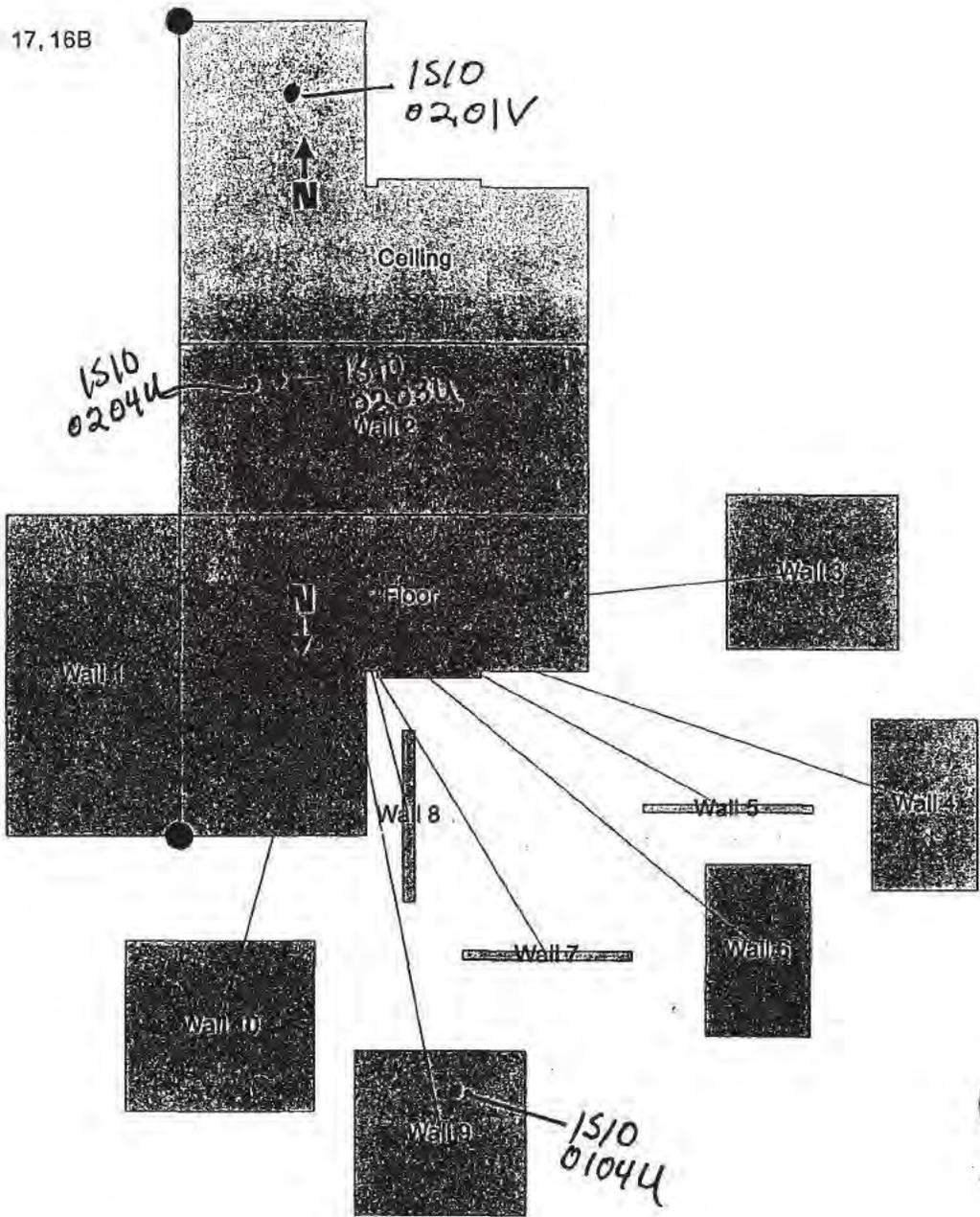
1S-10 Drains, vents, and utilities

17A, 17C



**COPY**

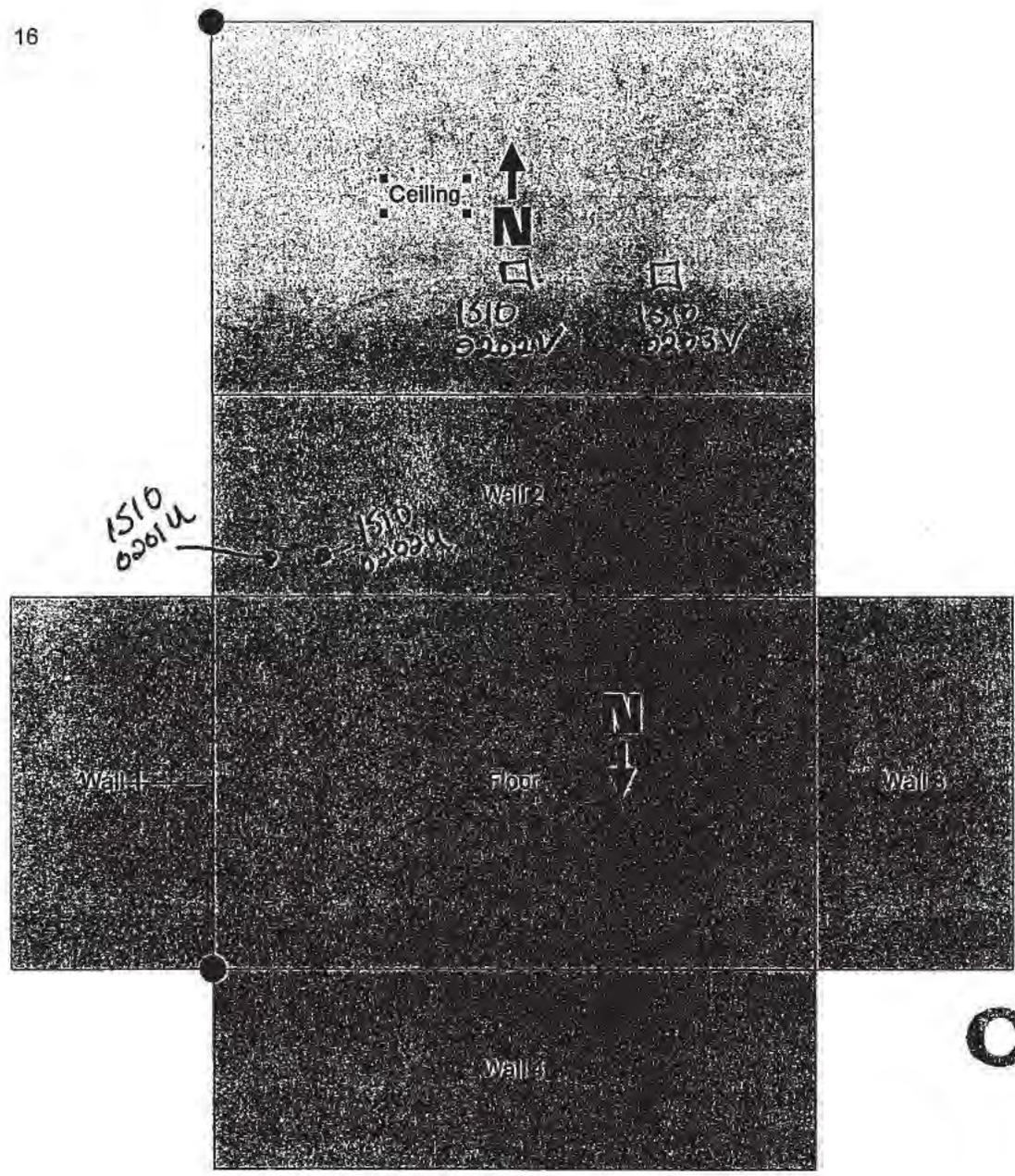
1S-10 Drains, vents, and utilities



**COPY**

1S-10 Drains, vents, and utilities

16



**COPY**

F 9/133

# T-Bldg Vents & Utilities Rms 16,16a,16b,17,17a& 17c

RSDS# Mt-05-430

RCT:           

RCT:           

Alpha	43-68 BKG:	0	EFF:	0.21	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.167	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S100101U	5854	7	5861	1	1	6/27/05	10:31	1	120	4
ALPHA	1S100102U	5854	7	5861	1	2	6/27/05	10:35	5	120	19
ALPHA	1S100103U	5854	7	5861	1	3	6/27/05	10:41	7	120	26
ALPHA	1S100104U	5854	7	5861	1	4	6/27/05	10:45	1	120	4
ALPHA	1S100105U	5854	7	5861	1	5	6/27/05	10:51	5	120	19
ALPHA	1S100201U	5854	7	5861	1	6	6/27/05	12:12	3	120	11
ALPHA	1S100202U	5854	7	5861	1	7	6/27/05	12:16	5	120	19
ALPHA	1S100203U	5854	7	5861	1	8	6/27/05	12:25	9	120	34
ALPHA	1S100204U	5854	7	5861	1	9	6/27/05	12:28	3	120	11
ALPHA	1S100201V	5854	7	5861	1	10	6/27/05	12:35	5	120	19
ALPHA	1S100202V	5854	7	5861	1	11	6/27/05	12:44	9	120	34
ALPHA	1S100203V	5854	7	5861	1	12	6/27/05	12:49	6	120	23
ALPHA	1S100204V	5854	7	5861	1	13	6/27/05	12:57	13	120	49
ALPHA	1S100205V	5854	7	5861	1	14	6/27/05	13:03	5	120	19
BETA	1S100101U	5854	7	5861	2	15	6/27/05	10:32	67	60	687
BETA	1S100102U	5854	7	5861	2	16	6/27/05	10:36	91	60	865
BETA	1S100103U	5854	7	5861	2	17	6/27/05	10:42	107	60	1017
BETA	1S100104U	5854	7	5861	2	18	6/27/05	10:46	107	60	1017
BETA	1S100105U	5854	7	5861	2	19	6/27/05	10:52	114	60	1084
BETA	1S100201U	5854	7	5861	2	20	6/27/05	12:13	109	60	1036
BETA	1S100202U	5854	7	5861	2	21	6/27/05	12:17	105	60	998
BETA	1S100203U	5854	7	5861	2	22	6/27/05	12:26	129	60	1226
BETA	1S100204U	5854	7	5861	2	23	6/27/05	12:29	135	60	1283
BETA	1S100201V	5854	7	5861	2	24	6/27/05	12:37	111	60	1055
BETA	1S100202V	5854	7	5861	2	25	6/27/05	12:45	113	60	1074
BETA	1S100203V	5854	7	5861	2	26	6/27/05	12:50	108	60	1027
BETA	1S100204V	5854	7	5861	2	27	6/27/05	12:58	143	60	1359
BETA	1S100205V	5854	7	5861	2	28	6/27/05	13:04	122	60	1160

7/18/05

COPY

N

A

# RADIOLOGICAL SURVEY DATA SHEET

Page 1 of 2 <sup>910</sup> 12/20/05

LOCATION: (BLDG/AREA/ROOM)	TBLDG Rms 17, 17A & 16 <sup>16</sup>	SURVEY NO.	MT-05-0944
PURPOSE:	TBLDG Rms 17, 17A & 16, 16 <sup>6</sup> POTENTIAL INVESTIGATION OF ELEVATED SCM READINGS by 2350 1510	RWP NO.	N/A
		DATE:	10/6/05
		TIME:	0810

## MAP/DRAWING

Follow-up RDS  
Room T-16 1510D108X  
Post Acid Etch MT-05-1071  
Second Post ACID ETCH MT-05-1103

~~3 ELEVATED READINGS DETECTED~~ 12/2/05  
100%  $\alpha/\beta$  scan on floors and walls up to 2 meters and 25%  $\alpha/\beta$  scan on walls above 2 meters using SCM 23 on RM 16 7/31/05, 17A/17C 7/31/05  
12 potentially elevated areas detected in Rm 16 7/31/05 (directs) (5m cards) MT-05-1145, MT-05-1156  
3 potentially elevated areas detected in Room 16  
5 potentially elevated areas detected in Room 17/16B  
2 potentially elevated areas detected in Room 17A/17C  
See MT-05-1071 and MT-05-1103 for follow-up survey

INSTRUMENT	SERIAL#	CAL DUE DATE
SCM 23	C180	6/1/06
SCM 23	R180	6/1/06

 COPY

LEGEND: # = mrem/hr ( $\gamma$ ) whole body       $\Delta$  = mrem/hr neutron      # = swipe number  
# E = mrem/hr ( $\beta+\gamma$ ) extremity on contact       $\square$  = air sample number      #/ $\alpha$  or  $\beta$  = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5895/5896	2/5/06

Completed by: (Signature) Wayne Jones	Date: 10/6/05
Completed by: (Print Name) Wayne Jones	
Counted by: (Signature) See attached	HP# N/A Date: N/A
Counted by: (Print Name)	
Reviewed/Approved by: (Signature) Jerry Taylor	Date: 10-19-05
Reviewed/Approved by: (Print Name) Jerry Taylor	

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	Beta	Alpha	Tritium	Comments
1	See	attach		15100101X ✓
2				15100102X ✓
3				15100103X ✓
4				15100104X ✓
5				15100105X ✓
6				15100106X ✓
7				15100107X ✓
8				15100108X ✓
9				15100109X ✓
10	↓	↓	↓	15100110X ✓
A N				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	Beta	Alpha	Tritium	Comments
A N				
COPY				

COMMENTS: N  
A

- NOTES:
- See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
  - To request RO Count Room analysis for beta, 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.
  - Annotate special sample type (e.g., soil, water); special identifiers or otherwise in Comments. If needed, mark N/A.

F 12/1

# Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_025  
 Batch Ended: 10/6/05 8:50  
 Cal. Due Date: 11/17/05  
 Serial Number: 26966-3

Batch ID: MT-05-0944 TR [10] GWD ✓

COPY

Detector ID	Sample ID
A1	1
A2	2
A3	3
A4	4
B1	5
B2	6
B3	7
B4	8
C1	9
C2	10

Alpha Activity		
DPM	$\sigma$	flags
1.74	2.19	
0.00	2.03	
0.00	2.27	
0.00	2.15	
0.00	1.90	
0.00	1.89	
0.00	2.22	
0.00	2.01	
0.00	2.05	
0.00	1.96	

Beta Activity		
DPM	$\sigma$	flags
0.00	1.33	
1.59	2.02	
0.00	1.27	
2.73	2.42	
0.54	1.69	
1.02	1.94	
1.63	2.30	
1.36	2.08	
0.00	1.23	
3.84	2.52	

wg

wg

wg 10/7/05  
 Page 1 of 1

F13/33

*[Handwritten signature]*

MT-05-0944

Pg 3 of 3

Protocol# 3 - MARSSIM\_Smear\_3.lsa

MARSSIM Smear Data

COPY

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM Smear 3\20051006 1006.results  
Comma-Delimited File Name: D:\MARSSIM LSC\MT-05-0944-002 MT-05-0944 EWD 10/6/05 ✓  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_3.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s%  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time  
A

Pr 407910  
12/23/05

MT-05-0944

F14/133

Out

10/6/05  
12:50:21  
Pg 508/10

10/6/05 10:48:04 AM

QuantaSmart (TM) - 1.31 - Serial# 423022

Page 1-2 w9

Protocol# 3 - MARSSIM\_Snear\_3.lsa

User: 5801/07/05

MARSSIM Snear Data

COPY

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S#	MESSAGES	P#
10/6/05	10:07:14 AM	-1	10.00	10.00	8	8	9	1	619.11	0	21.8	B	3
10/6/05	10:18:01 AM	0	2.00	2.00	280	264	0	1	525.86	552	8.6		3
10/6/05	10:20:42 AM	1	2.00	2.00	3	2	1	8	535.96	6	163.3		3
10/6/05	10:23:24 AM	2	2.00	2.00	0	0	2	18	466.11	0	0.0		3
10/6/05	10:26:06 AM	3	2.00	2.00	1	1	0	5	540.58	2	431.1		3
10/6/05	10:28:49 AM	4	2.00	2.00	0	0	0	13	467.48	0	0.0		3
10/6/05	10:31:31 AM	5	2.00	2.00	0	0	1	6	522.01	0	3239.6		3
10/6/05	10:34:12 AM	6	2.00	2.00	2	2	0	10	463.35	3	293.5		3
10/6/05	10:36:54 AM	7	2.00	2.00	0	0	2	8	471.99	0	0.0		3
10/6/05	10:39:36 AM	8	2.00	2.00	0	1	4	6	565.17	1	1262.3		3
10/6/05	10:42:18 AM	9	2.00	2.00	0	0	0	0	567.70	0	0.0		3
10/6/05	10:45:00 AM	✓10	2.00	2.00	0	0	3	0	577.92	0	0.0		3

w9

MT-05-0944

F15/133

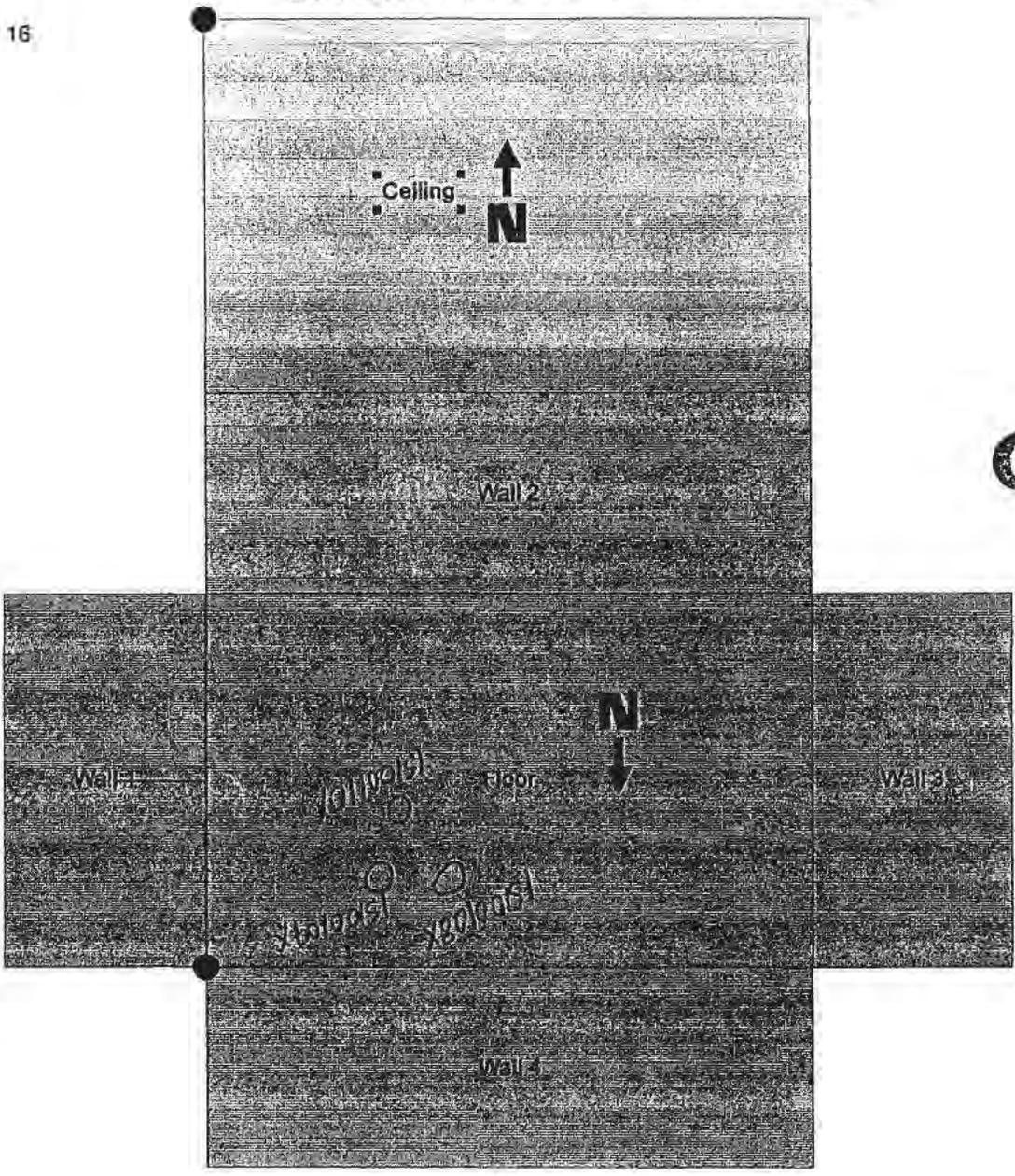
Wg 10/7/05

1S-10 100% scan of floor and walls up to 2 meters

Class 1 25% scan of walls above 2 meters

INVESTIGATION OF ELEVATED REMAINS

16



**COPY**

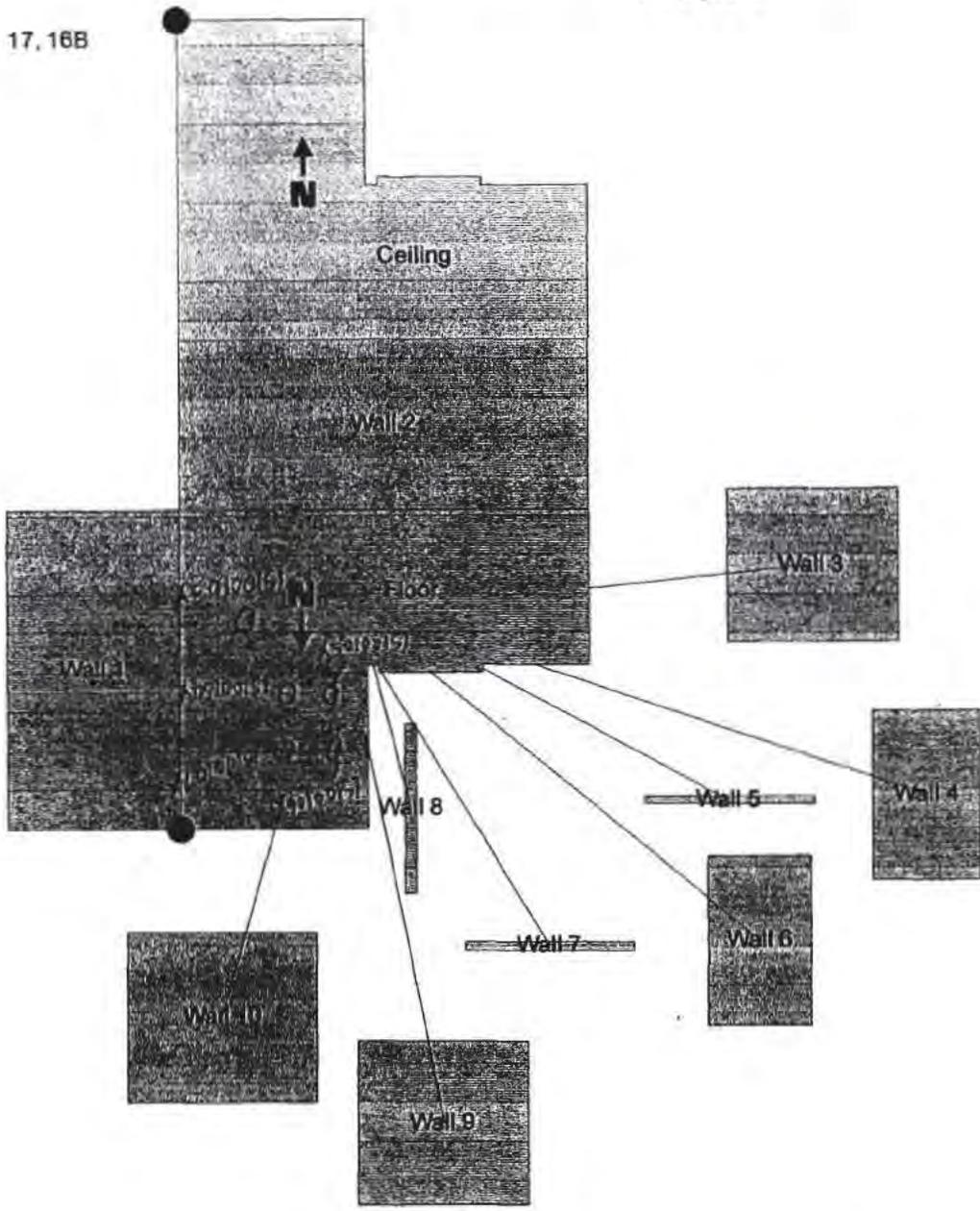
INVESTIGATION OF ELEVATED READINGS

1S-10 100% scan of floor and walls up to 2 meters

Class 1 25% scan of walls above 2 meters

10/7/05

17.168



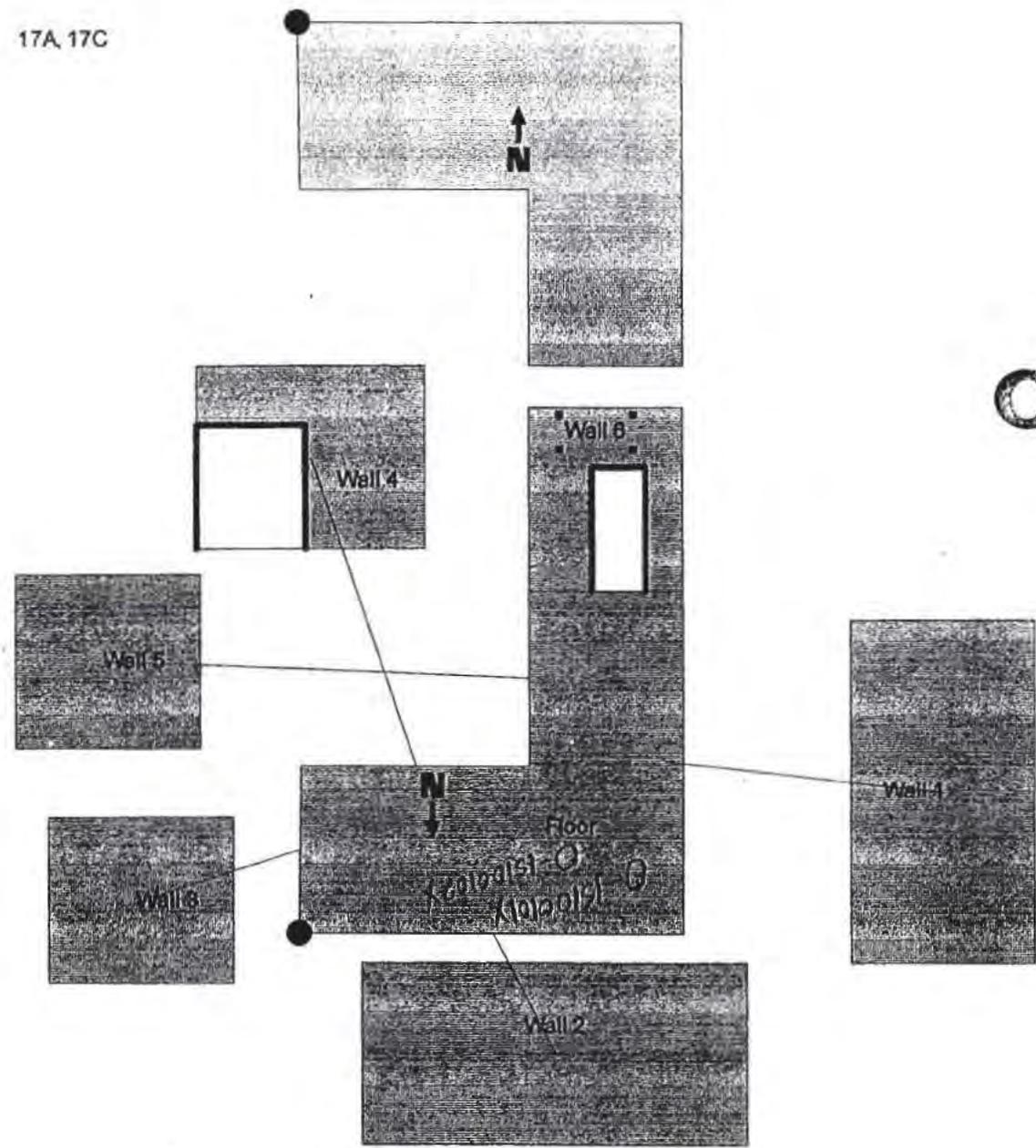
COPY

INVESTIGATION OF ELEVATED READINGS

pg 8 of 10  
12/05/05

1S-10 100% scan of floor and walls up to 2 meters  
Class 1 25% scan of walls above 2 meters 10/7/05 wj

17A, 17C



COPY

# T-Building Investigaton of Elevated Readings Survey

RSDS# MT-05-0944

RCT:           

RCT:           

Alpha	43-68 BKG:	0	EFF:	0.2166 ✓	PROBE AREA:	125	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.17 ✓	PROBE AREA:	125	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	IS100101X	5895		5896	1	1	10/6/05	6:26	15	120	55
ALPHA	IS100102X	5895		5896	1	2	10/6/05	6:33	10	120	37
ALPHA	IS100103X	5895		5896	1	3	10/6/05	6:44	6	120	22
ALPHA	IS100104X	5895		5896	1	4	10/6/05	6:51	5	120	18
ALPHA	IS100105X	5895		5896	1	5	10/6/05	6:54	11	120	40
ALPHA	IS100106X	5895		5896	1	6	10/6/05	6:59	10	120	37
ALPHA	IS100107X	5895		5896	1	7	10/6/05	7:06	14	120	51
ALPHA	IS100108X	5895		5896	1	8	10/6/05	7:18	402	120	1473
ALPHA	IS100109X	5895		5896	1	9	10/6/05	7:27	14	120	51
ALPHA	IS100110X	5895		5896	1	10	10/6/05	7:36	13	120	48
BETA	IS100101X	5895		5896	2	11	10/6/05	6:27	120	60	1120
BETA	IS100102X	5895		5896	2	12	10/6/05	6:34	122	60	1139
BETA	IS100103X	5895		5896	2	13	10/6/05	6:45	167	60	1559
BETA	IS100104X	5895		5896	2	14	10/6/05	6:52	169	60	1578
BETA	IS100105X	5895		5896	2	15	10/6/05	6:55	139	60	1298
BETA	IS100106X	5895		5896	2	16	10/6/05	7:01	145	60	1354
BETA	IS100107X	5895		5896	2	17	10/6/05	7:07	148	60	1382
BETA	IS100108X	5895		5896	2	18	10/6/05	7:19	8018	60	74865
BETA	IS100109X	5895		5896	2	19	10/6/05	7:28	218	60	2035
BETA	IS100110X	5895		5896	2	20	10/6/05	7:37	1549	60	14463
<div style="position: relative; width: 100%; height: 100%;"> <span style="position: absolute; top: 10%; left: 40%;">N</span> <span style="position: absolute; top: 20%; left: 60%;">A</span> </div>											

COPY



# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) T-BLDG 1510 16A	SURVEY NO. MT-05-1005
PURPOSE: MARSSIM SNOBKA INVESTIGATION By 2350	RWP NO. N/A
	DATE: 10/14/05
	TIME: 1600

## MAP/DRAWING

100%  $\alpha/\beta$  scan of floors and walls up to 2 meters  
 and 25%  $\alpha/\beta$  scan of walls above 2 meters  
 by SCM 23 on Room 16A 10/12/05  
 See MT-05-1018 and MT-05-1027 for follow-up surveys

**COPY**

INSTRUMENT SERIAL#	CAL	DUE DATE
SCM 23 C 180		6/1/06
SCM 23 R 180		6/1/06

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
 #E = mrem/hr ( $\beta+\gamma$ ) extremity on contact



= mrem/hr/neutron



= air sample number



= swipe number



or  $\beta$  + direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350/43-68	5904/5905	2/22/06
	N	
	A	

Completed by: (Signature)	HP	DATE: 10-18-05
Completed by: (Print Name)		
George Weissenburger		
Counted by: (Signature)	HP #	DATE: N/A
See	N/A	N/A
Counted by: (Print Name)		
Attachments		
Reviewed/Approved by: (Signature)	E	DATE: 10-20-05
Jerry Taylor		
Reviewed/Approved by: (Print Name)		
Jerry Taylor		

F21/  
1/32  
puc

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Sample #	Swipes (dpm/100cm <sup>2</sup> )			Comments
	Beta	Alpha	Tritium	
1	see attach			1S10E1
2				1S10E2
3				1S10E3
4				1S10E4
5				1S10E5
6				1S10E6
7				1S10E7
8				1S10E8
9				1S10E9
10				1S10E10
11				1S10E11
12				1S10E12
13	↓	↓	↓	1S10E13
14				
15				
16				
17				
18				
19				
20			N	
21				A
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

Removable Contamination				
Sample #	Swipes (dpm/100cm <sup>2</sup> )			Comments
	Beta	Alpha	Tritium	
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52			N	
53				A
54				
55				
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				

**COPY**

COMMENTS: N  
A

- NOTES:**
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
  2. To request RO Count Room analysts for beta, 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.

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# T-Building RM 16A FLOOR SHONKA (INVESTIGATION)

RSDS# MT-05-1005 RCT:            RCT: N/A

Alpha	43-68 BKG:	0	EFF:	0.21	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.175	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S101E	5904		5905	1	1	10/14/05	13:13	12	120	45
ALPHA	1S10E2	5904		5905	1	2	10/14/05	13:23	23	120	87
ALPHA	1S10E3	5904		5905	1	3	10/14/05	13:32	13	120	49
ALPHA	1S104E	5904		5905	1	4	10/14/05	13:37	22	120	83
ALPHA	1S105E	5904		5905	1	5	10/14/05	13:44	12	120	45
ALPHA	1S106E	5904		5905	1	6	10/14/05	13:51	19	120	72
ALPHA	1S10E7	5904		5905	1	7	10/14/05	14:01	34	120	128
ALPHA	1S10E8	5904		5905	1	8	10/14/05	14:08	29	120	110
ALPHA	1S109E	5904		5905	1	9	10/14/05	14:15	21	120	79
ALPHA	1S10E10	5904		5905	1	10	10/14/05	14:21	32	120	121
ALPHA	1S10E11	5904		5905	1	11	10/14/05	14:26	42	120	159
ALPHA	1S10E12	5904		5905	1	12	10/14/05	15:30	25	120	94
ALPHA	1S10E13	5904		5905	1	13	10/14/05	15:34	25	120	94
BETA	1S101E	5904	5905	2	1	10/14/05	13:14	160	60	1451	
BETA	1S102E	5904	5905	2	2	10/14/05	13:25	218	60	1977	
BETA	1S103E	5904	5905	2	3	10/14/05	13:33	180	60	1633	
BETA	1S104E	5904	5905	2	4	10/14/05	13:39	164	60	1488	
BETA	1S105E	5904	5905	2	5	10/14/05	13:45	184	60	1669	
BETA	1S106E	5904	5905	2	6	10/14/05	13:52	181	60	1642	
BETA	1S107E	5904	5905	2	7	10/14/05	14:02	245	60	2222	
BETA	1S108E	5904	5905	2	8	10/14/05	14:09	239	60	2168	
BETA	1S109E	5904	5905	2	9	10/14/05	14:16	201	60	1823	
BETA	1S110E	5904	5905	2	10	10/14/05	14:22	377	60	3420	
BETA	1S1011E	5904	5905	2	11	10/14/05	14:27	554	60	5025	
BETA	1S1012E	5904	5905	2	12	10/14/05	15:31	197	60	1787	
BETA	1S1013E	5904	5905	2	13	10/14/05	15:35	228	60	2068	

N  
A

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### Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_085  
 Batch Ended: 10/17/05 9:25  
 Cal. Due Date: 11/17/05  
 Serial Number: 26966-3

Batch ID: MT-05-1005 WEISSENBURGER (13) 10/17/05 TAS ✓

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	$\sigma$	flags	DPM	$\sigma$	flags
A1	1	0.00	2.23		2.30	2.62	
A2	2	0.00	2.00		0.00	1.18	
A3	3	0.00	2.27		0.00	1.27	
A4	4	0.00	2.10		0.00	1.22	
B1	5	0.00	1.88		0.00	1.20	
B2	6	0.00	1.85		0.00	1.14	
B3	7	0.00	2.20		0.31	1.88	
B4	8	0.00	1.97		0.00	1.21	
C1	9	0.00	2.06		0.26	1.74	
C2	10	0.00	1.91		0.00	1.13	
C3	11	0.00	2.06		0.00	1.22	
C4	12	0.00	1.99		2.87	2.25	
D1	13	0.00	2.05		0.00	1.25	

GW  
10-18-05

GW  
10-18-05

GW 10-18-05

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Protocol# 3 - MARSSIM\_Smear\_3.lsa

User: 5801

MARSSIM Smear Data

COPY

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_3\20051017\_1620.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1005.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_3.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s#  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time  
A

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MARSSIM Snear Data

COPY

B  
C

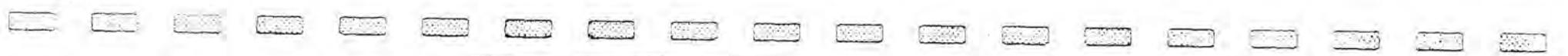
Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/17/05	4:20:52 PM	-1	10.00		8	8	10	4	612.77	0	22.2	B	3
10/17/05	4:31:36 PM	0	2.00		274	262	0	1	526.59	540	8.7		3
10/17/05	4:34:17 PM	1	2.00		0	0	0	7	559.15	0	0.0		3
10/17/05	4:36:58 PM	2	2.00		0	0	0	7	563.27	0	0.0		3
10/17/05	4:39:39 PM	3	2.00		1	1	0	6	483.33	2	512.1		3
10/17/05	4:42:20 PM	4	2.00		1	2	0	5	517.47	3	336.9		3
10/17/05	4:45:02 PM	5	2.00		2	2	0	5	565.17	4	253.7		3
10/17/05	4:47:44 PM	6	2.00		0	0	0	10	605.97	0	0.0		3
10/17/05	4:50:25 PM	7	2.00		0	0	0	7	512.07	0	0.0		3
10/17/05	4:53:05 PM	8	2.00		0	0	0	0	543.20	0	0.0		3
10/17/05	4:55:47 PM	9	2.00		0	0	4	0	586.43	1	1124.7		3
10/17/05	4:58:28 PM	10	2.00		0	0	0	7	547.67	0	0.0		3
10/17/05	5:01:08 PM	11	2.00		0	0	0	9	571.46	0	0.0		3
10/17/05	5:03:49 PM	12	2.00		0	0	1	10	545.87	0	0.0		3
10/17/05	5:06:30 PM	✓13	2.00		0	1	0	6	582.16	1	1003.4		3

W  
10-18-05

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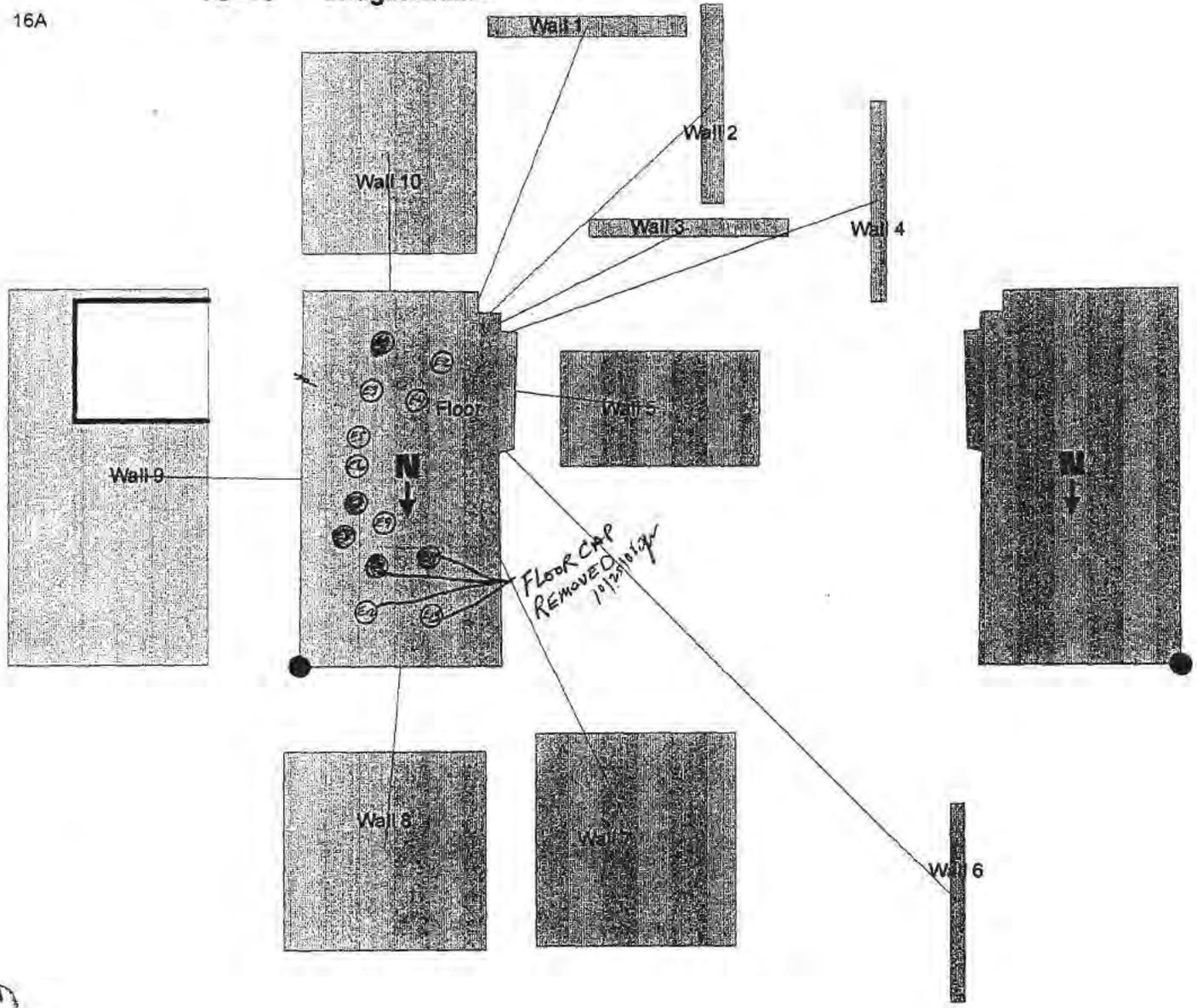
Shonka Investigation

EW 12-8-02

1S-10 **Judgmentals**

16A

**COPY**



F 29/133



# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) 7 Bldg 15-10 Rm16A	SURVEY NO. MT-05-1018
PURPOSE: <i>miss. → follow-up to elevated readings</i>	RWP NO. N/A
	DATE: 10/18/05
	TIME: 1600

## MAP/DRAWING

See Attached  
Original RSOS elevated judgements 1510E7, 1510E8, 1510E11 refer to MT-05-1005

Follow up (MT-05-1018) readings for 8J and 7J were covered in nine readings for 8J and 7J (1510E7) (1510E8)

7	8	9
1	2	3
4	5	6

readings taken in numeric order.

Remediation  
Follow-up  
MT-05-1027  
(Floor REMWED)

1510E11 1510E10 1510E12  
11J and 10J removed reference MT-05-1027  
1510E11 J and 1510E10 10J refer to 1510E12 to  
as 1510E11

GW 11-905

1510111 α average  $\frac{70.3}{67}$  dpm/100cm<sup>2</sup>

# COPY

LEGEND: # = mrem/hr (γ) whole body  
# E = mrem/hr (β+γ) extremity on contact

⊠ = mrem/hr neutron

# = swipe number

⊠ = air sample number

#/α or β = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	43-88 5673 5862	8-4-06
	NA	

Completed by: (Signature) <i>[Signature]</i>	Date: 10-18-05
Completed by: (Print Name) George Wassenberg	
Counted by: (Signature) <i>see Attached</i>	HP#
Counted by: (Print Name) Sheets	
Reviewed/Approved by: (Signature) <i>[Signature]</i>	Date: 11/22/05
Reviewed/Approved by: (Print Name) Jess Griffin	

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133  
RMC



MT-05-10-19-06

10/18/05 2:58:43 PM

QuantaSmart (TM) - 1.31 - Serial# 423022

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Protocol# 1 - MARSSIM\_Smear\_1.lsa

User: 5801

MARSSIM Smear Data

pg 3 of 7

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_1\20051018\_1436.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1018.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Regions	Half Life	Units	Reference Date	Reference Time
A				

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13/1/33

Protocol# 1 - MARSSIM\_Snear\_1.lsa

User: 5801

MARSSIM Snear Data

Pg 4 of 7  
MT-05-1018

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/18/05	2:36:46 PM	-1		10.00	8	8	12	3	621.84	0	22.5	B	1
10/18/05	2:47:32 PM	0		2.00	528	507	1	0	547.49	1022	6.2		1
10/18/05	2:50:14 PM	1		2.00	0	0	0	8	540.21	0	0.0		1
10/18/05	2:52:55 PM	2		2.00	0	0	0	18	504.24	0	0.0		1
10/18/05	2:55:36 PM	√3		2.00	0	0	0	0	582.58	0	0.0		1

u  
10-19-05

COPY

F-33/133



Handwritten notes at the top right of the page, including "5" and "1".

COPY

### Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_094  
Batch Ended: 10/18/05 12:04  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

Batch ID: MT-05-1018 G.W (3) AG ✓

1501801E  
- 1501807E  
1501101E -  
1501107E

Detector ID	Sample ID
A1	1
A2	2
A3	✓3

Alpha Activity		
DPM	$\sigma$	flags
0.00	2.20	
1.57	2.02	
0.00	2.28	

Beta Activity		
DPM	$\sigma$	flags
0.00	1.86	
0.26	1.65	
0.72	1.78	

GW  
10-19-05

F 33/133

Page 1 of 1  
GW  
10-19-05

Handwritten mark at the bottom right corner.

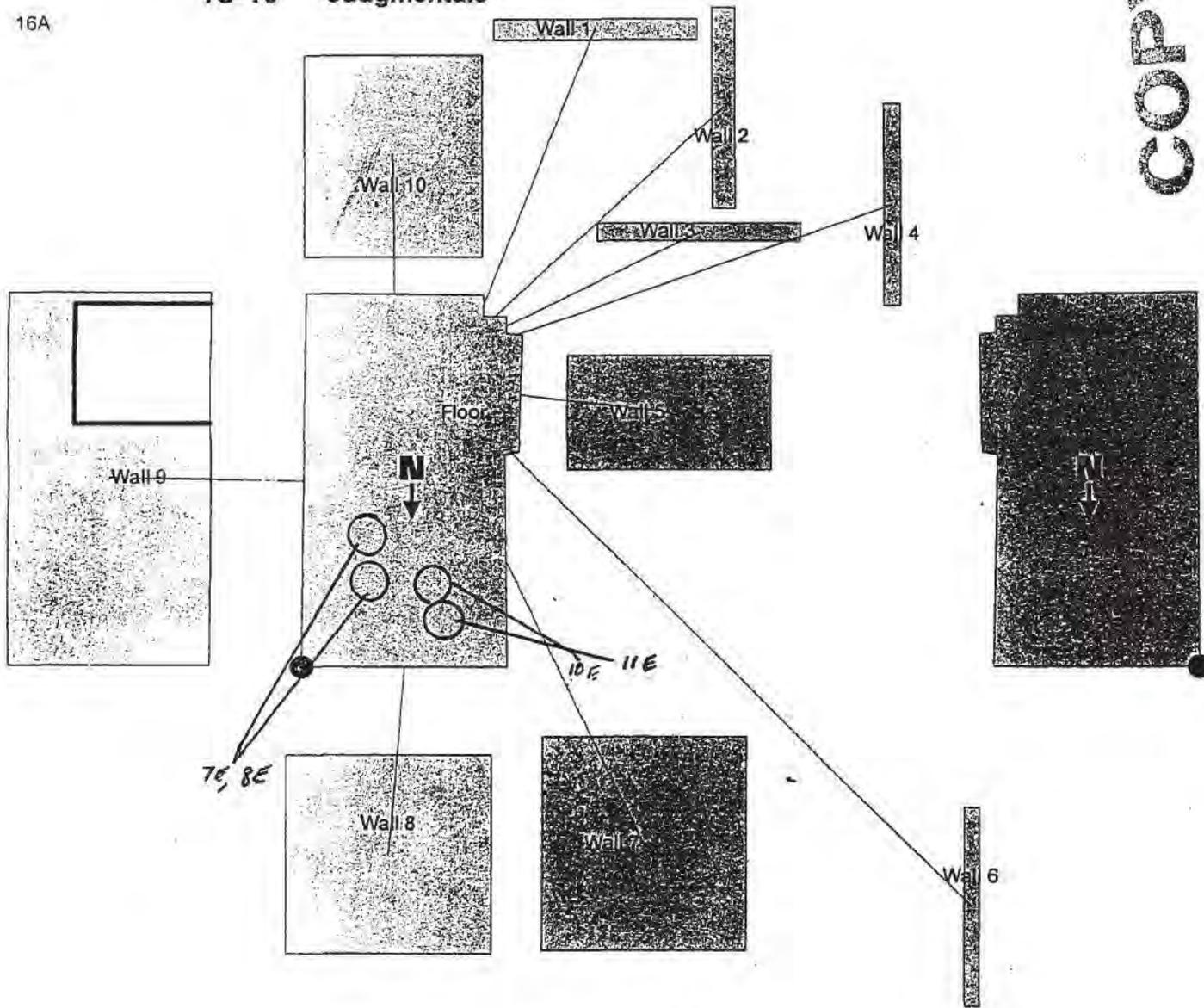


Page 01  
MT-05-1018

1S-10 Judgmentals

16A

COPY



F-35/133

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	T BLDG Rm 16A	SURVEY NO.	MT-05-1027
PURPOSE:	T BLDG Rm 16A Direct Reading on cut out of floor (Post Remediation) 1510	RWP NO.	N/A
		DATE:	10/19/05
		TIME:	0750

REF. ORIGINAL RSDS MT-05-1005  
1510E10, 1510E11, 1510E12  
MAP/DRAWING

Area scanned 100% for alpha/beta 1510E10  
No elevated readings covers 1510E11, 1510E12  
OFF RSDS MT-05-1005  
(151001014 IS AREA PER 6W8727)

**COPY**

See attached map

LEGEND: # = mrem/hr ( $\gamma$ ) whole body       $\Delta$  = mrem/hr neutron      # = swipe number  
# E = mrem/hr ( $\beta + \gamma$ ) extremity on contact      # = air sample number      #/a or  $\beta$  - direct cont. measurement in dpm/100cm<sup>2</sup>

**INSTRUMENTS USED**

Instrument	Serial Number	Cal. Due Date
2350	5895/5896	2/5/06

Completed by: (Signature)	Wayne Jones	Date:	10/19/05
Completed by: (Print Name)	TINA ROBERTSON WAYNE JONES		
Counted by: (Signature)	See attached	HP#	N/A
Counted by: (Print Name)		Date:	N/A
Reviewed/Approved by: (Signature)	Jerry Taylor	Date:	10/20/05
Reviewed/Approved by: (Print Name)	Jerry Taylor		

F36/135  
for



2097  
Pg 3 of 7

# Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_100  
Batch Ended: 10/19/05 12:58  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

COPY

Batch ID: MT-05-1027 [1] WJ 10-19-05 RLH

Detector ID	Sample ID
A1	✓1

Alpha Activity		
DPM	$\sigma$	flags
0.00	2.23	

Beta Activity		
DPM	$\sigma$	flags
2.30	2.62	

TR

TR

MT-05-1027

F-38/133

Page 1 of 1  
TR 10/20/05

RLH

Protocol# 4 - MARSSIM\_Smear\_4.lsa

User: 5801

MARSSIM Smear Data

COPY

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_4\20051019\_1445.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1027.001 ✓  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_4.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s\*  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1                      Repeat Sample Count: 1  
#Vials/Sample: 1                            Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On                      Luminescence Correction: Off  
Colored Samples: Off                      Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18              Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions      Half Life                      Units      Reference Date                      Reference Time

7/10/07  
Ed

1001-00-1111

139/133

Protocol# 4 - MARSSIM\_Smear\_4.lsa

User: 5801

MARSSIM Smear Data

COPY

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/19/05	2:46:25 PM	-1		10.00	10	9	12	7	619.82	0	20.2	B	4
10/19/05	2:57:12 PM	0		2.00	339	318	0	0	550.56	654	7.8		4
10/19/05	2:59:53 PM	✓1		2.00	0	0	0	6	601.93	0	0.0		4

TR

5 of 1  
M-F 05-1027

F-10/133



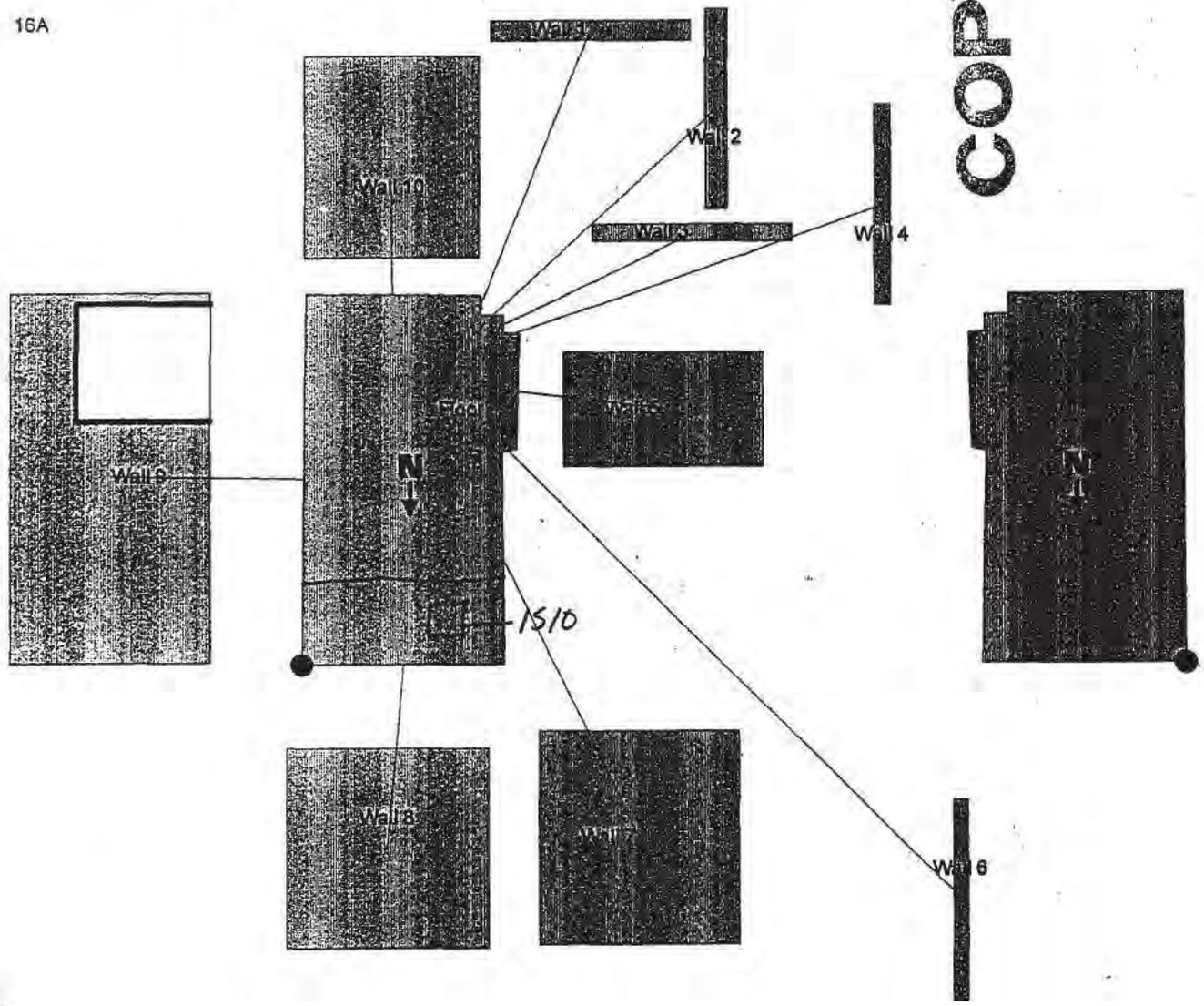
1117-05-1021

6 of 7

SCAN AND DIRECT READING  
FOR SPOT IN FLOOR THAT WAS CUT OUT  
WJ 10/19/05

1S-10 100% scan of floor and walls up to 2 meters  
Class 1 25% scan of walls above 2 meters

16A



F41/133

# T-Building Direct Reading on Cut Out of Floor Survey Rm 16A

RSDS# MT-05-1027

RCT: [REDACTED]

RCT: [REDACTED]

Alpha	43-68 BKG:	0	EFF:	0.2166 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.17 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S100101Y	5895	<span style="background-color: gray; color: gray;">[REDACTED]</span>	5896	1	1	10/19/05	7:24	15	120	55 ✓
BETA	1S100101Y	5895	<span style="background-color: gray; color: gray;">[REDACTED]</span>	5896	2	2	10/19/05	7:25	127	60	1186 ✓

N  
A

COPY

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) <i>TBLDG Rm 16, 16A, 17, 17A, 16B4</i>	SURVEY NO. <i>MT-05-1029</i>
PURPOSE: <i>17C</i>	RWP NO. <i>N/A</i>
<i>Upper &amp; Lower Judgemental / DOSE RATE</i>	DATE: <i>10/19/05</i>
<i>1510</i>	TIME: <i>1215</i>

## MAP/DRAWING

**COPY**

*Micro Rem BKG 5 with 10/27/05  
 micro Rem Reading 25 bar all of the survey unit  
 Thermo  
 3980  
 Cal due 5/13/06*

*See attached map*

LEGEND: # = mrem/hr (γ) whole body  
 # E = mrem/hr (β+γ) extremity on contact



= mrem/hr neutron



= swipe number



= air sample number



or β - direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
<i>2350</i>	<i>5895/5896</i>	<i>2/5/06</i>
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>

Completed by: (Signature) <i>Wayne Jones</i>	Date: <i>10/19/05</i>
Completed by: (Print Name) <i>TINA ROBERTSON WAYNE JONES</i>	
Counted by: (Signature) <i>all attached</i>	HP# <i>N/A</i> Date: <i>N/A</i>
Counted by: (Print Name) <i>↓ ↓</i>	
Reviewed/Approved by: (Signature) <i>Jerry Taylor</i>	Date: <i>10/20/05</i>
Reviewed/Approved by: (Print Name) <i>Jerry Taylor</i>	

*F43/135*  
*Jme*



# Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_102  
 Batch Ended: 10/19/05 13:06  
 Cal. Due Date: 11/17/05  
 Serial Number: 26966-3

Batch ID: MT-05-1029 [20] WJ 10-19-05 RLH

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	$\sigma$	flags	DPM	$\sigma$	flags
B1	1	0.00	1.88		0.00	1.20	
B2	2	0.00	1.85		0.00	1.13	
B3	3	0.00	2.20		0.31	1.88	
B4	4	0.00	2.01		1.56	2.08	
C1	5	0.00	2.07		1.49	2.13	
C2	6	0.00	1.93		1.59	1.95	
C3	7	0.00	2.06		0.00	1.22	
C4	8	0.00	1.95		0.00	1.12	
D1	9	0.00	2.08		2.79	2.50	
D2	10	0.00	2.15		0.00	1.19	
D3	11	0.00	2.09		0.00	1.24	
D4	12	0.00	2.04		0.00	1.18	
B1	13	0.77	1.88		0.00	1.21	
B2	14	0.00	1.85		0.00	1.13	
B3	15	0.00	2.18		0.00	1.34	
B4	16	0.00	2.05		3.95	2.68	
C1	17	0.00	2.07		1.49	2.13	
C2	18	0.00	1.91		0.00	1.12	
C3	19	0.00	2.06		0.00	1.22	
C4	20	0.00	1.96		0.62	1.59	

TR

TR

COPY

Page 1 of 1  
 TR 10/22/05

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MT-05-1029

3 of 11  
 3:05 PM  
 RLH

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM Smear 3\20051019\_1549.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1029.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_3.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2st  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Regions	Half Life	Units	Reference Date	Reference Time
A				

COPY

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MT-05-1029

11/5/11

Rev

11/01/11

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/19/05	3:49:53 PM	-1		10.00	9	8	12	3	613.83	0	21.2		B 3
10/19/05	4:00:42 PM	0		2.00	262	247	3	1	522.81	518	8.9		3
10/19/05	4:03:25 PM	1		2.00	2	2	0	5	508.93	4	240.7		3
10/19/05	4:06:08 PM	2		2.00	0	0	1	13	500.64	0	0.0		3
10/19/05	4:08:49 PM	3		2.00	0	0	0	6	592.75	0	0.0		3
10/19/05	4:11:32 PM	4		2.00	2	2	0	17	376.84	5	231.7		3
10/19/05	4:14:13 PM	5		2.00	18	11	1	4	539.90	35	42.4		3
10/19/05	4:16:54 PM	6		2.00	0	0	0	6	580.12	0	0.0		3
10/19/05	4:19:37 PM	7		2.00	0	0	0	13	457.71	0	0.0		3
10/19/05	4:22:20 PM	8		2.00	1	1	1	10	516.30	2	441.3		3
10/19/05	4:25:02 PM	9		2.00	0	0	0	10	566.28	0	0.0		3
10/19/05	4:27:43 PM	10		2.00	0	0	0	0	588.43	0	0.0		3
10/19/05	4:30:26 PM	11		2.00	0	0	0	0	563.19	0	4643.3		3
10/19/05	4:33:07 PM	12		2.00	1	1	0	10	586.74	2	441.3		3
10/19/05	4:35:48 PM	13		2.00	0	0	0	0	557.63	0	1956.0		3
10/19/05	4:38:30 PM	14		2.00	0	0	0	8	579.61	0	0.0		3
10/19/05	4:41:11 PM	15		2.00	0	0	1	9	577.62	0	0.0		3
10/19/05	4:43:53 PM	16		2.00	0	0	0	11	566.15	0	4643.3		3
10/19/05	4:46:57 PM	17		2.00	0	0	0	8	582.84	0	0.0		3
10/19/05	4:49:39 PM	18		2.00	0	0	0	14	587.55	0	0.0		3
10/19/05	4:52:19 PM	19		2.00	2	1	0	5	560.51	3	309.7		3
10/19/05	4:55:02 PM	20		2.00	0	0	0	6	586.40	0	0.0		3

MT-05-1079

TR

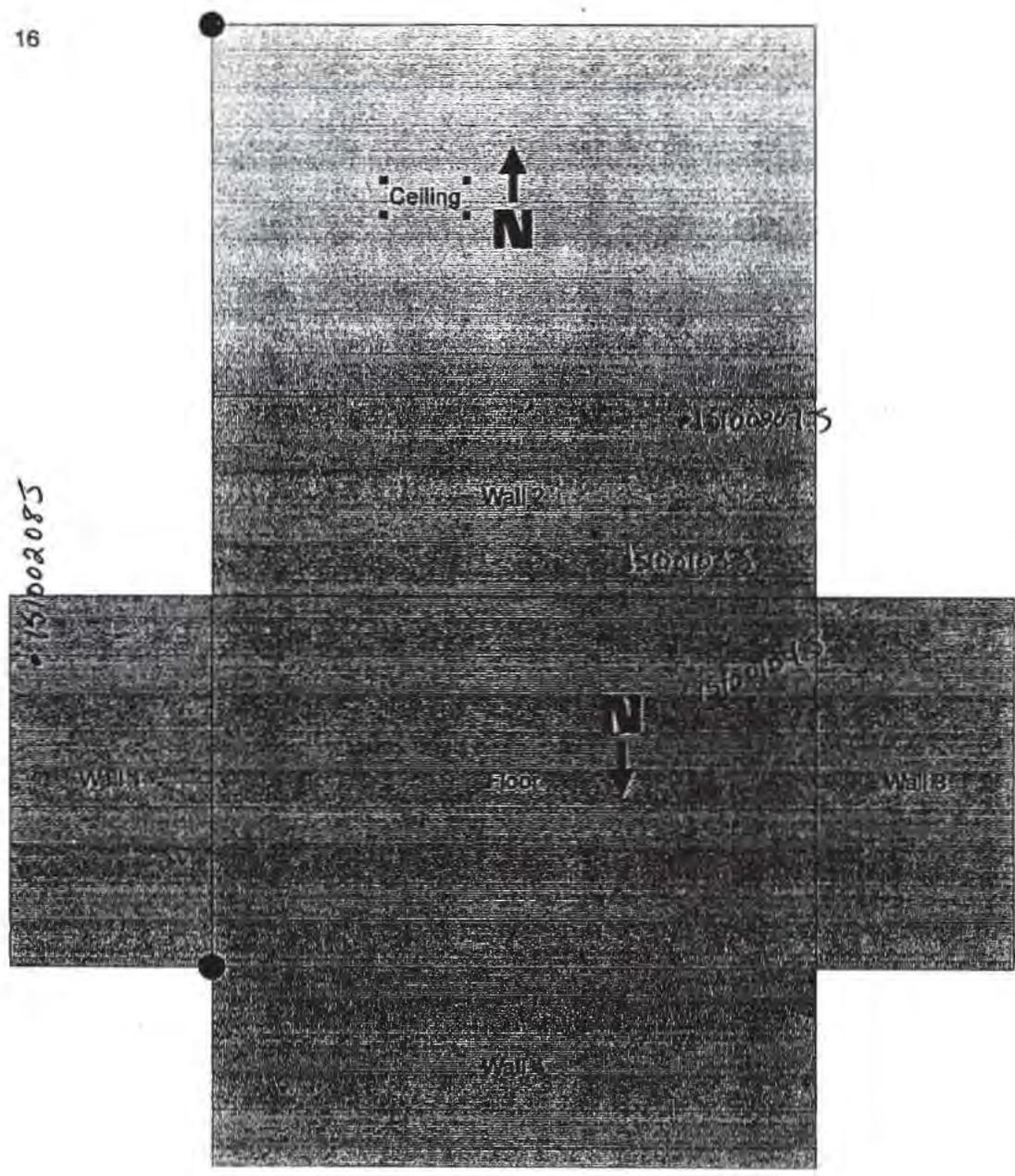
COPY

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1S-10 Judgmentals

16



COPY

F-48/133

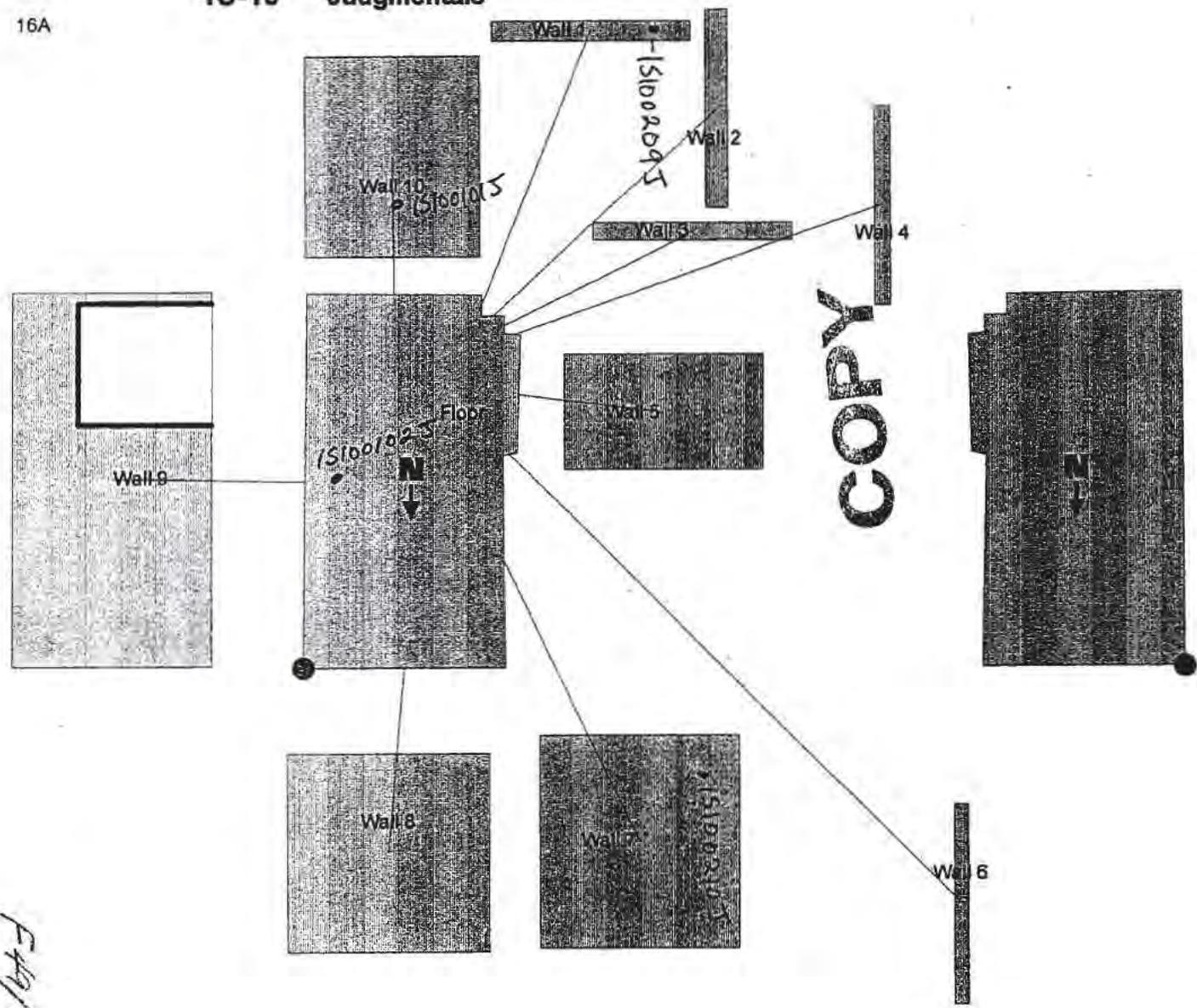
1 of 1  
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MT-05-1029

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16A

### 1S-10 Judgmentals

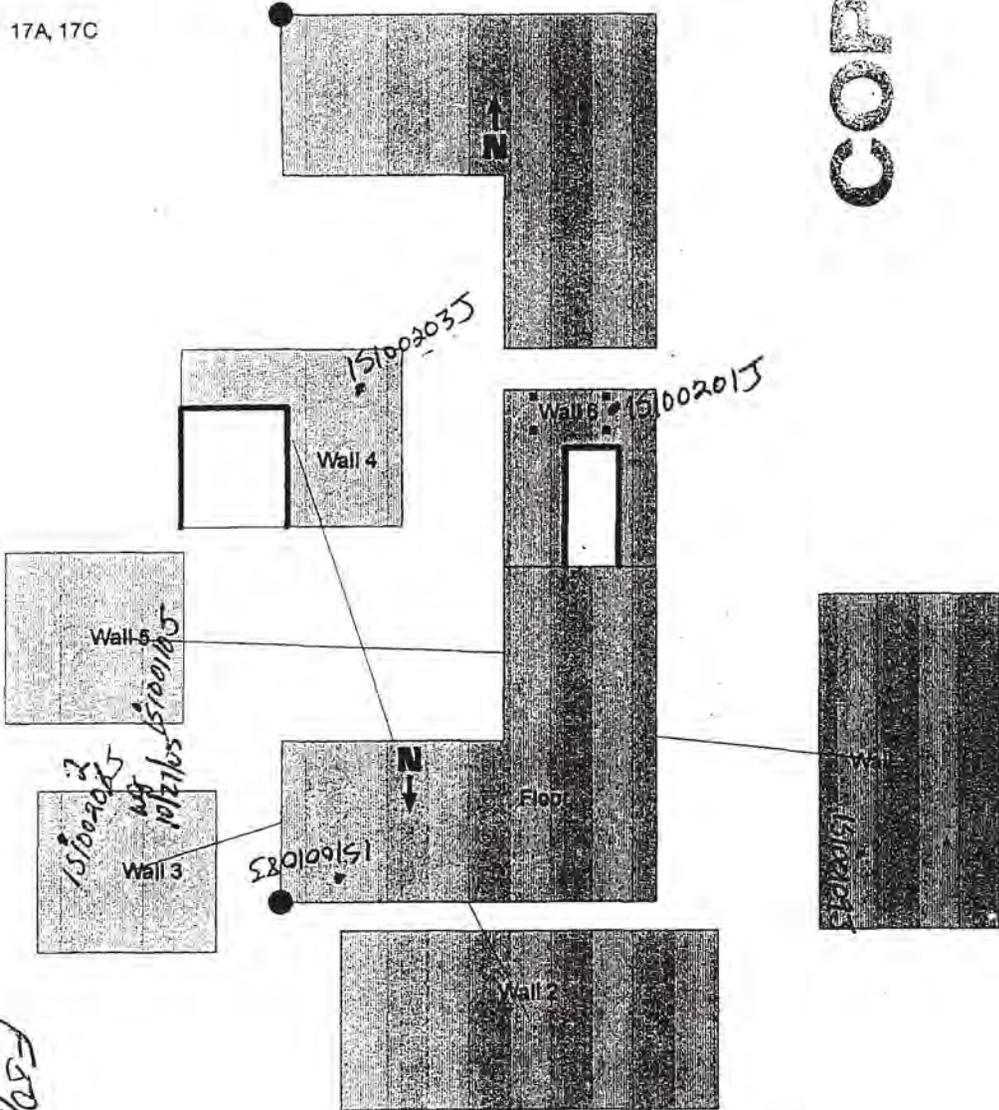


COPY

1S-10 Judgmentals

17A, 17C

COPY



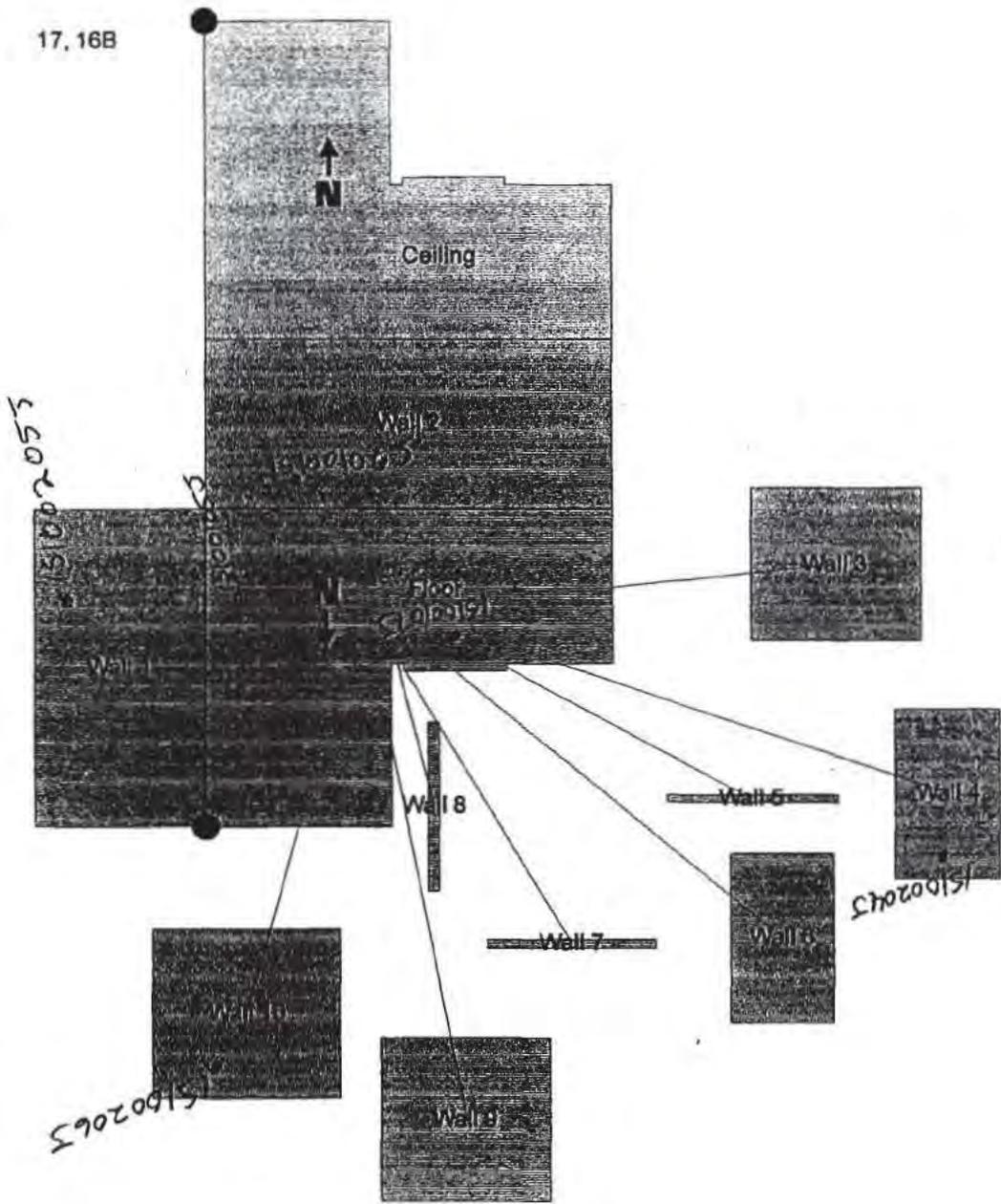
11 of 11

MLT-05-1029

F50/33

1S-10

17, 16B



COPY



**COPY**

**T-Building Judgemental Survey Upper and Lower Rms 16, 16a, 17 & 17a, 16B, & 17.**

RSDS# MT-05-1029

RCT:           

RCT:           

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
Alpha	43-68 BKG:	0	EFF:	0.216 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.17 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
ALPHA	1S100101J	5895		5896	1	1	10/19/05	8:22	11	120	40
ALPHA	1S100102J	5895		5896	1	2	10/19/05	8:25	8	120	29
ALPHA	1S100103J	5895		5896	1	3	10/19/05	8:29	4	120	15
ALPHA	1S100104J	5895		5896	1	4	10/19/05	8:33	9	120	33
ALPHA	1S100105J	5895		5896	1	5	10/19/05	8:37	14	120	51
ALPHA	1S100106J	5895		5896	1	6	10/19/05	8:41	3	120	11
ALPHA	1S100107J	5895		5896	1	7	10/19/05	8:45	9	120	33
ALPHA	1S100108J	5895		5896	1	8	10/19/05	9:35	10	120	37
ALPHA	1S100109J	5895		5896	1	9	10/19/05	9:39	8	120	29
ALPHA	1S100110J	5895		5896	1	10	10/19/05	9:43	4	120	15
ALPHA	1S100201J	5895		5896	1	11	10/19/05	9:50	5	120	18
ALPHA	1S100202J	5895		5896	1	12	10/19/05	9:56	10	120	37
ALPHA	1S100203J	5895		5896	1	13	10/19/05	10:01	7	120	26
ALPHA	1S100204J	5895		5896	1	14	10/19/05	10:06	6	120	22
ALPHA	1S100205J	5895		5896	1	15	10/19/05	10:11	13	120	48
ALPHA	1S100206J	5895		5896	1	16	10/19/05	10:16	7	120	26
ALPHA	1S100207J	5895		5896	1	17	10/19/05	10:22	7	120	26
ALPHA	1S100208J	5895		5896	1	18	10/19/05	10:26	9	120	33
ALPHA	1S100209J	5895		5896	1	19	10/19/05	10:31	8	120	29
ALPHA	1S100210J	5895		5896	1	20	10/19/05	10:36	5	120	18 ✓
BETA	1S100101J	5895		5896	2	21	10/19/05	8:23	119	60	1111
BETA	1S100102J	5895		5896	2	22	10/19/05	8:26	176	60	1643
BETA	1S100103J	5895		5896	2	23	10/19/05	8:30	115	60	1074
BETA	1S100104J	5895		5896	2	24	10/19/05	8:34	141	60	1317
BETA	1S100105J	5895		5896	2	25	10/19/05	8:38	200	60	1867
BETA	1S100106J	5895		5896	2	26	10/19/05	8:42	163	60	1522
BETA	1S100107J	5895		5896	2	27	10/19/05	8:46	180	60	1681
BETA	1S100108J	5895		5896	2	28	10/19/05	9:36	179	60	1671
BETA	1S100109J	5895		5896	2	29	10/19/05	9:40	146	60	1363
BETA	1S100110J	5895		5896	2	30	10/19/05	9:44	111	60	1036
BETA	1S100201J	5895		5896	2	31	10/19/05	9:51	148	60	1382
BETA	1S100202J	5895		5896	2	32	10/19/05	9:57	150	60	1401
BETA	1S100203J	5895		5896	2	33	10/19/05	10:02	146	60	1363
BETA	1S100204J	5895		5896	2	34	10/19/05	10:07	126	60	1176
BETA	1S100205J	5895		5896	2	35	10/19/05	10:12	173	60	1615
BETA	1S100206J	5895		5896	2	36	10/19/05	10:17	177	60	1653
BETA	1S100207J	5895		5896	2	37	10/19/05	10:23	120	60	1120
BETA	1S100208J	5895		5896	2	38	10/19/05	10:28	86	60	803
BETA	1S100209J	5895		5896	2	39	10/19/05	10:32	114	60	1064
BETA	1S100210J	5895		5896	2	40	10/19/05	10:37	102	60	952 ✓
						N					

**COPY**

F53/133

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM)	TBLDG Rms 16, 16A, 16B, 17, 17A, 17C	SURVEY NO.	MT-05-1033
PURPOSE:	Lower STATICS	RWP NO.	N/A
	1510	DATE:	10/19/05
		TIME:	1250

## MAP/DRAWING

**COPY**

*See attached maps*

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
 # E = mrem/hr ( $\beta + \gamma$ ) extremity on contact



# = mrem/hr neutron



# = air sample number



# = swipe number



#/ $\alpha$  or  $\beta$  - direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5895/5896	2/5/06
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>

Completed by: (Signature)	<i>Wayne Jones</i>	Date:	10/19/05
Completed by: (Print Name)	TINA ROBERTSON WAYNE JONES		
Counted by: (Signature)	<i>See attached</i>	HPB	N/A
Counted by: (Print Name)			N/A
Reviewed/Approved by: (Signature)	<i>Jerry Taylor</i>	Date:	10-27-05
Reviewed/Approved by: (Print Name)	Jerry Taylor		

F54/13  
 JMC

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
1	see attached	see attached		151001015
2				151001025
3				151001035
4				151001045
5				151001055
6				151001065
7				151001075
8				151001085
9				151001095
10				151001105
11				151001115
12				151001125
13				151001135
14				151001145
15				151001155
16				151001165
17				151001175
18				151001185
19				151001195
20				151001205
A				
N				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
COPY				

COMMENTS:

NOTES:

1. See MD-80038 10002 for calculations of WB, extremity and skin dose rates.
2. To request RD Count Room analysis for beta, 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. Analyze special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

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MT-05-1033

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### Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_108  
 Batch Ended: 10/20/05 9:55  
 Cal. Due Date: 11/17/05  
 Serial Number: 26966-3

COPY

Batch ID: MT-05-1033 [20] WJ 10-20-05 RLH ✓

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	$\sigma$	flags	DPM	$\sigma$	flags
A1	1	0.00	2.20		0.00	1.96	
A2	2	0.00	2.00		0.00	1.18	
A3	3	0.00	2.27		0.00	1.27	
A4	4	0.00	2.10		0.00	1.22	
B1	5	0.77	1.87		0.00	1.20	
B2	6	0.00	1.85		0.00	1.13	
B3	7	0.00	2.20		0.31	1.88	
B4	8	0.00	1.96		0.00	1.21	
C1	9	0.00	2.05		0.00	1.23	
C2	10	0.00	1.91		0.00	1.12	
C3	11	0.00	2.06		0.00	1.22	
C4	12	3.61	2.76		0.00	1.13	
D1	13	0.00	2.08		2.79	2.50	
D2	14	0.00	2.15		0.00	1.19	
D3	15	0.00	2.11		1.42	2.15	
D4	16	0.00	2.09		3.71	2.63	
C1	17	0.00	2.05		0.00	1.23	
C2	18	0.00	1.91		0.00	1.13	
C3	19	0.00	2.06		0.00	1.22	
C4	20	0.00	1.95		0.00	1.12	

*gc*

*gc*

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*RLH*

Protocol# 1 - MARSSIM\_Smear\_1.lsa

User: 5801/okz

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_1\20051020\_1332.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1033.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2st  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time

COPY

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F 5/1/03

Rev

MARSSIM Smear Data

COPY

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*MT-05-1033*

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:29%	MESSAGES	P#
10/20/05	1:32:41 PM	-1		10.00	8		10	2	620.03	0	22.5	B	1
10/20/05	1:43:28 PM	0		2.00	530	500	3	0	550.74	1022	6.2		1
10/20/05	1:46:11 PM	1		2.00	1	1	0	17	538.23	2	423.0		1
10/20/05	1:48:53 PM	2		2.00	1	1	0	6	543.43	1	652.0		1
10/20/05	1:51:36 PM	3		2.00	0	0	1	6	423.56	0	0.0		1
10/20/05	1:54:18 PM	4		2.00	7	5	0	6	560.06	14	79.7		1
10/20/05	1:57:01 PM	5		2.00	1	1	0	6	516.95	1	764.1		1
10/20/05	1:59:43 PM	6		2.00	0	0	0	7	597.78	0	0.0		1
10/20/05	2:02:26 PM	7		2.00	1	0	0	17	482.17	1	805.2		1
10/20/05	2:05:09 PM	8		2.00	2	0	0	15	427.68	4	235.7		1
10/20/05	2:07:51 PM	9		2.00	0	0	1	13	598.45	0	0.0		1
10/20/05	2:10:33 PM	10		2.00	0	0	0	10	516.39	0	0.0		1
10/20/05	2:13:16 PM	11		2.00	1	1	0	11	516.69	2	423.0		1
10/20/05	2:15:59 PM	12		2.00	0	0	1	7	502.42	0	0.0		1
10/20/05	2:18:41 PM	13		2.00	2	2	1	5	514.87	5	200.7		1
10/20/05	2:21:22 PM	14		2.00	3	2	0	10	531.63	5	190.0		1
10/20/05	2:24:04 PM	15		2.00	1	1	0	10	559.17	3	329.7		1
10/20/05	2:26:45 PM	16		2.00	1	0	0	12	561.37	1	764.1		1
10/20/05	2:29:33 PM	17		2.00	2	2	0	32	457.16	3	305.6		1
10/20/05	2:32:15 PM	18		2.00	0	0	0	20	526.26	0	0.0		1
10/20/05	2:34:57 PM	19		2.00	0	0	0	10	505.84	0	0.0		1
10/20/05	2:37:38 PM	√20		2.00	1	0	1	6	531.34	2	423.0		1

*ps*

*F58/133*

**1S-10-01 floor and lower walls**

Area: 17A, 17C				
Label	Type	Surface	LX	LY
✓ 1S-10-01-1	Systematic	Floor	15	7
✓ 1S-10-01-2	Systematic	Wall 1	6	5
✓ 1S-10-01-3	Systematic	Wall 2	4	5
✓ 1S-10-01-4	Systematic	Wall 3	0	5
✓ 1S-10-01-5	Systematic	Wall 4	8	5
✓ 1S-10-01-6	Systematic	Wall 6	3	5

Area: 17, 16B				
Label	Type	Surface	LX	LY
✓ 1S-10-01-7	Systematic	Floor	1	14
✓ 1S-10-01-8	Systematic	Floor	18	14
✓ 1S-10-01-9	Systematic	Wall 1	0	7
✓ 1S-10-01-10	Systematic	Wall 4	1	7
✓ 1S-10-01-11	Systematic	Wall 8	2	7
✓ 1S-10-01-12	Systematic	Wall 9	8	7
✓ 1S-10-01-13	Systematic	Wall 10	6	7
✓ 1S-10-01-14	Systematic	Wall 10	23	7

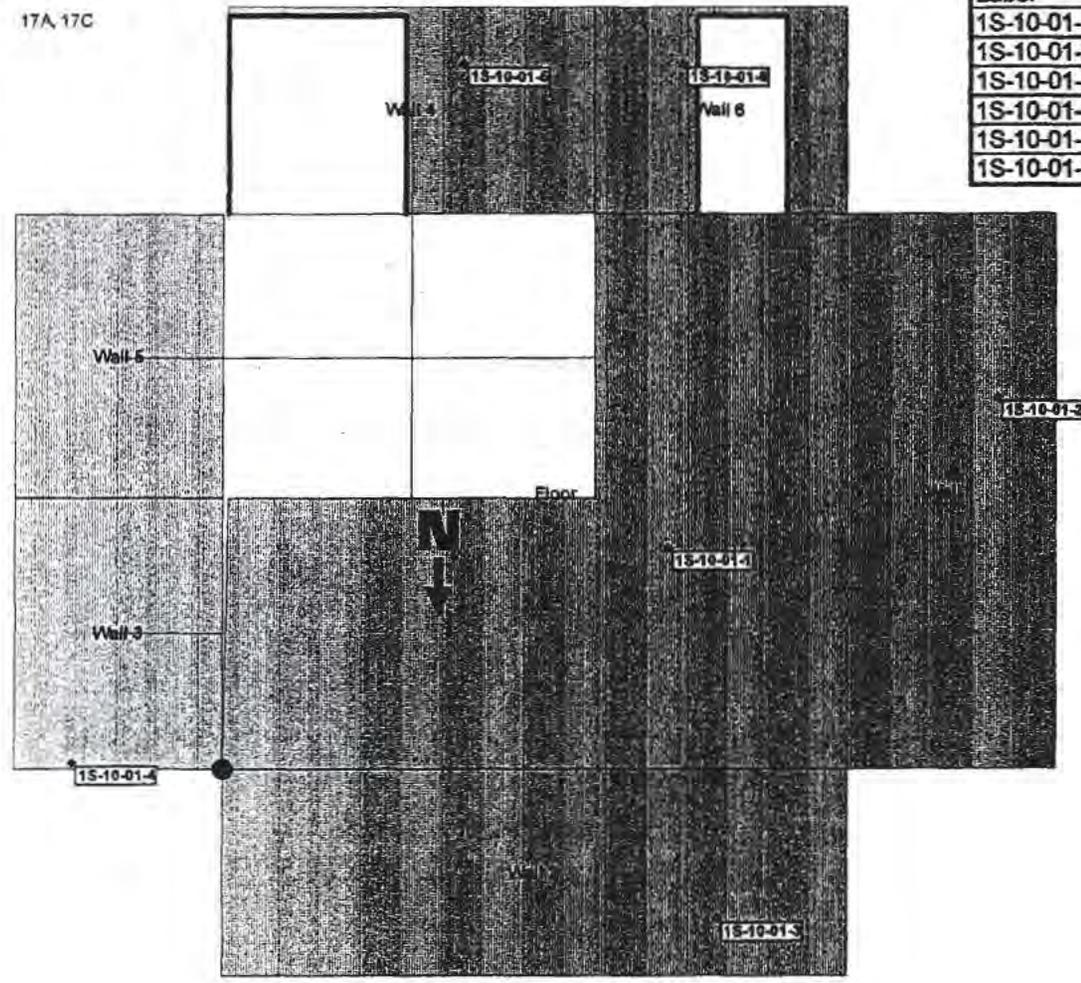
Area: 16				
Label	Type	Surface	LX	LY
✓ 1S-10-01-15	Systematic	Floor	15	0
✓ 1S-10-01-16	Systematic	Floor	6	15
✓ 1S-10-01-17	Systematic	Floor	23	15

COPY

Area: 16A				
Label	Type	Surface	LX	LY
✓ 1S-10-01-18	Systematic	Floor	5	3
✓ 1S-10-01-19	Systematic	Wall 7	1	3
✓ 1S-10-01-20	Systematic	Wall 8	7	3

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17A, 17C



Area: 17A, 17C				
Label	Type	Surface	LX	LY
1S-10-01-1	Systematic	Floor	15	7
1S-10-01-2	Systematic	Wall 1	6	5
1S-10-01-3	Systematic	Wall 2	4	5
1S-10-01-4	Systematic	Wall 3	0	5
1S-10-01-5	Systematic	Wall 4	8	5
1S-10-01-6	Systematic	Wall 6	3	5

**COPY**

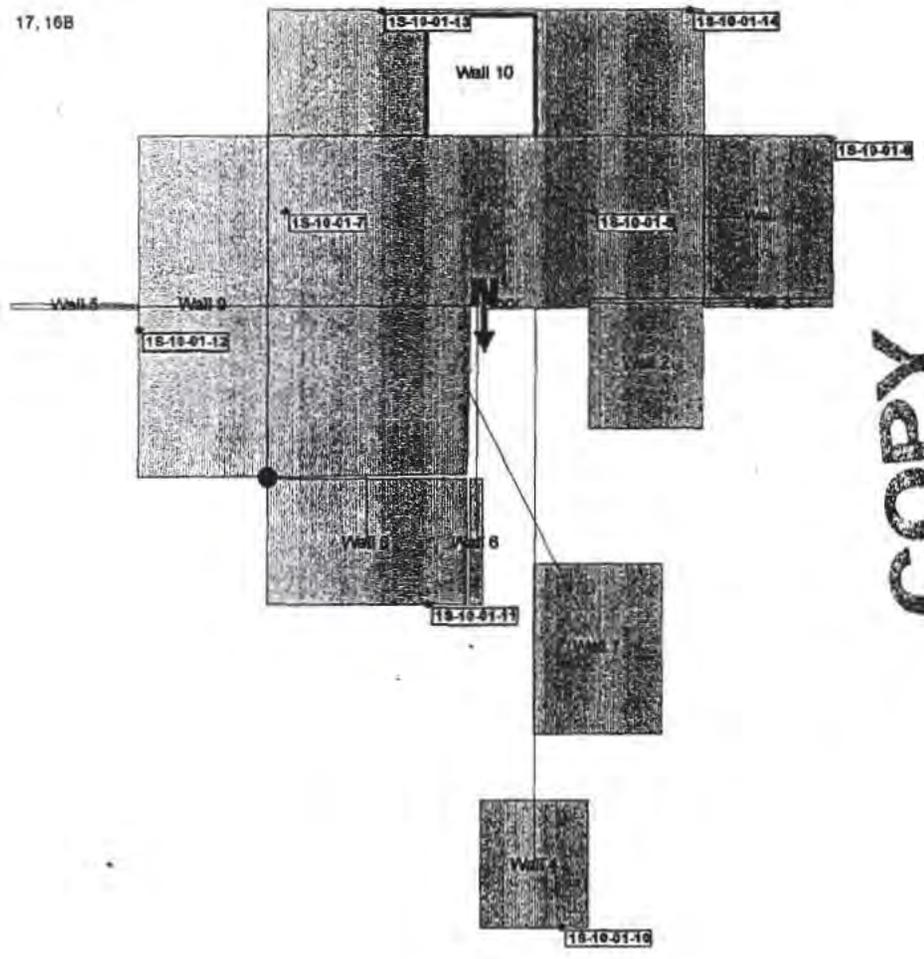
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17, 16B

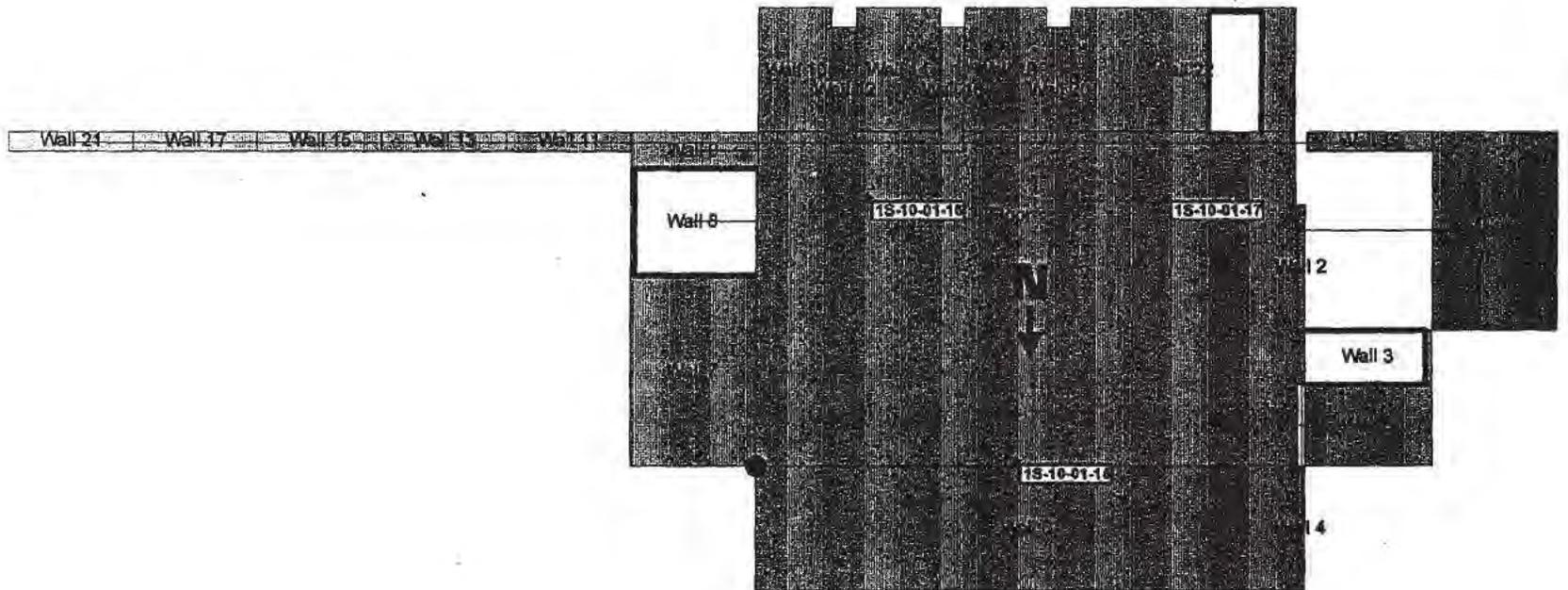


COPY

Area: 17, 16B				
Label	Type	Surface	LX	LY
1S-10-01-7	Systematic	Floor	1	14
1S-10-01-8	Systematic	Floor	18	14
1S-10-01-9	Systematic	Wall 1	0	7
1S-10-01-10	Systematic	Wall 4	1	7
1S-10-01-11	Systematic	Wall 8	2	7
1S-10-01-12	Systematic	Wall 9	8	7
1S-10-01-13	Systematic	Wall 10	6	7
1S-10-01-14	Systematic	Wall 10	23	7

Area: 16				
Label	Type	Surface	LX	LY
1S-10-01-15	Systematic	Floor	15	0
1S-10-01-16	Systematic	Floor	6	15
1S-10-01-17	Systematic	Floor	23	15

COPY



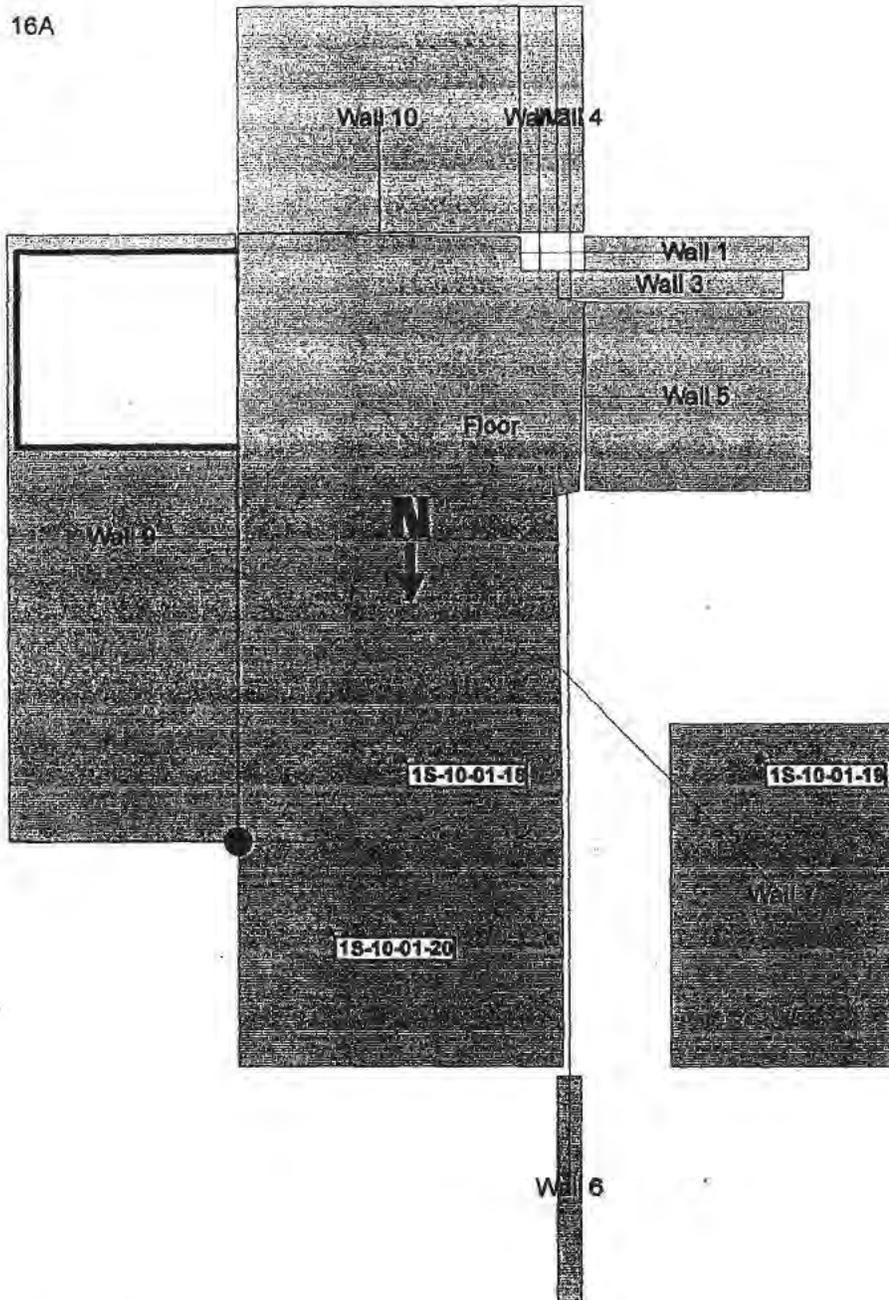
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16A



**COPY**

Area: 16A				
Label	Type	Surface	LX	LY
1S-10-01-18	Systematic	Floor	5	3
1S-10-01-19	Systematic	Wall 7	1	3
1S-10-01-20	Systematic	Wall 8	7	3

# T-Building Lower Statics Survey 1S10 Rms 16,16A,16B,17,17A,17C

RSDS# MT-05-1033 RCT:            RCT:           

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
Alpha	43-68 BKG:	0	EFF:	0.216	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	<b>COPY</b>		1
Beta	43-68 BKG:	0	EFF:	0.17	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
ALPHA	1S100101S	5895		5896	1	1	10/19/05	13:14	7	120	26
ALPHA	1S100102S	5895		5896	1	2	10/19/05	13:18	6	120	22
ALPHA	1S100103S	5895		5896	1	3	10/19/05	13:21	2	120	7
ALPHA	1S100104S	5895		5896	1	4	10/19/05	13:25	5	120	18
ALPHA	1S100105S	5895		5896	1	5	10/19/05	13:28	3	120	11
ALPHA	1S100106S	5895		5896	1	6	10/19/05	13:32	14	120	51
ALPHA	1S100107S	5895		5896	1	7	10/19/05	13:36	18	120	66
ALPHA	1S100108S	5895		5896	1	8	10/19/05	13:40	4	120	15
ALPHA	1S100109S	5895		5896	1	9	10/19/05	13:43	3	120	11
ALPHA	1S100110S	5895		5896	1	10	10/19/05	13:47	6	120	22
ALPHA	1S100111S	5895		5896	1	11	10/19/05	13:50	2	120	7
ALPHA	1S100112S	5895		5896	1	12	10/19/05	13:54	5	120	18
ALPHA	1S100113S	5895		5896	1	13	10/19/05	13:57	4	120	15
ALPHA	1S100114S	5895		5896	1	14	10/19/05	14:01	8	120	29
ALPHA	1S100115S	5895		5896	1	15	10/19/05	14:05	9	120	33
ALPHA	1S100116S	5895		5896	1	16	10/19/05	14:09	12	120	44
ALPHA	1S100117S	5895		5896	1	17	10/19/05	14:12	14	120	51
ALPHA	1S100118S	5895		5896	1	18	10/19/05	14:16	11	120	40
ALPHA	1S100119S	5895		5896	1	19	10/19/05	14:20	4	120	15
ALPHA	1S100120S	5895		5896	1	20	10/19/05	14:23	2	120	7 ✓
BETA	1S100101S	5895		5896	2	21	10/19/05	13:15	154	60	1438
BETA	1S100102S	5895		5896	2	22	10/19/05	13:19	120	60	1120
BETA	1S100103S	5895		5896	2	23	10/19/05	13:22	128	60	1195
BETA	1S100104S	5895		5896	2	24	10/19/05	13:26	131	60	1223
BETA	1S100105S	5895		5896	2	25	10/19/05	13:29	117	60	1092
BETA	1S100106S	5895		5896	2	26	10/19/05	13:33	128	60	1195
BETA	1S100107S	5895		5896	2	27	10/19/05	13:37	173	60	1615
BETA	1S100108S	5895		5896	2	28	10/19/05	13:41	195	60	1821
BETA	1S100109S	5895		5896	2	29	10/19/05	13:44	162	60	1513
BETA	1S100110S	5895		5896	2	30	10/19/05	13:48	105	60	980
BETA	1S100111S	5895		5896	2	31	10/19/05	13:51	141	60	1317
BETA	1S100112S	5895		5896	2	32	10/19/05	13:55	135	60	1261
BETA	1S100113S	5895		5896	2	33	10/19/05	13:58	178	60	1662
BETA	1S100114S	5895		5896	2	34	10/19/05	14:02	140	60	1307
BETA	1S100115S	5895		5896	2	35	10/19/05	14:07	250	60	2334
BETA	1S100116S	5895		5896	2	36	10/19/05	14:10	194	60	1811
BETA	1S100117S	5895		5896	2	37	10/19/05	14:14	170	60	1587
BETA	1S100118S	5895		5896	2	38	10/19/05	14:17	178	60	1662
BETA	1S100119S	5895		5896	2	39	10/19/05	14:21	95	60	887
BETA	1S100120S	5895		5896	2	40	10/19/05	14:24	96	60	896 ✓

*N/A*

*N/A COPY*

*F-64/133*

# RADIOLOGICAL SURVEY DATA SHEET

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LOCATION: (BLDG/AREA/ROOM)	T BLDG Rm 16, 16A, 16B, 17, 17A	SURVEY NO.	MT-05-1043
PURPOSE:	17C	RWP NO.	N/A
	Upper Station	DATE:	10/20/05
	1510	TIME:	1035

## MAP/DRAWING

All Statics on the ceiling were not reachable and moved to different location. See attached map.

NOTE: The ceiling in these areas has been removed due to <sup>11-1-05</sup> to gain better access to the crawl space areas. Ceiling static locations were therefore placed on items located in the crawl space area.

**COPY**

See attached map

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
# E = mrem/hr ( $\beta + \gamma$ ) extremity on contact

$\Delta$  = mrem/hr neutron

# = swipe number

# = air sample number

#/a or #/b - direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5895/5896	2/5/06
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>
<del> </del>	<del> </del>	<del> </del>

Completed by: (Signature)	<i>Wayne Jones</i>	Date:	10/20/05
Completed by: (Print Name)	TINA GIBSON WAYNE JONES		
Counted by: (Signature)	<i>See attached</i>	HP#	N/A
Counted by: (Print Name)		Date:	N/A
Reviewed/Approved by: (Signature)	<i>Jerry Taylor</i>	Date:	10-27-05
Reviewed/Approved by: (Print Name)	Jerry Taylor		

F 65/139  
JTC



30811  
MT-05-1043

### Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_113  
Batch Ended: 10/20/05 13:46  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

COPY

Batch ID: MT-05-1043 [20] WJ 10-20-05 RLH

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	$\sigma$	flags	DPM	$\sigma$	flags
A1	1	0.00	2.25		3.60	2.93	
A2	2	0.00	2.02		0.42	1.65	
A3	3	0.00	2.28		0.72	1.78	
A4	4	0.00	2.10		0.00	1.22	
B1	5	0.00	1.92		1.73	2.07	
B2	6	0.00	1.85		0.00	1.13	
B3	7	1.93	2.18		0.00	1.35	
B4	8	0.00	2.05		3.95	2.68	
C1	9	0.00	2.06		0.26	1.74	
C2	10	0.00	1.92		0.47	1.59	
C3	11	0.00	2.06		0.00	1.22	
C4	12	0.00	1.96		0.62	1.59	
D1	13	1.75	2.10		3.89	2.80	
D2	14	0.00	2.15		0.00	1.19	
D3	15	0.00	2.09		0.00	1.25	
D4	16	0.00	2.06		1.37	2.03	
C1	17	1.69	2.06		0.11	1.74	
C2	18	0.00	1.93		1.59	1.95	
C3	19	0.00	2.06		0.00	1.22	
C4	✓ 20	0.00	1.98		1.74	1.95	

wj

wj

F 67/133

RLH

Protocol# 4 - MARSSIM\_Smear\_4.lsa

User: 580110/24

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_4\20051020\_1530.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1043.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_4.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2st  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time

COPY

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MT-05-1043

F 608/133



MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

COPY

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tsIE	DPM1	A:2S%	MESSAGES	P#
10/20/05	3:30:36 PM	-1		10.00	10	9	13	9	621.14	0	20.2	B	4
10/20/05	3:41:24 PM	0		2.00	326	307	0	0	548.68	630	8.0		4
10/20/05	3:44:05 PM	1		2.00	4	5	1	4	627.64	7	148.6		4
10/20/05	3:46:47 PM	2		2.00	5	5	0	3	609.55	9	121.0		4
10/20/05	3:49:28 PM	3		2.00	5	5	0	3	572.25	9	121.0		4
10/20/05	3:52:11 PM	4		2.00	0	1	0	5	597.87	0	8891.9		4
10/20/05	3:54:53 PM	5		2.00	35	33	0	1	565.86	67	27.5		4
10/20/05	3:57:35 PM	6		2.00	54	52	0	2	543.62	105	21.1		4
10/20/05	4:00:16 PM	7		2.00	17	15	0	2	574.07	32	45.2		4
10/20/05	4:02:59 PM	8		2.00	4	5	0	7	547.89	8	133.2		4
10/20/05	4:05:41 PM	9		2.00	641	233	0	100	617.27	1171	5.6		4
10/20/05	4:08:31 PM	10		2.00	17	16	0	4	622.39	30	45.1		4
10/20/05	4:11:13 PM	11		2.00	8	8	0	3	526.26	16	75.8		4
10/20/05	4:13:55 PM	12		2.00	6	6	0	3	543.92	11	105.7		4
10/20/05	4:16:36 PM	13		2.00	2	1	0	4	595.32	4	235.6		4
10/20/05	4:19:18 PM	14		2.00	2	2	0	4	570.37	4	235.6		4
10/20/05	4:21:59 PM	15		2.00	2	2	0	4	579.87	3	297.7		4
10/20/05	4:24:42 PM	16		2.00	0	0	0	0	583.21	0	0.0		4
10/20/05	4:27:30 PM	17		2.00	0	0	0	5	617.25	0	0.0		4
10/20/05	4:30:12 PM	18		2.00	3	4	1	4	595.71	6	179.8		4
10/20/05	4:32:52 PM	19		2.00	1	2	0	5	578.66	2	409.8		4
10/20/05	4:35:35 PM	20		2.00	1	2	0	8	614.32	3	360.1		4

W9

pg 5 of 11

MT-05-1043

F 6/9/33

Area: 17A, 17C

Label	Type	Surface	LX	LY	
1S-10-02-1	Systematic	ceiling-f		<del>8</del>	3 - moved to wall 2
1S-10-02-2	Systematic	ceiling-f		<del>20</del> <sup>10/27/05</sup>	3 - moved to wall 1
1S-10-02-3	Systematic	ceiling-f		<del>14</del> <sup>9/21/05</sup>	13 - moved to wall 5
1S-10-02-4	Systematic	Wall 1		8	2
1S-10-02-5	Systematic	Wall 2		0	2
1S-10-02-6	Systematic	Wall 2		11	2
1S-10-02-7	Systematic	Wall 3		2	2
1S-10-02-8	Systematic	Wall 5		3	2

Area: 17, 16B

Label	Type	Surface	LX	LY	
1S-10-02-9	Systematic	ceiling-f		<del>9</del> <sup>10/27/05</sup>	9 - moved to wall 7

Area: 16A

Label	Type	Surface	LX	LY	
1S-10-02-10	Systematic	ceiling-f		<del>5</del> <sup>10/27/05</sup>	10 - moved to suit work
1S-10-02-11	Systematic	Wall 5		4	2
1S-10-02-12	Systematic	Wall 7		8	2
1S-10-02-13	Systematic	Wall 8		9	2
1S-10-02-14	Systematic	Wall 9		10	2
1S-10-02-15	Systematic	Wall 10		2	2

COPY

Area: 16

Label	Type	Surface	LX	LY	
1S-10-02-16	Systematic	ceiling-f		<del>9</del>	9 - moved to wall 4
1S-10-02-17	Systematic	ceiling-f		<del>20</del>	9 - moved to wall 4
1S-10-02-18	Systematic	ceiling-f		<del>3</del>	10 - moved to light fixture
1S-10-02-19	Systematic	ceiling-f		<del>14</del>	10 - moved to vent (wash side)
1S-10-02-20	Systematic	ceiling-f		<del>26</del>	10 - moved to wall 3

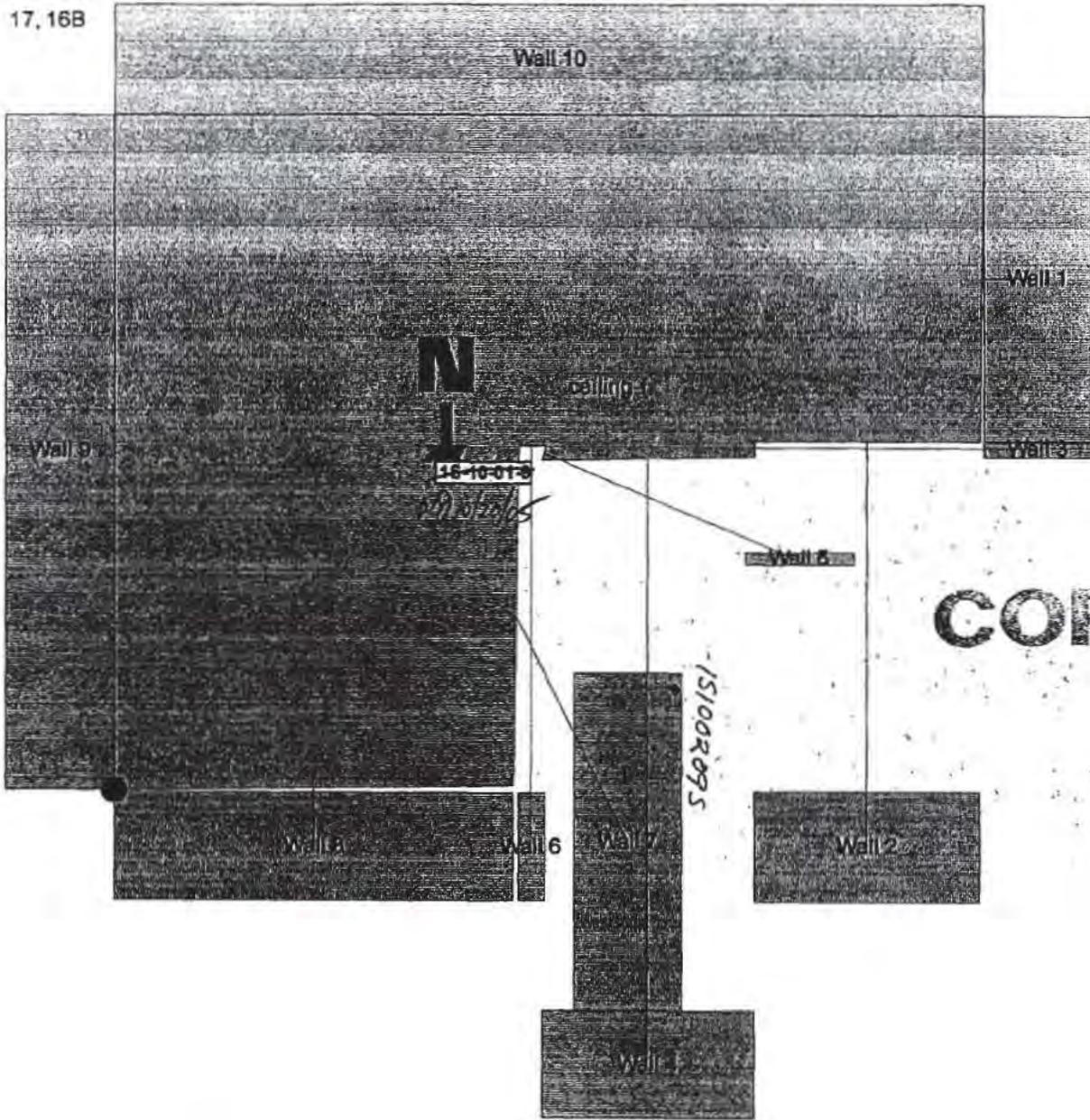
MT-05-1043

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1S-10-02

Ceiling and upper walls

17, 16B



COPY

F71/133

pg 8 of 11

MT-05-1043

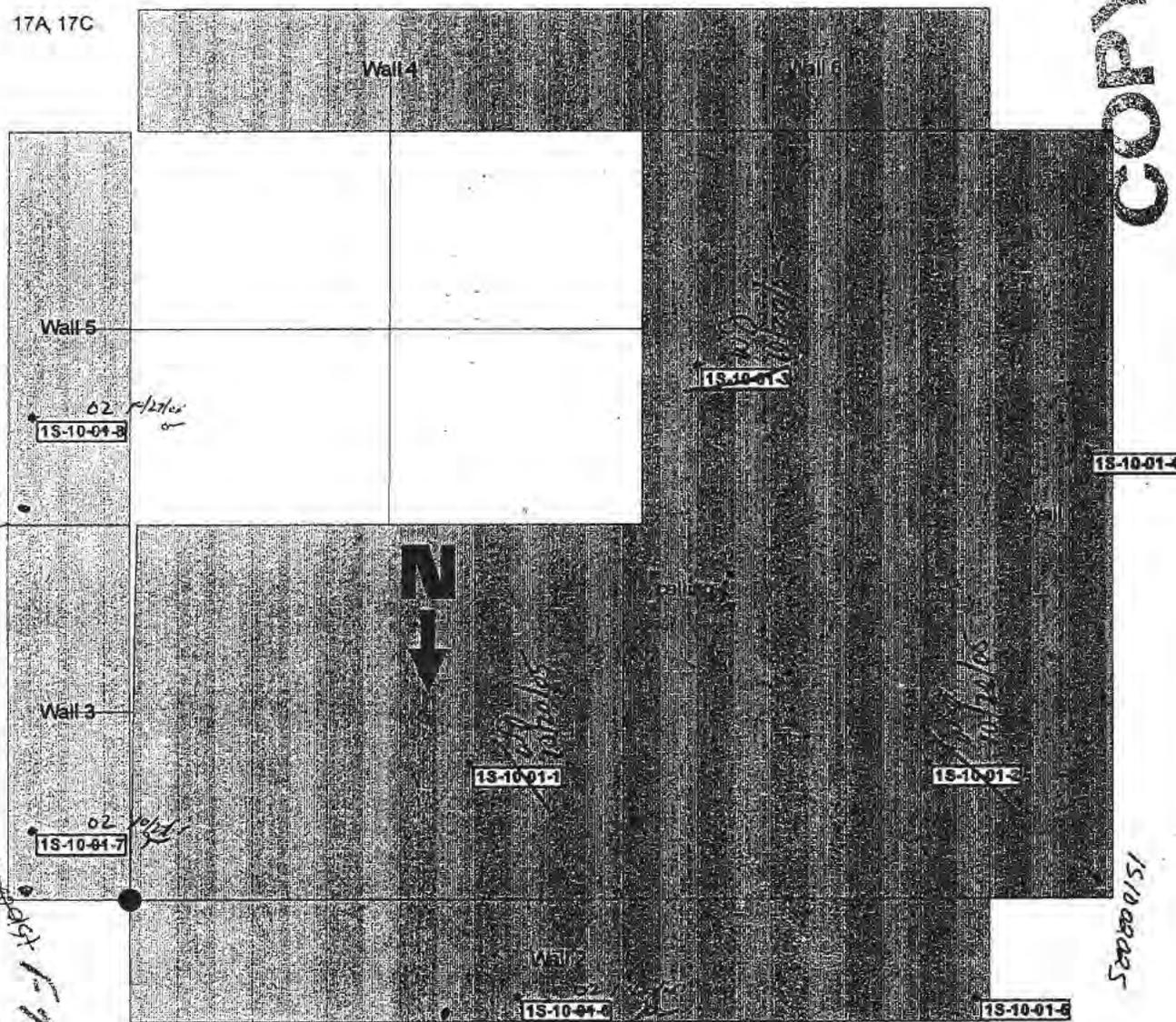
151002035

151002015  
151002025  
151002035  
151002045  
151002055  
151002065  
151002075  
151002085  
151002095  
151002105  
151002115  
151002125  
151002135  
151002145  
151002155  
151002165  
151002175  
151002185  
151002195  
151002205  
151002215  
151002225  
151002235  
151002245  
151002255  
151002265  
151002275  
151002285  
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151002605  
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151002765  
151002775  
151002785  
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151002805  
151002815  
151002825  
151002835  
151002845  
151002855  
151002865  
151002875  
151002885  
151002895  
151002905  
151002915  
151002925  
151002935  
151002945  
151002955  
151002965  
151002975  
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151002995  
151003005

1S-10-02

### Ceiling and upper walls

17A 17C



COPY

151002025

151002015



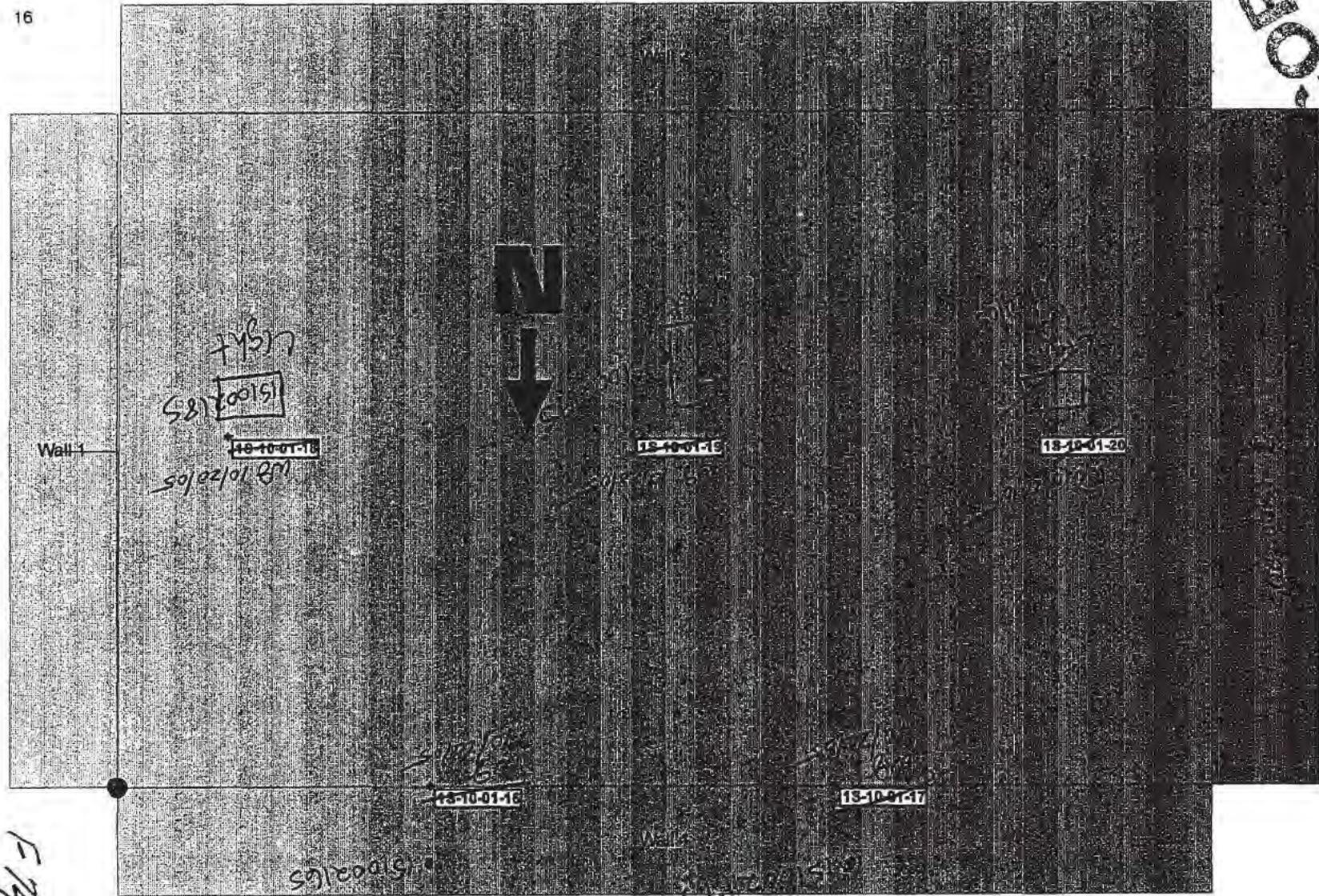
11/8/01 Ed

MT-05-1043

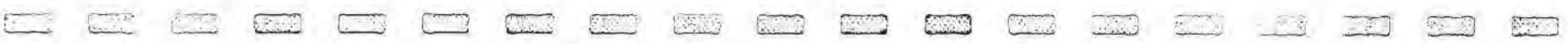
1S-10-02 Ceiling and upper walls

16

COOPY



E 74/133



T-Building Upper Statics Survey 1S10

**COPY**

RSDS# MT-05-1043

RCT:           

RCT:           

Alpha	43-68 BKG:	0	EFF:	0.216 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.17 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S100201S	5895		5896	1	1	10/20/05	7:46	4	120	15
ALPHA	1S100202S	5895		5896	1	2	10/20/05	7:52	5	120	18
ALPHA	1S100203S	5895		5896	1	3	10/20/05	7:57	2	120	7
ALPHA	1S100204S	5895		5896	1	4	10/20/05	8:02	5	120	18
ALPHA	1S100205S	5895		5896	1	5	10/20/05	8:06	1	120	4
ALPHA	1S100206S	5895		5896	1	6	10/20/05	8:11	6	120	22
ALPHA	1S100207S	5895		5896	1	7	10/20/05	8:15	7	120	26
ALPHA	1S100208S	5895		5896	1	8	10/20/05	8:22	6	120	22
ALPHA	1S100209S	5895		5896	1	9	10/20/05	8:29	4	120	15
ALPHA	1S100210S	5895		5896	1	10	10/20/05	8:36	3	120	11
ALPHA	1S100211S	5895		5896	1	11	10/20/05	8:41	6	120	22
ALPHA	1S100212S	5895		5896	1	12	10/20/05	8:46	7	120	26
ALPHA	1S100213S	5895		5896	1	13	10/20/05	9:21	6	120	22
ALPHA	1S100214S	5895		5896	1	14	10/20/05	9:25	5	120	18
ALPHA	1S100215S	5895		5896	1	15	10/20/05	9:30	5	120	18
ALPHA	1S100216S	5895		5896	1	16	10/20/05	9:35	8	120	29
ALPHA	1S100217S	5895		5896	1	17	10/20/05	9:40	4	120	15
ALPHA	1S100218S	5895		5896	1	18	10/20/05	9:47	1	120	4
ALPHA	1S100219S	5895		5896	1	19	10/20/05	9:52	7	120	26
ALPHA	1S100220S	5895		5896	1	20	10/20/05	9:57	5	120	18 ✓
BETA	1S100201S	5895		5896	2	21	10/20/05	7:47	142	60	1326
BETA	1S100202S	5895		5896	2	22	10/20/05	7:53	110	60	1027
BETA	1S100203S	5895		5896	2	23	10/20/05	7:58	101	60	943
BETA	1S100204S	5895		5896	2	24	10/20/05	8:03	90	60	840
BETA	1S100205S	5895		5896	2	25	10/20/05	8:07	126	60	1176
BETA	1S100206S	5895		5896	2	26	10/20/05	8:12	133	60	1242
BETA	1S100207S	5895		5896	2	27	10/20/05	8:16	103	60	962
BETA	1S100208S	5895		5896	2	28	10/20/05	8:23	126	60	1176
BETA	1S100209S	5895		5896	2	29	10/20/05	8:30	114	60	1064
BETA	1S100210S	5895		5896	2	30	10/20/05	8:37	87	60	812
BETA	1S100211S	5895		5896	2	31	10/20/05	8:42	96	60	896
BETA	1S100212S	5895		5896	2	32	10/20/05	8:47	104	60	971
BETA	1S100213S	5895		5896	2	33	10/20/05	9:22	119	60	1111
BETA	1S100214S	5895		5896	2	34	10/20/05	9:26	124	60	1158
BETA	1S100215S	5895		5896	2	35	10/20/05	9:31	113	60	1055
BETA	1S100216S	5895		5896	2	36	10/20/05	9:36	115	60	1074
BETA	1S100217S	5895		5896	2	37	10/20/05	9:41	131	60	1223
BETA	1S100218S	5895		5896	2	38	10/20/05	9:48	87	60	812
BETA	1S100219S	5895		5896	2	39	10/20/05	9:53	91	60	850
BETA	1S100220S	5895		5896	2	40	10/20/05	9:59	112	60	1046 ✓
	<i>N/A</i>										
	<i>N/A</i>										

*F 75/33*

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) <u>T-Bldg Unit 1510</u>	SURVEY NO. <u>MT-05-1060</u>
PURPOSE: <u>T-Bldg Fiddler Survey IN TRENCH IN Unit 1510. Rooms 16A, 16B, 17, 17A, 17C</u>	RWP NO. <u>N/A</u>
	DATE: <u>10-21-05</u>
	TIME: <u>1320</u>

## MAP/DRAWING

ALL FIDLER READINGS BELOW BACKGROUND

 **COPY**

See ATTACHMENTS

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
#E = mrem/hr ( $\beta+\eta+\gamma$ ) extremity on contact

 # = mrem/hr neutron  
 # = air sample number

 # = swipe number  
 #/a or/b = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5895/5896	2/5/06
2360	5874/3966	6/13/06

Completed by: (Signature) <i>Jim Robertson</i>	DATE: <u>10/24/05</u>
Completed by: (Print Name) <u>Tina Robertson</u>	
Counted by: (Signature) <i>See Attachments</i>	RIP # <u>N/A</u> DATE: <u>or N/A</u>
Counted by: (Print Name) <i>Jerry Taylor</i>	
Reviewed/Approved by: (Signature) <i>Jerry Taylor</i>	DATE: <u>10-24-05</u>
Reviewed/Approved by: (Print Name) <u>Jerry Taylor</u>	

F96/133  
*YMC*

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Sample #	Swipes (dpm/100cm <sup>2</sup> )			Comments
	B $\gamma$	Alpha	Tritium	
1	See	Attachments		15100101 T
2				15100102 T
3				15100103 T
4				15100104 T
5				15100105 T
6				15100106 T
7				15100107 T
8	↓	↓	↓	15100108 T
9				
10				
11				
12				
13				
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28				
29				
30				
31				
32				
33				
34				
35				

Removable Contamination				
Sample #	Swipes (dpm/100cm <sup>2</sup> )			Comments
	B $\gamma$	Alpha	Tritium	
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
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67				
68				
69				
70				

COPY A

COMMENTS: see maps for Fiddler Readings and Background in trenches.

- NOTES:
1. See MD-80038 10002 for calculations of WB, extremity and skin dose rates.
  2. To request RO Count Room analysis for B $\gamma$ , 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.

F 711/133

# Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_120  
 Batch Ended: 10/24/05 7:14  
 Cal. Due Date: 11/17/05  
 Serial Number: 26966-3

Batch ID: MT-05-1060 [8] TR 10-24-05 RLH ✓

Detector ID	Sample ID
B1	1
B2	2
B3	3
B4	4
C1	5
C2	6
C3	7
C4	8

Alpha Activity		
DPM	$\sigma$	flags
0.00	1.90	
0.00	1.85	
0.00	2.18	
0.00	1.96	
0.00	2.06	
0.00	1.93	
0.00	2.10	
0.00	1.95	

Beta Activity		
DPM	$\sigma$	flags
0.54	1.69	
0.00	1.14	
0.00	1.34	
0.00	1.21	
0.26	1.74	
1.59	1.95	
2.70	2.43	
0.00	1.12	

TR

TR

COPY

Page 1 of 1 10/24/05 TR

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RLH

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MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_2\20051024\_0838.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1060.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_2.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time

A

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MT-05-1060

404

R6W

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/24/05	8:39:09 AM	-1		10.00	8	7	11	5	617.75	0	22.3	B	2
10/24/05	8:49:57 AM	0		2.00	544	511	0	0	585.83	1019	6.1		2
10/24/05	8:52:39 AM	1		2.00	2	3	1	0	629.20	4	199.2		2
10/24/05	8:55:20 AM	2		2.00	0	0	0	0	606.65	0	0.0		2
10/24/05	8:58:01 AM	3		2.00	2	2	0	0	608.72	5	199.5		2
10/24/05	9:00:42 AM	4		2.00	2	3	0	0	599.79	4	241.6		2
10/24/05	9:03:24 AM	5		2.00	3	3	0	0	598.11	5	178.9		2
10/24/05	9:06:05 AM	6		2.00	0	0	0	8	592.36	0	0.0		2
10/24/05	9:08:46 AM	7		2.00	0	0	0	0	560.90	0	0.0		2
10/24/05	9:11:28 AM	8		2.00	0	0	0	0	538.97	0	0.0		2

TR

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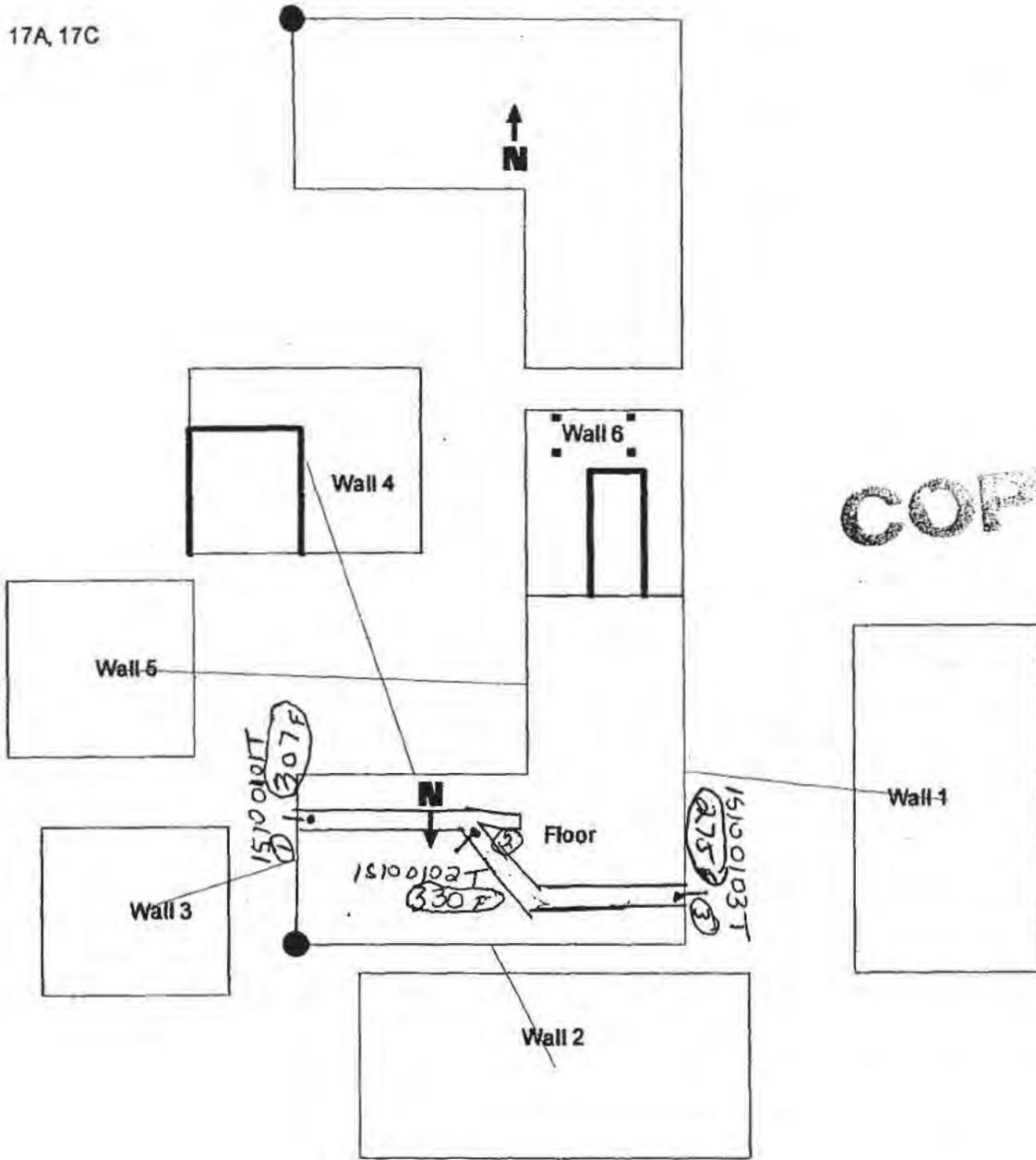
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1S-10 ~~100% scan of floor and walls up to 2 meters~~ TR 10/24/05  
 Class 1 ~~25% scan of walls above 2 meters~~ TR 10/25/05  
 Fiddler Survey IN Floor Trench.

17A, 17C

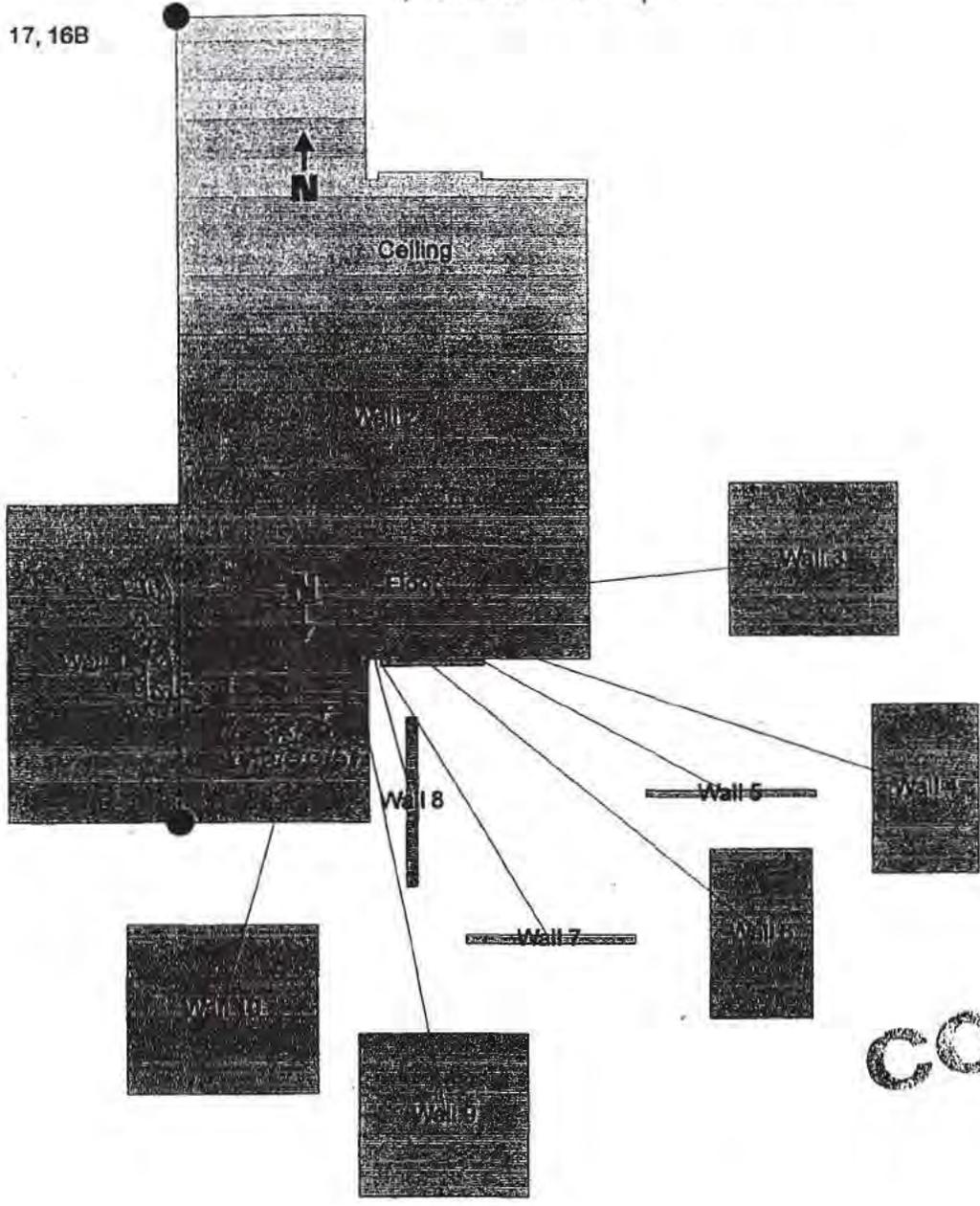


BACKGROUND of Fiddler was 387.cpm ✓  
 15100101T 307 cpm ✓  
 15100102T 330 cpm ✓  
 15100103T 275 cpm ✓

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1S-10 100% scan of floor and walls up to 2 meters TR 10/24/03  
Class 1 25% scan of walls above 2 meters TR 10/24/05  
Fiddler Survey IN TRENCH

17, 16B



Background of Fiddler was 409.6 cpm ✓  
 1S100104T 295 cpm. ✓  
 1S100105T 365 cpm. ✓

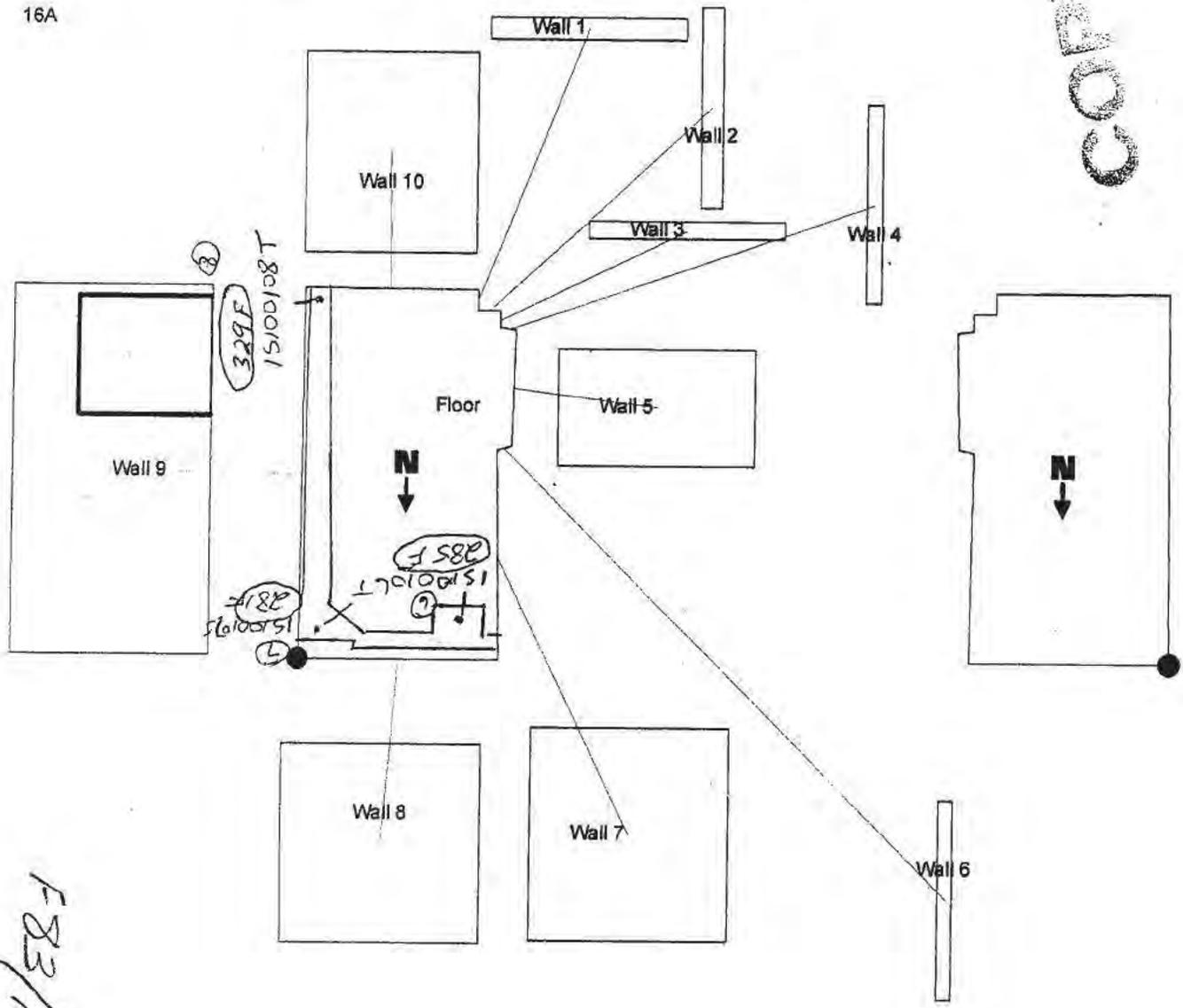
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8049

1S-10  
Class 1

Fiddler Survey IN TRENCH  
100% scan of floor and walls up to 2 meters  
25% scan of walls above 2 meters 10/24/05 TR

16A



MT-05-1060

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Background of Fiddler was 406 cpm ✓  
 15100106T 285 cpm. ✓  
 15100107T 281 cpm. ✓  
 15100108T 329 cpm ✓

# T-Bldg Fiddler directs in Trenches in Unit 1S10, Rooms 16A,16B,17,17A,17C

RSDS# MT-05-1060

RCT:           

RCT: N/A

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
Alpha	43-68 BKG:	0	EFF:	0.2166	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.17	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
ALPHA	1S100101T	5895		5896	1	1	10/21/05	10:25	4	120	15
ALPHA	1S100102T	5895		5896	1	2	10/21/05	10:29	11	120	40
ALPHA	1S100103T	5895		5896	1	3	10/21/05	10:33	7	120	26
ALPHA	1S100104T	5895		5896	1	4	10/21/05	10:40	6	120	22
ALPHA	1S100105T	5895		5896	1	5	10/21/05	12:19	8	120	29
ALPHA	1S100106T	5895		5896	1	6	10/21/05	12:50	7	120	26
ALPHA	1S100107T	5895		5896	1	7	10/21/05	12:54	2	120	7
ALPHA	1S100108T	5895		5896	1	8	10/21/05	12:58	9	120	33 ✓
BETA	1S100101T	5895		5896	2	9	10/21/05	10:26	97	60	906
BETA	1S100102T	5895		5896	2	10	10/21/05	10:30	103	60	962
BETA	1S100103T	5895		5896	2	11	10/21/05	10:34	88	60	822
BETA	1S100104T	5895		5896	2	12	10/21/05	10:41	99	60	924
BETA	1S100105T	5895		5896	2	13	10/21/05	12:20	133	60	1242
BETA	1S100106T	5895		5896	2	14	10/21/05	12:51	115	60	1074
BETA	1S100107T	5895		5896	2	15	10/21/05	12:55	124	60	1158
BETA	1S100108T	5895		5896	2	16	10/21/05	12:59	137	60	1279 ✓

N A

COPY

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) <b>T BLDG Rm 16</b>	SURVEY NO. <b>MT-05-1061</b>
PURPOSE: <b>Fiddler AND 2350 IN TRENCHES AND Hole Rm 16</b> <b>1510</b>	RWP NO. <b>N/A</b>
	DATE: <b>10/24/05</b>
	TIME: <b>0850</b>

## MAP/DRAWING

**COPY**

Fiddler 5 minute BKG 1634 cpm <sup>AMC 11-1-05</sup> GROSS COUNTS  
Converted

to Fiddler BKG 326.8 cpm  
~~334.8 cpm~~ <sup>AMC 11-1-05</sup>

Trenches and Hole scanned 100% with fiddler  
<sup>WY</sup> ~~Hole~~ Sump was scanned 100% for alpha/Beta  
with 2350

See attached map

LEGEND: # = mrem/hr ( $\gamma$ ) whole body       $\Delta$  = mrem/hr neutron      # = swipe number  
# E = mrem/hr ( $\beta + \gamma$ ) extremity on contact      # = air sample number      #/a or /b = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2360	5874/3966	6/13/06
2350	5855/5921	6/9/06
<hr/>		
<hr/>		

Completed by: (Signature) <i>Wayne Jones</i>	Date: <b>10/24/05</b>
Completed by: (Print Name) <b>Wayne Jones</b>	
Counted by: (Signature) <i>See attached</i>	HPs: <b>N/A</b> Date: <b>N/A</b>
Counted by: (Print Name)	
Reviewed/Approved by: (Signature) <i>Jerry Taylor</i>	Date: <b>10-27-05</b>
Reviewed/Approved by: (Print Name) <b>Jerry Taylor</b>	

**RADIOLOGICAL SURVEY DATA SHEET (cont.)**

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	Beta	Alpha	Tritium	Comments
1	see attached			15100109T
2				15100110T
3				15100111T
4				15100112T
5				15100113T
6				15100114T
7				15100115T
8	✓	✓	✓	15100116T
A N				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	Beta	Alpha	Tritium	Comments
A N				
COPY				

COMMENTS: A N

- NOTES:**
- See MD-80038 10002 for calculations of WB, extremity and skin dose rates.
  - To request RO Count Room analysis for beta, 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.
  - Indicate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

MT-05-1061  
Pg 3 of 7

### Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_128  
Batch Ended: 10/24/05 9:53  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

COPY

Batch ID: MT-05-1061 [8] TR 10-24-05 RLH

Detector ID	Sample ID
B1	1
B2	2
B3	3
B4	4
C1	5
C2	6
C3	7
C4	8

Alpha Activity		
DPM	$\sigma$	flags
0.00	1.90	
0.00	1.89	
0.00	2.24	
0.00	1.97	
0.00	2.05	
0.00	1.91	
0.00	2.06	
0.00	1.96	

wg

Beta Activity		
DPM	$\sigma$	flags
0.54	1.69	
1.02	1.94	
2.95	2.66	
0.00	1.21	
0.00	1.23	
0.00	1.12	
0.00	1.22	
0.62	1.59	

wg

F87/33

Page 4 of 4 wg  
10/25/05

RLH

Protocol# 1 - MARSSIM\_Smear\_1.lsa

MARSSIM Smear Data

COPY

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)

Report Name: Report1

Output Data Path: D:\MARSSIM LSC

Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM Smear 1\20051024\_1316.results

Comma-Delimited File Name: D:\MARSSIM LSC\MT-05-1059.002\_1061\_RLH 10-24-05

Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

Count Conditions-

Nuclide: H-3 Mound

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s\*

Pre-Count Delay (min): 0.00

Quench Set:

Low Energy: H-3 Smear

Count Time (min): 2.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

#Vials/Sample: 1

Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On

Luminescence Correction: Off

Colored Samples: Off

Heterogeneity Monitor: Off

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				

F 304 Ed

F 88/133

RLH

MARSSIM Smear Data

*78504*

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

**COPI**

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/24/05	1:17:14 PM	-1		10.00	8	7	13	3	621.58	0	22.4	B	1
10/24/05	1:27:58 PM	0		2.00	520	483	2	0	551.92	1001	6.3		1
10/24/05	1:30:39 PM	1		2.00	0	0	0	13	584.32	0	0.0		1
10/24/05	1:33:22 PM	2		2.00	2	3	0	10	459.44	5	198.5		1
10/24/05	1:36:04 PM	3		2.00	3	2	0	10	532.87	5	196.8		1
10/24/05	1:38:45 PM	4		2.00	8	7	0	3	541.01	15	75.2		1
10/24/05	1:41:28 PM	5		2.00	2	2	0	10	540.93	4	240.8		1
10/24/05	1:44:08 PM	6		2.00	2	2	0	0	568.80	4	240.8		1
10/24/05	1:46:51 PM	7		2.00	3	3	0	5	569.35	6	167.3		1
10/24/05	1:49:32 PM	✓8		2.00	0	0	0	8	541.01	0	0.0		1

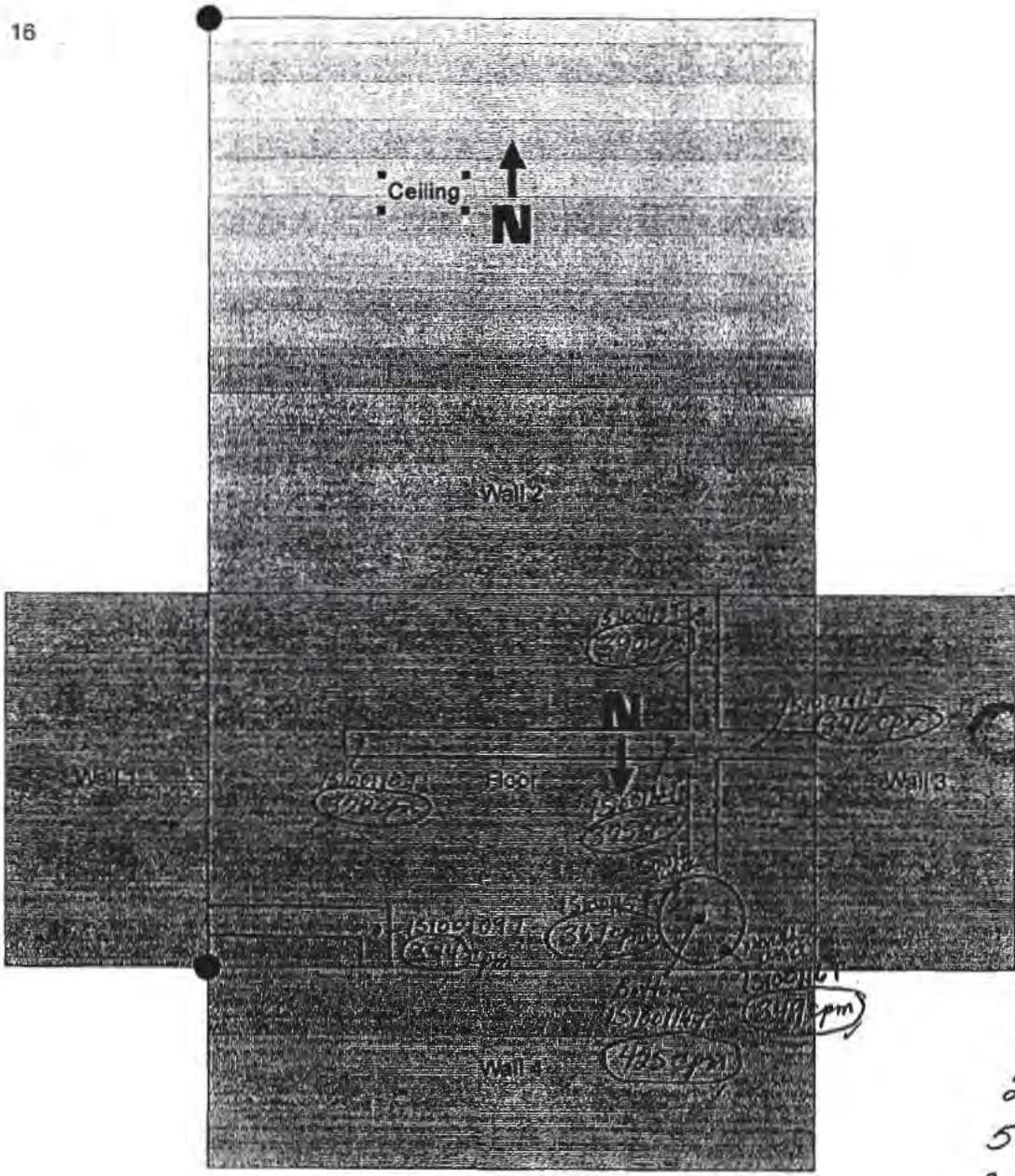
*WJ*

*F89/33*

# Fiddler AND 2350 DIRECT READINGS on TRENCHES AND HOLE

1S-10 100% scan of floor and walls up to 2 meters.  
Class 1 25% scan of walls above 2 meters-

16



COPY

Fiddler Readings  
IN CIRCLES

2350  
5855/5921  
Cal due 6/9/06  
WS [redacted]  
TR [redacted]

Fiddler 2360  
'5874/3966  
Cal due 6/13/06  
WS [redacted]  
TR [redacted]

F90/133

# T-Building Trench and Hole Survey Rm 16 1S10

RSDS# MT-05-1061

RCT:           

RCT:           

Alpha	43-68 BKG:	0	EFF:	0.211	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.1657	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm <sup>2</sup>
ALPHA	1S100109T	5855		5921	1	1	10/24/05	7:50	7	120	26
ALPHA	1S100110T	5855		5921	1	2	10/24/05	7:54	12	120	45
ALPHA	1S100111T	5855		5921	1	3	10/24/05	7:59	5	120	19
ALPHA	1S100112T	5855		5921	1	4	10/24/05	8:04	8	120	30
ALPHA	1S100113T	5855		5921	1	5	10/24/05	8:07	8	120	30
ALPHA	1S100114T	5855		5921	1	6	10/24/05	8:10	12	120	45
ALPHA	1S100115T	5855		5921	1	7	10/24/05	8:14	4	120	15
ALPHA	1S100116T	5855		5921	1	8	10/24/05	8:17	4	120	15 ✓
BETA	1S100109T	5855		5921	2	9	10/24/05	7:51	157	60	1504
BETA	1S100110T	5855		5921	2	10	10/24/05	7:55	210	60	2012
BETA	1S100111T	5855		5921	2	11	10/24/05	8:00	185	60	1772
BETA	1S100112T	5855		5921	2	12	10/24/05	8:05	168	60	1609
BETA	1S100113T	5855		5921	2	13	10/24/05	8:08	170	60	1635
BETA	1S100114T	5855		5921	2	14	10/24/05	8:11	300	60	2874
BETA	1S100115T	5855		5921	2	15	10/24/05	8:15	185	60	1772
BETA	1S100116T	5855		5921	2	16	10/24/05	8:18	166	60	1590 ✓
<div style="text-align: right; margin-right: 20%;">COPY</div> <div style="text-align: center; font-size: 2em; margin-top: 20px;">N A</div>											

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) <u>T-#E 16</u> <u>1510</u>	SURVEY NO. <u>MT-05-1071</u>
PURPOSE: <u>POST ACID ETCH SURVEY</u>	RWP NO. <u>N/A</u>
<u>REFERENCE ORIGINAL RSDS MT-05-0944</u>	DATE: <u>10-24-05</u>
	TIME: <u>15:00</u>

## MAP / DRAWING

For STATIC COUNT RESULTS SEE ATTACHED.

Prior To ACID ETCH LOCATION 15100108X <sup>FIXED</sup>  
 HAD 1473 DPM/100 cm<sup>2</sup> <sup>FIXED</sup> AND 74,865 DPM/100 cm<sup>2</sup> <sup>β-</sup>  
 PER SHAWKA

DIRECT READING AFTER ACID ETCH FOR 15100108X  
 IS 249 DPM/100 cm<sup>2</sup> AND 21,224 DPM/100 cm<sup>2</sup> <sup>β-</sup>  
<sup>FIXED</sup>

# COPY

**LEGEND:**

- # = mrem/hr (γ) whole body
- #E = mrem/hr (β+γ+γ) extremity on contact
- K = factor of 1000
- = radiological boundary
- △ = mrem/hr neutron
- ⊙ = swipe number
- ⊙# = air sample number
- ⊙#/α or β = direct contamination measurement in dpm/100 cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5923/5925	5-17-06
<u>N/A</u>		

Completed by: (Signature) <u>[Signature]</u>	Date: <u>10-25-05</u>
Completed by: (Print Name) <u>NEAL REYNOLDS</u>	
Counted by: (Signature) <u>SEE</u>	HP# <u>N/A</u> Date: <u>N/A</u>
Counted by: (Print Name) <u>ATTACHED</u>	
Reviewed/Approved by: (Signature) <u>[Signature]</u>	Date: <u>11-4-05</u>
Reviewed/Approved by: (Print Name) <u>Jerry Taylor</u>	

F92/133  
 [Signature]

Survey No.  
MT-05-1071

# RADIOLOGICAL SURVEY DATA SHEET ( cont. )

Removable Contamination				
Swipes ( dpm/100cm <sup>2</sup> )				
Sample #	DO	Alpha	Tritium	Comments
1	SEE	ATTACHED	1510	0108X
N/A				

Removable Contamination				
Swipes ( dpm/100cm <sup>2</sup> )				
Sample #	DO	Alpha	Tritium	Comments
N/A				

COPY 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 DO, alpha, or tritium, leave column blank. Mark column N/A if not needed. If count room results are attached, write " see attached " in column.
3. Annotate special sample type ( e.g., soil, water), special indentifiers or otherwise in Comments. If not needed, mark N/A.

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NR 10-25-05

10/25/05 12:16:07 PM

QuantaSmart (TM) - 1.31 - Serial# 423022

Page # 1

User: 5801

Protocol# 1 - MARSSIM\_Smear\_1.lsa

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_1\20051025\_1159.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1071.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Regions	Half Life	Units	Reference Date	Reference Time
A				

COPY

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MT-05-1071  
Ret

F94/133

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/25/05	12:00:08 PM	-1		10.00	9	8	10	3	619.35	0	21.7	B	1
10/25/05	12:10:55 PM	0		2.00	526	498	2	0	551.73	1014	6.2		1
10/25/05	12:13:37 PM	✓1		2.00	2	2	0	5	577.78	4	253.2		1

*✓*

COPY

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MT-05-1071

# Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_139  
Batch Ended: 10/25/05 10:32  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

Batch ID: MT-05-1071 [1] REYNOLDS 10-25-05 RLH ✓

Detector ID	Sample ID
A1	1

Alpha Activity		
DPM	$\sigma$	flags
0.00	2.23	

✓  
n/c

Beta Activity		
DPM	$\sigma$	flags
2.30	2.62	

✓  
n/c

COPY

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MT-05-1071

RLH

← Page 1 of 1  
n/c 10-25-05

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## T-Bldg. Rm.16 post acid etch survey

RSDS# MT-05-1071

RCT: ████████

RCT: N/A

Alpha	43-68 BKG:	0	EFF:	0.2073 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.1578 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	Item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S100108X1E	5923	████████	5925	1	1	10/24/05	15:39	65	120	249
BETA	1S100108X1E	5923	████████	5925	2	2	10/24/05	15:40	2110	60	21224

COPY

1S-10 Class 1 Survey Unit

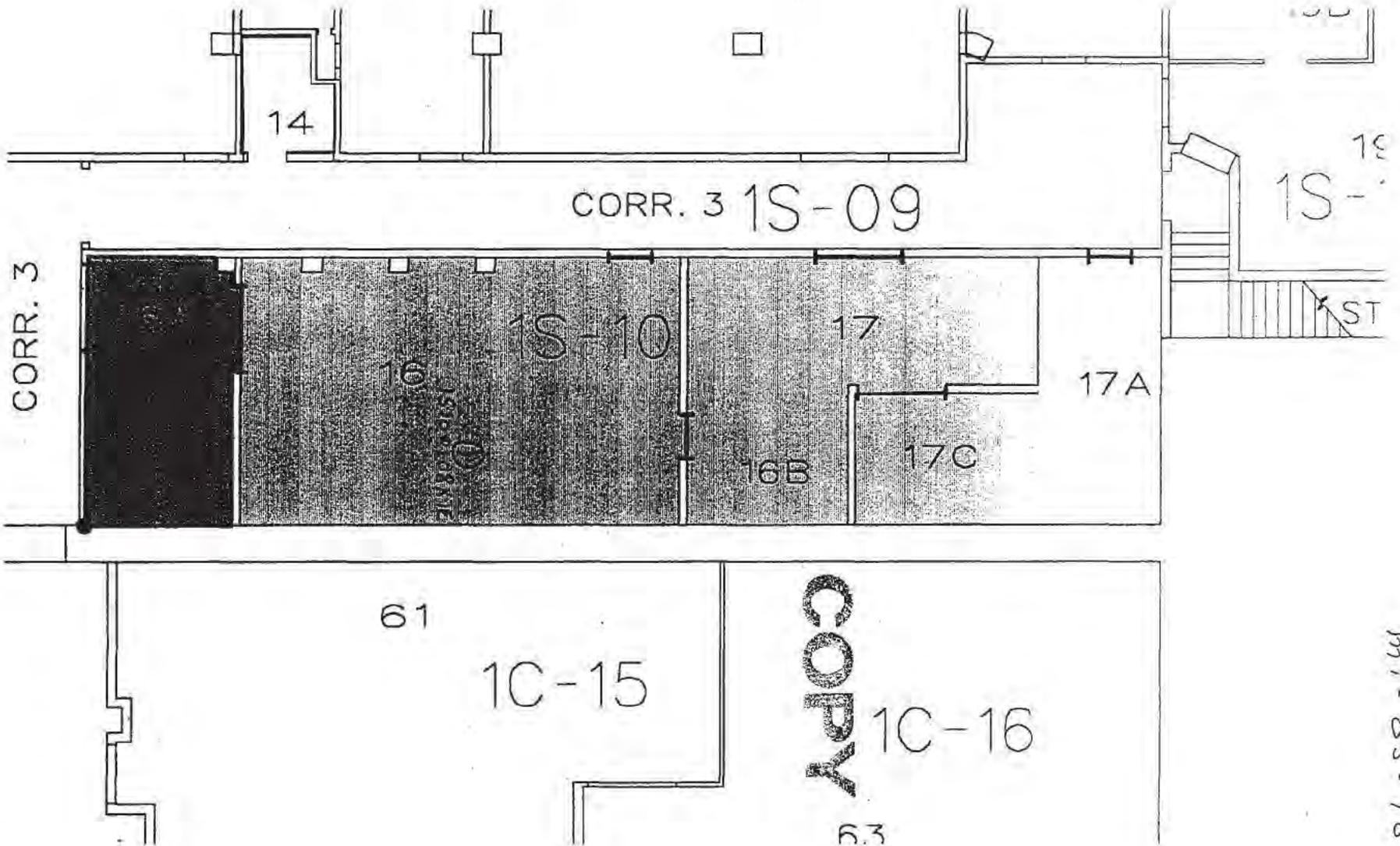


Fig 1/33

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MT-05-1071

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) <u>T-16</u> <u>1510</u>	SURVEY NO. <u>MT-05-1103</u>
PURPOSE: <u>SECOND POST ACID ETCH SURVEY</u> <u>REF. ORIGINAL RSDS MT-05-0944</u>	RWP NO. <u>N/A</u>
	DATE: <u>10-28-05</u>
	TIME: <u>1000</u>

~~Follow-up RSDS to 11/3/05~~ MAP / DRAWING

PRIOR TO SECOND ACID ETCH, LOCATION 15100108X HAD 249 DPM/100 cm<sup>2</sup> α, AND 21,224 DPM/100 cm<sup>2</sup> β- REFERENCE MT-05-1071

FOR SMEAR AND DIRECT COUNT RESULTS SEE ATTACHED

DIRECT READING AFTER ACID ETCH FOR 15100108XAEX2 IS 66 DPM/100 cm<sup>2</sup> α AND 4528 DPM/100 cm<sup>2</sup> β-

**COPY**

LEGEND: # = mrem/hr (γ) whole body

#E = mrem/hr (β+γ) extremity on contact

K = factor of 1000

----- = radiological boundary



= mrem/hr neutron



= swipe number



= air sample number



or β = direct contamination measurement in dpm/100 cm<sup>2</sup>

**INSTRUMENTS USED**

Instrument	Serial Number	Cal. Due Date
2350-1	5924/5929	5-7-06

Completed by: (Signature) <u>[Signature]</u>	Date: <u>10-31-05</u>
Completed by: (Print Name) <u>DEAN REYNOLDS</u>	
Counted by: (Signature) <u>SEE</u>	HP# <u>N/A</u> Date: <u>N/A</u>
Counted by: (Print Name) <u>ATTACHED</u>	
Reviewed/Approved by: (Signature) <u>[Signature]</u>	Date: <u>11/1/05</u>
Reviewed/Approved by: (Print Name) <u>Jenny Taylor</u>	



MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)

Report Name: Report1

Output Data Path: D:\MARSSIM\_LSC

Raw Results Path: C:\Packard\TriCarb\Results\5801\MARSSIM\_Smear\_4\20051031\_0903.results

Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1103.001

Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_4.lsa

Count Conditions-

Nuclide: H-3 Mound

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s

Pre-Count Delay (min): 0.00

Quench Set:

Low Energy: H-3 Smear

Count Time (min): 2.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1

#Vials/Sample: 1

Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off

2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On

Luminescence Correction: Off

Colored Samples: Off

Heterogeneity Monitor: Off

Coincidence Time (nsec): 18

Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				

COPY

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MT-05-1103

RH

F-101/133

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
10/31/05	9:03:52 AM	-1		10.00	8	8	12	7	617.74	0	21.7	B	4
10/31/05	9:14:41 AM	0		2.00	346	330	2	0	546.45	669	7.7		4
10/31/05	9:17:22 AM	1		2.00	0	1	0	6	605.73	0	*****		4

✓  
mc

COPY

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MT-05-1103

# Smear Analysis

Unit Type: LB4100/W  
Counting Unit ID: Green  
Data file name: Mar\_165  
Batch Ended: 10/31/05 8:56  
Cal. Due Date: 11/17/05  
Serial Number: 26966-3

Batch ID: MT-05-1103 [1] REYNOLDS 10-31-05 RLH ✓

Detector ID	Sample ID
B3	1

Alpha Activity		
DFM	$\sigma$	flags
0.00	2.18	

✓na

Beta Activity		
DFM	$\sigma$	flags
0.00	1.34	

✓na

COPY

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na 10-31-05

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MT-05-1103

RLH

# T-Bldg. Rm.16 Second Post acid etch survey

RSDS# MT-05-1103

RCT: ████

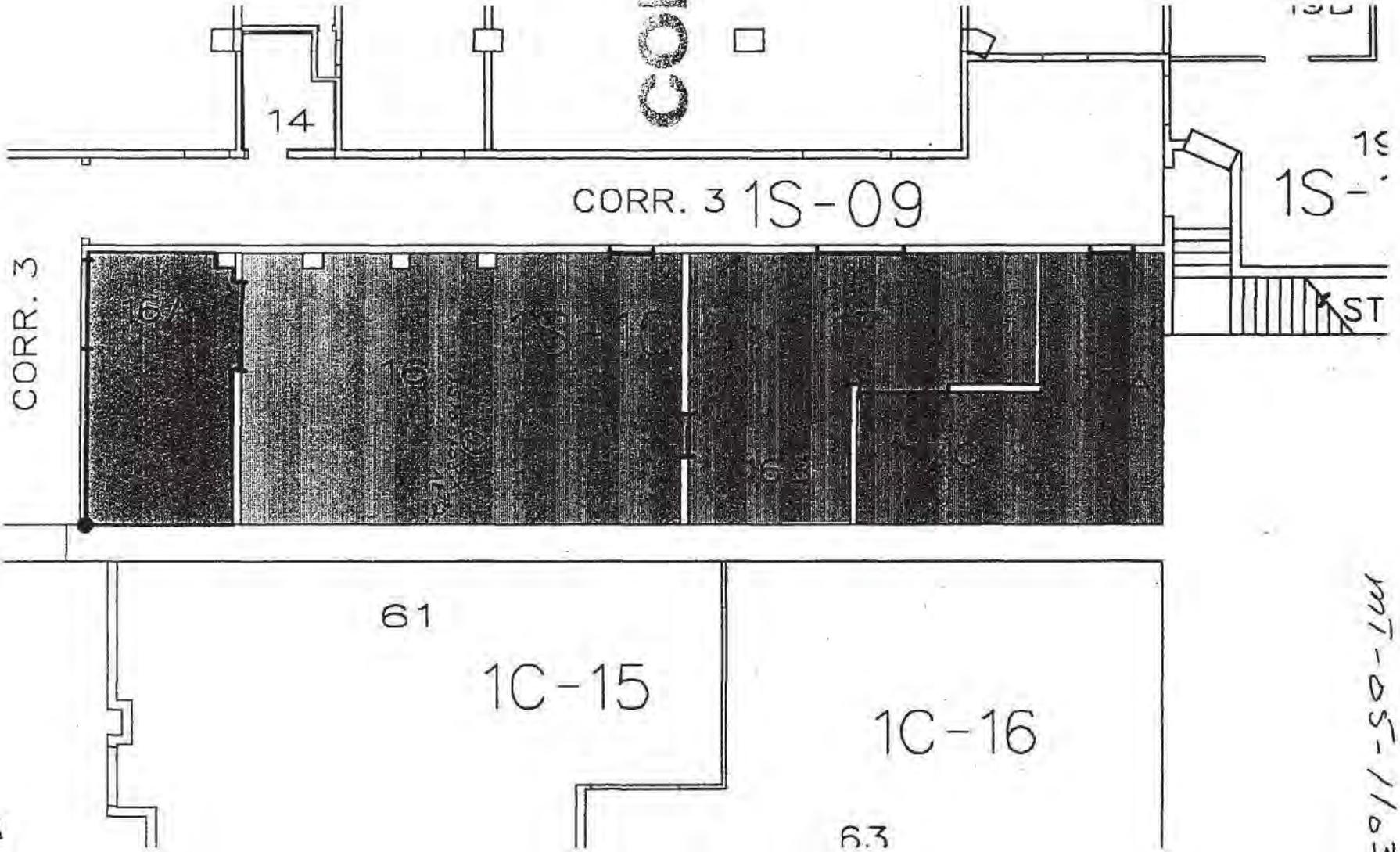
RCT: N/A

Alpha	43-68 BKG:	0	EFF:	0.3 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.21 ✓	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm <sup>2</sup>
ALPHA	1S100108XAE#2	5924	<span style="background-color: gray; color: gray;">████</span>	5929	1	1	10/28/05	10:27	25	120	66 ✓
BETA	1S100108XAE#2	5924	<span style="background-color: gray; color: gray;">████</span>	5929	2	1	10/28/05	10:29	599	60	4528 ✓
	AE=Acid Etch										

COPY

1S-10 Class 1 Survey Unit

COPY



F 105/133

PAGE 7 of 7  
MT-05-1103

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) <i>7-16</i>	<i>1510</i>	SURVEY NO. <i>MT-05-1145</i>
PURPOSE: <i>SURVEY FOR RESRAD SAMPLING LOCATIONS</i>	RWP NO. <i>N/A</i>	DATE: <i>11-4-05</i>
	TIME: <i>0800</i>	

## MAP/DRAWING

*NO REMOVABLE CONTAMINATION FOUND AT SAMPLE LOCATIONS. FOR RESULTS REFERENCE MT-05-1156*

*STATIC COUNTS AT POINT LOCATIONS WERE PERFORMED IN MT-05-1033, SEE PAGE 3 & 4.*

*REMAINING SAMPLE LOCATIONS WERE TAKEN AT ELEVATED AREAS FOUND BY SHANKA.*

*SEE PAGE <sup>12-31-05</sup> 5 & 6, <sub>OR 12-12-05</sub>*

# COPY

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
#E = mrem/hr ( $\beta + \gamma$ ) extremity on contact

= mrem/hr neutron  
 = air sample number

= swipe number  
 or  $\beta$  = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
<i>2350</i>	<i>5673/5862</i>	<i>8-4-06</i>
<i>2350</i>	<i>5895/5896</i>	<i>2-5-06</i>
<i>N/A</i>		

Completed by: (Signature) <i>[Signature]</i>	HP #	DATE: <i>11-4-05</i>
Completed by: (Print Name) <i>NEAL REYNOLDS</i>		
Counted by: (Signature) <i>N/A</i>	HP #	DATE: <i>N/A</i>
Counted by: (Print Name) <i>N/A</i>		
Reviewed/Approved by: (Signature) <i>[Signature]</i>	HP #	DATE: <i>12/5/05</i>
Reviewed/Approved by: (Print Name) <i>JESS GIBSON</i>		

Survey No. MT-05-1145

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

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

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				
Sample #	βγ	Alpha	Tritium	Comments
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55		N/A		
56				
57				
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70				

**COPY**

COMMENTS: For SMEAR RESULTS  
SEE MT-05-1156

**NOTES:**

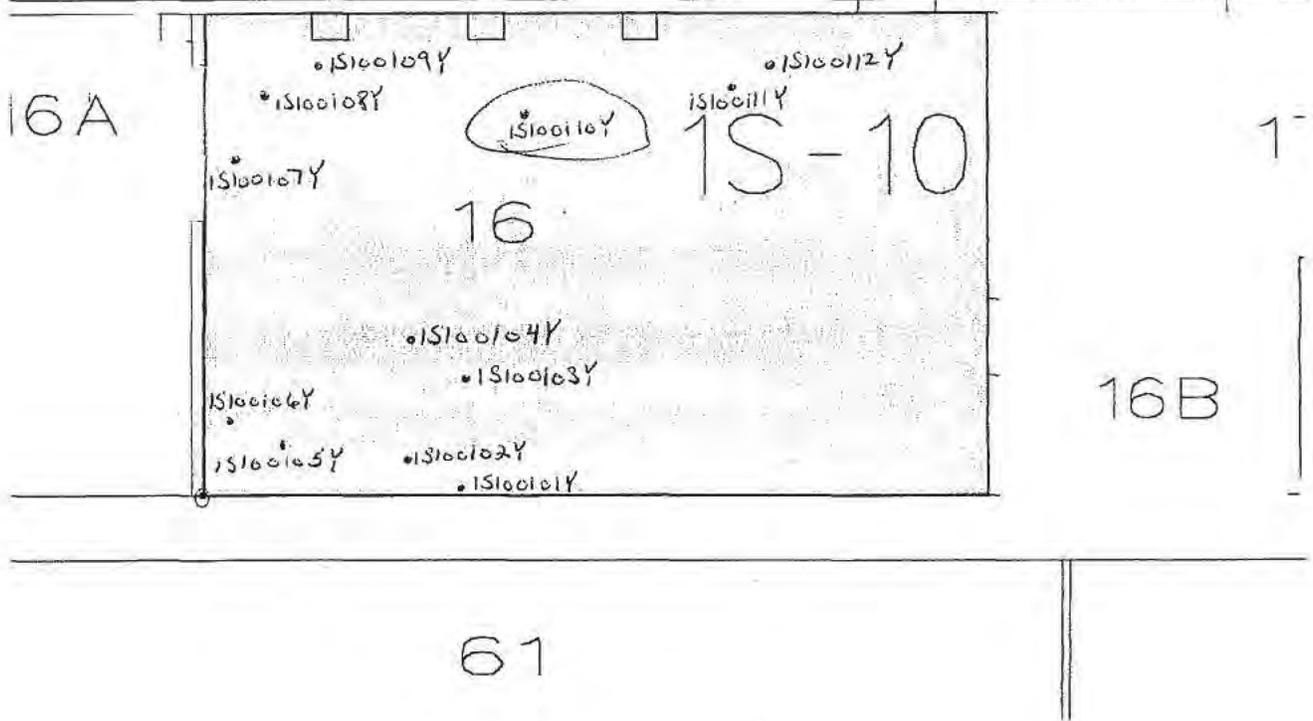
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for βγ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type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

F107/133

**1S-10 Biased core samples**

After a direct alpha and beta measurement are taken and the smear is taken, then collect a bulk sample at the highest 20% (maximum 10) elevated activity areas identified on the floor. Composite bulk sample with bulk samples taken at static locations on the floor.

CORR. 3 1S-(



Label	Room	Surface	RSDS#	
1S1001Y	16	floor	MT-05-1033	(1S100115 S)
1S1002Y	16	floor	MT-05-1145	
1S1003Y	16	floor	MT-05-1145	
1S1004Y	16	floor	MT-05-1145	
1S1005Y	16	floor	MT-05-1145	
1S1006Y	16	floor	MT-05-1145	
1S1007Y	16	floor	MT-05-1145	
1S1008Y	16	floor	MT-05-1145	
1S1009Y	16	floor	MT-05-1033	(1S100116 S)
1S1010Y	16	floor	MT-05-1145	
1S1011Y	16	floor	MT-05-1145	
1S1012Y	16	floor	MT-05-1033	(1S100117 S)

**COPY**

F108/133



# SOIL ANALYSIS REPORT

Field Sample ID:  
 Lab Sample ID: GL08687  
 File ID: 25000092.s0  
 Priority: Yes

**Description\Location**

T-16 Concrete Drill Sample  
 Long Count

Collector:             
 Date Received: 11/14/05  
 Date Collected: 11/10/05

<u>Radionuclide</u>	<u>Activity (pCi/g)</u>	<u>MDA</u>
Co-60	1.47	0.21
Cs-137	1.09	0.11
Pb-210 *	0.34	0.6
Ra-226 *	0.72	0.81
Ac-227 (D) *	0	0.32
Th-230 *	0	6.32
Th-232 (D)	0.64	0.64
Pu-238 *	0	4.76
Am-241 *	0.01	0.06

COPY

**Other Nuclides**

<u>Radionuclide</u>	<u>Activity (pCi/g)</u>	<u>MDA</u>
Ag-108m	0.01	0.05
Bi-207	0.04	0.04
Bi-210m	0.02	0.05

$\sum$  DOT 0.02 nCi/g

Instrument type: High Purity Germanium

$\sum$  DOT 2nCi/g limit, total activity.  
 (D) Denotes identification by daughter emissions.  
 Sample is Assumed to be in secular equilibrium.  
 \* Indicates activity < MDA. MDA used in limits calculation

COPY

**Comments:** Reissued to add isotopes per M.Sizemore's request.

Date: 11/15/05    Counted By:               Analyzed By:               Initials GS

Pg 6 of 8  
12-12-05

MT-05-1145

Laboratory ID#: 0506255 & 0506256  
Project/function: T Bldg.  
Submitted: Nov. 16, 2005  
Submitted by: Neal Reynolds  
Point of Contact: R. Coblenz 608-8206  
RSDS#: Concrete Dust for RESRAD  
Date: Nov. 28, 2005

Lab ID 0506255  
Sample Location T-88

Isotope	pCi/g	Uncertainty +/-	LDL
Th-227	0.16	0.05	0.07
Th-228	0.25	0.07	0.07
Th-230	0.68	0.13	0.08
Th-232	0.23	0.07	0.09

Lab ID 0506256  
Sample Location T-16

Isotope	pCi/g	Uncertainty +/-	LDL
Th-227	0.09	0.03	0.05
Th-228	0.21	0.05	0.03
Th-230	0.41	0.08	0.06
Th-232	0.18	0.05	0.04

**COPY**

Charles A. Chelley HP# [redacted] Date 12/13/05  
Analyst

Lori Marione Nass HP# [redacted] Date 12/13/05  
Data Verification

F111/133

MT-06-1145

7 of 8 dw  
3-29-05

From  
2nd RESRAD  
Sampling  
3-18-06

# SOIL ANALYSIS REPORT

Field Sample ID:  
Lab Sample ID: GL10930  
File ID: 25000125.s0  
Priority: Yes

### Description\Location

0601106 T-16 Top  
Long Count

### Collector:

Date Received: 03/22/06  
Date Collected: 03/17/06

<u>Radionuclide</u>		<u>Activity (pCi/g)</u>	<u>MDA</u>
Co-60	*	0	0.09
Cs-137		0.45	0.08
Pb-210	*	0.29	0.45
Ra-226		0.98	0.71
Ac-227 (D)	*	0.05	0.2
Th-230	*	1.27	5.34
Th-232 (D)	*	0.22	0.26
Pu-238	*	0.28	4.34
Am-241	*	0	0.06

### Other Nuclides

<u>Radionuclide</u>	<u>Activity (pCi/g)</u>	<u>MDA</u>
Ag-108m	0	0.06
Bi-207	0.02	0.03
Bi-210m	0	0.05

$\Sigma$   
DOT 0.01 nCi/g

Instrument type: High Purity Germanium

$\Sigma$  DOT 2nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.  
Sample is Assumed to be in secular equilibrium.

\* Indicates activity < MDA. MDA used in limits calculation

# COPY

Comments: U-238d 0 pCi/g 14.94 pCi/g MDA

Date: 03/24/06 Counted By:  Analyzed By:  Initials WB

FILE 1133

8048 DJ  
3-29-05  
MT-06-1145

From  
2nd RESRAD  
SAMPLE  
3-18-04

# SOIL ANALYSIS REPORT

Field Sample ID:  
Lab Sample ID: GL10931  
File ID: 25000126.s0  
Priority: Yes

### Description\Location

0601107 T-16 Bottom  
Long Count

### Collector:

Date Received: 03/22/06  
Date Collected: 03/17/06

Radionuclide		Activity (pCi/g)	MDA
Co-60	*	0	0.23
Cs-137	*	0	0.08
Pb-210		0.54	0.46
Ra-226		0.78	0.64
Ac-227 (D)	*	0.06	0.26
Th-230	*	2.35	5.2
Th-232 (D)		0.98	0.41
Pu-238	*	0	4.49
Am-241	*	0.01	0.06

### Other Nuclides

Radionuclide	Activity (pCi/g)	MDA
Ag-108m	0	0.05
Bi-207	0	0.05
Bi-210m	0	0.05

$\Sigma$   
DOT 0.01 nCi/g

Instrument type: High Purity Germanium

- $\Sigma$  DOT 2nCi/g limit, total activity.
- (D) Denotes identification by daughter emissions. Sample is Assumed to be in secular equilibrium.
- \* Indicates activity < MDA. MDA used in limits calculation

# COPY

Comments: U-238d 0 pCi/g 15.28 pCi/g MDA

Date: 03/24/06 Counted By:  Analyzed By:  Initials GD

F111B/133

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM)	T-16	1516	SURVEY NO.	MT-05-124P
PURPOSE:	STATIC READINGS FOR RESRAD		RWP NO.	N/A
			DATE:	12-1-05
			TIME:	0800

## MAP/DRAWING

FOR STATIC COUNT RESULTS SEE  
ATTACHED

**COPY**

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
#E = mrem/hr ( $\beta+\gamma$ ) extremity on contact

# = mrem/hr/neutron  
 # = air sample number

# = swipe number  
 #/alpha = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350	5923/5925	5-17-06
	N	
	A	

Completed by: (Signature)	<i>[Signature]</i>	DATE:	12-1-05
Completed by: (Print Name)	ONEAL REYNOLDS		
Counted by: (Signature)	N/A	HI #	N/A
Counted by: (Print Name)	N/A	DATE:	N/A
Reviewed/Approved by: (Signature)	<i>[Signature]</i>	HI #	N/A
Reviewed/Approved by: (Print Name)	Jerry Taylor	DATE:	12-5-05

Survey No. 177-05-1248

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	β/γ	Alpha	Tritium	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18		N		
19			A	
20				
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22				
23				
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30				
31				
32				
33				
34				
35				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	β/γ	Alpha	Tritium	
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				
52				
53				
54				
55		N		
56			A	
57				
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68				
69				
70				

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.

K 115/133

T-Bldg. Rm. 16, static counts for RESRAD

**COPY**

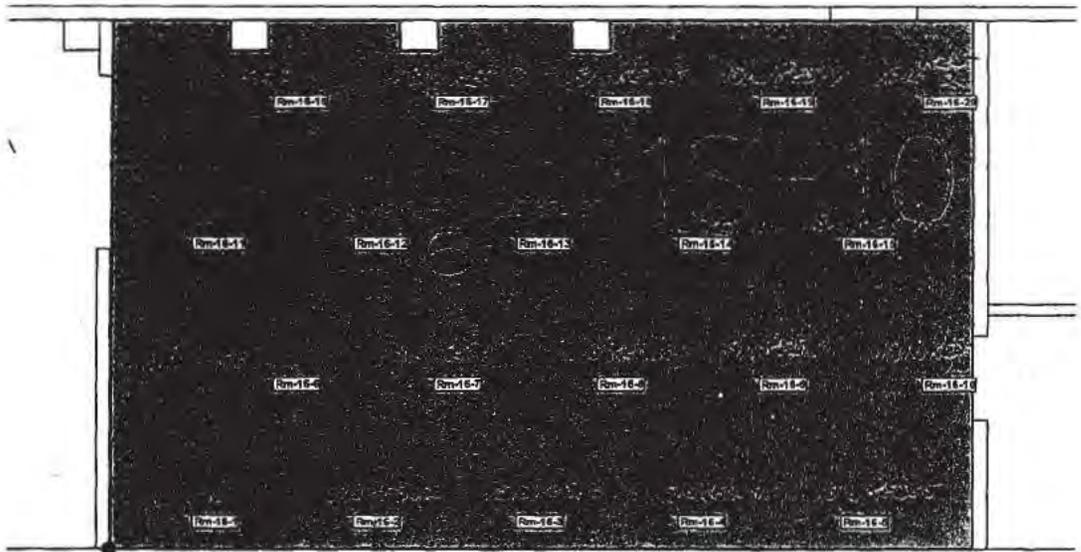
RSDS# MT-05-1248

RCT:           

RCT: N/A

TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm <sup>2</sup>
Alpha	43-68 BKG:	0	EFF:	0.2073	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.1578	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
ALPHA	1S10RES01	5923		5925	1	1	12/01/05	8:33	20	120	77
ALPHA	1S10RES02	5923		5925	1	2	12/01/05	8:37	14	120	54
ALPHA	1S10RES03	5923		5925	1	3	12/01/05	8:41	7	120	27
ALPHA	1S10RES04	5923		5925	1	4	12/01/05	8:46	8	120	31
ALPHA	1S10RES05	5923		5925	1	5	12/01/05	8:50	18	120	69
ALPHA	1S10RES06	5923		5925	1	6	12/01/05	8:55	15	120	57
ALPHA	1S10RES07	5923		5925	1	7	12/01/05	8:59	18	120	69
ALPHA	1S10RES08	5923		5925	1	8	12/01/05	9:03	11	120	42
ALPHA	1S10RES09	5923		5925	1	9	12/01/05	9:52	9	120	34
ALPHA	1S10RES10	5923		5925	1	10	12/01/05	9:56	12	120	46
ALPHA	1S10RES11	5923		5925	1	11	12/01/05	10:00	9	120	34
ALPHA	1S10RES12	5923		5925	1	12	12/01/05	10:05	15	120	57
ALPHA	1S10RES13	5923		5925	1	13	12/01/05	10:09	6	120	23
ALPHA	1S10RES14	5923		5925	1	14	12/01/05	10:13	2	120	8
ALPHA	1S10RES15	5923		5925	1	15	12/01/05	10:19	11	120	42
ALPHA	1S10RES16	5923		5925	1	16	12/01/05	10:23	17	120	65
ALPHA	1S10RES17	5923		5925	1	17	12/01/05	10:27	19	120	73
ALPHA	1S10RES18	5923		5925	1	18	12/01/05	10:31	19	120	73
ALPHA	1S10RES19	5923		5925	1	19	12/01/05	10:34	3	120	11
ALPHA	1S10RES20	5923		5925	1	20	12/01/05	10:39	11	120	42 ✓
BETA	1S10RES01	5923		5925	2	1	12/01/05	8:35	243	60	2444
BETA	1S10RES02	5923		5925	2	2	12/01/05	8:38	266	60	2676
BETA	1S10RES03	5923		5925	2	3	12/01/05	8:42	219	60	2203
BETA	1S10RES04	5923		5925	2	4	12/01/05	8:47	210	60	2112
BETA	1S10RES05	5923		5925	2	5	12/01/05	8:52	180	60	1811
BETA	1S10RES06	5923		5925	2	6	12/01/05	8:56	319	60	3209
BETA	1S10RES07	5923		5925	2	7	12/01/05	9:00	235	60	2364
BETA	1S10RES08	5923		5925	2	8	12/01/05	9:04	167	60	1680
BETA	1S10RES09	5923		5925	2	9	12/01/05	9:54	135	60	1358
BETA	1S10RES10	5923		5925	2	10	12/01/05	9:58	154	60	1549
BETA	1S10RES11	5923		5925	2	11	12/01/05	10:02	132	60	1328
BETA	1S10RES12	5923		5925	2	12	12/01/05	10:06	186	60	1871
BETA	1S10RES13	5923		5925	2	13	12/01/05	10:10	162	60	1630
BETA	1S10RES14	5923		5925	2	14	12/01/05	10:14	200	60	2012
BETA	1S10RES15	5923		5925	2	15	12/01/05	10:20	220	60	2213
BETA	1S10RES16	5923		5925	2	16	12/01/05	10:24	159	60	1599
BETA	1S10RES17	5923		5925	2	17	12/01/05	10:28	189	60	1901
BETA	1S10RES18	5923		5925	2	18	12/01/05	10:32	196	60	1972
BETA	1S10RES19	5923		5925	2	19	12/01/05	10:36	175	60	1760
BETA	1S10RES20	5923		5925	2	20	12/01/05	10:40	184	60	1851 ✓
RES=RESRAD											

COPY



Area: Rm 16				
Label	Type	Surface	LX	LY
Rm-16-1	Systematic	Floor	3	1
Rm-16-2	Systematic	Floor	8	1
Rm-16-3	Systematic	Floor	14	1
Rm-16-4	Systematic	Floor	20	1
Rm-16-5	Systematic	Floor	26	1
Rm-16-6	Systematic	Floor	6	6
Rm-16-7	Systematic	Floor	11	6
Rm-16-8	Systematic	Floor	17	6
Rm-16-9	Systematic	Floor	23	6
Rm-16-10	Systematic	Floor	28	6
Rm-16-11	Systematic	Floor	3	11
Rm-16-12	Systematic	Floor	8	11
Rm-16-13	Systematic	Floor	14	11
Rm-16-14	Systematic	Floor	20	11
Rm-16-15	Systematic	Floor	26	11
Rm-16-16	Systematic	Floor	6	16
Rm-16-17	Systematic	Floor	11	16
Rm-16-18	Systematic	Floor	17	16
Rm-16-19	Systematic	Floor	23	16
Rm-16-20	Systematic	Floor	28	16

COPY

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PAGE 4 OF 4  
MT-05-1248

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) <u>T BLDG / 1510 / Rms 16/10A/117/10B/17/17C</u>	SURVEY NO. <u>MT-05-1310</u>
PURPOSE: <u>ADDITIONAL UPPER STATIC POINTS</u>	RWP NO. <u>N/A</u>
	DATE: <u>12/12/05</u>
	TIME: <u>1630</u>

## MAP/DRAWING

SEE ATTACHED FOR SURVEY LOCATION.  
 SEE ATTACHED FOR SURVEY RESULTS.  
 A SCAN OF THE AREA 1 M<sup>2</sup> AROUND EACH CEILING POINT SHOWED NO ELEVATED  $\alpha$  OR  $\beta$  CONTAMINATION.

# COPY

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
 #E = mrem/hr ( $\beta+\gamma$ ) extremity on contact

$\triangle$  # = mrem/hr/neutron  
 # = air sample number

$\odot$  # = swipe number  
 $\odot$  #/ $\alpha$  or  $\beta$  = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5928/5927	8/24/06
	N	
	A	

Completed by: (Signature) <u>K. Abercrombie</u>	DATE: <u>12/12/05</u>
Completed by: (Print Name) <u>KICARDO V. BURKE / K. Abercrombie</u>	
Counted by: (Signature) <u>SEE ATTACHED SHEET</u>	HI #
Counted by: (Print Name) <u>SEE ATTACHED SHEET</u>	DATE:
Reviewed/Approved by: (Signature) <u>Jess Gritter</u>	DATE: <u>12/13/05</u>
Reviewed/Approved by: (Print Name) <u>Jess Gritter</u>	

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
1	SEE ATTACHED SHEET			1510-0221J
2				1510-0222J
3				1510-0223J
4				1510-0224J
5				1510-0225J
6				1510-0226J
7				1510-0227J
8				1510-0228J
9				1510-0229J
10	✓	✓	✓	1510-0230J
11				
12				
13				
14				
15				
16				
17				
18				
19		N		
20				
21				
22				
23				
24				
25			A	
26				
27				
28				
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30				
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32				
33				
34				
35				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
36				
37				
38				
39				
40				
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42				
43				
44				
45				
46				
47				
48				
49		N		
50				
51				
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**COPY**

COMMENTS: N A

- NOTES:**
- See MD-80038 10002 for calculations of WB, extremity and skin dose rates.
  - To request RO Count Room analysis for beta, 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.
  - Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

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Protocol# 2 - MARSSIM\_Smear\_2.lsa

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_2\20051212\_1319.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1310.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_2.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

COPY

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Regions	Half Life	Units	Reference Date	Reference Time
A				

F-118/133

Red



Protocol# 2 - MARSSIM\_Smear\_2.lsa

User: 5801

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

COPY

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
12/12/05	1:19:34 PM	-1		10.00	10	9	12	15	607.99	0	19.5	B	2
12/12/05	1:30:25 PM	0		2.00	523	495	0	0	577.00	986	6.3		2
12/12/05	1:33:06 PM	1		2.00	1	1	1	5	576.34	1	1016.9		2
12/12/05	1:35:49 PM	2		2.00	0	0	0	8	603.24	0	0.0		2
12/12/05	1:38:31 PM	3		2.00	0	0	0	13	610.46	0	0.0		2
12/12/05	1:41:13 PM	4		2.00	2	2	0	4	636.12	3	353.2		2
12/12/05	1:43:55 PM	5		2.00	0	0	0	5	642.50	0	0.0		2
12/12/05	1:46:36 PM	6		2.00	1	2	0	4	640.16	2	519.8		2
12/12/05	1:49:18 PM	7		2.00	1	1	0	8	621.68	2	557.1		2
12/12/05	1:52:00 PM	8		2.00	0	0	0	6	613.55	0	0.0		2
12/12/05	1:54:41 PM	9		2.00	0	0	0	8	633.92	0	0.0		2
12/12/05	1:57:23 PM	10		2.00	0	0	0	5	644.00	0	0.0		2

RB

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MT-05-1310

F 11/9/03

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### Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_047  
 Batch Ended: 12/12/05 12:31  
 Cal. Due Date: 11/17/06  
 Serial Number: 26966-3

COPY

Batch ID: MT-05-1310 [10] BURKE 12-12-05 RLH

Detector ID	Sample ID
B1	1
B2	2
B3	3
B4	4
C1	5
C2	6
C3	7
C4	8
D1	9
D2	10

Alpha Activity		
DPM	$\sigma$	flags
0.00	1.87	
0.00	1.85	
0.00	2.18	
0.00	1.99	
0.00	2.06	
0.00	1.92	
0.00	2.06	
1.68	1.96	
0.00	2.07	
0.00	2.15	

Beta Activity		
DPM	$\sigma$	flags
0.00	1.19	
0.00	1.12	
0.00	1.33	
1.60	2.07	
0.26	1.74	
0.47	1.59	
0.00	1.22	
0.47	1.59	
1.54	2.16	
0.00	1.19	

RB

RB

F-120/133

RLH

# T-Building Static Survey (1S10) Rms. 16/16A/17/16B/17A/17C

RSDS# MT-05-1310 RCT:            RCT:           

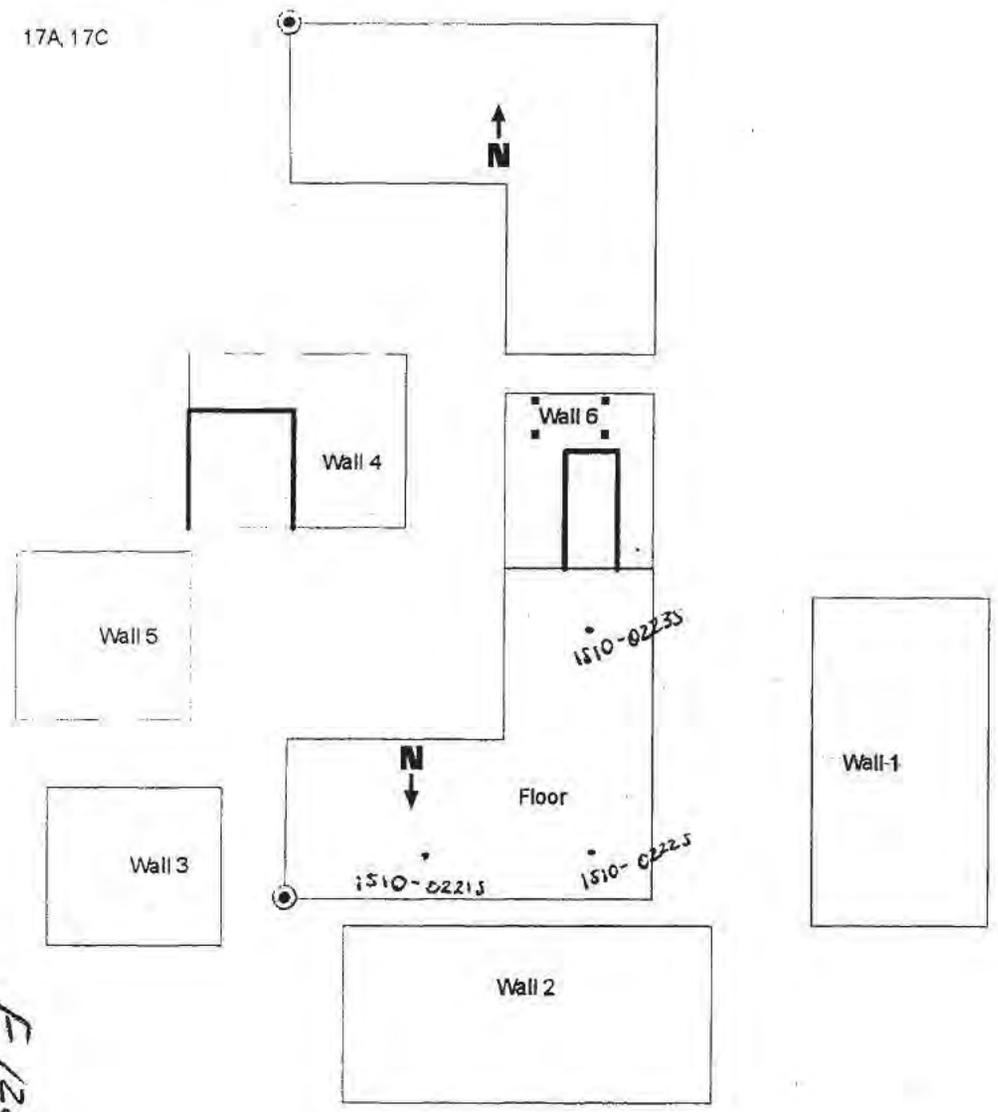
Alpha	43-68 BKG:	0	EFF:	0.22	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector # :	1
Beta	43-68 BKG:	0	EFF:	0.168	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector # :	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector # :	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector # :	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm2
ALPHA	1S100221S	5928		5927	1	1	12/12/05	12:49	5	120	18
ALPHA	1S100222S	5928		5927	1	2	12/12/05	12:58	2	120	7
ALPHA	1S100223S	5928		5927	1	3	12/12/05	13:03	7	120	25
ALPHA	1S100224S	5928		5927	1	4	12/12/05	13:34	11	120	40
ALPHA	1S100225S	5928		5927	1	5	12/12/05	13:43	3	120	11
ALPHA	1S100226S	5928		5927	1	6	12/12/05	13:49	3	120	11
ALPHA	1S100227S	5928		5927	1	7	12/12/05	14:52	2	120	7
ALPHA	1S100228S	5928		5927	1	8	12/12/05	15:02	6	120	22
ALPHA	1S100229S	5928		5927	1	9	12/12/05	15:08	6	120	22
ALPHA	1S100230S	5928		5927	1	10	12/12/05	15:16	4	120	14
BETA	1S100221S	5928		5927	2	1	12/12/05	12:50	163	60	1540
BETA	1S100222S	5928		5927	2	2	12/12/05	12:59	129	60	1219
BETA	1S100223S	5928		5927	2	3	12/12/05	13:04	129	60	1219
BETA	1S100224S	5928		5927	2	4	12/12/05	13:35	138	60	1304
BETA	1S100225S	5928		5927	2	5	12/12/05	13:44	69	60	652
BETA	1S100226S	5928		5927	2	6	12/12/05	13:50	66	60	624
BETA	1S100227S	5928		5927	2	7	12/12/05	14:54	131	60	1238
BETA	1S100228S	5928		5927	2	8	12/12/05	15:03	126	60	1190
BETA	1S100229S	5928		5927	2	9	12/12/05	15:09	132	60	1247
BETA	1S100230S	5928		5927	2	10	12/12/05	15:17	119	60	1124

COPY

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1S-10 Static

17A, 17C



COPY

F 122/133

5921/5927 5/24/06

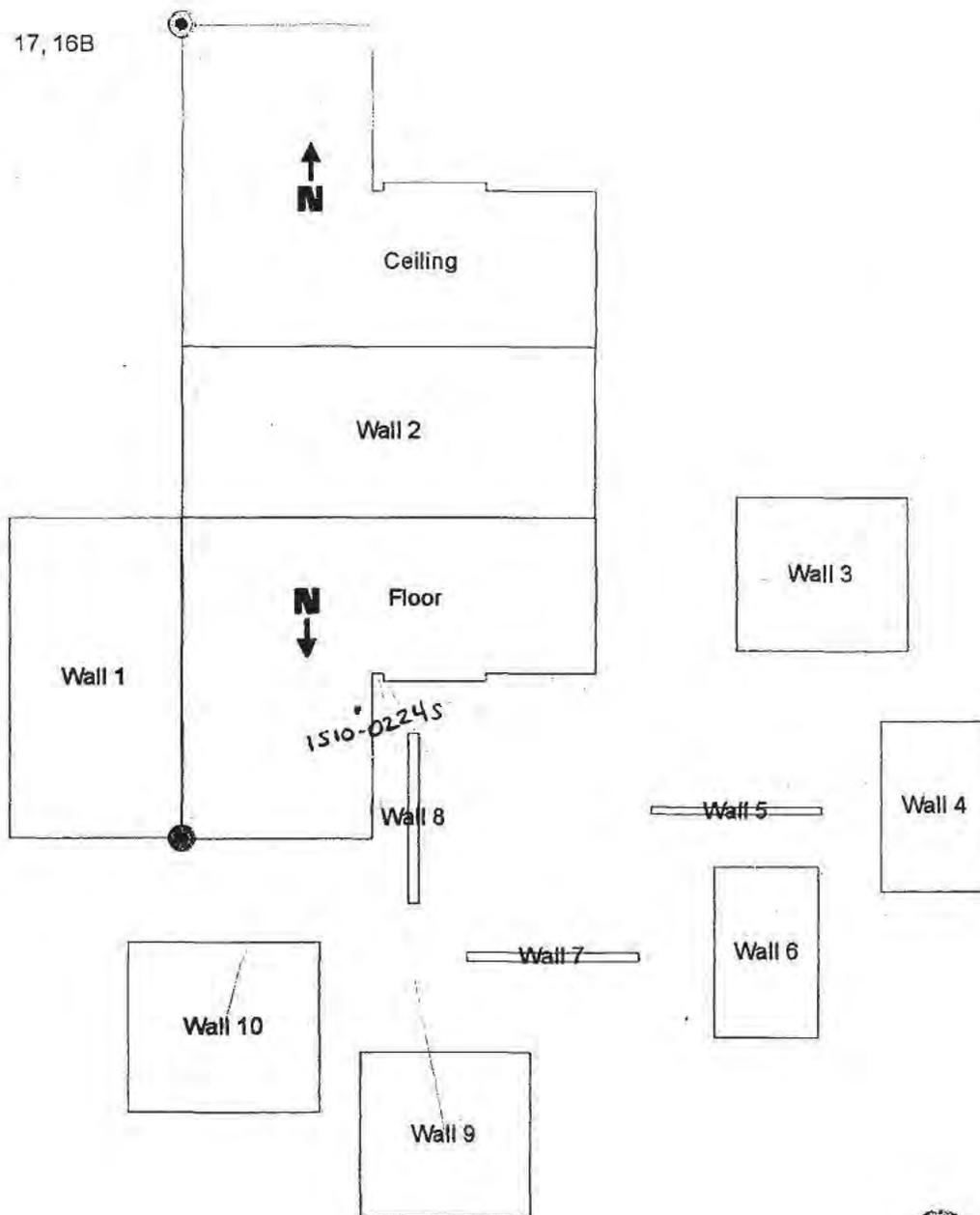
ABEL CLAMBLE

350-1

3 ME

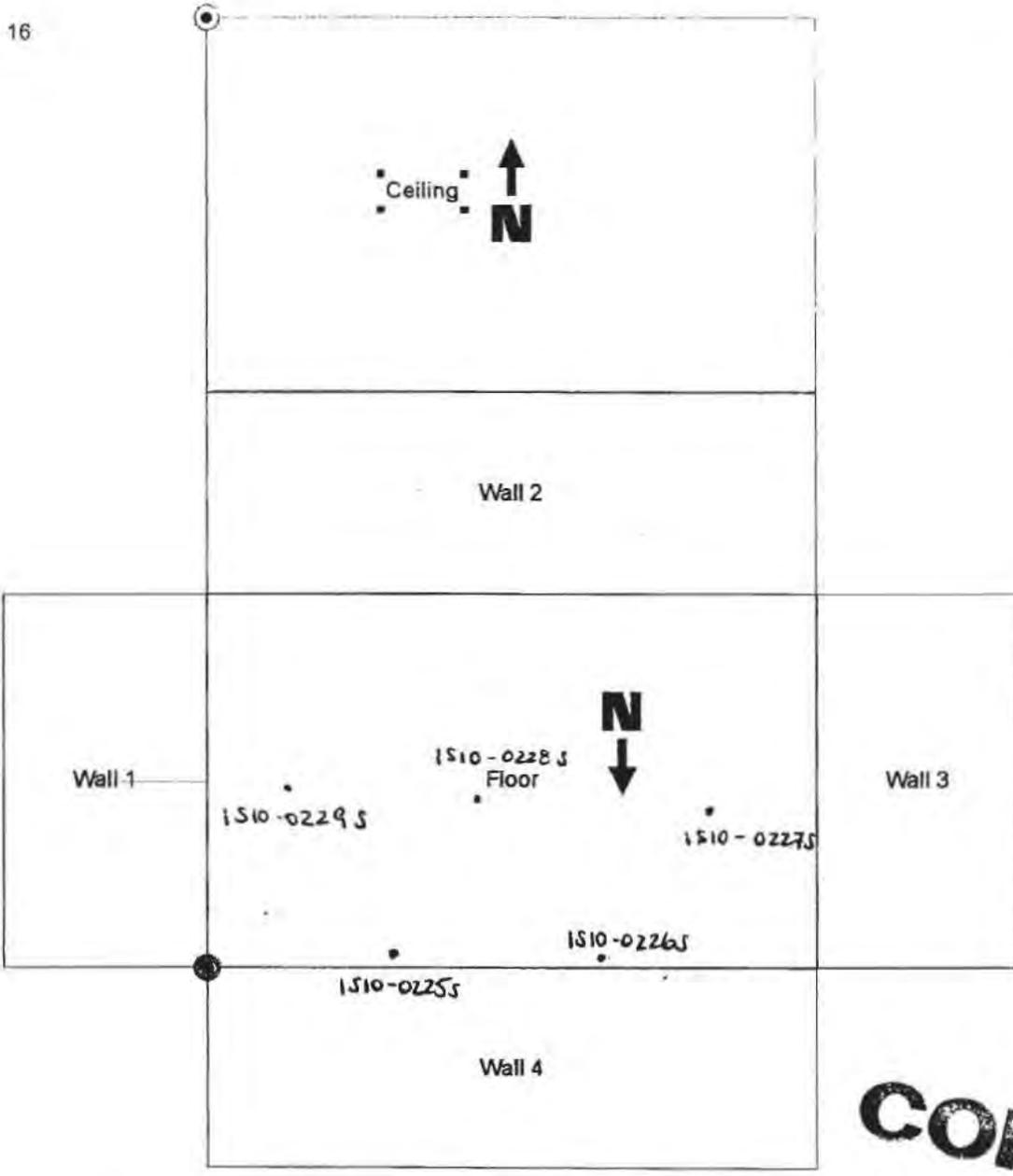
1S-10 Static

17, 16B



CCFY

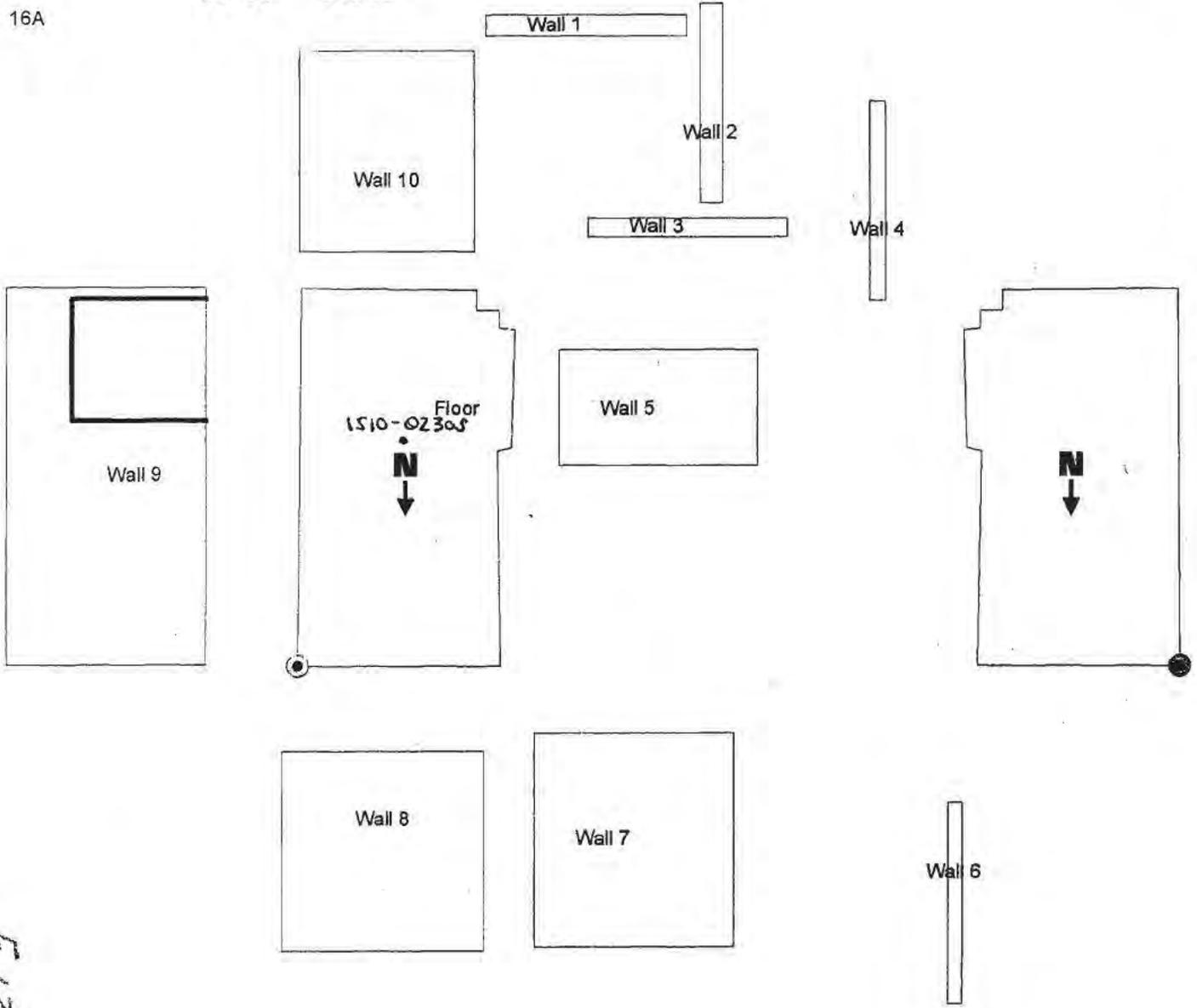
1S-10 Static



**COPY**

16A

1S-10 Static



COPY

F 125/133

2350-1 5928 / 5927 5/24/06

3406

ADRIAN B. BIRNBAUM

Survey Unit Number:  
1S-10-02

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RSDS #  
RCT INT/HP

MT-05-1310  
DB  
KA 7474

Label	Room	Surface	LX	LY
1S10-0221S	17A/17C	Concrete I-Beam	6	3
1S10-0222S	17A/17C	Concrete I-Beam	18	2
1S10-0223S	17A/17C	Concrete I-Beam	18	4
1S10-0224S	17/16B	Concrete I-Beam	6	12
1S10-0225S	16	I-Beam	10	0
1S10-0226S	16	I-Beam	17	0
1S10-0227S	16	Concrete I-Beam	22	11
1S10-0228S	16	Concrete I-Beam	14	11
1S10-0229S	16	Concrete I-Beam	3	11
1S10-0230S	16A	Concrete I-Beam	5	10

- J- designator represents measurement as judgmental location
- E-designator represents measurement as potentially elevated activity.
- D-designator represents measurement at a drain.
- V-designator represents measurement on ventilation system.
- U-designator represents measurement on a utility drop.

**COPY**

FRG/133

# RADIOLOGICAL SURVEY DATA SHEET

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LOCATION: (BLDG/AREA/ROOM) <b>1 BLDG / 1010 / ROOM 17A</b>	SURVEY NO. <b>MT-05-1314</b>
PURPOSE: <b>REMEDIATION FOLLOW UP SURVEY</b>	RWP NO. <b>N/A</b>
	DATE: <b>12/13/05</b>
	TIME: <b>1600</b>

## MAP/DRAWING

SEE ATTACHED FOR SURVEY LOCATION.  
SEE ATTACHED FOR SURVEY RESULTS.

A SCAN OF THE REMEDIATED AREA SHOWED NO ELEVATED  $\alpha$  OR  $\beta$  CONTAMINATION.

**COPY**

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
#E = mrem/hr ( $\beta$ + $\gamma$ ) extremity on contact

= mrem/hr/neutron  
 = air sample number

= swipe number  
 or  $\beta$  = direct cont. measurement in dpm/100cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
2350-1	5928/5927	5/24/06
	N	
		A

ML-0020 (2-08)

Completed by: (Signature) <i>K. Abernethy</i>	DATE: <b>12/13/05</b>
Completed by: (Print Name) <b>KICARDO V. BURKE / K. Abernethy</b>	
Counted by: (Signature) <i>SEE ATTACHED SHEETS</i>	DATE:
Counted by: (Print Name) <i>SEE ATTACHED SHEETS</i>	
Reviewed/Approved by: (Signature) <i>[Signature]</i>	DATE: <b>12/14/05</b>
Reviewed/Approved by: (Print Name) <b>Jess Griffin</b>	<b>F127/33</b>

*Done*

# RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
1	SEE ATTACHED SHEET			1S10-0101X
2	↓	↓	↓	1S10-0102X
3				
4				
5				
6				
7				
8				
9				
10				
11		N		
12		N		
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				A
23				COPY
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				

Removable Contamination				
Swipes (dpm/100cm <sup>2</sup> )				Comments
Sample #	Beta	Alpha	Tritium	
36				
37				
38				
39				
40				
41				
42				
43				
44				
45		N		
46		N		
47				
48				
49				
50				
51				
52				
53				
54				
55				
56				
57				A
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				

COMMENTS: N A

- NOTES:
- See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
  - To request RO Count Room analysis for beta, 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.
  - Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.
- ML-6626 (4-88) F128/133

Protocol# 1 - MARSSIM\_Smear\_1.lsa

MARSSIM Smear Data

Assay Definition-

Assay Description:  
MARSSIM Smear Data

Assay Type: DPM (Single)  
Report Name: Report1  
Output Data Path: D:\MARSSIM\_LSC  
Raw Results Path: C:\Packard\Tricarb\Results\5801\MARSSIM\_Smear\_1\20051213\_1129.results  
Comma-Delimited File Name: D:\MARSSIM\_LSC\MT-05-1314.001  
Assay File Name: C:\Packard\TriCarb\Assays\MARSSIM\_Smear\_1.lsa

Count Conditions-

Nuclide: H-3 Mound  
Quench Indicator: tSIE/AEC  
External Std Terminator (sec): 0.5 2s  
Pre-Count Delay (min): 0.00  
Quench Set:  
Low Energy: H-3 Smear  
Count Time (min): 2.00  
Count Mode: Normal  
Assay Count Cycles: 1 Repeat Sample Count: 1  
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial  
Low CPM Threshold: Off  
2 Sigma % Terminator: Off

Regions	LL	UL	Bkg Subtract
A	0.5	18.6	1st Vial
B	2.0	18.6	1st Vial
C	40.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: Off  
Colored Samples: Off Heterogeneity Monitor: Off  
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off  
Regions Half Life Units Reference Date Reference Time  
A

COPY

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MT-05-1314

12/14/05

Protocol# 1 - MARSSIM\_Smear\_1.lsa

User: 5801

MARSSIM Smear Data

B  
C

Instrument Block Data  
Machine=Tri-Carb 2900TR  
Version=2.06  
423022  
MODEL=Tri-Carb 2900TR  
VERSION=2.06  
SERIAL=423022

Cycle 1 Results

DATE	TIME	S#	Count	Time	CPMA	CPMB	CPMC	LUM	tSIE	DPM1	A:2S%	MESSAGES	P#
12/13/05	11:30:21 AM	-1		10.00	9	8	9	4	617.74	0	21.4	B	1
12/13/05	11:41:11 AM	0		2.00	458	434	1	0	544.53	888	6.7		1
12/13/05	11:43:52 AM	1		2.00	0	0	0	0	612.71	0	0.0		1
12/13/05	11:46:34 AM	2		2.00	0	0	0	0	629.96	0	0.0		1

COPY

RS

F130/133



### Smear Analysis

Unit Type: LB4100/W  
 Counting Unit ID: Green  
 Data file name: Mar\_050  
 Batch Ended: 12/13/05 10:36  
 Cal. Due Date: 11/17/06  
 Serial Number: 26966-3

Batch ID: MT-05-1314 KA 7074 12/13/05 TAS

Detector ID	Sample ID
A1	1
A2	2

Alpha Activity		
DPM	$\sigma$	flags
1.72	2.18	
0.00	2.03	

RB

Beta Activity		
DPM	$\sigma$	flags
0.00	1.31	
1.51	2.01	

COPY RB

F1311/133

# T-Building Remediation Follow-up Survey (1S10) Rm. 17A

RSDS# MT-05-1314 RCT:            RCT:           

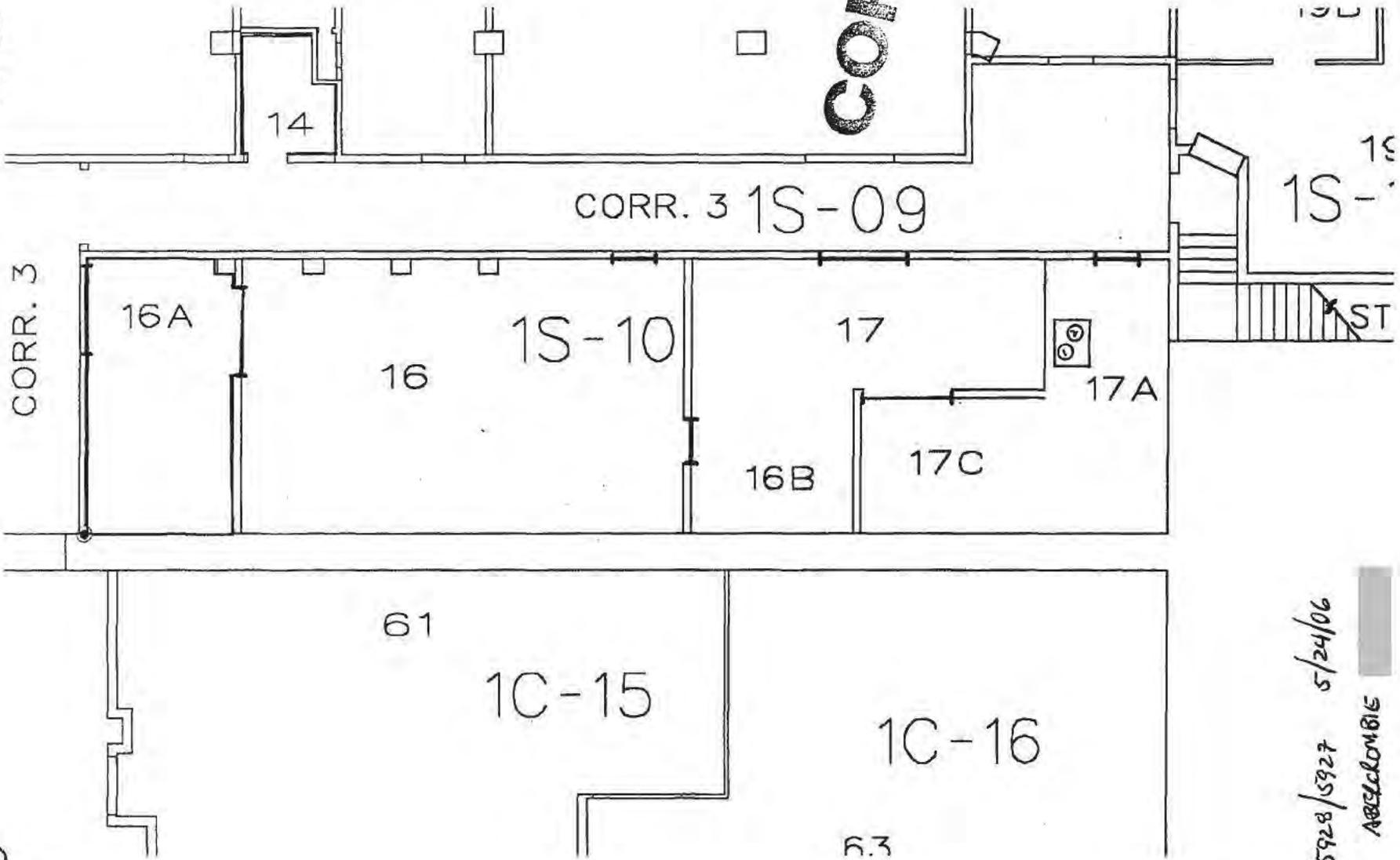
Alpha	43-68 BKG:	0	EFF:	0.22	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	1
Beta	43-68 BKG:	0	EFF:	0.168	PROBE AREA:	126	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	2
Alpha Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	3
Beta Scan	43-37 BKG:	0	EFF:	0.22	PROBE AREA:	584	cm <sup>2</sup>	Surface Eff:	0.5	Detector #:	4
TYPE	LOCATION	2350#	RCT ID	PROBE	DET #	item	DATE	TIME	CNTS	CT TIME	dpm/100cm <sup>2</sup>
ALPHA	1S100101X	5928		5927	1	1	12/13/05	8:25	6	120	22
ALPHA	1S100102X	5928		5927	1	2	12/13/05	8:41	3	120	11
BETA	1S100101X	5928		5927	2	1	12/13/05	8:27	141	60	1332
BETA	1S100102X	5928		5927	2	2	12/13/05	8:42	140	60	1323

COPY

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MT-05-1314

1S-10 Class 1 Survey Unit

COPY



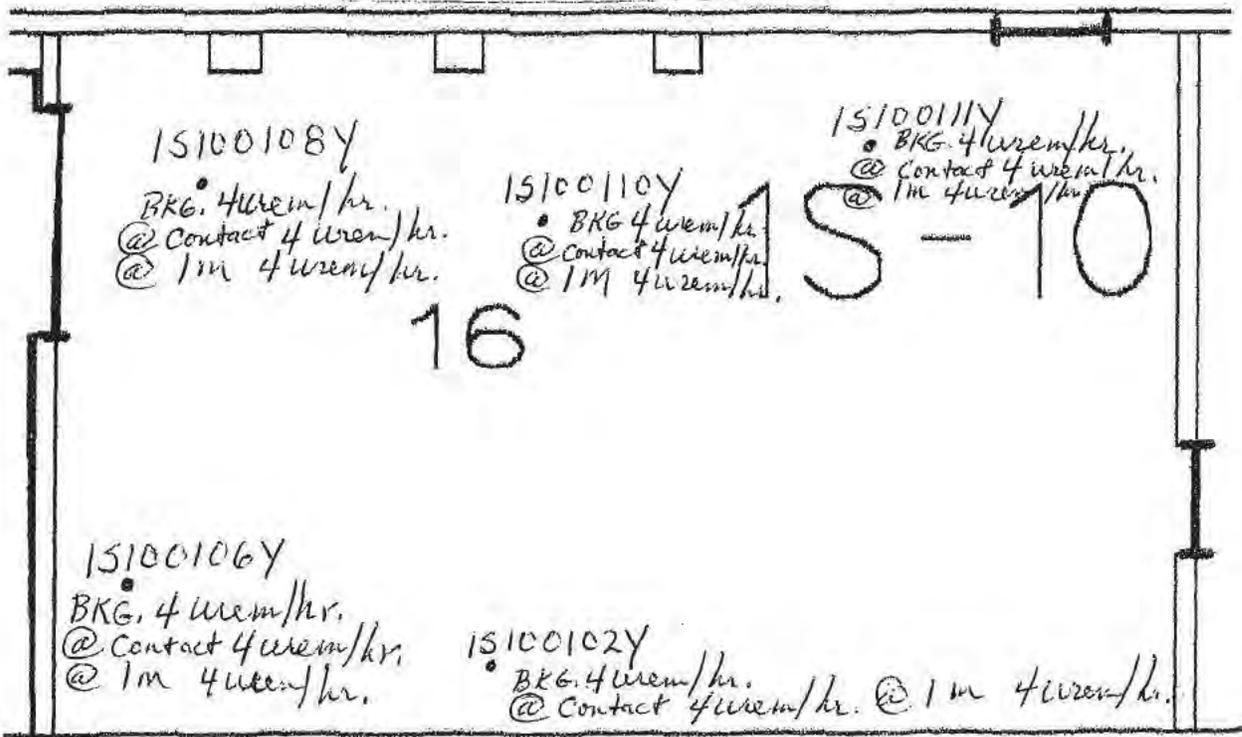
133/133

2350-1 5928/5927 5/24/06  
BULL ABELLOMBIE

# RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG / AREA / ROOM)	T-16	SURVEY NO.	MT-06-0393
PURPOSE: MICRO MEASUREMENTS 15100110Y, 15100102Y, 15100106Y, 15100108Y, 15100111Y BACKGROUND / CONTACT 1510		RWP NO.	N/A
		DATE:	4-4-06
		TIME:	1345

## MAP / DRAWING



COPY

LEGEND: # = mrem/hr ( $\gamma$ ) whole body  
 #E = mrem/hr ( $\beta + \gamma$ ) extremity on contact  
 K = factor of 1000  
 - - - = radiological boundary

# = mrem/hr neutron      # = swipe number  
 # = air sample number      #/α or  $\beta$  = direct contamination measurement in dpm/100 cm<sup>2</sup>

### INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
MICRO	3980	5-13-06
	N	
	A	

Completed by: (Signature)	<i>Jerry Taylor</i>	Date:	4/4/06
Completed by: (Print Name)	Jerry Taylor		
Counted by: (Signature)	N/A	HP#	N/A
Counted by: (Print Name)	N/A		
Reviewed/Approved by: (Signature)	<i>Jerry Taylor</i>	Date:	4-4-06
Reviewed/Approved by: (Print Name)	J. Hollibaugh		

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