ROBERT WOOD JOHNSON
UNIVERSITY HOSPITAL
HAMILTON

Ellen L. Guarnieri
President and CEO

G-8

April 30, 2009

RECEIVED
REGION 1
2009 MAY -4 AM 10:39

Mr. Hector Bermudez
United States Nuclear Regulatory Commission
Region I
Licensing Assistance Section
475 Allendale Rd.
King of Prussia, PA. 19407

03010491

Dear Mr. Bermudez:

Robert Wood Johnson University Hospital at Hamilton, license number 29-16145-01 wishes to submit the final report of the additional wipe tests and survey of our Clinical Pharmacology Unit located at # 3 Hamilton Health Place, as performed by Antkowiak & Mahoney Enterprises, Inc. Please note this report addresses fixed as well as removable contamination (enclosed).

During the assessment, 3 areas located within the fume hood in the Pharmacy Room 220 detected Carbon-14 contamination (see page 12). These parts were disassembled, decontaminated, and additional wipe tests were performed which demonstrated final readings less than the MDA. In addition, two areas on the floor under the hood and near the benches detected contamination (see page 12). The tile was either cleaned or removed. Following decontamination efforts, no removable radioactive contamination was found in the room surveyed that exceeded 10% of the site specific DCGL of 5,000 dpm/100cm2. In addition, no direct radioactive contamination was found in any of the rooms surveyed following final cleaning of the rooms.

All radioactive waste produced by the decontamination of these areas has been removed from the site by Energy Solutions Inc. (formally Duratek, Inc). A copy of the waste manifest is enclosed. Should you have any questions, please contact our Radiation Safety Officer, Ms. Janet Bryant through her office at 908-788-9440, extension 40, or you may contact Mr. Ryszard Czarnuszewicz, Administrative Director of Radiology at 609-584-6606.

Sincerely,

Ellen L. Guarnieri
President and CEO

cc: Mr. Ryszard Czarnuszewicz, MBA
Ms. Janet Bryant, MS

VIA FACSIMILE
610-337-5269

143104
NMSS/RGN1 MATERIALS-002

Antkowiak and Mahoney
Enterprises, Inc.

FINAL STATUS SURVEY

for

Clinical Research Center
Hamilton, New Jersey

Prepared by

Antkowiak and Mahoney
Enterprises, Inc.
36 Dawkins Drive
East Earl, PA 17519

Antkowiak and Mahoney
Enterprises, Inc.

FINAL STATUS SURVEY

for
Clinical Research Center
Hamilton, New Jersey

Survey Dates:

April 6, 9, and 22, 2009

Survey performed by:

Joel Antkowiak
Robert Mahoney

Report prepared by:

Joel Antkowiak
Robert Mahoney

Reviewed and Approved by: Joel Antkowiak Digitally signed by Joel Antkowiak DN: CN = Joel Antkowiak, C = US, O = AME Inc. Date: 2009.04.28 15:27:01 -04'00' Date: _____
(AME Inc.)

Reviewed and Approved by: Janet Bryant Date: 4/28/09
(Client)

Introduction

During the month of April 2009 Antkowiak and Mahoney Enterprises, Inc. (AME) conducted decommissioning surveys for the Robert Wood Johnson Hospital and Bristol-Myers Squibb at the Clinical Research Center located at the Robert Wood Johnson Hospital in Hamilton, New Jersey. The intent of the survey was to document the radiological condition of the areas covered by the hospital's radioactive materials license prior to its free release. This survey report is based on the methods presented in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). MARSSIM provides guidance on determining the number of data points required in each survey unit, the interpretation of survey results, choice of instrumentation, and data reduction. Values for activity to dose conversions are obtained from Regulatory Guide for Decommissioning (NUREG-1500). Much of the Quality Assurance plan is developed based on an EPA document, "Guidance for the Data Quality Objectives Process". (EPA /600/R-96)

Radionuclides of Concern

Based on information provided by staff for this site, the only nuclide that was used in these rooms since the last decommissioning of the facility in July of 2005 was carbon-14.

Release Criterion

The TEDE value of 25 mrem/y has been set in Subpart E - Radiological Criteria for License Termination, 10 CFR 20.1402. However, that regulation also invokes the ALARA principle. In NUREG-1500, the statement is made, "...the NRC will consider that the licensee has complied with the ALARA requirement if the licensee can demonstrate that the TEDE to the average member of the critical group does not exceed 3 mrem per year".

This site will be decontaminated such that, at a maximum, the highest Total Effective Dose Equivalent (TEDE) received by an individual occupying the site after release would be 3 millirem. This predicted dose level is based on the building occupancy scenario/model of NUREG/CR5512, which in turn is used to calculate the surface contamination limits presented in Table B-1 of NUREG 1500. Those values for selected nuclides are presented in Table 1, below.

Residual Radioactivity Limits

Residual radioactivity limits are called Derived Concentration Guideline levels (DCGL). These are values of surface contamination or soil concentrations that will deliver the TEDE over the next 1,000 years, under specific use scenarios. Carbon-14 and tritium are the limiting isotopes due to the short-lived nature of the other isotopes used.

Radionuclide	Surface Concentration dpm/100cm^2
C-14	158,000

Table 2 - Concentration values which deliver 3 mrem/y under the building occupancy scenario.

Because the detection of surface contamination with current field instrumentation is essentially a "gross beta" measurement, the value of the most restrictive of the listed radionuclides would normally be selected as the DCGL for this project. However, the footnote to Table B-1 states "For most radionuclides, based on ALARA and best practice, it is not necessary to leave contamination in excess of 5,000 dpm/100cm^2 ". Therefore the DCGL for this project will be 5,000 dpm/100cm^2, with the knowledge that this value would deliver a TEDE well below 3 mrem/y.

Survey Units

All survey units for this project were designated as Class 2 per the MARSSIM terminology. Classification was based on the information provided by site staff. The survey units were as follows:

Room 102	Room 103	Room 104	Room 126
Room 154	Room 180	Room 195C	Room 216
Room 217	Room 220	Room 221	Room 242

Survey Design

The number of data points necessary for a given survey unit in this survey is based on using the one sample Sign test for analysis of the data. This statistical test is appropriate when the contaminant is not present in background, or is present at such a small fraction of the DCGL as to be insignificant. The likely contaminant as identified by site staff is C-14, which falls into this category of radionuclides. In terms of data reduction, this means the survey units are not compared to a reference (i.e. non-impacted) area, but are compared directly to the DCGL. Equation 5-2 is then used to determine the number of data points in each survey unit as follows:

$$N = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(\text{sign } p - 0.5)^2}$$

We define each "data point" as a measurement location for both an integrated surface activity count (beta and gamma) and wipe sample. These are in addition to the scanning surveys conducted in each survey unit. The contamination limits for this decommissioning project are less than 5,000 dpm/100 cm^2 for total (fixed and removable) radioactivity. The release limits are called Derived Concentration Guideline Levels (DCGL) in the MARSSIM document.

The first step in determining the number of samples is to define the gray region. The gray region is the range of values where the consequences of making a decision error are minor. Typically the lower boundary of the gray region (LBGR) is one half of the DCGL, therefore the shift or delta (Δ) is equal to DCGL-LBGR. For this project:

$$\Delta = 5{,}000 \text{ dpm}/100\text{cm}^2 - 2{,}500 \text{ dpm}/100\text{cm}^2$$

The next step is to estimate the standard deviation of the measurements of the contaminants. If results from characterization surveys are not available, it is reasonable to assume a relative standard deviation of 30%.

The DCGL and LBGR are expressed in counts per minute based on 3.2% efficiency for the detection of C-14 (it will be slightly higher efficiency for F-18) and a 126 cm^2 probe. This would make the gray region from 202 cpm to 101 cpm. Thirty percent of the DCGL would give a standard deviation of 60.6. The relative shift would then be:

$$\Delta/\sigma = (202\text{-}101)/60.6 = 1.67$$

The value of Sign p as obtained from Table 5.4 in the MARSSIM manual for a relative shift of 1.67 is 0.945201.

The acceptable error rates for this project are 0.10 for a Type I error and 0.05 for a Type II error. That is, there is a 5% chance of releasing a survey unit that, in reality does not meet the release criteria (Type I). Conversely, there is a 90% chance of not releasing a survey unit that truly does meet the release criteria.

The percentiles, $Z_{1-\alpha}$ and $Z_{1-\beta}$ represented by these decision errors are 1.645 and 2.326.

Substituting all the values determined above into equation 5.2 gives the number of data points, N as;

$$N = \frac{(1.645 + 2.326)^2}{4\,(0.945201\text{-}0.5)^2} = 14$$

The number of data points is increased by 20% to account for missing or unusable data, making

$$N = 14 \times 1.2 = 17$$

As a check on this calculation, the number of data points necessary based on the error rates and relative shift was also determined using Table 5.5 in MARSSIM. That value is 24 data points. Therefore, we obtained at least 24 data points in each survey unit. Not included in that number are biased measurements, obtained in areas where professional judgment would suggest contamination could be encountered.

Any contamination in the areas surveyed is most likely isolated spots. Section 5.5.2.4 of MARSSIM states that the preceding statistical tests are most appropriate for uniformly distributed contamination. Specifically, "systematic measurements and sampling, in conjunction with surface scanning, are used to obtain an adequate assurance level that small areas of elevated radioactivity will satisfy the release criterion." The method employed for this survey includes enough randomly located data points to satisfy the statistical test, as well as scanning and a systematic grid measurements to detect small areas of elevated activity.

Equipment

This project utilized the following instruments or their equivalent for verification of the presence or absence of radioactive contamination.

Beta/Gamma Surveying

Ludlum Model 12 meter with 43-68 gas proportional probe designed to detect beta/gamma radiation was used. This probe has an active surface area of 126 cm^2 with an open area of 100 cm^2. The floor was surveyed with the same instrument.

Based on the information in MARSSIM Chapter 6, section 6.7, the scanning minimum detectable concentration for these systems can be determined based on the following equation:

$$\textit{Scan}\ \text{MDC} = \text{MDCR} / [p^{1/2} * e_i * e_s * (\text{probe area} / 100\ cm^2)$$

where

MDCR = minimum detectable count rate
e_i = instrument efficiency
e_s = surface efficiency (typically = 0.5)
p = surveyor efficiency (typically = 0.5)

Assuming a background count rate of 300 cpm, the MDCR for the model 43-68 probes for this project is 512 cpm. This is based on a scan rate of 1 probe width per second, with a requirement of 95% correct detections and an acceptable rate of false positives equal to 60%.

The Scan MDC is then as presented in Table 1, assuming typical values of 0.5 for both surveyor efficiency and surface efficiency, and efficiency for carbon-14 of 0.137.

Instrument	MDCR (cpm)	Scan MDC (dpm/100 cm^2)
Ludlum Model 12 w/Model 43-68 probe	512	3,737

This is below the site specific DCGLof 5,000 dpm/100 cm2 for a dose of 3 mRem/year.

Instrument Scan MDCs

For scaler readings, the minimum detectable activity for each meter-probe combination is dependent on several factors. These include count time, efficiency for each specific isotope, and the radiological content of each different material surveyed (i.e., ceramic tiles will have a higher background than dry wall). Table 2 shows typical MDAs for these survey systems for carbon-14. The actual MDAs will be determined at the time of the surveys. These are determined using the following formula:

$$MDA = \frac{2.71 + 4.65\sqrt{Br \times t}}{t \times E \times A/100}$$

where:

MDA = activity in dpm/100 cm^2
Br = background rate in counts per minute
t = counting time in minutes
E = detector efficiency in counts per disintegration (4π)
A = probe area or area wiped in cm^2

Instrument Scaler MDAs

Instrument	Minimum Detectable Activity
Ludlum Model 12 w/Model 43-68 probe	500-600 dpm/100 cm^2

Calibration certificates for each meter used are provided.

Sample Analysis

Sampling for removable activity was conducted by wiping approximately 100 cm^2 area with a two inch diameter dry filter paper. The samples were then placed directly into a scintillation vial in a specific location of a uniquely identified rack or tray. The position numbers are then described on the scintillation counter log sheet. The samples remain in the specified container and position throughout sample preparation and analysis. This reduces the risk of mislabeling or cross contamination among the many samples taken during this project.

The samples were analyzed by setting three energy windows on the liquid scintillation counter. The low energy channel (channel 1) is set for optimal tritium efficiency, the second window (channel 2) is set for optimal carbon-14 efficiency, and the third window (channel 3) is set for higher energy beta emitters.

Each day samples are analyzed, NIST traceable tritium and carbon-14 sources are also analyzed at the end of each "batch". The daily counts for both tritium and carbon-14 were within the specified ranges. The minimum detectable activity (MDA) for the counter used (Beckman model 5000 TD; serial number 7040372) is as follows:

Channel 1 MDA = 102 dpm

Channel 2 MDA = 46 dpm

Channel 3 MDA = 33 dpm

For purposes of free release of the rooms, the removable activity exhibited in all three channels is combined to determine compliance with the release criteria. The results are presented in Appendix I.

Statistical Test of Measurement Results

Because all samples and readings indicated residual activity below the site specific DCGL, no statistical analysis is required.

Quality Assurance Plan

Providing quality data for a decommissioning project is based on certain key elements as discussed in EPA guidance documents (EPA 504/G-93/071). These are known as PARRC (precision, accuracy, representativeness, completeness, and comparability) parameters. In addition, the sensitivity of measurements, expressed as the Minimum Detectable Activity (MDA) must be sufficiently low to detect contamination $\leq$ 25% of the release criteria (NRC, 1992). The processes for assessing these parameters are discussed below.

Precision

Precision is a test of how closely one can replicate a measurement. Replicate measurements for total beta contamination will be made by obtaining two one minute counts in sequence at the same location. At least 5% of the total measurements will be duplicated in this manner. To replicate the removable activity analysis a second wipe sample will be obtained as close as possible to the original sample. Both the Item Release Survey Log and the Contamination Measurements Log have a reminder to perform this function on every twentieth line. The formula below will be used to determine the relative percent difference (RPD). One can expect measurements of contaminated areas at this site to be reproduced within $\pm$ the RPD for each category (fixed and removable) with similar instrumentation and count times.

Reproducibility of Fixed Location Measurements

$$\text{*Relative Percent Difference} = \frac{\text{Measurement - Replicate Meas.}}{(\text{Measurement + Replicate Meas.})/2} \times 100\%$$

Accuracy

Accuracy is a test of how close the meters response is to a known value. The beta standard used for this project will be a Carbon-14 windowless source, (serial # E948) with a radioactivity level of 215,880 disintegrations per minute as certified by the National Institute of Standards and Testing. AME recognizes contamination on items may be in a geometry different from the calibration standard (i.e. different size area, or not uniformly distributed). However, the difference between the meter's efficiency for a point source and large areas of contamination is estimated to be less than 6% (NRC, 1995a).

To ensure continued accuracy in the field a check log was established at the beginning of the project. This is accomplished by counting the same source multiple times and plotting the average and two and three sigma values. A daily check of the meters, employing a radioactive source of known quantity, serves as the accuracy check. A source check "jig" was used to ensure the source and meter are always in the same position relative to one another. The value was plotted on the Quality Control chart against the average and standard deviations as determined previously. Instruments greater than plus or minus three standard deviations were removed from use, and tagged "out of service" until repaired.

Representativeness

Representative data would be that data which accurately reflects the environment where the measurement was obtained. One measurement of this parameter is to simply compare the number of times the premise the data is intended to show fails, compared to the number of times the premise is tested. For this project, the premise is elevated count rates with the meter indicates contamination. The equation used is:

$$\text{Representativeness} = (1\text{-}F/N) \times 100\%$$

For this project the goal is for data to be 100% representative. To achieve this goal, all hot spots identified during the scanning survey were verified by a second technician prior to reporting.

Completeness

Completeness is a measure of the amount of valid data obtained compared to the amount that was specified. For the purposes of evaluation, data defined as invalid through a QA review is subtracted from the complete data set to determine the number of valid data points. For this project, completeness greater than 95% is desirable.

Comparability

Comparability is a non quantitative evaluation of the agreement between different types of data sets which should be, intuitively, related to each other. For example, on this project, all metal locations exhibiting elevated fixed beta contamination would also exhibit some removable beta contamination. For firebrick, areas exhibiting elevated beta count rates would show positive beta results for volumetric analysis.

Sensitivity

To determine a meters suitability for a measurement, the minimum detectable activity (MDA) is compared with the project specific release limits. The minimum detectable activity will be calculated using an equation from NUREG-5849, and the average of the daily background and source checks. Meters and count times were adjusted so that the fixed activity MDA's are less than 20% of the release limits, and removable activity measurements were less than 10% of the release limits. Typical MDA's are presented in the Attachments, which also illustrates the equation used to determine the MDA.

Data Reduction

All data is to be reported at the 95% confidence level. Data was reviewed by the QA manager and Project Manager before being reported. Basic parameters such as efficiency and background was evaluated from instrument check logs to determine if the values are within expected ranges. When several transformations of the data is required, a few values were traced from raw data to reported value to ensure continuity of data, and absence of transcription errors.

All reported data will bear an approval signature. All values of radioactivity (concentration or contamination levels) are reported with an estimate of the statistical uncertainty. Both values have the same number of decimal places. Results in disintegration per minute (dpm) are only reported as whole numbers. Surface and removable activity values are reported in dpm/100 cm2. Volumetric analyses are reported in picocuries per gram (pCi/g) or picocuries per liter (pCi/L). Concentrations are reported to one decimal place. The radioactive decay process is assumed to be normally distributed, so the standard deviation is estimated using standard statistical methods. Values below the calculated minimum detectable activity (MDA) are reported as "less than" or "$\leq$ " the MDA.

Understanding the Appendices

The appendices presenting the results of the removable contamination surveys show diagrams of each area surveyed. On each diagram, if two smears are shown to be taken on one item (drawers, cabinet, etc.), the odd numbered smear was taken on the outside of the item. The inside is represented by the even numbered smear.

The appendices that present the data from the scalar measurements refer to the numbers of the smear on the pictures of Appendix I as appropriate. For example, reading number one taken in Room 102 corresponds to the location represented in the picture for the removable activity. There is a scalar reading for each location noted on the main view of the room, if it were possible to take one at that location. If the number of locations was not sufficient to meet the 17 point minimum on the main view, then additional readings were taken on the additional views for that room. Where readings or samples are indicated on drawers and cabinets, the odd numbered reading/sample was taken on the outside of the item, and the even numbered reading represents the inside. For drawers and cabinets, the inside reading was taken inside the drawer, or on the shelf nearest, the location of the number on the diagram.

Survey Results – Final Status

Contamination was found in Pharmacy Room 220. The contamination was found in the hood and on the floor under the hood as well as the floor near the benches. Parts of the hood were disassembled and cleaned, while floor tiles were either cleaned or removed. The original contamination levels are shown in Appendix IV.

Following decontamination efforts, no removable radioactive contamination was found in the room surveyed that exceeded 10% of the site specific DCGL of 5,000 dpm/100 cm^2.

In addition, no direct radioactive contamination was found in any of the rooms surveyed following final cleaning of the rooms.

No samples for removable activity showed levels above the DCGL for this project. In addition, no readings showed activity above the DCGL for this project. Therefore, no statistical analysis is required.

The final survey results for each of the surveyed areas are presented in Appendices I and II. Appendix III consists of a copy of the meter calibration certificate.

References

U.S. Nuclear Regulatory Commission (NRC), NUREG/CR-5849, *Manual for Conducting Radiological Surveys in Support of License Termination*. Draft Report for Comment, June 1992

U.S. Nuclear Regulatory Commission (NRC), NUREG-1500 *Working Draft Regulatory Guide on Release Criteria for Decommissioning*. Draft Report for Comment, August 1994

U.S. Nuclear Regulatory Commission (NRC), NUREG-1505 *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys*. Draft Report for Comment, August 1995

U.S. Nuclear Regulatory Commission (NRC), NUREG-1506 *Measurement Methods for Radiological Surveys in Support of New Decommissioning Criteria*. Draft Report for Comment, August 1995

U.S. Nuclear Regulatory Commission (NRC), NUREG-1507 *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. Draft Report for Comment, August 1995

U.S. Nuclear Regulatory Commission (NRC) *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material*, Policy and Guidance Directive FC 83-23. November 1983

Environmental Protection Agency (EPA) EPA 540/G-93/071 *Data Quality Objectives Process for Superfund*. Washington, DC 1994

Appendix I

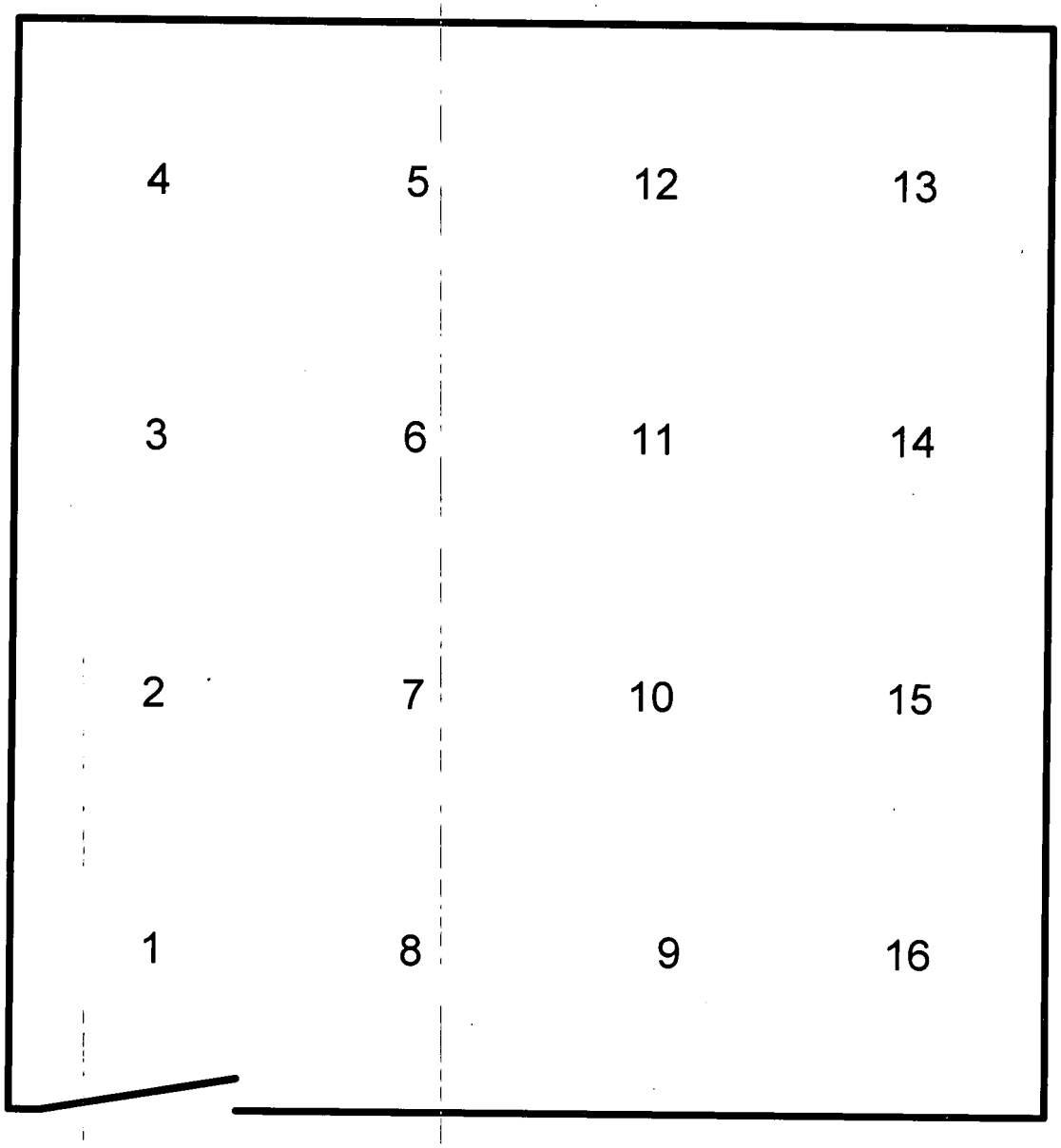
Diagrams and Smear Results

Room: 102

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

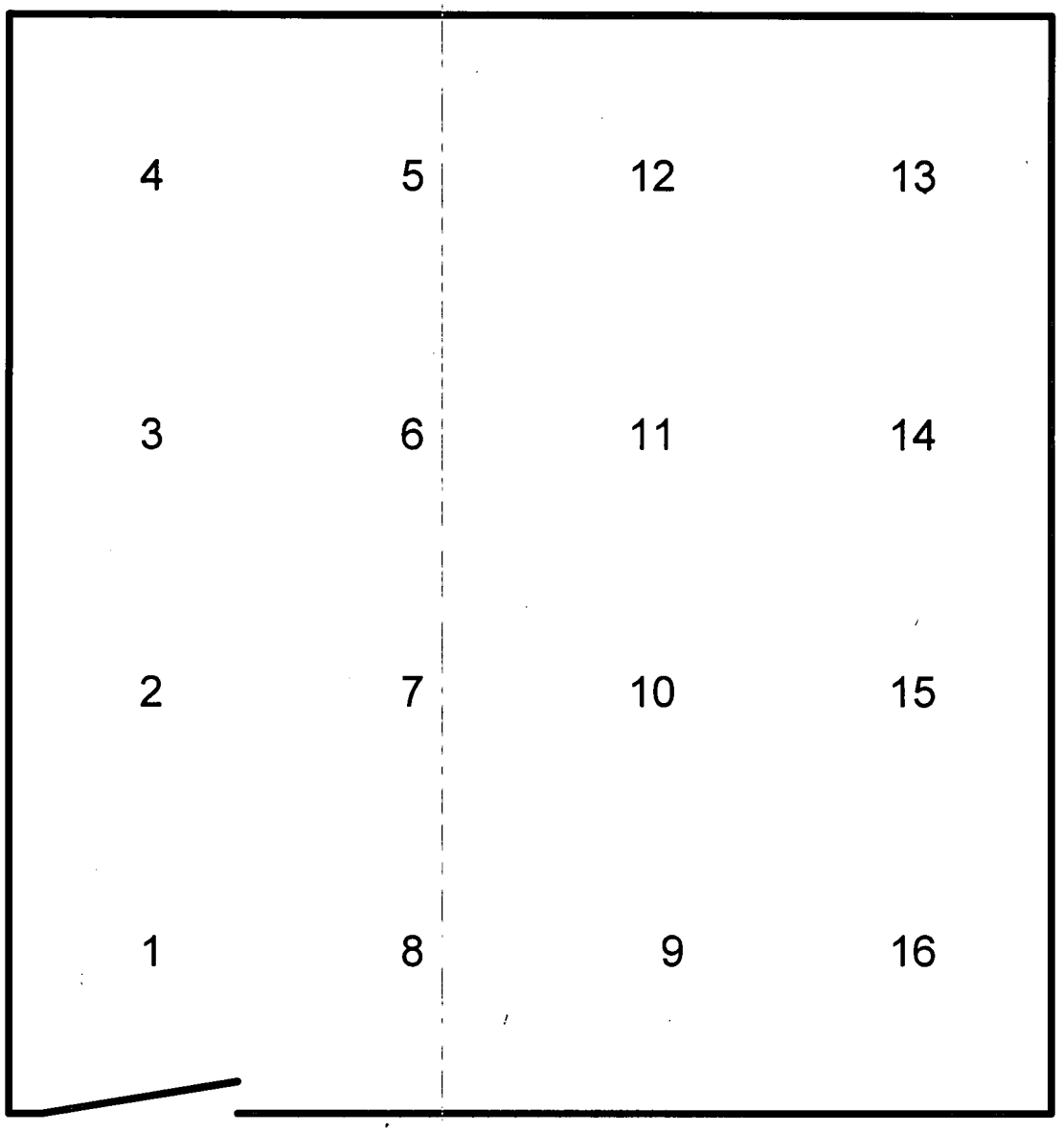
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA

Room: 103

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

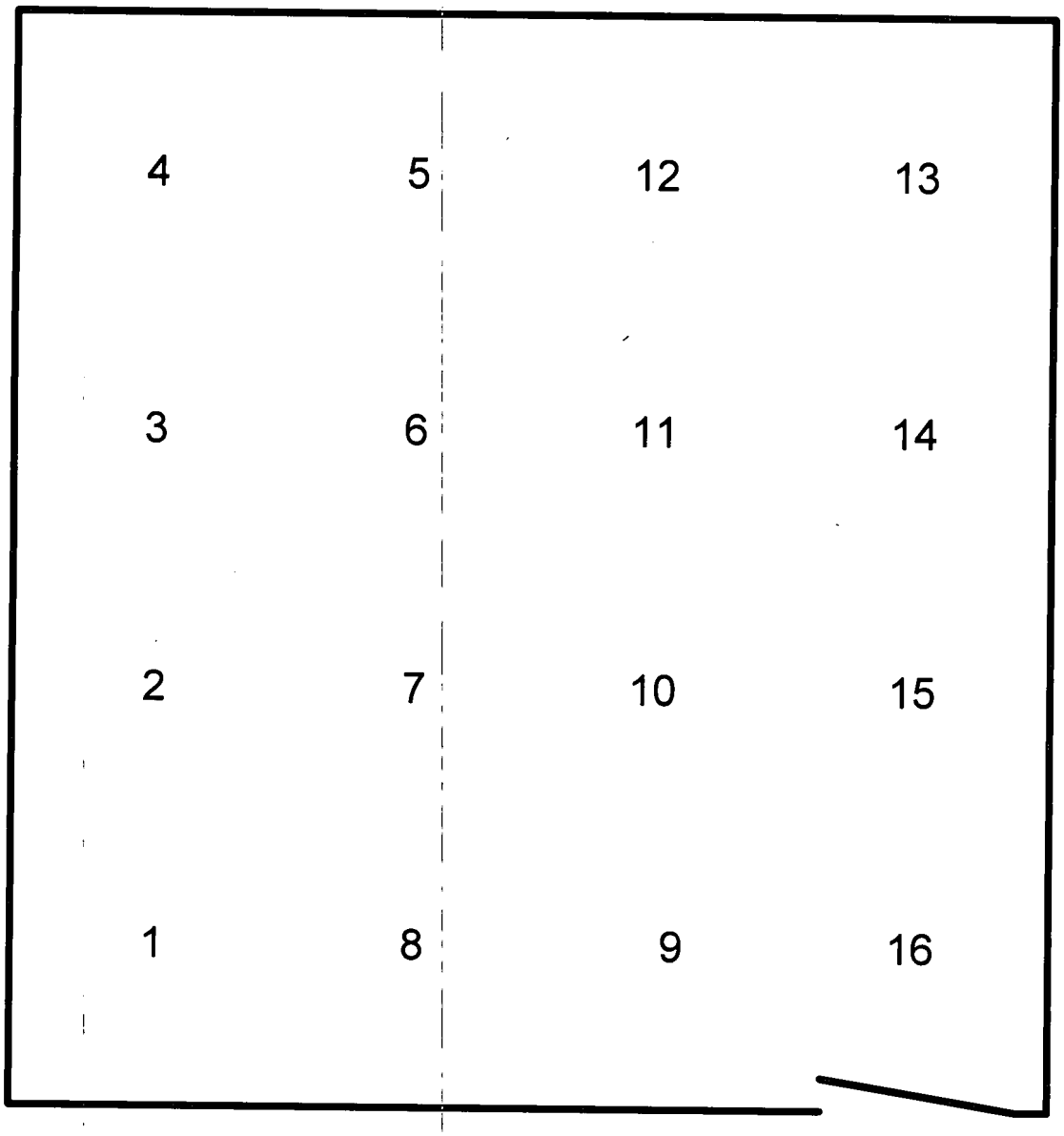
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA

Room: 104

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

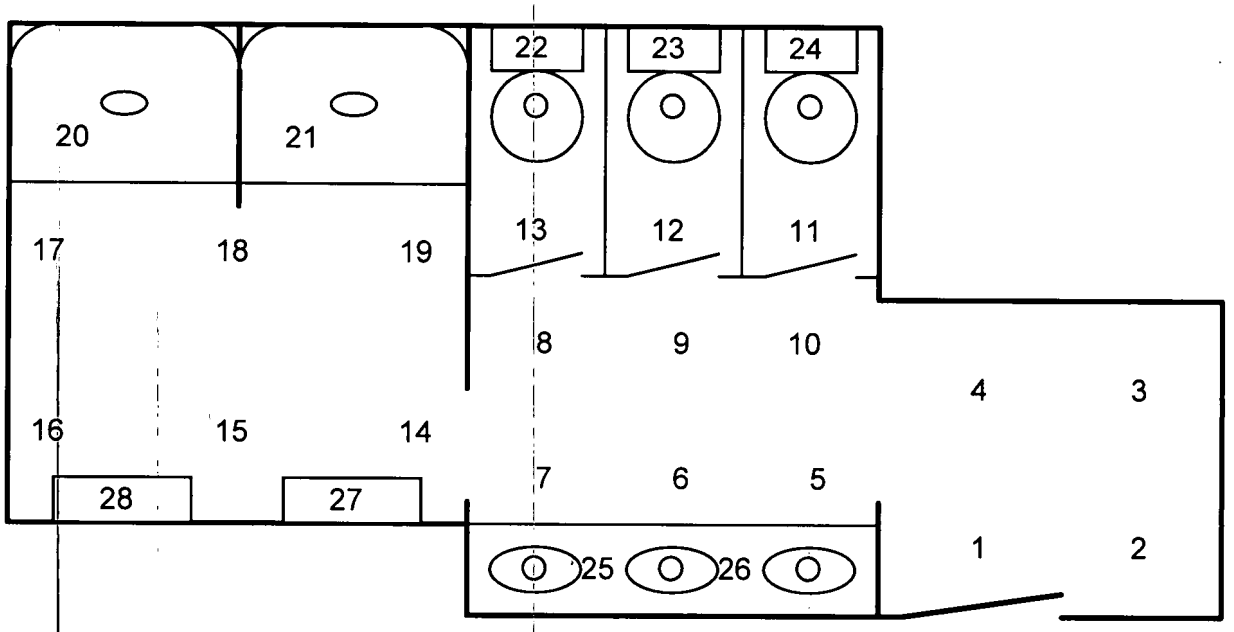
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA

Antowiak and Mahoney Enterprises, Inc.

Room: 126 (Lavatory)

Name:

Notes: Part 1, smears 1 through 20



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

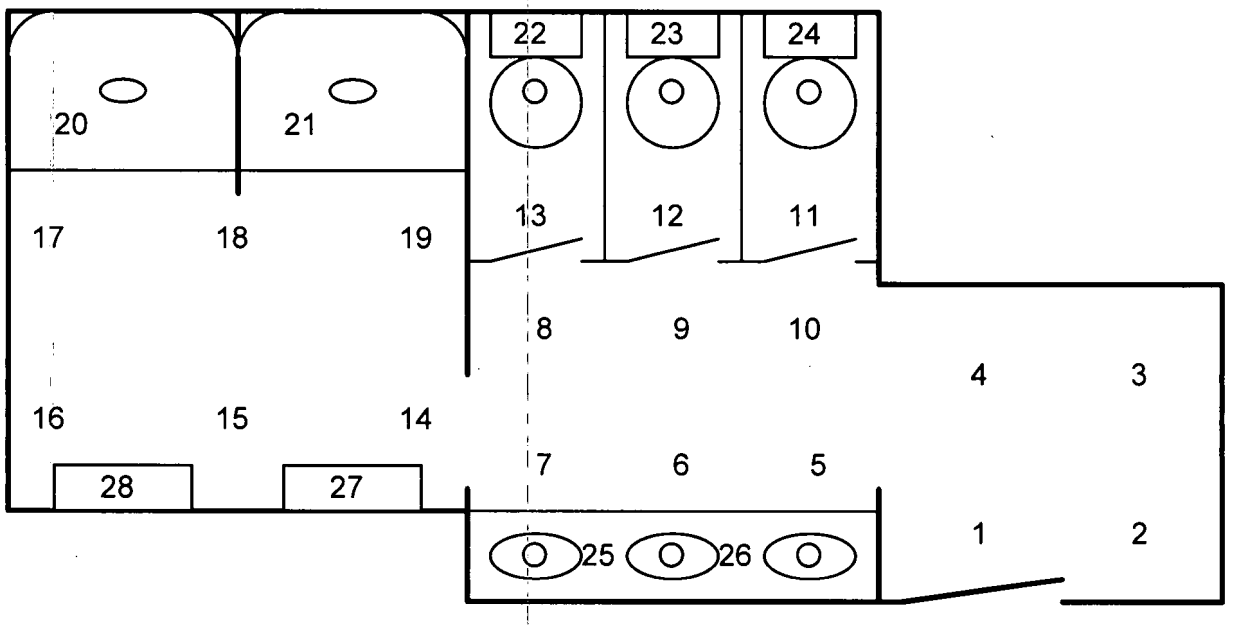
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Antkowiak and Mahoney Enterprises, Inc.

Room: 126 (Lavatory)

Name:

Notes: Part 2, smears 21 through 28



Smear Analysis Results - Analysis by Liquid Scintillation Counting

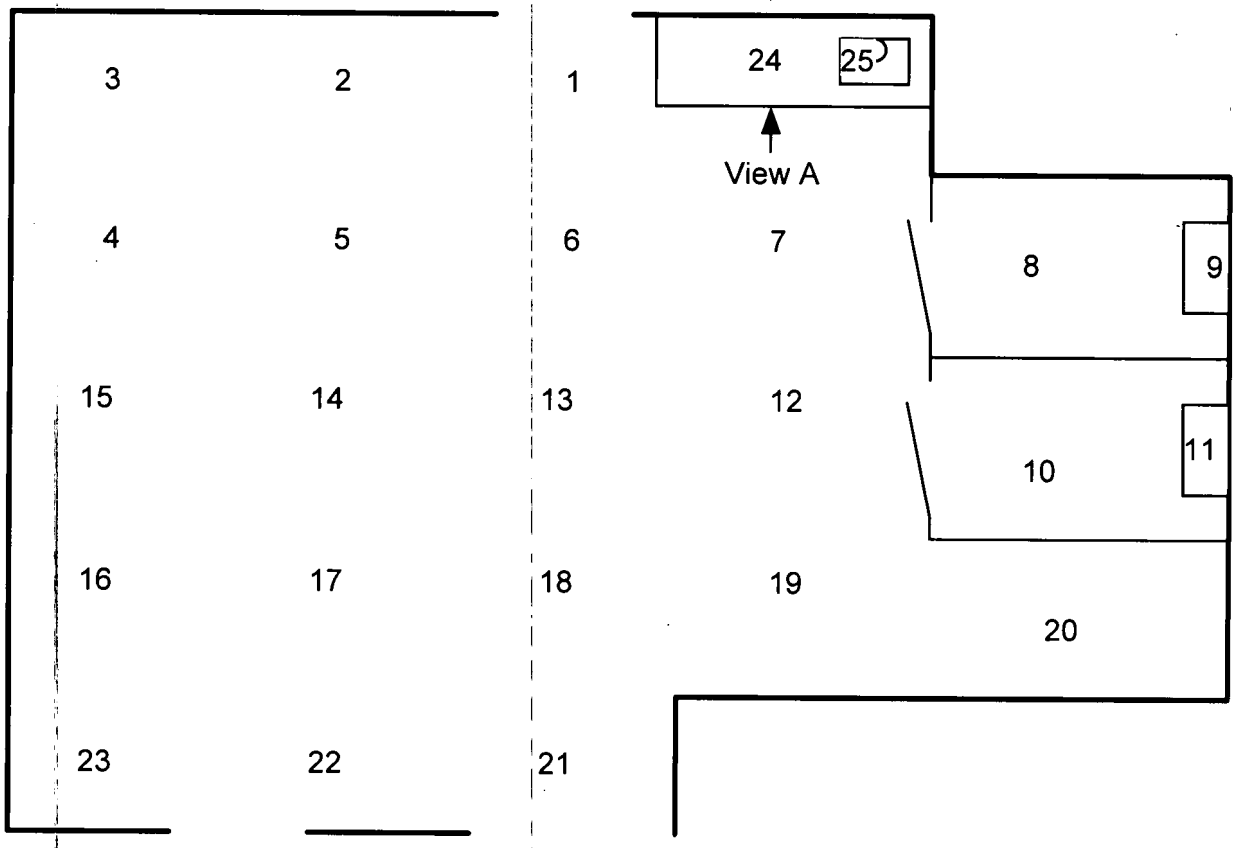
Smear ID	Channel 1	Channel 2	Channel 3	Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA				
22	<MDA	<MDA	<MDA				
23	<MDA	<MDA	<MDA				
24	<MDA	<MDA	<MDA				
25	<MDA	<MDA	<MDA				
26	<MDA	<MDA	<MDA				
27	<MDA	<MDA	<MDA				
28	<MDA	<MDA	<MDA				

Room: 154 Main View

Name:

Notes: Part 1, smears 1 through 20

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

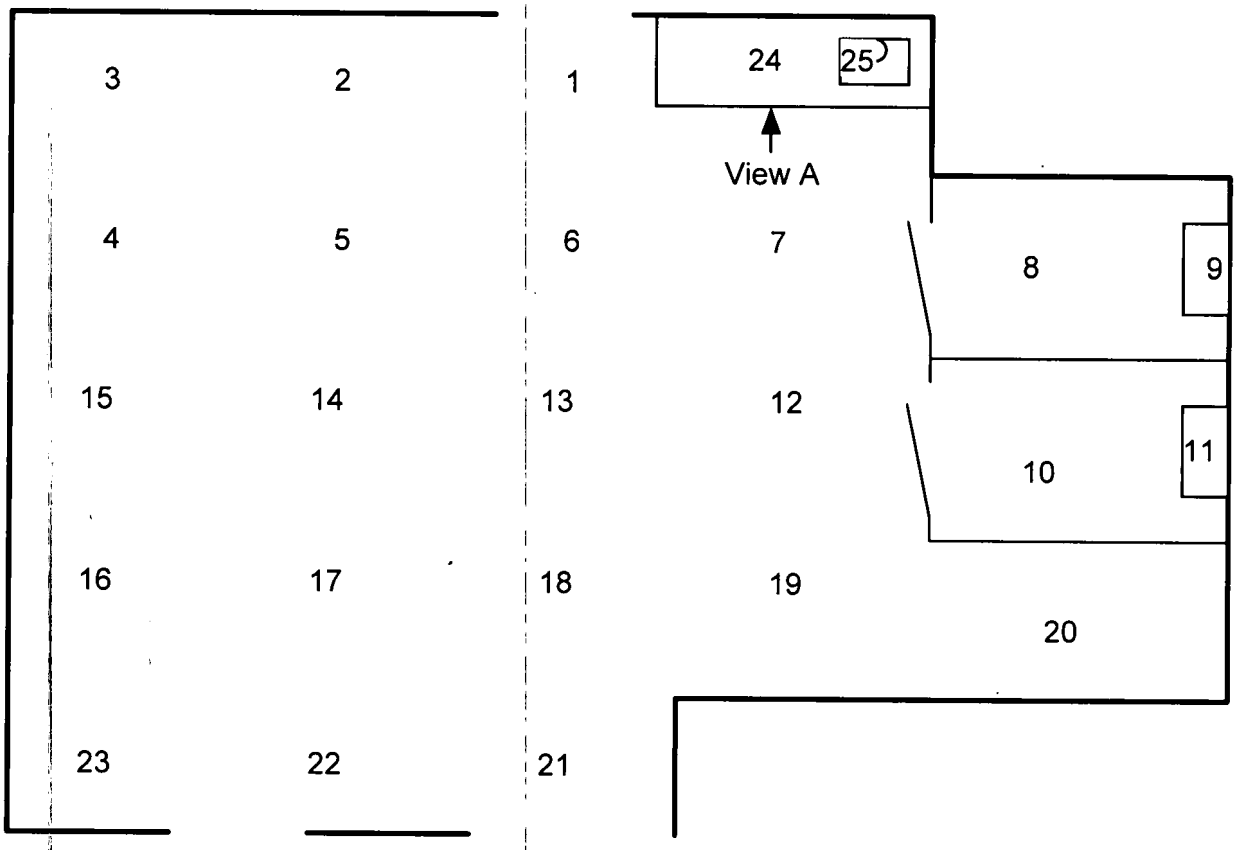
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Room: 154 Main View

Name:

Notes: Part 2, smears 21 through 25

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA
22	<MDA	<MDA	<MDA
23	<MDA	<MDA	<MDA
24	<MDA	<MDA	<MDA
25	<MDA	<MDA	<MDA

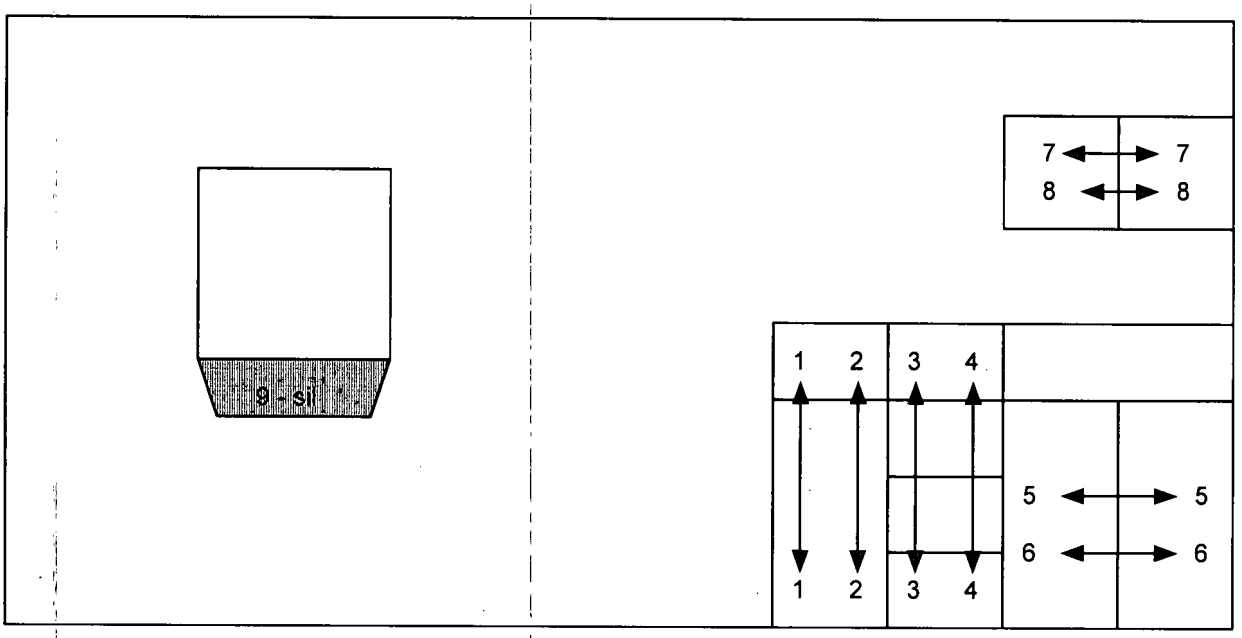
Smear ID	Channel 1	Channel 2	Channel 3

Room: 154 View A

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA

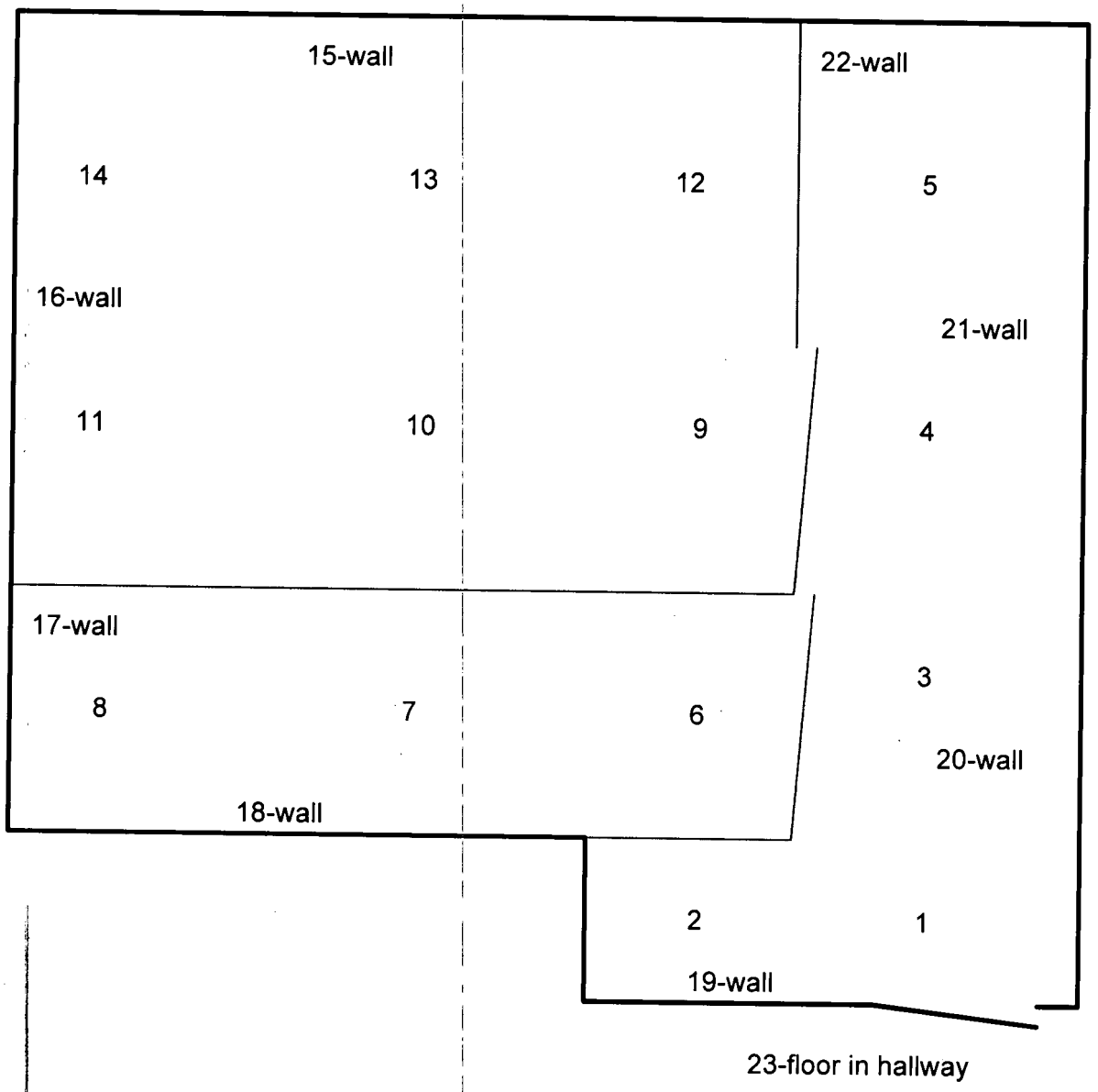
Smear ID	Channel 1	Channel 2	Channel 3

Room: 180 Waste Room

Name:

Notes: Part 1, smears 1 through 20

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

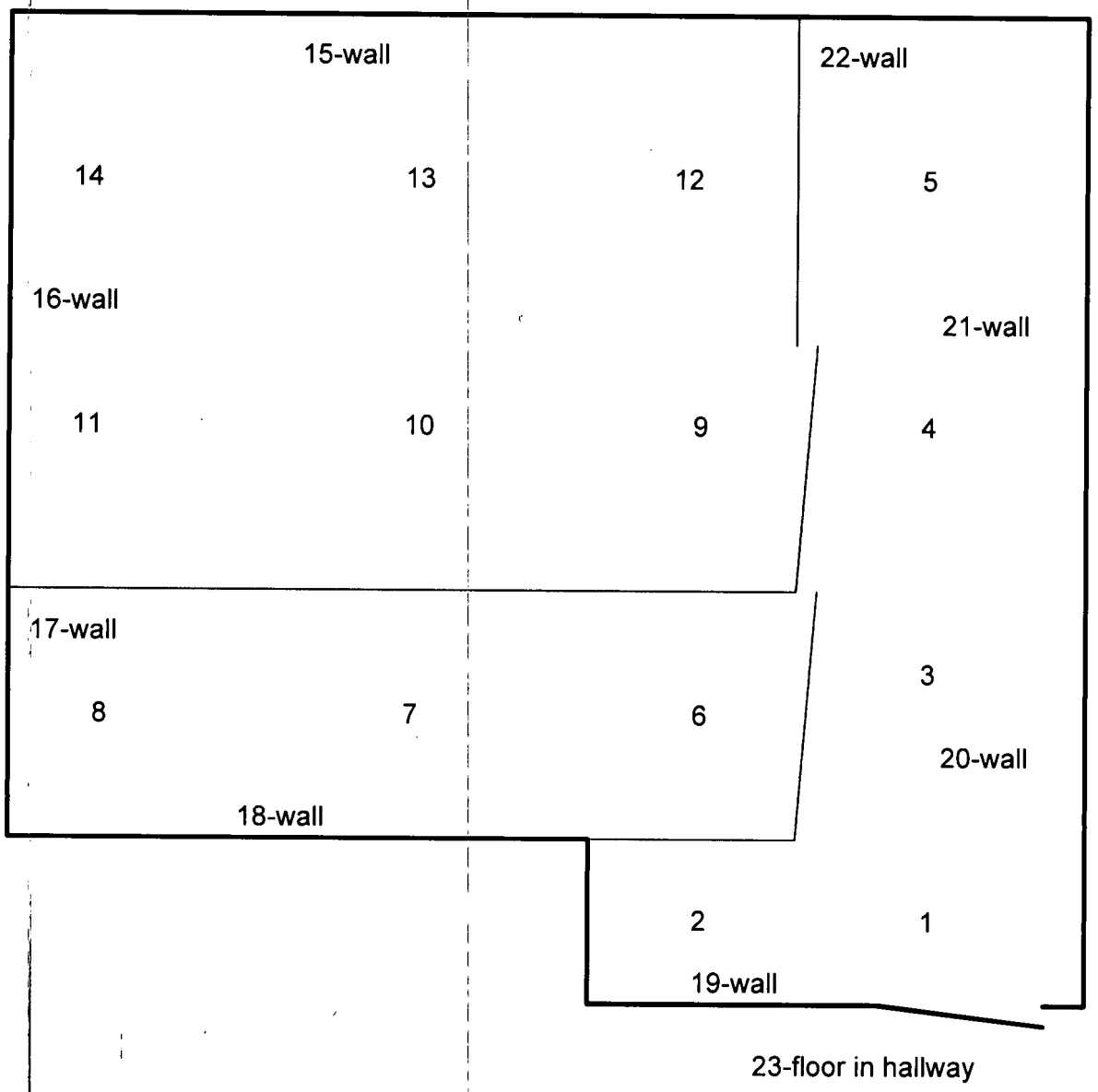
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Room: 180 Waste Room

Name:

Notes: Part 2, smears 21 through 22

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA
22	<MDA	<MDA	<MDA
23	<MDA	<MDA	<MDA

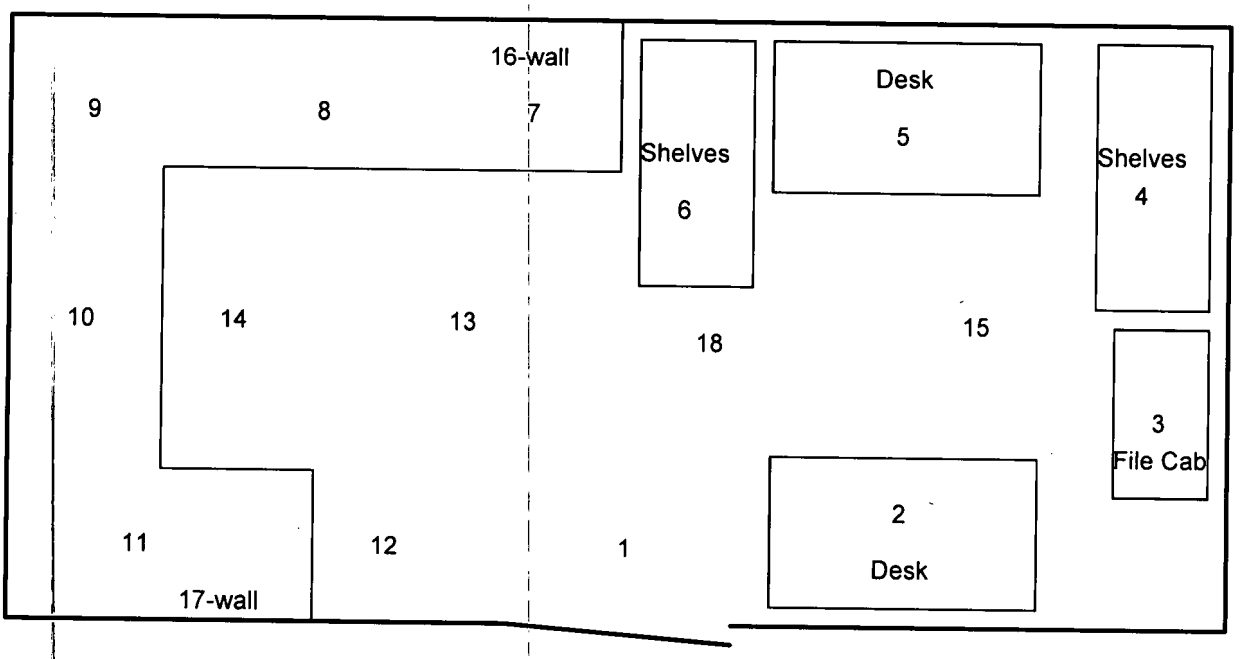
Smear ID	Channel 1	Channel 2	Channel 3

Room: 195 C

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

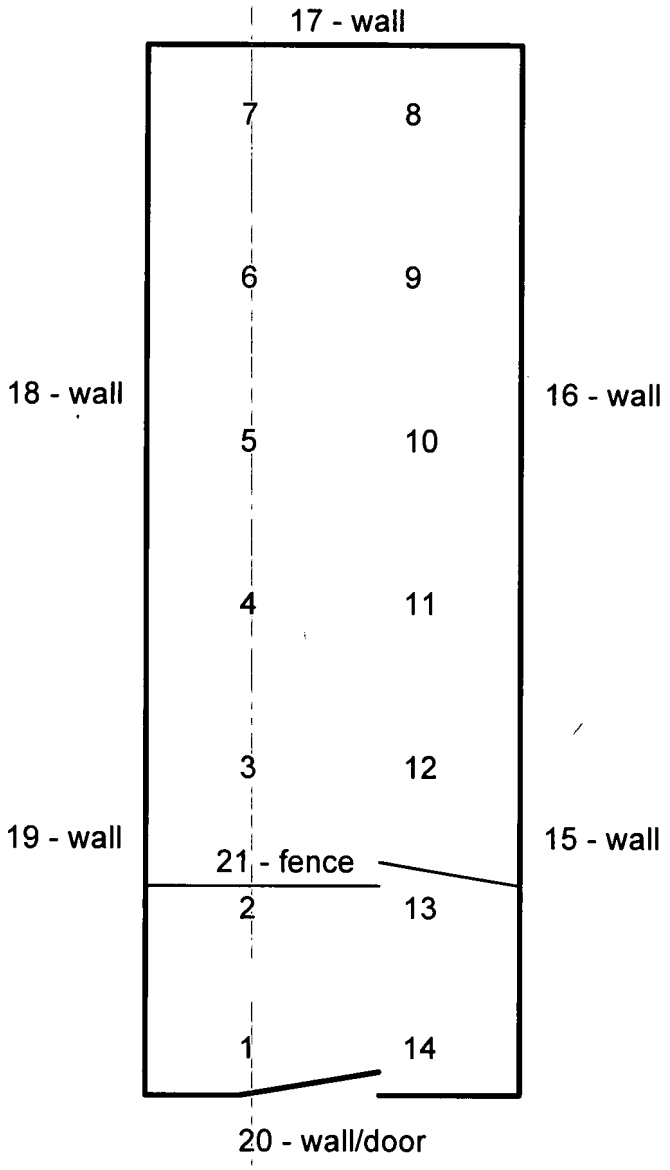
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA

Antkowiak and Mahoney Enterprises, Inc.

Room: 216

Name:

Notes: Smear #21 (Fence) was <MDA in all channels.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

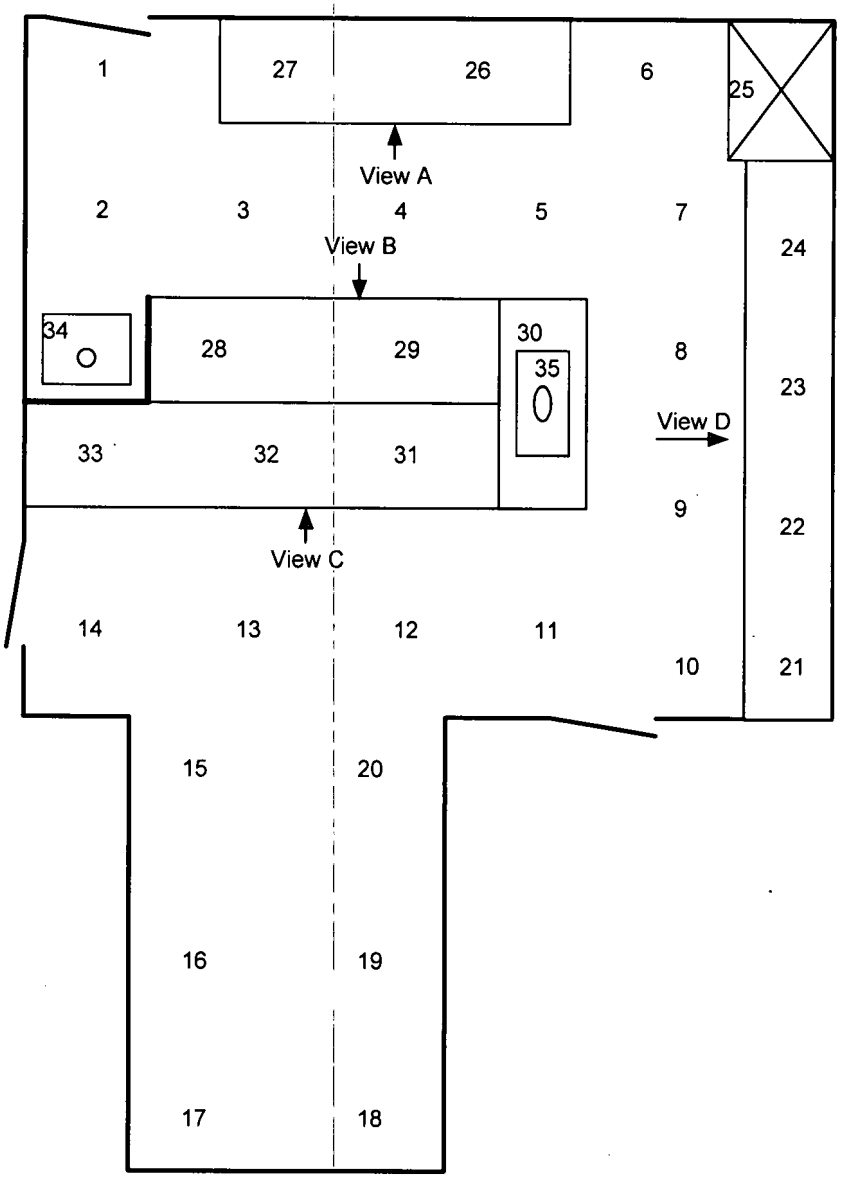
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Room: 217 Main View

Name:

Notes: Part 1, smears 1 through 20

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

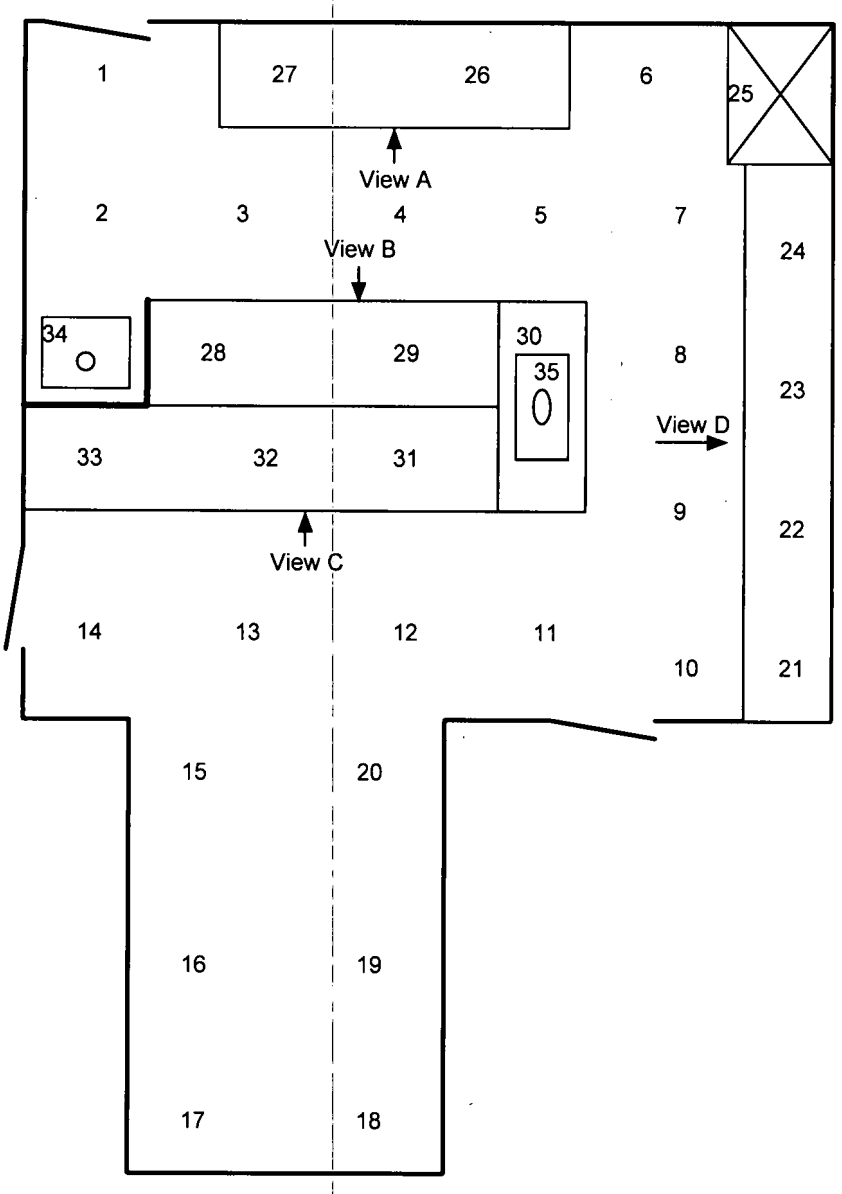
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Room: 217 Main View

Name:

Notes: Part 2 smears 21 through 35

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA
22	<MDA	<MDA	<MDA
23	<MDA	<MDA	<MDA
24	<MDA	<MDA	<MDA
25	<MDA	<MDA	<MDA
26	<MDA	<MDA	<MDA
27	<MDA	<MDA	<MDA
28	<MDA	<MDA	<MDA
29	<MDA	<MDA	<MDA
30	<MDA	<MDA	<MDA

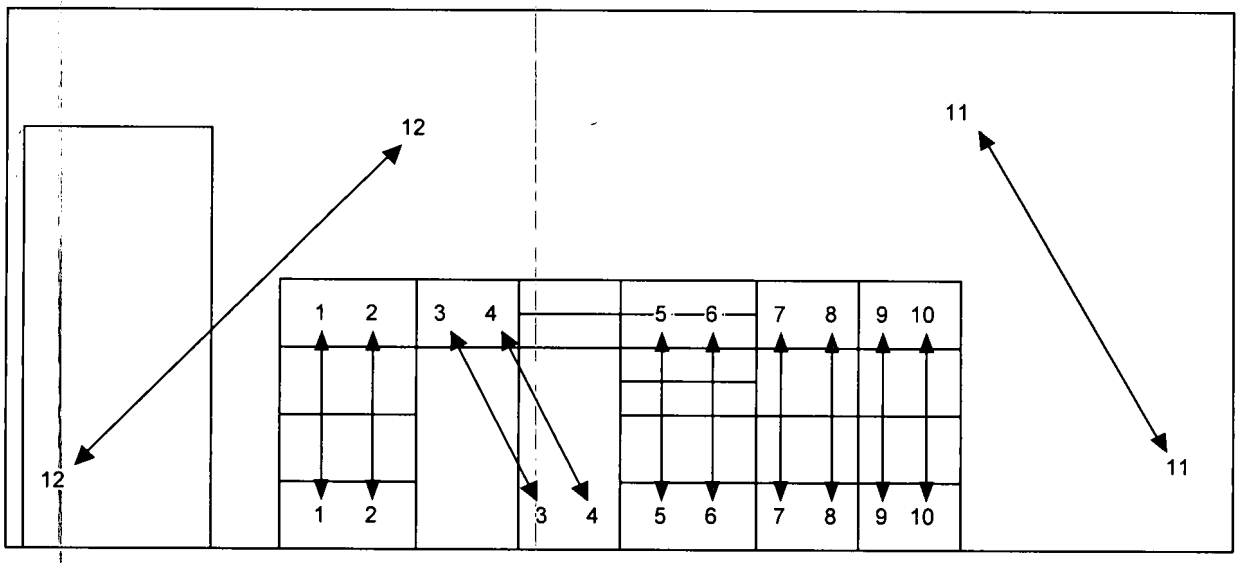
Smear ID	Channel 1	Channel 2	Channel 3
31	<MDA	<MDA	<MDA
32	<MDA	<MDA	<MDA
33	<MDA	<MDA	<MDA
34	<MDA	<MDA	<MDA
35	<MDA	<MDA	<MDA

Room: 217 View A

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

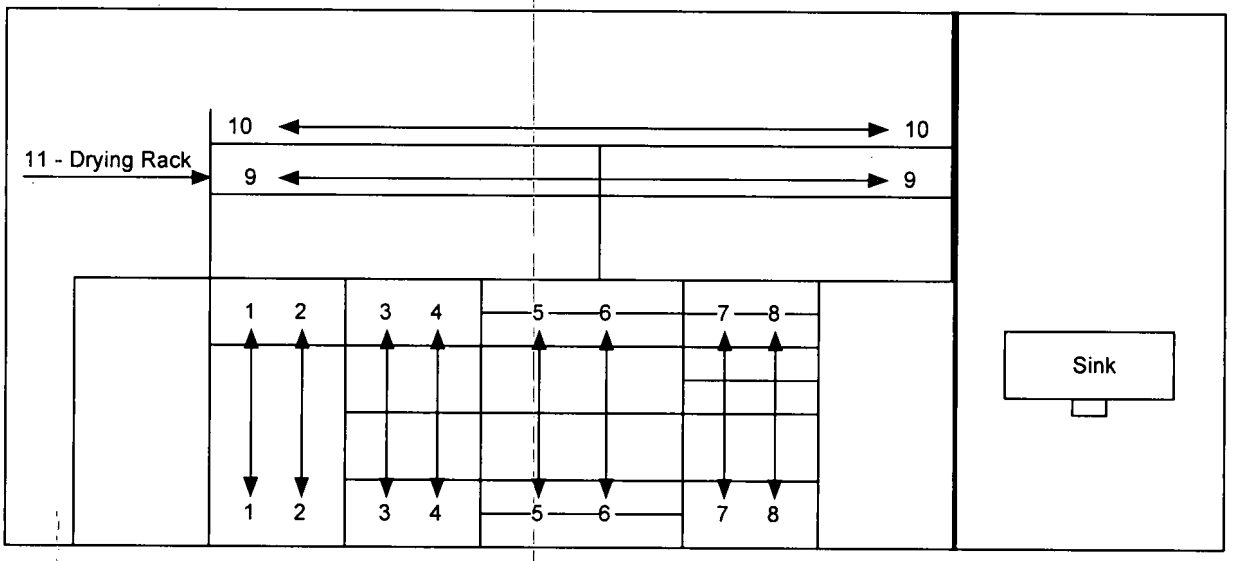
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA

Room: 217 View B

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

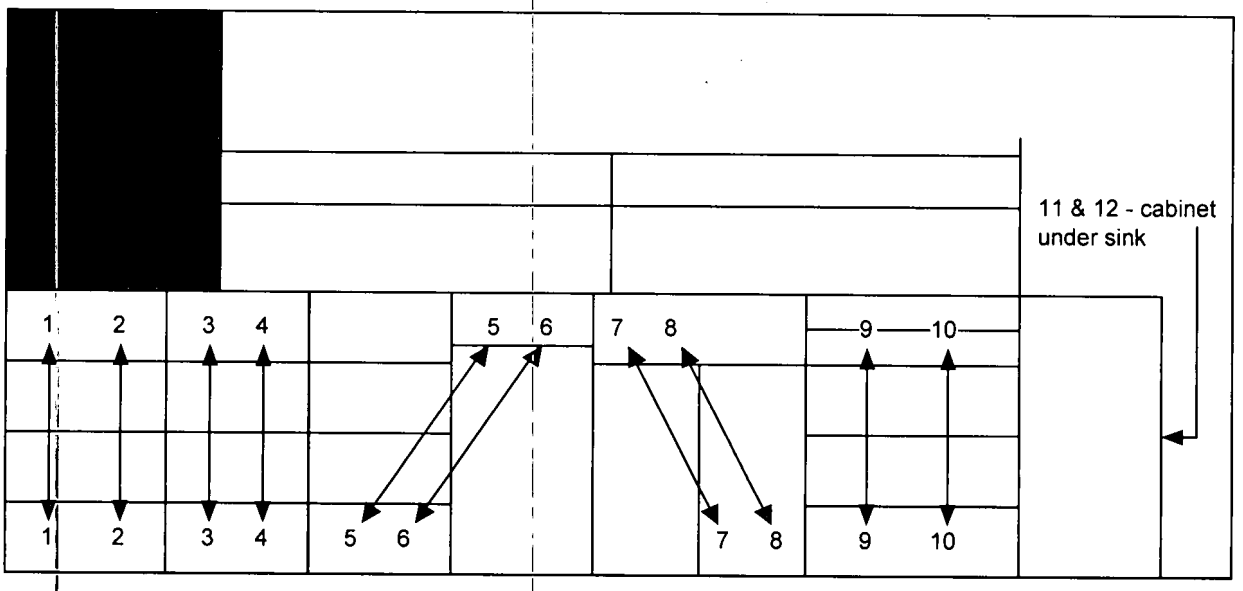
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA

Room: 217 View C

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

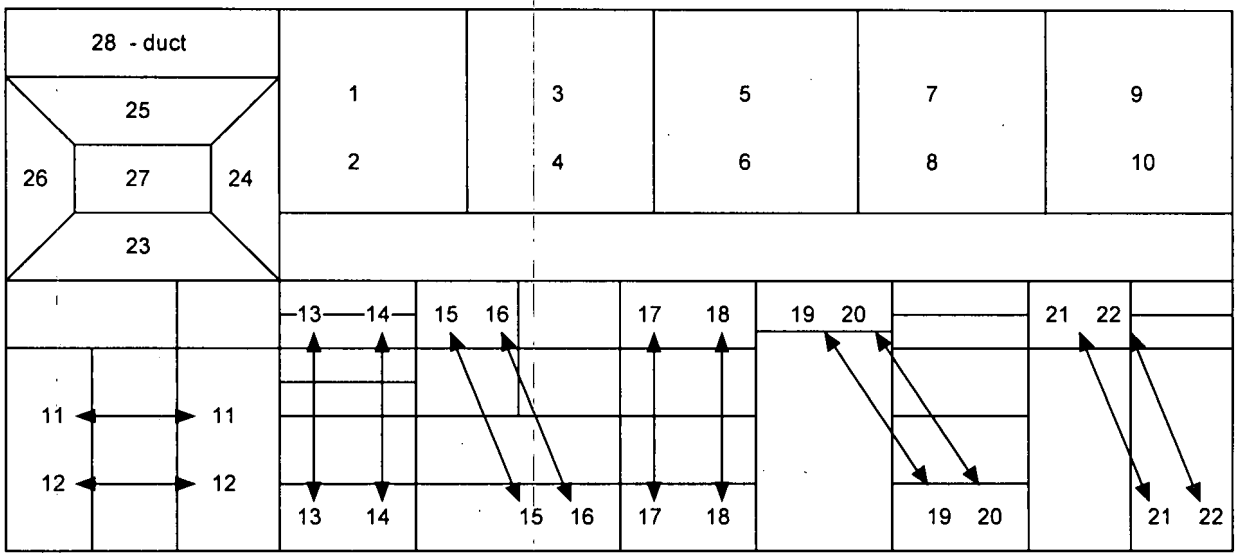
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA

Room: 217 View D

Name:

Notes: Part 1, smears 1 through 20

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

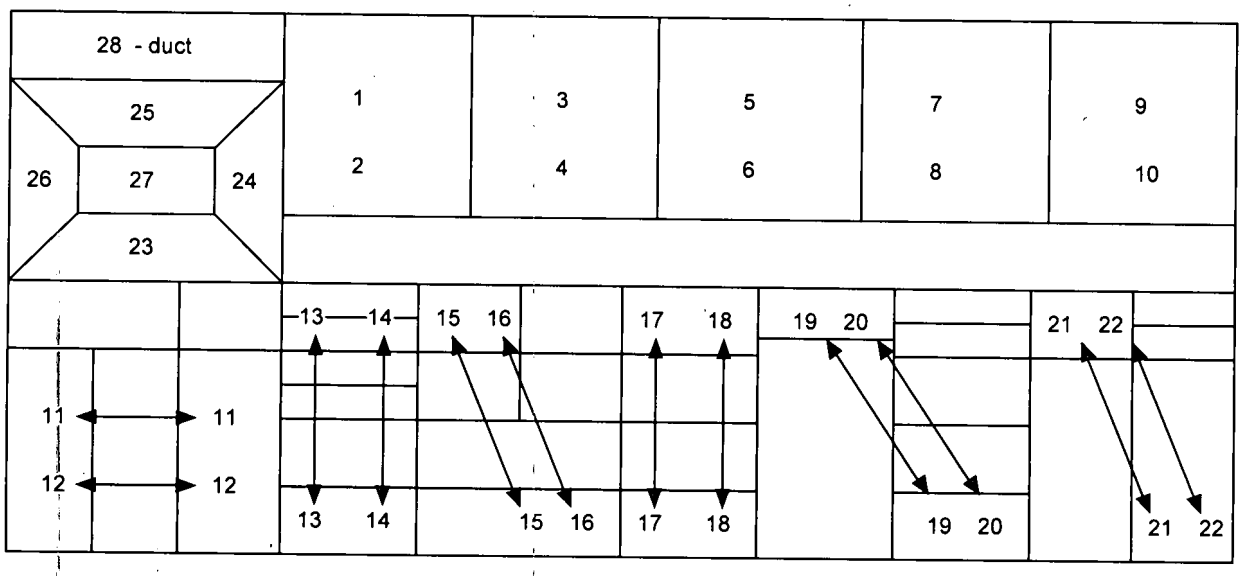
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Room: 217 View D

Name:

Notes: Part 2 smears 21 through 28

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA
22	<MDA	<MDA	<MDA
23	<MDA	<MDA	<MDA
24	<MDA	<MDA	<MDA
25	<MDA	<MDA	<MDA
26	<MDA	<MDA	<MDA
27	<MDA	<MDA	<MDA
28	<MDA	<MDA	<MDA

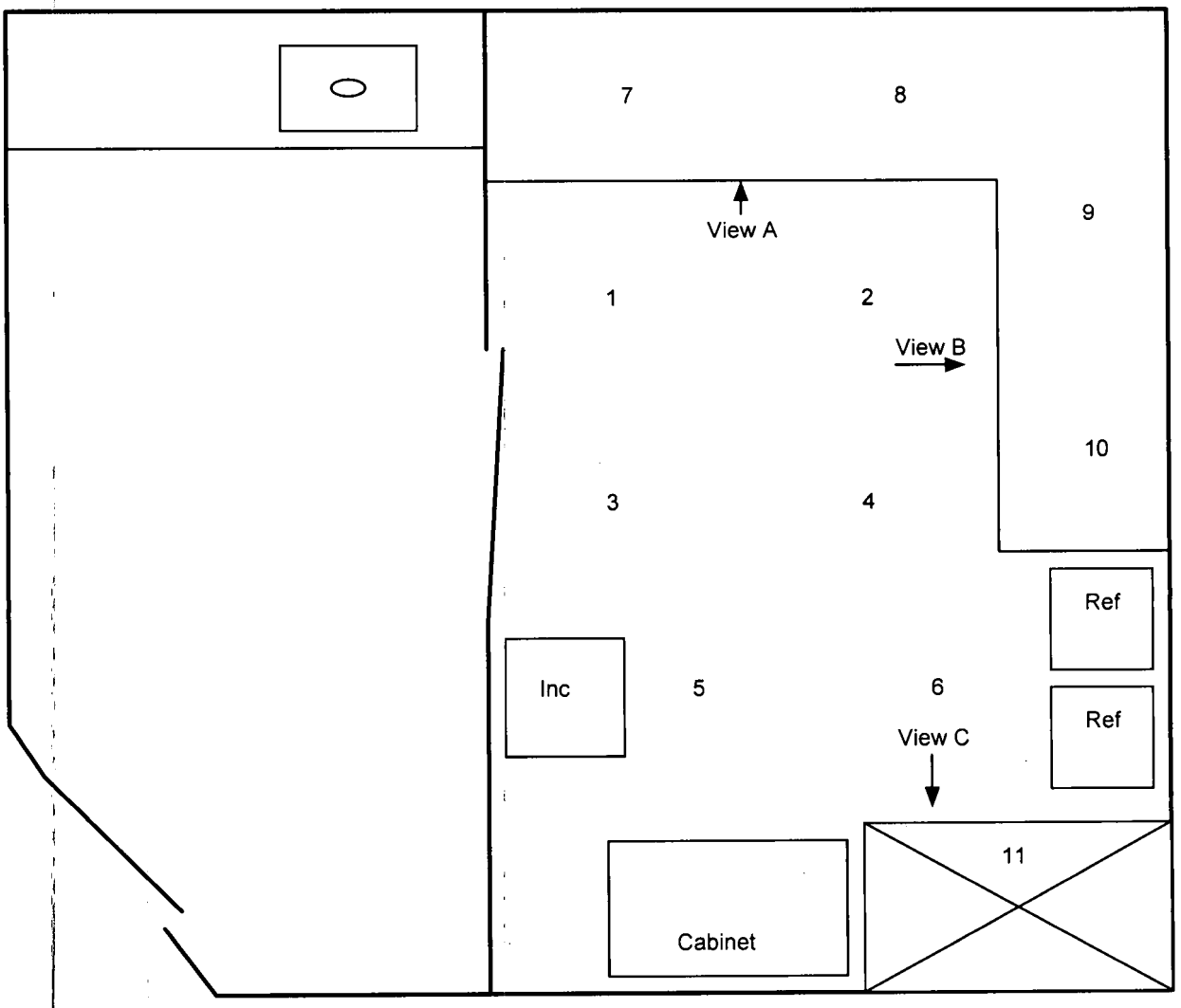
Smear ID	Channel 1	Channel 2	Channel 3

Room: 220 Main View

Name:

Notes:

Antonwiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

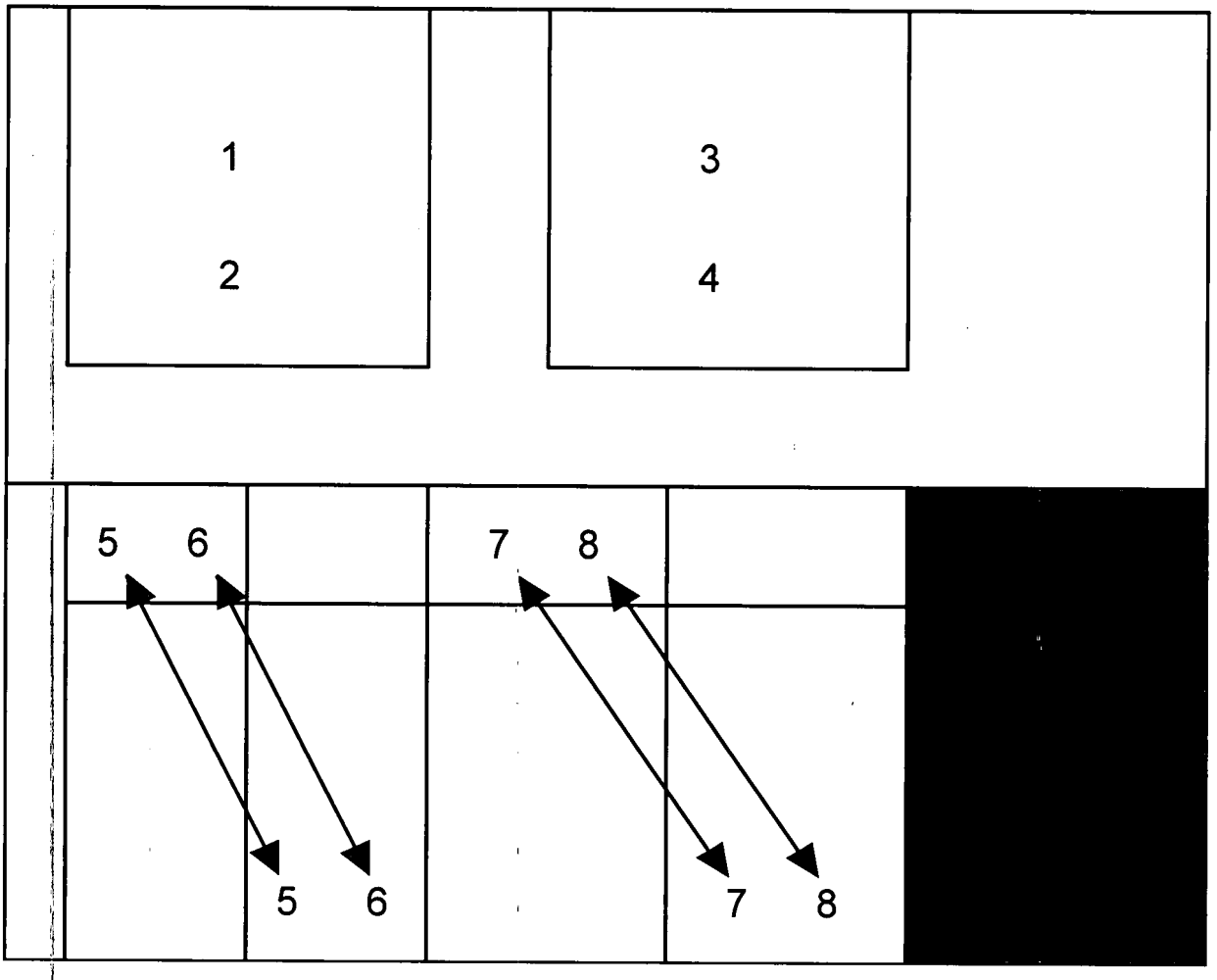
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA

Room: 220 View A

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA

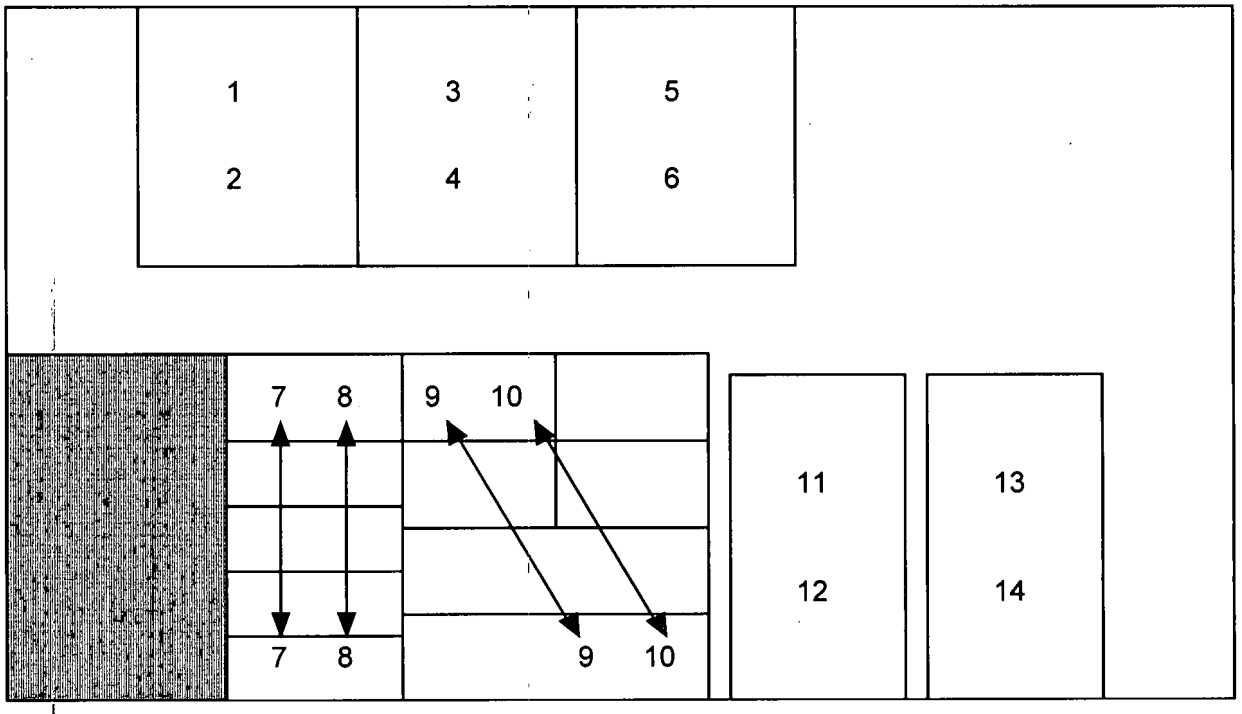
Smear ID	Channel 1	Channel 2	Channel 3

Room: 220 View B

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

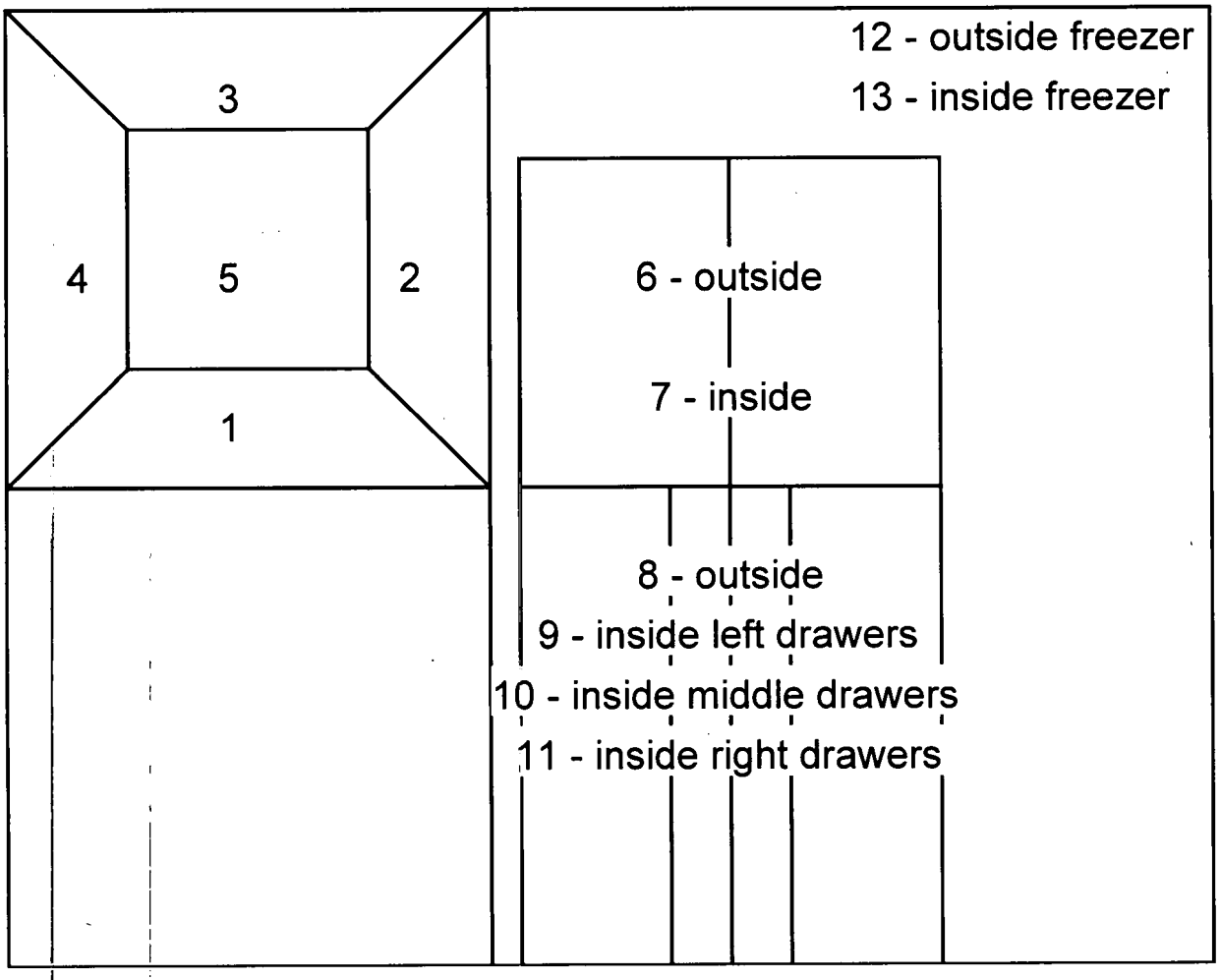
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA

Room: 220 View C

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

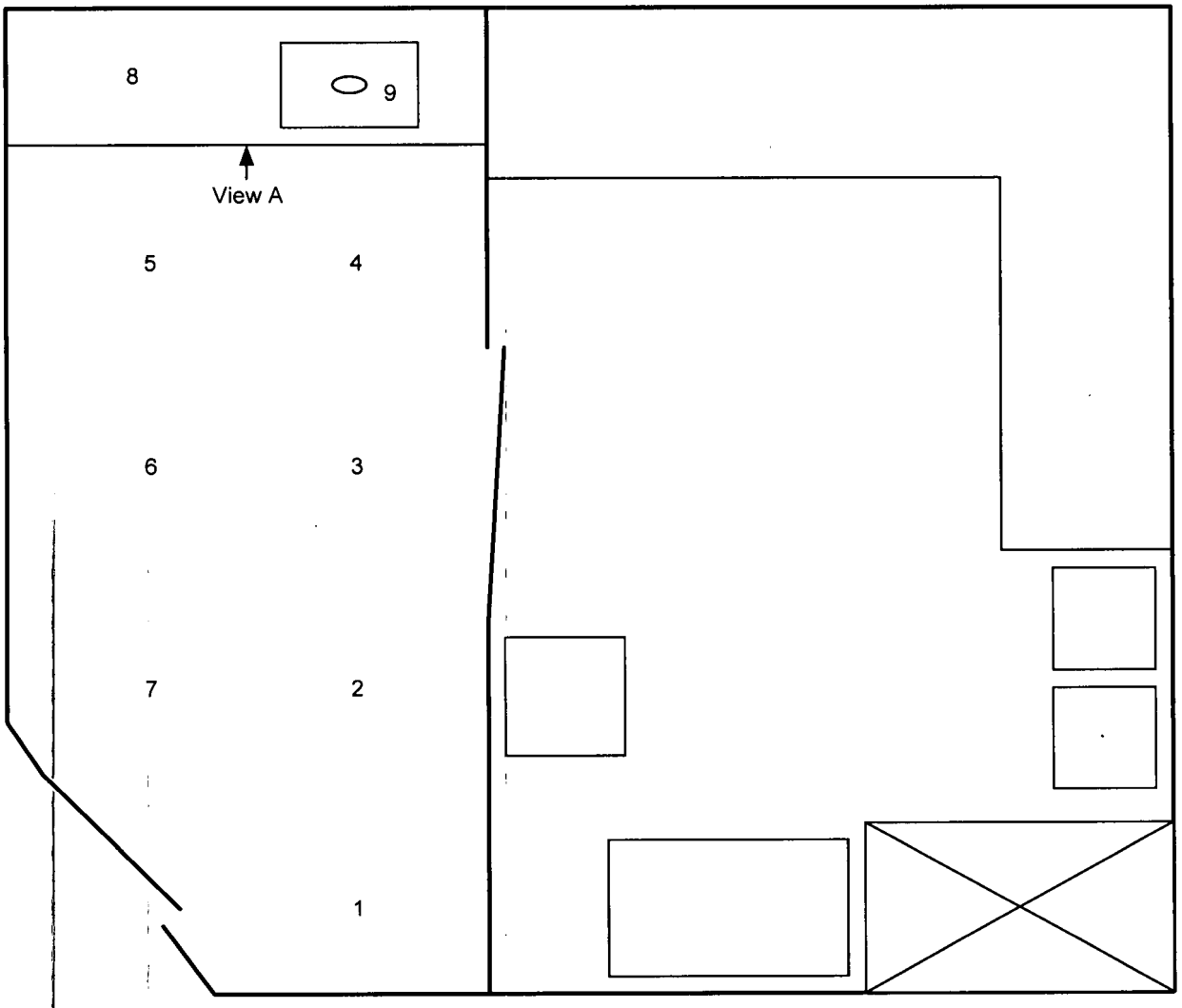
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA

Room: 221 Main View

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA

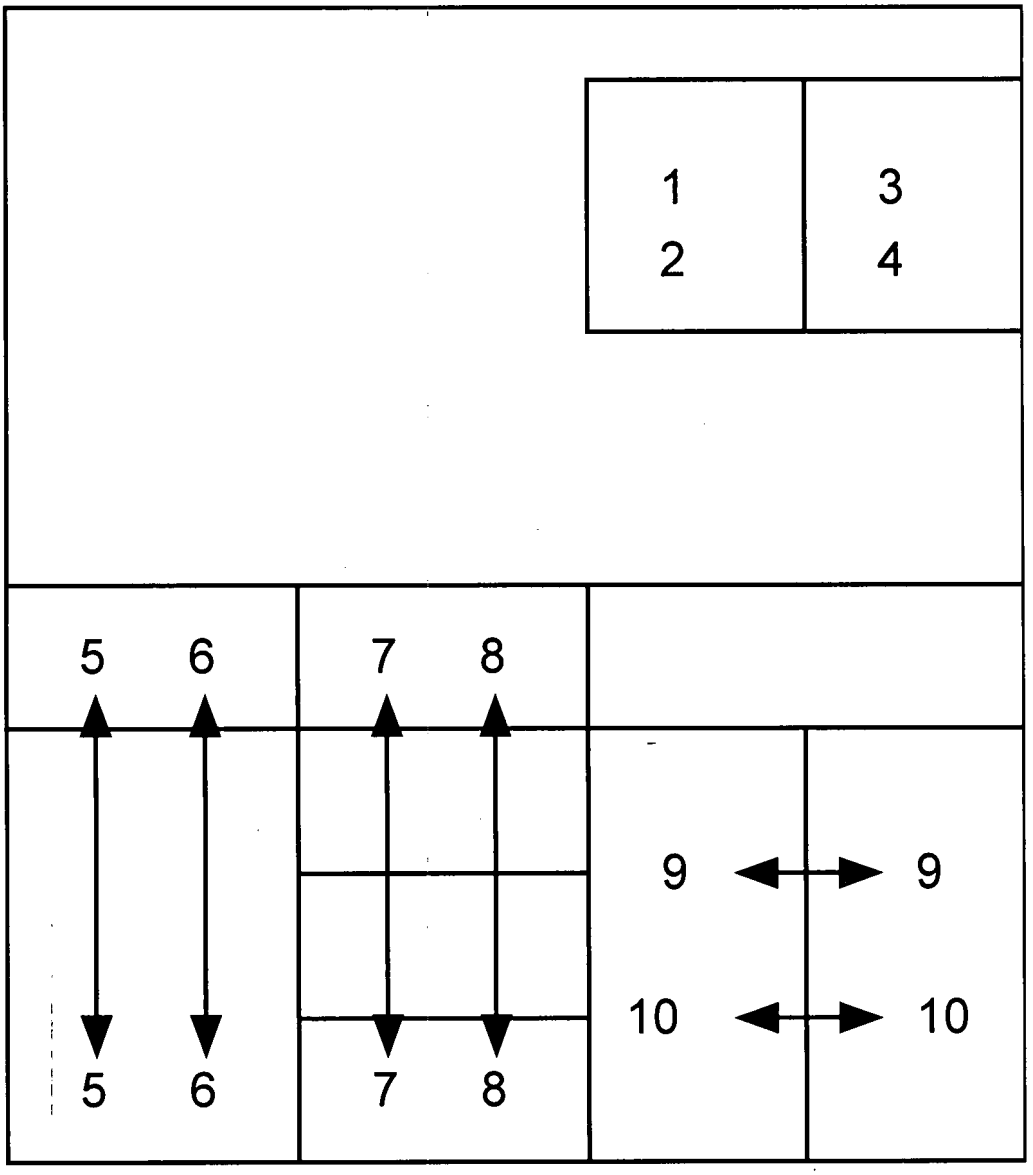
Smear ID	Channel 1	Channel 2	Channel 3

Room: 221 View A

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

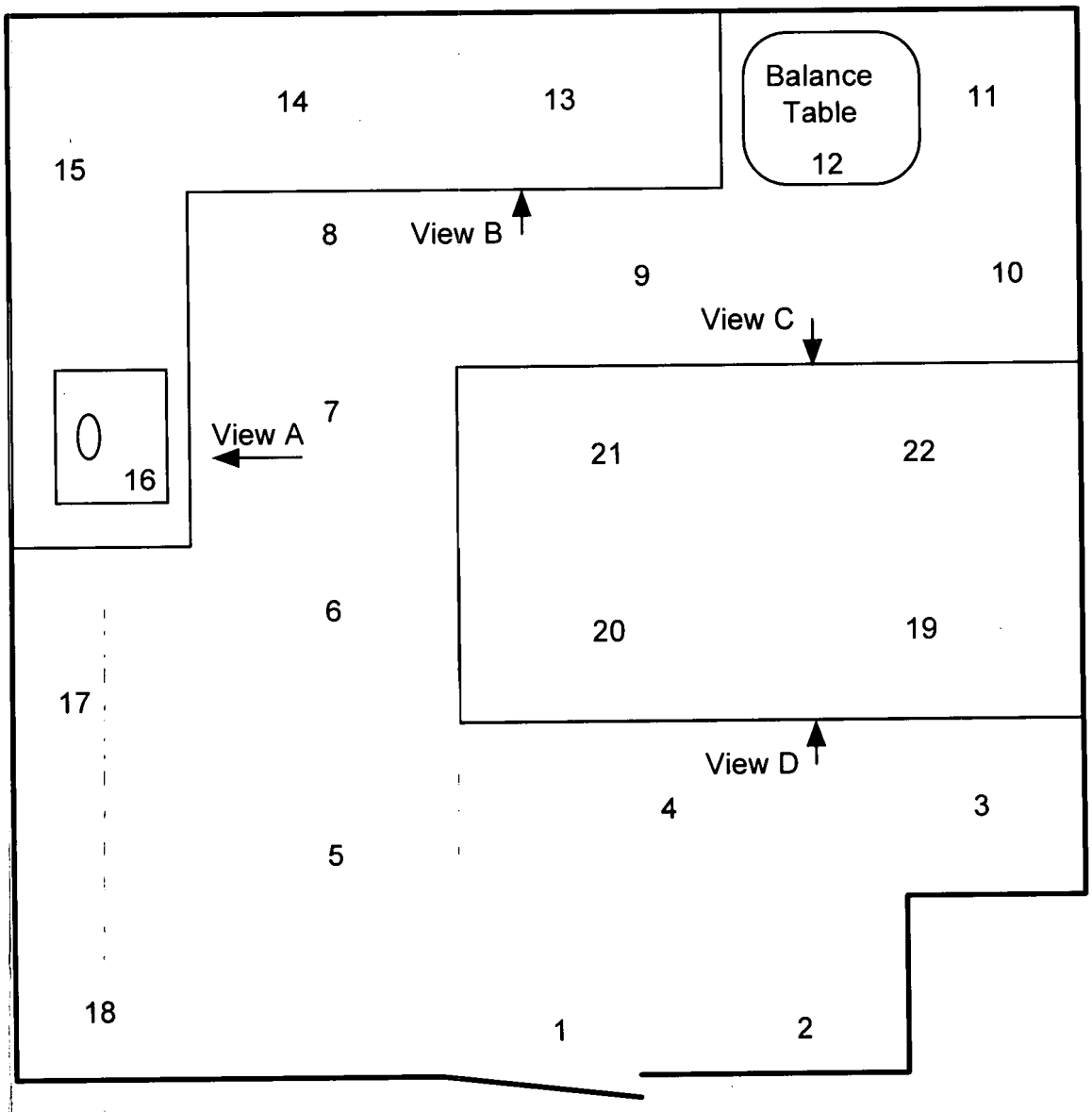
Smear ID	Channel 1	Channel 2	Channel 3

Antkowiak and Mahoney Enterprises, Inc.

Room: 242 Main View

Name:

Notes: Part 1, smears 1 through 20



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

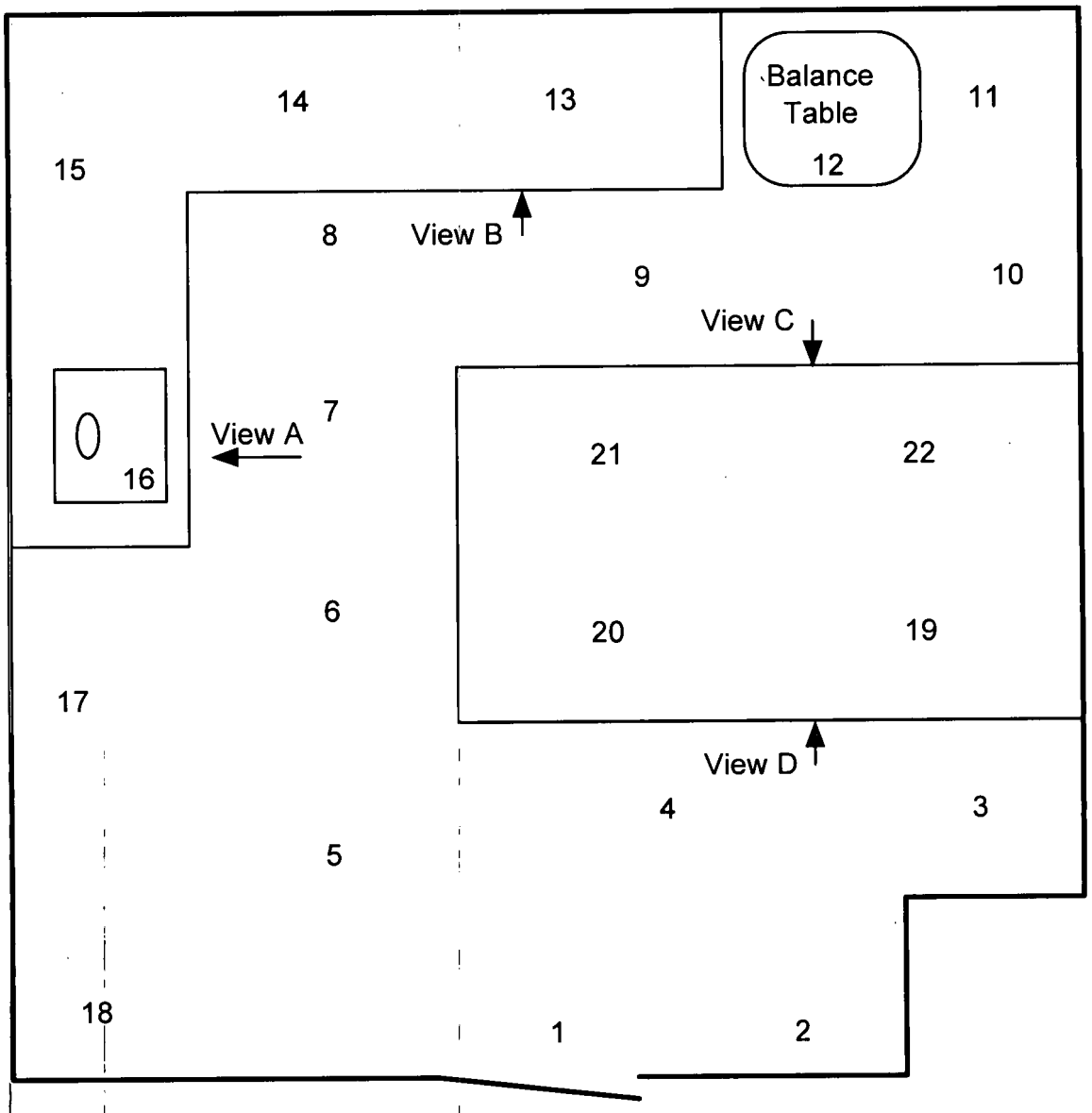
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA
19	<MDA	<MDA	<MDA
20	<MDA	<MDA	<MDA

Antkowiak and Mahoney Enterprises, Inc.

Room: 242 Main View

Name:

Notes: Part 2, smears 21 through 22



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
21	<MDA	<MDA	<MDA
22	<MDA	<MDA	<MDA

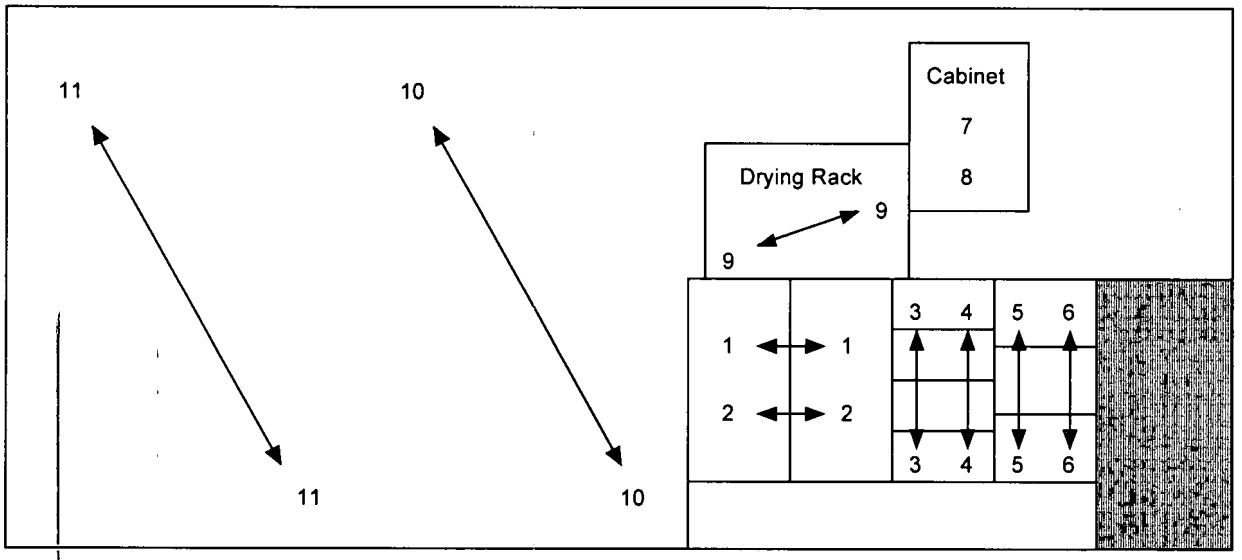
Smear ID	Channel 1	Channel 2	Channel 3

Room: 242 View A

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

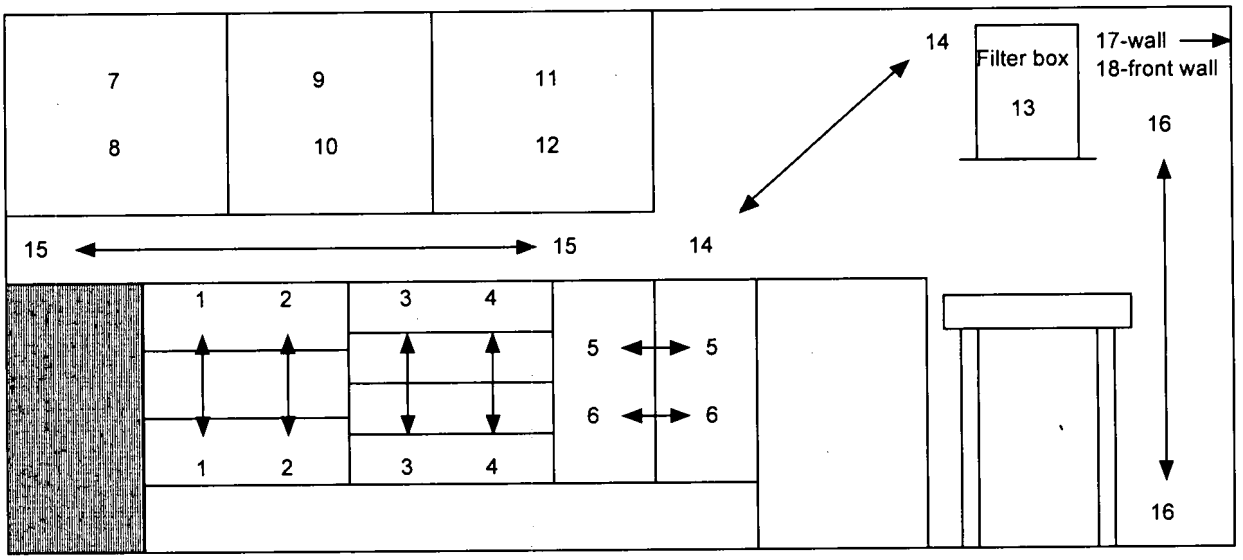
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA

Room: 242 View B

Name:

Notes:

Antowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

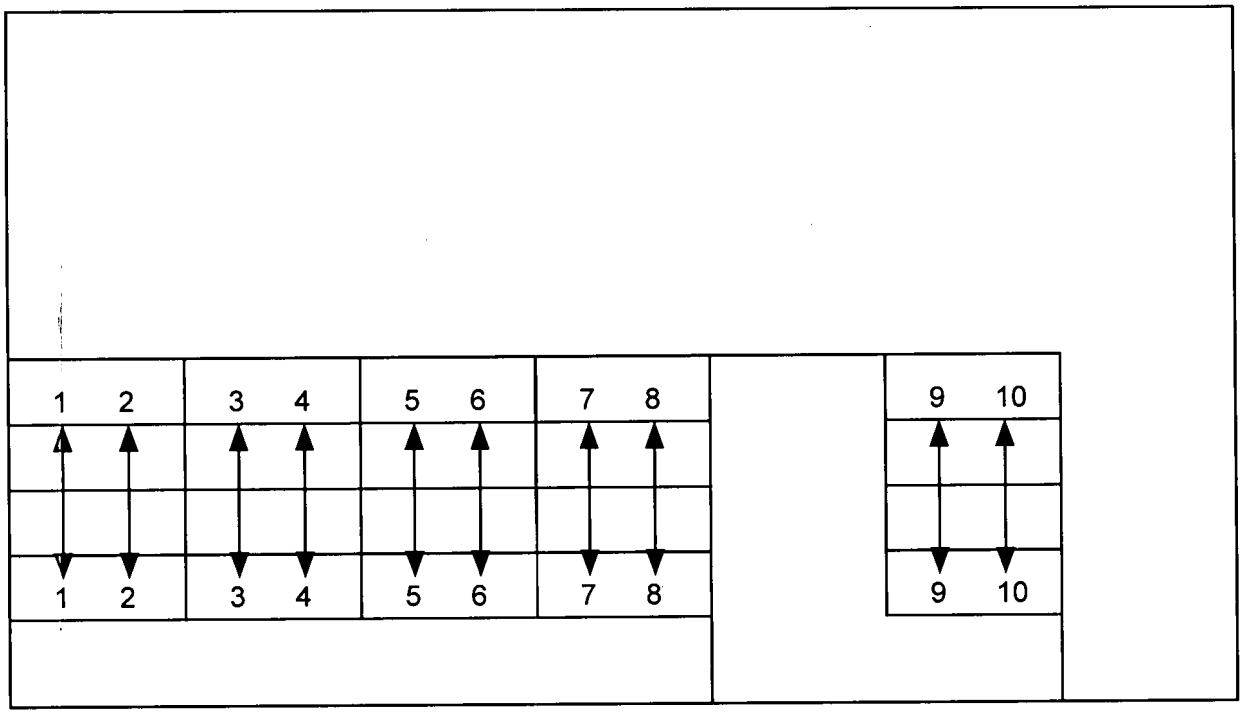
Smear ID	Channel 1	Channel 2	Channel 3
11	<MDA	<MDA	<MDA
12	<MDA	<MDA	<MDA
13	<MDA	<MDA	<MDA
14	<MDA	<MDA	<MDA
15	<MDA	<MDA	<MDA
16	<MDA	<MDA	<MDA
17	<MDA	<MDA	<MDA
18	<MDA	<MDA	<MDA

Room: 242 View C

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA
9	<MDA	<MDA	<MDA
10	<MDA	<MDA	<MDA

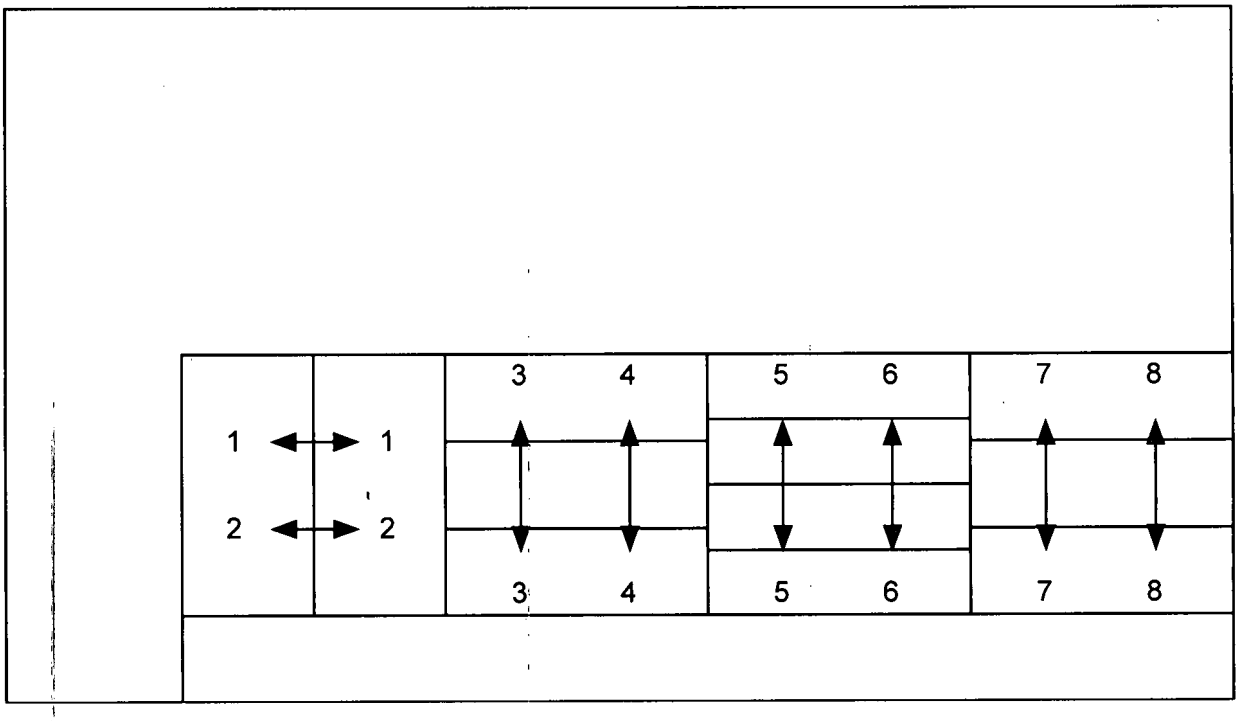
Smear ID	Channel 1	Channel 2	Channel 3

Room: 242 View D

Name:

Notes:

Antkowiak and Mahoney Enterprises, Inc.



Smear Analysis Results - Analysis by Liquid Scintillation Counting

Smear ID	Channel 1	Channel 2	Channel 3
1	<MDA	<MDA	<MDA
2	<MDA	<MDA	<MDA
3	<MDA	<MDA	<MDA
4	<MDA	<MDA	<MDA
5	<MDA	<MDA	<MDA
6	<MDA	<MDA	<MDA
7	<MDA	<MDA	<MDA
8	<MDA	<MDA	<MDA

Smear ID	Channel 1	Channel 2	Channel 3

Appendix II

Scalar Measurements Results

Scalar Measurements - Room 102

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 102	1	265	<MDA
Room 102	2	321	<MDA
Room 102	3	271	<MDA
Room 102	4	302	<MDA
Room 102	5	308	<MDA
Room 102	6	273	<MDA
Room 102	7	325	<MDA
Room 102	8	332	<MDA
Room 102	9	258	<MDA
Room 102	10	248	<MDA
Room 102	11	284	<MDA
Room 102	12	296	<MDA
Room 102	13	315	<MDA
Room 102	14	300	<MDA
Room 102	15	264	<MDA
Room 102	16	279	<MDA

Scalar Measurements - Room 103

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 103	1	293	<MDA
Room 103	2	316	<MDA
Room 103	3	285	<MDA
Room 103	4	276	<MDA
Room 103	5	349	<MDA
Room 103	6	275	<MDA
Room 103	7	294	<MDA
Room 103	8	304	<MDA
Room 103	9	309	<MDA
Room 103	10	312	<MDA
Room 103	11	291	<MDA
Room 103	12	323	<MDA
Room 103	13	308	<MDA
Room 103	14	286	<MDA
Room 103	15	322	<MDA
Room 103	16	289	<MDA

Scalar Measurements - Room 104

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 104	1	285	<MDA
Room 104	2	307	<MDA
Room 104	3	268	<MDA
Room 104	4	278	<MDA
Room 104	5	326	<MDA
Room 104	6	279	<MDA
Room 104	7	283	<MDA
Room 104	8	284	<MDA
Room 104	9	296	<MDA
Room 104	10	336	<MDA
Room 104	11	330	<MDA
Room 104	12	281	<MDA
Room 104	13	308	<MDA
Room 104	14	301	<MDA
Room 104	15	354	<MDA
Room 104	16	308	<MDA

Scalar Measurements - Room 126 (Lavatory)

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 126	1	313	<MDA
Room 126	2	277	<MDA
Room 126	3	286	<MDA
Room 126	4	336	<MDA
Room 126	5	293	<MDA
Room 126	6	266	<MDA
Room 126	7	302	<MDA
Room 126	8	315	<MDA
Room 126	9	279	<MDA
Room 126	10	354	<MDA
Room 126	11	309	<MDA
Room 126	12	324	<MDA
Room 126	13	357	<MDA
Room 126	14	323	<MDA
Room 126	15	290	<MDA
Room 126	16	283	<MDA
Room 126	17	294	<MDA
Room 126	18	293	<MDA
Room 126	19	288	<MDA
Room 126	20	296	<MDA
Room 126	21	335	<MDA
Room 126	22	327	<MDA
Room 126	23	319	<MDA
Room 126	24	332	<MDA
Room 126	25	284	<MDA
Room 126	26	349	<MDA
Room 126	27	275	<MDA
Room 126	28	312	<MDA

Scalar Measurements - Room 154

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/ 100 cm^2)
Room 154 Main View	1	303	<MDA
Room 154 Main View	2	309	<MDA
Room 154 Main View	3	330	<MDA
Room 154 Main View	4	325	<MDA
Room 154 Main View	5	326	<MDA
Room 154 Main View	6	360	<MDA
Room 154 Main View	7	341	<MDA
Room 154 Main View	8	313	<MDA
Room 154 Main View	9	283	<MDA
Room 154 Main View	10	295	<MDA
Room 154 Main View	11	298	<MDA
Room 154 Main View	12	316	<MDA
Room 154 Main View	13	327	<MDA
Room 154 Main View	14	326	<MDA
Room 154 Main View	15	317	<MDA
Room 154 Main View	16	318	<MDA
Room 154 Main View	17	310	<MDA
Room 154 Main View	18	309	<MDA
Room 154 Main View	19	303	<MDA
Room 154 Main View	20	343	<MDA
Room 154 Main View	21	310	<MDA
Room 154 Main View	22	303	<MDA
Room 154 Main View	23	320	<MDA

Scalar Measurements - Room 180

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 180	1	325	<MDA
Room 180	2	282	<MDA
Room 180	3	280	<MDA
Room 180	4	324	<MDA
Room 180	5	317	<MDA
Room 180	6	300	<MDA
Room 180	7	269	<MDA
Room 180	8	329	<MDA
Room 180	9	299	<MDA
Room 180	10	292	<MDA
Room 180	11	361	<MDA
Room 180	12	339	<MDA
Room 180	13	360	<MDA
Room 180	14	350	<MDA
Room 180	15	269	<MDA
Room 180	16	245	<MDA
Room 180	17	226	<MDA
Room 180	18	231	<MDA
Room 180	19	219	<MDA
Room 180	20	239	<MDA
Room 180	21	216	<MDA
Room 180	22	228	<MDA
Room 180	23	301	<MDA

Scalar Measurements - Room 195C

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 195 C	1	286	<MDA
Room 195 C	2	267	<MDA
Room 195 C	3	258	<MDA
Room 195 C	4	278	<MDA
Room 195 C	5	272	<MDA
Room 195 C	6	289	<MDA
Room 195 C	7	225	<MDA
Room 195 C	8	247	<MDA
Room 195 C	9	267	<MDA
Room 195 C	10	259	<MDA
Room 195 C	11	276	<MDA
Room 195 C	12	267	<MDA
Room 195 C	13	272	<MDA
Room 195 C	14	270	<MDA
Room 195 C	15	299	<MDA
Room 195 C	16	240	<MDA
Room 195 C	17	229	<MDA
Room 195 C	18	285	<MDA

Scalar Measurements - Room 216

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 216	1	302	<MDA
Room 216	2	267	<MDA
Room 216	3	309	<MDA
Room 216	4	282	<MDA
Room 216	5	333	<MDA
Room 216	6	321	<MDA
Room 216	7	312	<MDA
Room 216	8	299	<MDA
Room 216	9	286	<MDA
Room 216	10	313	<MDA
Room 216	11	301	<MDA
Room 216	12	318	<MDA
Room 216	13	266	<MDA
Room 216	14	261	<MDA
Room 216	15	249	<MDA
Room 216	16	266	<MDA
Room 216	17	263	<MDA
Room 216	18	271	<MDA
Room 216	19	280	<MDA
Room 216	20	277	<MDA

Scalar Measurements - Room 217

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 217 Main View	1	279	<MDA
Room 217 Main View	2	270	<MDA
Room 217 Main View	3	314	<MDA
Room 217 Main View	4	298	<MDA
Room 217 Main View	5	247	<MDA
Room 217 Main View	6	301	<MDA
Room 217 Main View	7	300	<MDA
Room 217 Main View	8	272	<MDA
Room 217 Main View	9	257	<MDA
Room 217 Main View	10	250	<MDA
Room 217 Main View	11	274	<MDA
Room 217 Main View	12	309	<MDA
Room 217 Main View	13	287	<MDA
Room 217 Main View	14	290	<MDA
Room 217 Main View	15	275	<MDA
Room 217 Main View	16	278	<MDA
Room 217 Main View	17	281	<MDA
Room 217 Main View	18	282	<MDA
Room 217 Main View	19	278	<MDA
Room 217 Main View	20	285	<MDA
Room 217 Main View	21	252	<MDA
Room 217 Main View	22	248	<MDA
Room 217 Main View	23	243	<MDA
Room 217 Main View	24	260	<MDA
Room 217 Main View	25	264	<MDA
Room 217 Main View	26	283	<MDA
Room 217 Main View	27	255	<MDA
Room 217 Main View	28	236	<MDA
Room 217 Main View	29	231	<MDA
Room 217 Main View	30	279	<MDA
Room 217 Main View	31	247	<MDA
Room 217 Main View	32	234	<MDA
Room 217 Main View	33	256	<MDA

Scalar Measurements - Room 220

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 583 dpm/100 cm^2

Survey Date: April 9, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 220 Main View	1	287	<MDA
Room 220 Main View	2	298	<MDA
Room 220 Main View	3	278	<MDA
Room 220 Main View	4	344	<MDA
Room 220 Main View	5	300	<MDA
Room 220 Main View	6	358	<MDA
Room 220 Main View	7	236	<MDA
Room 220 Main View	8	244	<MDA
Room 220 Main View	9	230	<MDA
Room 220 Main View	10	245	<MDA
Room 220 View A	2	267	<MDA
Room 220 View A	4	278	<MDA
Room 220 View A	5	261	<MDA
Room 220 View A	6	263	<MDA
Room 220 View A	8	280	<MDA
Room 220 View B	2	259	<MDA
Room 220 View B	3	269	<MDA
Room 220 View B	6	279	<MDA
Room 220 View B	8	273	<MDA
Room 220 View B	9	260	<MDA
Room 220 View B	10	265	<MDA
Room 220 View C	1	320	<MDA
Room 220 View C	2	331	<MDA
Room 220 View C	3	294	<MDA
Room 220 View C	4	282	<MDA
Room 220 View C	5	327	<MDA
Room 220 View C	6	278	<MDA
Room 220 View C	7	265	<MDA

Scalar Measurements - Room 221

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 583 dpm/100 cm^2

Survey Date: April 9, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 221 Main View	1	284	<MDA
Room 221 Main View	2	292	<MDA
Room 221 Main View	3	317	<MDA
Room 221 Main View	4	325	<MDA
Room 221 Main View	5	277	<MDA
Room 221 Main View	6	329	<MDA
Room 221 Main View	7	272	<MDA
Room 221 Main View	8	272	<MDA
Room 221 Main View	9	274	<MDA
Room 221 View A	1	249	<MDA
Room 221 View A	2	257	<MDA
Room 221 View A	3	264	<MDA
Room 221 View A	4	253	<MDA
Room 221 View A	5	238	<MDA
Room 221 View A	6	271	<MDA
Room 221 View A	9	255	<MDA
Room 221 View A	10	298	<MDA

Scalar Measurements - Room 242

Ludlum Model 12, serial no. 195030

Limiting MDA (C-14) = 575 dpm/100 cm^2

Survey Date: April 6, 2009

Location	Smear Number	Reading (cpm)	Activity (dpm/100 cm^2)
Room 242 Main View	1	300	<MDA
Room 242 Main View	2	274	<MDA
Room 242 Main View	3	264	<MDA
Room 242 Main View	4	273	<MDA
Room 242 Main View	5	276	<MDA
Room 242 Main View	6	290	<MDA
Room 242 Main View	7	305	<MDA
Room 242 Main View	8	260	<MDA
Room 242 Main View	9	293	<MDA
Room 242 Main View	10	300	<MDA
Room 242 Main View	11	279	<MDA
Room 242 Main View	12	276	<MDA
Room 242 Main View	13	277	<MDA
Room 242 Main View	14	246	<MDA
Room 242 Main View	15	250	<MDA
Room 242 Main View	16	291	<MDA
Room 242 Main View	17	274	<MDA
Room 242 Main View	18	280	<MDA
Room 242 Main View	19	294	<MDA
Room 242 Main View	20	245	<MDA
Room 242 Main View	21	274	<MDA
Room 242 Main View	22	314	<MDA

Appendix III

Calibration Certificates

Certificate of Calibration

Antkowiak and Mahoney Enterprises, Inc.
36 Dawkins Drive
East Earl, PA 17519

Company Antkowiak and Mahoney Enterprises, Inc. **Certificate Number: L** 1750

Manufacturer Ludlum

Model 12 **Serial Number** 195030

Probe Model 43-68 **Serial Number** PR178507

Calibration Type Linearity and Efficiency Check **Calibration Geometry** 2 Pi

Battery Check Pass **High Voltage** 1650 **v** **Background Reading** 185 **cpm**

Pulse Generator: Ludlum Model 500, S/N : 174393 Calibrated: September 28, 2007

Scale	Calibration Point (cpm)	As Found (cpm)	Meter Reading (cpm)	Correction Factor
x1000	340,000	340,000	340,000	N/A
x1000	170,000	170,000	170,000	N/A
x100	34,000	34,000	34,000	N/A
x100	17,000	17,000	17,000	N/A
x10	3,400	3,400	3,400	N/A
x10	1,700	1,700	1,700	N/A
x1	340	340	340	N/A
x1	170	170	170	N/A

Source Isotope	Source Activity	Source Serial Number	Source Reading	Efficiency
Carbon-14	1.793 kBq	1010-66-2	13,000	0.119
Silicon-32	1.870 kBq	1010-66-3	45,000	0.401
Iodine-129	1.902 kBq	1010-66-1	950	0.008

Calibrated by Robert Mahoney **Calibration Date** September 21, 2008

Approved by Joel Antkowiak Digitally signed by Joel Antkowiak DN: CN = Joel Antkowiak, C = US, O = AME Inc. Date: 2009.02.23 09:37:07 -05'00' **Approval Date** September 21, 2008

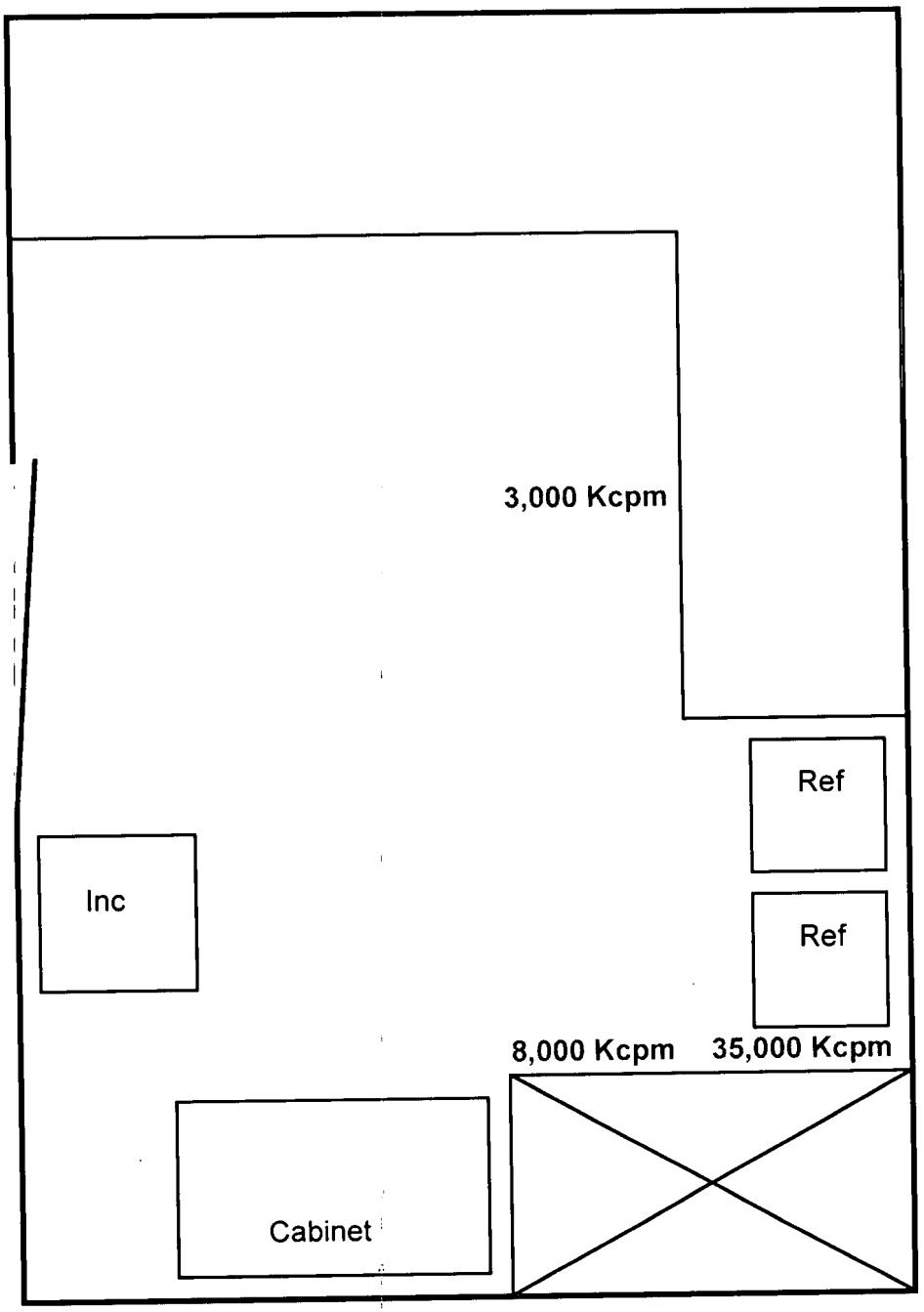
Comments:

Phone: 845-406-1917 e-mail: healthphysics@comcast.net Fax: 973-831-8235

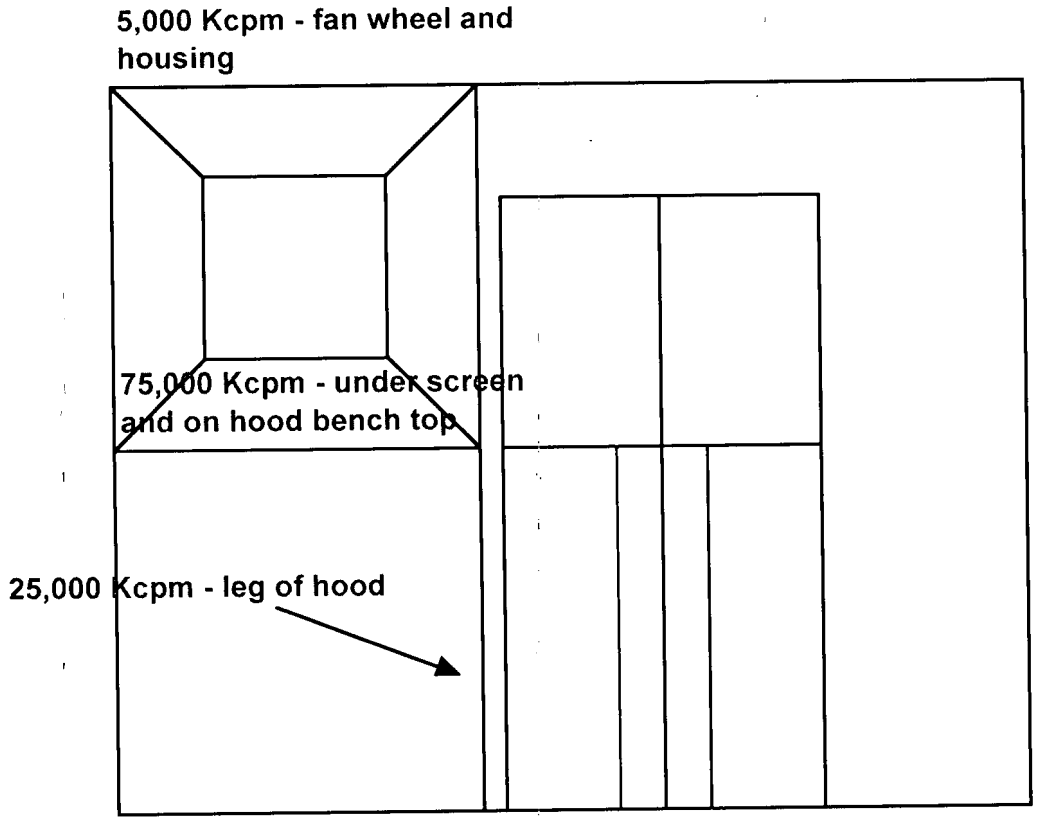
Appendix IV

As-Found Contamination Levels

Room 220



Room 220 - Hood



2	1.00	15.00	7.00	36.30	6.31	528.	37.510	– HAM-1
3	1.00	9.00	4.00	20.37	3.63	530.	29.500	– HAM-2
4	1.00	4.00	17.00	4.53	20.50	456.	81.620	– HAM-3
								– HAM Floor

} BKG

April 24th 2009

Hamilton Waste Survey

FORM 540 — Energy Solutions / Bear Creek Operations

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code)
(865) 220-1555

ORGANIZATION
Energy Solutions Attn: Emergency Duty Officer

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?
[ ] YES
[X] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST ==========> 3

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT? [ ] YES [X] NO
If "Yes", provide Manifest Number ====>

EPA MANIFEST NUMBER
N/A

5. SHIPPER - NAME AND FACILITY
Bristol-Myers Squibb / Hamilton
C/O Energy Solutions
3 Hamilton Health Place
Hamilton, NJ 08690

SHIPMENT ID NUMBER
T091932

X COLLECTOR
PROCESSOR
GENERATOR TYPE (Specify)

USER PERMIT NUMBER
T-TN012-L-09

SHIPMENT NUMBER
T091932

CONTACT
Jim Owens

TELEPHONE NUMBER (Include Area Code)
(609) 818-5611

6. CARRIER - Name and Address
Energy Solutions: operated by Hittman
628 Gallaher Road
Kingston, TN 37763-9986

Truck #: 5437
Trailer #: 730986

EPA I.D. NUMBER
TND 987783065

SHIPPING DATE
04/28/2009

CONTACT
Karen Kirby

TELEPHONE NUMBER (Include Area Code)
1-800-233-8933

SIGNATURE - Authorized carrier acknowledging waste receipt — K Kirby — **DATE** 4/28/09

7. FORM 540 AND 540A PAGE 1 OF 1 PAGE(S)
FORM 541 AND 541A 1 PAGE(S)
FORM 542 AND 542A 1 PAGE(S)
ADDITIONAL INFORMATION 3 PAGE(S)

8. MANIFEST NUMBER (Use this number on all continuation pages)
T091932

9. CONSIGNEE - Name and Facility Address
Energy Solutions / Bear Creek Operations
Operated By EnergySolutions
1560 Bear Creek Road
Oak Ridge, TN 37830

CONTACT
Fred Schulz

TELEPHONE NUMBER (Include Area Code)
(865) 481-0222

SIGNATURE - Authorized consignee acknowledging waste receipt

DATE

10. CERTIFICATION

This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and in proper condition for transportation and disposal in accordance with the requirements of 10 CFR Parts 20 and 61, or equivalent state regulation

AUTHORIZED SIGNATURE — C W Deaton — **TITLE** Broker/Driver — **DATE** 4/28/09

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY MBq	16. TOTAL PACKAGE ACTIVITY mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
Non-Radioactive per DOT METAL 1 - PLASTIC PAIL	NA	NA	SOLID/METAL OXIDES	C-14	37.00000	(1.00000)	NA	0.70 ft³ 19.00 lb	09-000490 (HAM 1)
UN2910, Radioactive material, excepted package-limited quantity of material, 7 METAL 1 - PLASTIC PAIL	NA	NA	SOLID/METAL OXIDES	C-14	37.00000	(1.00000)	NA	0.70 ft³ 5.00 lb	09-000491 (HAM 2)
UN2910, Radioactive material, excepted package-limited quantity of material, 7 DAW 1 - POLY FIBER	NA	NA	SOLID/METAL OXIDES	C-14	37.00000	(1.00000)	NA	7.50 ft³ 10.20 lb	09-000492 (HAM 3)

FOR CONSIGNEE USE ONLY

Tennessee "License For Delivery" No. _____

South Carolina Transport Permit No. _____

US Ecology Generator No. _____

US Ecology Permit No. _____

20. Generator Certification Statement

A) Radioactive Materials. Certification is hereby made that this shipment of low-level radioactive waste has been prepared in accordance with a radioactive waste management program which has been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and with the current revision of the site Material Acceptance Criteria.

B) Hazardous Materials. Generator hereby certifies that this material __ does (or) ✓ does not contain a hazardous waste as defined in 40 CFR 261.

C) Data. Generator hereby represents and warrants that all data set forth in this (UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with all applicable governmental laws, rules, regulations and site Radioactive Material Licenses.

D) INFECTIOUS SUBSTANCE: Generator hereby certifies that this material does not contain an infectious substance as defined in 49CFR173.134

SA Janet Bryant — Janet Bryant — 4/28/09
Print Name — Signature — Date

Form 540 (10-96)

Modified Date: 04/24/2009 14:02

FORM 541 — Energy Solutions / Bear Creek Operations

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL NUCLEAR MATERIAL (grams) U-233	U-235	Pu	TOTAL
3	m^3 0.25 / ft^3 8.90	kg 10.98 / lb 24.20	NP	NP	NP	NP

ACTIVITY (MBq/mCi) (LLD UNITS IN uCi/cc)	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129	SOURCE
MBq	111.00000	NP	111.00000	NP	NP	NP
mCi	3.00000	NP	3.00000	NP	NP	NP

2. MANIFEST NUMBER: T091932

3. PAGE 1 OF 1 PAGE(S)

4. SHIPPER NAME: Bristol-Myers Squibb / HamiltonC/O Energy Sol

SHIPMENT ID NUMBER: T091932

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. CONTAINER IDENTIFICATION NUMBER/ GENERATOR NUMBER (# - Innerpack Container)	6. CONTAINER DESCRIPTION (See Note 1) PROCESS REQUESTED (See Note 1A) BURIAL/DISPOSITION (See Note 2A)	7. VOLUME m^3 / ft^3	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION MBq/100 cm^2 / dpm/100 cm^2 ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m^3 / ft^3	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	14. CHEMICAL DESCRIPTION CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	15. RADIOLOGICAL DESCRIPTION INDIVIDUAL RADIONUCLIDES AND ACTIVITY AND CONTAINER TOTAL; OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT RADIONUCLIDES	MBq	mCi	16. WASTE CLASSIFICATION AS - Class A Stable AU - Class A Unstable B - Class B C - Class C
09-000490 (HAM 1) 2483	3 C E	0.02 / 0.70	8.62 / 19.00	< 5.0000E-03 / < 5.0000E-01	< 1.6700E-06 / < 1.0000E+02	< 1.6700E-05 / < 1.0000E+03	59(METAL)	0.02 / 0.70	100	SOLID METAL OXIDES / NP	NP	C-14	37.00000	1.00000	AU
												Sub Total	37.00000	1.00000	
												Package Total	37.00000	1.00000	
09-000491 (HAM 2) 2483	3 C E	0.02 / 0.70	2.27 / 5.00	< 5.0000E-03 / < 5.0000E-01	< 1.6700E-06 / < 1.0000E+02	< 1.6700E-05 / < 1.0000E+03	59(METAL)	0.02 / 0.70	100	SOLID METAL OXIDES / NP	NP	C-14	37.00000	1.00000	AU
												Sub Total	37.00000	1.00000	
												Package Total	37.00000	1.00000	
09-000492 (HAM 3) 2483	19 Poly Fiber O - INCINERATION E	0.21 / 7.50	4.63 / 10.20	< 5.0000E-03 / < 5.0000E-01	< 1.6700E-06 / < 1.0000E+02	< 1.6700E-05 / < 1.0000E+03	59(DAW)	0.21 / 7.50	100	SOLID METAL OXIDES / NP	NP	C-14	37.00000	1.00000	AU
												Sub Total	37.00000	1.00000	
												Package Total	37.00000	1.00000	
Shipment Total		0.25 / 8.90	15.52 / 34.20										111.00000	3.00000	

NOTE 1: Container Description Codes. For containers/waste requiring disposal in approved structural overpacks, the numerical code must be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethylene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk, Unpacked Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in Item 6, or additional page

NOTE 1A: Process Requested

C. Compaction
BR. Steam Reforming
DI. Direct Incineration
SI. Sort & Incinerate
D. Decon
G. Green is Clean
M. Metal Melt
T. Trans-Ship
LI. Liquid for Incineration
OI. Oil for Incineration
O. Other (describe)

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/ Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
49. Other. Describe in Item 11; or additional page

NOTE 2A: Burial/Disposition Site

B Barnwell Waste Management Facility
E Envirocare
R Richland, WA
PR Process and Return
O Other

NOTE 3: Solidification and Stabilization Media Codes. (Choose up to three which predominate by volume.) For media meeting disposal site structural stability requirements, the numerical code must be followed by "-S" and the media vendor and brand name must also be identified in Item 13. Code 100=None Required

Solidification

80. Cement
81. Concrete (encapsulation)
82. Bitumen
83. Vinyl Chloride
84. Vinyl Ester Styrene
89. Other. Describe in Item 13, or additional page
100. None Required

Form 541 (10-96) * - Indicates Cross Contamination

NRC FORM 542 (7-2001)

Energy Solutions / Bear Creek Operations

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

MANIFEST INDEX AND REGIONAL COMPACT TABULATION

List all original "PROCESSED WASTE" generators (if any) before "COLLECTED WASTE" generators

1. WASTE COLLECTOR/PROCESSOR

NAME: Bristol-Myers Squibb / HamiltonC/O Energy Solutions

IDENTIFICATION NUMBER: 2483

SHIPPING DATE: 04/28/2009

SHIPPER USE ONLY

2. MANIFEST NUMBER: T091932

3. PAGE 1 OF 1 PAGE(S)

4. GENERATOR IDENTIFICATION NUMBER	5. GENERATOR NAME PERMIT NUMBER (IF APPLICABLE), AND TELEPHONE NUMBER	6. GENERATOR FACILITY ADDRESS	7. PREPROCESSED WASTE (OR MATERIAL) VOLUME m^3	8. MANIFEST NUMBER(S) UNDER WHICH WASTE (OR MATERIAL) RECEIVED AND DATE OF RECEIPT	9. WASTE CODE P=PROCESSED C=COLLECTED	10. ORIGINATING COMPACT REGION OR STATE	11. AS PROCESSED/COLLECTED TOTAL A. SOURCE MATERIAL (kg)	B. SNM (g)	C. ACTIVITY MBq	D. VOLUME m^3
2483	Bristol-Myers Squibb / Hamilton EPA #: (609) 818-5611	3 Hamilton Health Place Hamilton, NJ 08690	0.25	Onsite Generation 04/24/2009	C	NJ	NP	NP	111	0.25
						TOTALS OF ALL PAGES (FORMS 542 AND 542A)	NP	NP	111.00000	0.25

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST
ISOTOPIC SUMMARY
For Manifest # T091932
Energy Solutions / Bear Creek Operations

Isotope	Total Activity (MBq)	(mCi)	(Ci)	Total SNM (gm)	Total Source (lb)
C-14	111.00000	3.00000	0.00300	<0.00001	<0.00001
Totals:	111.00000	3.00000	0.00300	<0.00001	<0.00001

General Emergency Response Procedure
Emergency Response Information
24 Hour Emergency Contact

These instructions apply to the following:

Radioactive material, low specific activity (LSA-I), *non fissile or fissile-excepted;* 7: UN2912
Radioactive material, low specific activity (LSA-II), *non fissile or fissile-excepted;* 7: UN3321
Radioactive material, surface contaminated objects (SCO-I *or* SCO-II), *non fissile or fissile-excepted;* 7: UN2913
Radioactive material, Type A package, *non-special form, non fissile or fissile-excepted;* 7: UN2915
Radioactive material, Type A package, special form, *non fissile or fissile-excepted;* 7: UN3332
✓Radioactive material, excepted package-limited quantity of material; 7: UN2910
Radioactive material, excepted package-instruments or articles; 7: UN2917
Radioactive material, excepted package-empty packaging; 7: UN2908

POTENTIAL HAZARDS

Health Hazards

- External radiation hazard from unshielded radioactive material.
- Internal radiation hazard from inhalation, ingestion or breaks in skin.
- Radioactive material; degree of hazard will vary greatly, depending on type and quantity of radioactive material and type of packaging.
- Materials in special Form or in Type B Packagings are not expected to cause contamination in accidents.
- Some radioactive materials cannot be detected by commonly available instruments.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

Some of materials may burn, but none of them ignites readily. Radioactivity does not change flammability or other properties of the materials.

EMERGENCY ACTION

- Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind, or if advised by Radiation Authority.
- Isolate hazard area and deny entry.
- Response actions may be performed prior to any measurement of radiation; limit entry to shortest possible time.
- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection.
- Notify Radiation Authority of accident conditions.
- Detain uninjured persons, isolate equipment with suspected contamination and delay cleanup until instruction of Radiation Authority.
- Call Energy*Solutions* at (865) 220-1555 for EMERGENCY ASSISTANCE. If water pollution occurs, notify the appropriate authorities.

FIRE

Do not move damaged containers; move undamaged containers out of fire zone.
Small Fires: Dry Chemical , C02, water spray, or regular foam.
Large Fires: Water spray, fog (flooding amounts).
For massive fire in cargo area, use unmanned hose holder or monitor nozzles.

SPILL OR LEAK

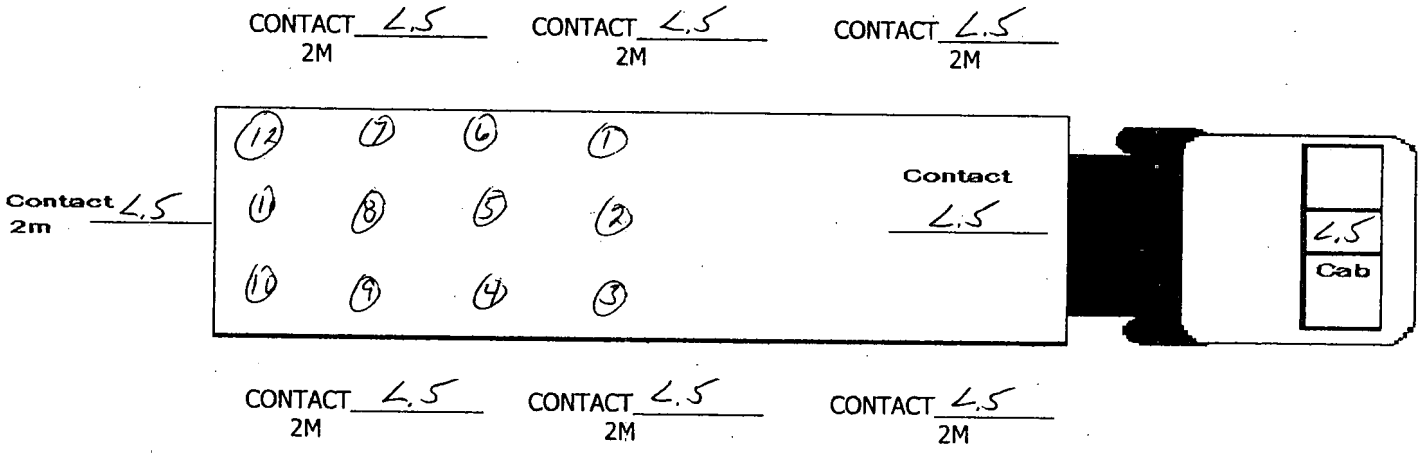
Do not touch damaged containers or spilled material.
Damage to outer container may not affect primary inner container.
Small Liquid Spills: Take up with sand, earth or other noncombustible absorbent material.
Large Spills: Dike far ahead to collect runoff water.

FIRST AID

- Use First Aid treatment according to the nature of the injury.
- If not affecting injury, remove and isolate suspected contaminated clothing and shoes; wrap victim in sheet or blanket before transporting.
- If there is no injury, remove and isolate suspected contaminated clothing and shoes; assist person to shower with soap and water, and notify Radiation Authority of Action.
- Advise medical personnel that victim may be contaminated with radioactive material.

FULL VEHICLE SURVEY FORM

SURVEY NUMBER 1 -TRAN- 1



DOSE RATE UNDER TRAILER <2.5

ALL DOSE RATES IN mR/Hr AS NOTED

SMEAR RESULTS @ DPM/100CM2		
LOC	BETA / GAMMA	ALPHA
1	<1000	<100
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

CIRCLED NUMBER ON THE ABOVE DRAWING INDICATES SWIPED LOCATION.

RWP # _____

DATE: 4/28/09 TIME: _____

SHIPMENT NUMBER: T091932, T091931, T091930

TRACTOR # : 5437 TRAILER # : 730986

INCOMING: FULL _____

OUTGOING: FULL ✓

~~TRUCKING COMPANY~~: ES

TRAILER TYPE : FLAT ___ RAGTOP ___ VAN ___
CASK ___ DROPDECK ___

DOSE RATE INSTRUMENT
TYPE: 14C
SERIAL NUMBER: 35121
CAL. DUE DATE: 12/11/09

CONTAMINATION SURVEY INST. - BETA / GAMMA
TYPE: Model 3
SERIAL NUMBER: 92977
CAL. DUE DATE: 10/29/09

CONTAMINATION SURVEY INST. – ALPHA
TYPE: Model 3
SERIAL NUMBER: 96752
CAL. DUE DATE: 10/2/09

SHIPPING & RECEIVING TECHNICIAN: CD
Initials

REVIEWED BY : Chris Denton

Duratek™ Shipment Summary Form

Required for all Duratek waste processing facilities

Form WAG-501-F1 Rev. 1

Generator: Bristol Myers (Hamilton) cust #2483 Shipment Date: 4-28-09

Shipment Number: T091932 TN License for Delivery No: T-TN012-L09

Contract/Release Number: Total # of Containers: 4

Shipment Weight: 34.2 lbs Total Activity (mCi): 3.0 mCi

Highest Contact Dose Rate: <.5 mR/hr SNM Grams: N/A

MATERIALS SHIPPED

Please Estimate Percentage of Total Shipment by Weight (Must Add to 100%)

DAW (Incineration, Compaction)	DAW	25 %	Asbestos	%
METALS (Melting, Decontamination, Volume Reduction & Disposal)	Metals	75 %	Asbestos	%
	Lead Blankets (wool)	%	Lead Sheets	%
	Lead Brick	%	Lead Shot	%
LIQUIDS (Incineration, drying, solidification)	Aqueous Liquids	%	Sludge	%
	Oil	%	Oily Waste	%
	Grease	%	EHC	%
POTENTIALLY CLEAN MATERIAL (Green Is Clean, Safecheck)	Plant Trash	%	Construction & Demolition Debris	%
	Wastewater Sludge (NOTE 1)	%	Sewage Sludge (NOTE 1)	%
	Cation/Anion Resin	%	PCB Bulk Product Waste (NOTE 1)	%
	Carbon Filter Media	%	Asbestos	%
	Other (*specify*):			%
SPECIAL PROJECT	Describe nature of project in Special Instructions, below (e.g., Transship, Dewatering, Source Encapsulation, etc.)			

NOTE 1: Requires TCLP analysis prior to shipment of each campaign of similar waste.

WASTE INFORMATION

(ITEMS IDENTIFIED WITH ** REQUIRE DURATEK APPROVAL PRIOR TO SHIPMENT; SEE SECTION 8 OF THE WAG)

**DAW > 200 mrem/hr @ contact with waste ☐		**Metals > 100 mrem/hr @ contact with waste ☐	
Hot Particles ☐	Activated Material ☐	**High Smearable ☐	**SNM/Source Material ☐
CLASSIFIED/NOFORN ☐	Sharps ☐	**Sealed Sources ☐	**Lead-Acid Batteries ☐
**Paint Chips (NOTE 1) ☐	**PCBs ☐	** Hazardous Waste (per 40 CFR 261) ☐	
Biological ☐	**Trans-shipment ☐	Liquid Filters (Separate Isotopics Required) ☐	
**RCRA Empties ☐	**Soils ☐	**Refrigeration Equipment ☐	
Class 7 Labeled Waste	White I ☐	Yellow II ☐	Yellow III ☐

SPECIAL INSTRUCTIONS

If necessary, provide additional information on a separate page.

DISPOSAL SITE

Barnwell (Permit/Allocation Required) ☐	Envirocare ☒	Barnwell or Envirocare ☐	Other/Return (specify):

CONTAINERS

Duratek-Owned Containers ☐	Containers to Be Returned to Generator ☐