



**U. S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
Great Lakes Environmental Research Laboratory  
2205 Commonwealth Blvd.  
Ann Arbor, Michigan 48105-2945

September 19, 2007

Material Licensing Branch  
U. S. Nuclear Regulatory Commission, Region III  
2443 Warrenville Road, Suite 210  
Lisle, IL 60532-4352

03011209  
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**Re: Amendment of License No. 21-16544-01**

To: Mr. Kevin G. Null

The Great Lakes Environmental Research Laboratory is requesting that our License No. 21-16544-01 be amended to remove the 2205 Commonwealth Blvd., Ann Arbor, MI 48105 location from the listing of restricted areas on our NRC license. All licensed radioactivity at that site has been disposed of or transferred and a final status survey documenting that the location may be released for unrestricted use has been performed. Two hard copies and an electronic version of the final status survey report, prepared for us by Integrated Environmental Management, Inc., are enclosed.<sup>1</sup>

Thank you for your assistance in this matter. If you have any questions, please call me at (734) 741-2074.

Sincerely,

Kimberly A. Kulpanowski, MS  
Radiation Safety Officer

316578

<sup>1</sup> IEM is licensed to perform decommissioning and related services by the Maryland Department of the Environment (License No. MD-31-281-01), although the work performed at the GLERL was pursuant to the conditions of License No. 21-16544-01 (i.e., reciprocity was not invoked).



# **Final Status Survey Report for the Great Lakes Environmental Research Laboratory**

Submitted to

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August 2, 2007

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## 1 INTRODUCTION

The Great Lakes Environmental Research Laboratory, located at 2205 Commonwealth Blvd, Ann Arbor, Michigan (hereinafter referred to as GLERL) is named as a radiologically restricted area on License No. 21-16544-01, issued to the U. S. Department of Commerce/NOAA by the U. S. Nuclear Regulatory Commission. At the GLERL, there are nineteen laboratories, two environmental chambers, one storage room and one waste storage building (hereinafter referred to as labs/laboratories) that were authorized to use the radioactive materials listed on License No. 21-16544-01, the selection of which was dictated by the type of study being performed. Radioactivity use was thus limited to selected laboratories.<sup>1</sup>

In order to remove the GLERL from the listing of restricted areas on License No. 21-16544.01, the Department of Commerce/NOAA radiation safety staff must demonstrate that there are no radiological issues of concern therein. To that end, BMT Entech, Inc. (Entech) was contracted to perform/document a final status survey demonstrating that the labs may be released for unrestricted use (i.e., without regard for their radiological constituents). Entech subcontracted Integrated Environmental Management, Inc. (IEM) to assist in this task.<sup>2</sup>

The on-site portion of the project was completed between June 18 and June 28, 2007, followed by the preparation of this report. Included herein is a description of the site, a review of the history of radiological operations in the laboratories and recent radiological conditions, an overview of the project and its objectives, a description of the procedures followed, a listing of all data acquired from the site, and a statement in regard to the release status of the GLERL. Representatives of the GLERL were given an opportunity to review and comment on a draft before the publication of this Final Status Survey Report.

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<sup>1</sup> For example, radioactive polonium 209 and radium 226 were only used in Laboratories 305 and 406 and stored in Room 400 and the Waste Storage Building.

<sup>2</sup> IEM is licensed by the Maryland Department of the Environment (MDE License No. MD-31-281-01), a USNRC Agreement State, to perform the types of radiation-related services required for this project. However, the final status survey was performed under the applicable terms/conditions of the GLERL license.

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## 2 HISTORICAL ASSESSMENT

### 2.1 Facility History

The GLERL, located at 2205 Commonwealth Boulevard in Ann Arbor, Michigan, has been operating in that location since 1987. The laboratory provides environmental and ecosystem research in support of the Great Lakes and coastal marine environments. It is currently licensed to use radioactive materials by the USNRC for the performance of a variety of fate and transport studies.<sup>3</sup> The work with radioactive materials at the site has ceased and the GLERL wishes to release the building from the listing of restricted areas on License No. 21-16544-01.

### 2.2 Facility Description

The GLERL consists of offices and laboratories in a single-floor, brick building with a total area of approximately 29,000 square feet. Nineteen laboratories and the storage room have been designated as restricted areas where licensed radioactive materials were used (approximately 4,600 square feet) and are thus subject to the final status survey. They are located in the center of the building, separated by six hallways. In addition, there are two walk in environmental chambers, rooms 801A and 801B, and the waste storage building outside the main building. A list of specific rooms is provided in Table 6.1 and Figure 7.1 is a floor plan of the building.

Each of the laboratories is equipped with benches and cabinets for storage. The floors are covered with floor tiles. Most of the laboratories have at least one sink, with connections to a sanitary sewer that discharges to the public-owned treatment works (POTW). Nine of the laboratories have bench hoods, each of which is equipped with a ventilation fan with airborne discharge to the roof of the building.

### 2.3 Source Term

The GLERL was licensed to use a variety of radioactive materials in an unsealed form. However, not all of those listed on the license were ever present at the site, and many exhibited radiological half lives of less than 120 days, meaning they have long-since decayed. As such, they were not considered in the performance of the final status survey.<sup>4</sup> Table 6.2 contains the source term applicable to the survey effort.

Over the years, each laboratory was authorized to use any of the isotopes listed on the applicable amendment of the license, the selection of which was dictated by the type of study being performed. Therefore, the radioactivity usage in each laboratory is known. For example, Polonium-209 and Radium-226 were only used in Laboratories 305 and 406, and stored in Room 400 and the Waste

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<sup>3</sup> US Nuclear Regulatory Commission, *Radioactive Materials License 21-16544-01*, Docket 030-11209, expires on August 31, 2014.

<sup>4</sup> U.S. Nuclear Regulatory Commission, *Consolidated Decommissioning Guidance Characterization, Survey, and Determination of Radiological Criteria*, Appendix B, NUREG 1757, Volume 2, Rev 1, September, 2006.

Storage Building. The GLERL was licensed to use Polonium-210 but did not receive the isotope as a unique stock.<sup>5</sup> Carbon-14 and Hydrogen-3 (tritium) had the most common use in the laboratories.

During the development of the survey plan, the manifest for the most recent waste shipment on May 9, 2007 was reviewed. According to the RSO, radioactive waste generated during licensed operations was collected within the respective laboratories, packaged into approved shipping containers and transferred to a waste storage building pending disposal.<sup>6</sup>

#### **2.4 Results of Previous Surveys**

Routine wipe tests and direct radiation surveys were performed by GLERL on selected surfaces in each laboratory as required by their license. The frequency of surveys varied according to the type of experiment in process, but were generally performed under the direction of the authorized user on a weekly or monthly basis. The laboratories listed in Table 6.1 were surveyed by the RSO or Assistant RSO on a monthly, quarterly, or biannual basis.<sup>7</sup>

The action levels for the historical surveys were essentially "3 times background". If any survey results exceeded this level, the residual radioactivity was removed and the area re-surveyed before the routine surveillance in that area was deemed complete. The Radiation Safety Officer's records, maintained over the history of the license, do not contain evidence of significant spills or otherwise large release of radioactive material on the floor of any laboratory or into the sewer.

A radiation survey of each laboratory and adjacent hallway, performed by GLERL staff on December 16, 2006, shows there was no removable gross beta activity on any surfaces above a detection limit of less than 10 dpm/100cm<sup>2</sup>. Direct scans for alpha and beta radiation, performed by GLERL using a calibrated, gas flow proportional counter with a sensitive area of approximately 100 cm<sup>2</sup>, again reveals the presence of no detectable fixed activity above a detection level of about 33 disintegrations per minute per 100 square centimeter (dpm/100cm<sup>2</sup>) for beta radiation or 98 dpm/100cm<sup>2</sup> for alpha radiation for a scan rate of approximately two inches per second.<sup>8</sup>

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<sup>5</sup> Conversation between Kim Kulpanowski (GLERL RSO) and Bill Thomas (IEM), June 4, 2007.

<sup>6</sup> No evidence of packaged waste staged for disposal was noted during the on-site portion of this effort other than that previously identified by the RSO prior to the field team mobilizing to the site. The waste consisted of a container of laboratory grade uranyl acetate, a container of Po-209 labeled filter paper, and some Cesium-137-bearing paper contained within lead pigs. The paper was removed from the pigs-which were subsequently resurveyed and released by the HP Technician-and packaged along with the Po-209 filter paper and uranyl acetate for disposal. The package was picked up for disposal on July 16, 2007.

<sup>7</sup> Conversation between Kim Kulpanowski (GLERL RSO) and Bill Thomas (IEM), June 4, 2007.

<sup>8</sup> The RSO maintains similar survey records collected previously with similar results.

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## 3 APPROACH

### 3.1 Project Organization

For this work, Mr. R. Alan Duff, RRPT, of IEM's Tennessee office, served as the Project Manager and coordinated the field and final status survey efforts. Mr. Jeffrey W. Sumlin, RRPT, also of IEM's Tennessee office, was the on-site Health Physics (HP) Technician and was responsible for data acquisition and the preparation of this report. Mr. Bill R. Thomas, CHP, CIH of IEM's Ohio office served as the Project CHP and was responsible for the technical requirements associated with the project. Two GLERL survey technicians assisted with the on-site survey effort under the direction of Mr. Sumlin. Appendix 8.1 contains the qualifications of Mr. Thomas, Mr. Duff and Mr. Sumlin.

### 3.2 Survey Planning

In advance of mobilizing to the site, a survey plan was prepared and submitted to the Department of Commerce/NOAA RSO for review/approval.<sup>9</sup> Included in the plan were data quality objectives, instrumentation requirements, survey unit classification, data acquisition procedures and quality control and reporting requirements. Additional detail on the remaining subsections of this Chapter can be found in the survey plan.

### 3.3 Release Criteria

The USNRC has established criteria for ensuring that facilities and property that were used for licensed operations present negligible radiological risk to people and the environment once licensed operations cease. The radiation dose limit that the USNRC believes presents negligible risk is published in Title 10, Code of Federal Regulations, Part 20.1402:

*"Decommissioning with license termination shall be limited to sites considered acceptable for unrestricted release where the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group that does not exceed twenty-five millirem per year (25 mrem/yr), including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA)..."*

The level of residual radioactivity permissible on a building surface at the GLERL that would ensure compliance with USNRC's radiation dose objective is designated as the derived concentration guideline level (DCGL) as defined in MARSSIM.<sup>10</sup>

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<sup>9</sup> Integrated Environmental Management, Inc., Report No. 2005006/G-3344 (Rev. 0), "Final Status Survey and Sampling Plan for the Great Lakes Environmental Research Laboratory", June 13, 2007.

<sup>10</sup> U.S. Nuclear Regulatory Commission, *Multi-agency Radiation Survey and Site Investigation Manual*, NUREG-1575, Revision 1, August, 2000.

For the purpose of this survey effort, the DCGLs were conservatively set to the screening values presented in Table H.1 of NUREG-1757, Volume 2 and Table 5.19 of NUREG-5512, Volume 3.<sup>11,12</sup> These screening values were established by the USNRC based on an exposure assessment of less than 25 millirem per year to the critical population for the 1,000-year period after release for unrestricted use. Assumptions designed to maximize the resulting dose were used as input to the assessment.

Table 6.2 contains the DCGLs applicable to the GLERL. For the on-site effort, the data acquired were compared to the lowest applicable DCGL shown in the table. As such, the following are the gross activity release criteria applicable to this survey effort:

- Gross beta - 7,100 dpm/100 cm<sup>2</sup> (DCGL for Cobalt-60); and
- Gross alpha - 1,120 dpm/100 cm<sup>2</sup> (DCGL for Radium-226).<sup>13</sup>

### **3.4 Data Quality Objectives**

The objective of the final status survey was to release the laboratories at the GLERL in accordance with guidance established by the USNRC and MARSSIM. This objective was accomplished in general by:

- Selecting the appropriate instrumentation to adequately detect the radionuclides of concern;
- Establishing proper count times and measurement methods to verify that the release criteria are met;
- Performing surveys to verify the radiological status of the facility;
- Verifying that personnel exposure from residual contamination will not exceed 25 mrem/year based on the future use of the facility; and
- Evaluating the data to ensure that sufficient information is collected to release the rooms for unrestricted use.

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<sup>11</sup> U.S. Nuclear Regulatory Commission, *Consolidated Decommissioning Guidance Characterization, Survey, and Determination of Radiological Criteria*, Table H.1, NUREG 1757, Volume 2, Rev 1, September, 2006.

<sup>12</sup> U.S. Nuclear Regulatory Commission, *Residual Radioactive Contamination From Decommissioning - Parameter Analysis*, Table 5.19, NUREG 5512, Volume 3, Draft, October, 1999.

<sup>13</sup> Naturally-occurring radioactive materials, specifically Polonium-209 and Radium-226 were used at the GLERL. Radium-226 was selected as the limiting DCGL for gross alpha radiation measurements.

In order to ensure the laboratory surfaces meet the applicable release criteria to a reasonable degree of scientific certainty, the following statistical procedures were implemented, with details on each provided in Chapter 5 of the survey plan:

- Impacted areas were classified by contamination potential as Class 2 or Class 3 areas based on use history and contamination probability. Survey unit boundaries were specified based on common history.
- Statistical testing was based on the null hypothesis, which states that the residual radioactivity in the survey unit exceeds the site dose criterion.
- The upper bound of the gray region (UBGR) was defined as the DCGL, and the lower bound of the gray region (LBGR) was set at  $0.4 \times \text{DCGL}$ .<sup>14</sup>
- The Type I decision error was defined as the probability of passing a survey unit that should fail. The Type II decision error was defined as the probability of failing a survey that should pass. Probability limits of 0.05 were assigned for both decision errors.
- The standard deviation was estimated as  $0.2 \times \text{DCGL}$ .
- The relative shift was set at greater than 1.5.
- The detection sensitivity for all measurement techniques (scan, direct measurements and sample analysis) was normally less than or equal to 75 percent of the DCGL.

### 3.5 Instrumentation

The radiation detection instrumentation used for this effort was selected and operated according to the type of analysis being performed, and to ensure sensitivities sufficient to detect the identified radionuclides at the minimum detection requirements. Table 6.3 is a list of the instrument types that were used for the GLERL final status survey, along with the types of radiations they detect, and the necessary calibration sources.

The instrument detection limits are dependent upon count times, geometry, sample size, detector efficiency, background, scanning rate and the efficiency of the surveyor.<sup>15</sup> Nominal detection sensitivities were calculated using the guidance in NUREG 1507 and shown in the following

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<sup>14</sup> The gray region of a population distribution is the range of possible values for which the consequences of decision errors are relatively minor.

<sup>15</sup> U.S. Nuclear Regulatory Commission, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG/CR-1507, December, 1997.

subsections, and are summarized in Table 6.4. The following subsections give the calculation methodologies.

### 3.5.1 Alpha/Beta Direct Measurements

The equation used to calculate the minimum detectable activity for direct measurements of alpha and beta radiation is:

$$MDA = \frac{\frac{2.71}{t_s} + 3.29 \sqrt{\frac{R_b}{t_s} + \frac{R_b}{t_b}}}{E \times \frac{A}{100}}$$

where MDA = Minimum detectable activity (dpm/100cm<sup>2</sup>), R<sub>b</sub> = Background count rate (cpm), t<sub>b</sub> = Background count time (minutes), t<sub>s</sub> = Sample count time (minutes), A = Detector area (cm<sup>2</sup>), and E = Detector efficiency (counts/disintegration).

### 3.5.2 Alpha/Beta Scans

The equation used for calculating the MDA for alpha and beta scans (MDA<sub>SCAN</sub>) is:

$$MDA_{SCAN} = \frac{d' \times \sqrt{b_i} \times \frac{60}{i}}{E_i \times E_s \times \sqrt{p} \times \frac{A}{100}}$$

where MDA = Minimum detectable activity (dpm/100cm<sup>2</sup>), d' = Decision error taken from Attachment 2. (Assumed to be 3.28 for α=0.05 and β=0.95), I = Observation counting interval (detector width divided by the scan speed), b<sub>i</sub> = Background count per observation interval, E<sub>i</sub> = Detector efficiency, E<sub>s</sub> = Surface efficiency (assumed to be 25% for alpha and beta contamination on concrete), p = Surveyor efficiency (Assumed to be 50%), and A = Detector area (cm<sup>2</sup>).<sup>16,17</sup>

### 3.6 Survey Unit Classification

The GLERL was divided into discrete survey units with a specific size and shape for which separate decisions relative to the DCGL could be made. Impacted areas were those with a potential of being contaminated (i.e., the designated laboratories). Non-impacted areas were those that did not have a potential for being contaminated and were not addressed further in the survey effort.

<sup>16</sup> ISO-7503 recommends using a surface efficiency based on the type of radiation and radiation energy in the absence of experimentally derived values. A surface efficiency of 0.25 is recommended for alpha radiation and beta radiation with a maximum beta energy between 150 keV and 400 keV.

<sup>17</sup> International Organization for Standardization (ISO), *Evaluation of Surface Contamination*, ISO 7503, 1988.

Survey units were classified as Class 1, 2, or 3. In general, a Class 1 survey unit is an impacted area where there are expected to be locations with concentrations of residual radioactivity that exceed the DCGL. A Class 2 survey unit is an impacted area, less than 1,000 square meters, where there are expected to be locations with concentrations of residual radioactivity detectable above background levels, but that do not exceed the DCGL. A Class 3 survey unit is an impacted areas where there are no expected locations with concentrations of residual radioactivity detectable above background.

### **3.6.1 Class 1 Survey Unit**

No laboratories or rooms at the GLERL were classified as a Class 1 survey unit for the purposes of this survey effort. There are no recorded incidents of significant spills or releases of radioactive materials over the history of the license, and routine surveillance indicated no building surfaces that exceeded the DCGLs specified in Table 6.2. The radiation surveys previously performed by the RSO indicated that the surfaces are not likely to exceed the DCGLs.

### **3.6.2 Class 2 Survey Unit**

Three laboratories and the waste storage building were classified as a Class 2 survey unit. Rooms 305 and 406 are known to have been used for experiments using Polonium-209 and Radium-226, both decaying by alpha emission. The previous surveys performed by the RSO and the authorized users focused on the presence of beta/gamma isotopes and consequently the detection limit for the alpha surveys was not established. While no area is known to be impacted in excess of the DCGLs, these rooms and the waste storage building were surveyed pursuant to the requirements for a Class 2 survey unit. The walls in these rooms to a height of two (2) meters from the floor, and all overhead areas, were classified as a Class 3 survey unit.

### **3.6.3 Class 3 Survey Unit**

All other laboratories listed in Table 6.1 were classified as Class 3. The hallways adjacent to each of these rooms were also surveyed as required for a Class 3 survey unit, as was the walkway in Room 801 that leads from the building to the outside door of the building. This walkway was used to move drums of radioactive waste to the waste storage building, located outside of the facility.

## **3.7 Survey Procedures**

The final status survey of the rooms consisted of beta scans, fixed beta measurements (and alpha measurements where applicable), smears for liquid scintillation analysis, and smears for gross alpha/beta counting. They were performed as described in the following subsections.

### **3.7.1 Surface Scans**

For Class 2 survey units, beta scans were performed over approximately 50% of the accessible building surfaces using proportional counters, equivalent to a Ludlum Model 43-68, while listening to the audible output of the instrument. The detector was maintained at a distance of one (1) centimeter from the surface or less, depending on surface conditions. Scan speeds were established such that contamination at levels of approximately 50% of the applicable release criterion were detectable.



For Class 3 survey units, beta scans were performed for more than 10 percent of the surface area. Those areas with the highest potential for elevated residual radioactivity, based on professional judgement, were selected for scanning. The results for the surface scans are provided in Table 6.8 and Table 6.10.

### **3.7.2 Direct Alpha/Beta Measurements**

Direct alpha/beta measurements were made on the structural surfaces of each survey unit. Direct measurements were also performed on the bench tops and cabinets in the rooms. Measurements were conducted by integrating the total counts over a count time of two minutes, necessary to attain appropriate detection levels. The instrument-specific background was subtracted and the activity in units of dpm/100cm<sup>2</sup> was calculated. Measurements were made at the nodes of the grids, using a square grid pattern. The number of measurements and spacing were as outlined in the survey plan, with results shown in Tables 6.5 of this report.

### **3.7.3 Removable Activity Measurements**

Smears for removable radioactivity were collected at each direct measurement location and analyzed for beta radiation by liquid scintillation counting. The results, reported in units of dpm/100cm<sup>2</sup>, are shown in Tables 6.6, 6.7 and 6.9.

### **3.7.4 Measurement Grid Spacing**

Grids were established for the purpose of referencing locations of measurements and sampling, relative to structural and/or site features. The grid spacing for the measurement and samples was determined assuming a square grid pattern as follows:

$$L = \sqrt{\frac{A}{N}}$$

where L = grid spacing, A = Survey unit area (square meters), and N = the number of measurements.

The starting point for the survey was established for each survey unit by selecting a reference point for the survey unit such as the corner of the room. A random number generator was used to provide a random number between 0 and 1 for an initial offset from the reference point in both the x and y coordinates. The random number pair was multiplied by the calculated grid spacing providing the offset from the reference point for the first grid location. The one-meter square grid dimensions (one meter by one meter) were described in the survey plan.

## **3.8 On-site Activities**

The field team mobilized to the site on June 18, 2007. Appendix 8.2 contains a copy of the Field Activity Daily Log maintained by the HP Technician. After the necessary training and health safety provisions required in the survey plan were completed, the surveys commenced. Appendix 8.3 contains the instrument records (i.e., calibration certificates and daily checks).

Each room was cleared of all loose equipment and materials to the maximum extent possible prior to the start of the surveys. The background and detector response to a known quantity of radiation was documented each day before the instrument was used. For each laboratory, the HP Technician developed a data package of results for both direct measurements and removable radioactivity. Completion and review signature blocks in the data packages were used to track the progress of the radiation survey.

Once all of the data were acquired, they were compared to the release criteria shown in Section 3.3, above. The field team demobilized on June 28, 2007.

## 4 RESULTS

Once the surveys were complete, data were reviewed to ensure they were acquired pursuant to the provisions of the survey plan. The following requirements were confirmed:

- The instruments used to collect the data were capable of detecting the radiation of interest at or below the DCGL;
- The calibration status of the instruments used to collect the data was less than twelve months old;
- Instrument response was checked with satisfactory results before the instrument was used;
- The MDAs and assumptions to develop them are appropriate for the instruments and the survey methods used to collect the data;
- The final survey data set consisted of qualified measurement results that were representative of the current facility status and collected as prescribed in the survey plan; and
- The data were properly recorded.

No discrepancies were identified during data review, thus the data set was deemed valid by both the Project Manager and the Project CHP.

Appendix 8.4 contains the Radiation Survey Forms for each of the rooms identified in Table 6.1. The data points are summarized in Tables 6.5 through 6.10. These show that the residual radioactivity in all of the rooms/areas is not distinguishable from background and, in all cases, below the applicable release criteria.

## 5 SUMMARY AND CONCLUSIONS

All survey data collected during the on-site portion of this effort were validated and compared to the following release criteria:

- Gross beta - 7,100 dpm/100 cm<sup>2</sup> (based on the limiting DCGL for Cobalt-60); and
- Gross alpha - 1,120 dpm/100 cm<sup>2</sup> (based on the limiting DCGL for Radium-226).

It is appropriate to assume that a given survey unit or room met the requirements for release for unrestricted use provided (1) an adequate number of measurements were made; and (2) no measurements exceeded these criteria.

The data shown on the Radiation Survey Forms (Appendix 8.4) and measurement records (Tables 6.5 through 6.10) generated during the performance of the final status surveys demonstrate that residual radioactivity within the GLERL is not only below the release criteria, it is not distinguishable from that in the natural background. To a reasonable degree of scientific certainty, the GLERL may thus be released for unrestricted use (i.e., for any purpose without regard for radiological concerns).

**6 TABLES**

**Table 6.1 - Listing of Rooms Subject to Survey**

<b>Laboratory Room Number</b>	<b>Area (square feet)</b>
305	316
307	400
309	391
311	212
400	85
406	296
408	207
410	202
501	246
505	215
505A	71
507	318
509	105
511	211
511A	91
600	227
602	122
604	122
606	227
608	198
801A	128
801B	104
Waste Storage Building	102

**Table 6.2 - Source Term and Derived Concentration Guideline Levels**

<b>Radionuclide<sup>Note1</sup></b>	<b>Principal Radiation</b>	<b>Radiation Energy, E<sub>max</sub> (keV)</b>	<b>Derived Concentration Guideline Levels (dpm/100 cm<sup>2</sup>)<sup>Note2</sup></b>
Antimony-125	beta	303	4.4x10 <sup>4</sup>
Cadmium-109	beta	126	1.1x10 <sup>5</sup>
Calcium-45	beta	257	2.8x10 <sup>6</sup>
Carbon-14	beta	156	3.7x10 <sup>6</sup>
Cerium-144	beta	319	4.3x10 <sup>4</sup>
Cesium-134	beta	658	1.3x10 <sup>4</sup>
Cesium-137	beta	514	2.8x10 <sup>4</sup>
Chlorine-36	beta	710	5.0x10 <sup>5</sup>
Cobalt-60	beta	318	7.1x10 <sup>3</sup>
Hydrogen-3	beta	18	1.2x10 <sup>8</sup>
Iodine-129	beta	154	3.5x10 <sup>4</sup>
Iron-55	beta	231	4.5x10 <sup>6</sup>
Manganese-54	beta	542	3.2x10 <sup>4</sup>
Polonium-209	alpha	4,883	2.5x10 <sup>3</sup>
Polonium-210	alpha	5,304	2.5x10 <sup>3</sup>
Radium-226	alpha	4,784	1.1x10 <sup>3</sup>
Silver-100m	beta	531	1.0x10 <sup>4</sup>
Sodium-22	positron	545	9.5x10 <sup>3</sup>
Zinc-65	beta	1,352	4.8x10 <sup>4</sup>

Note 1: Isotopes with a radioactive half-life shorter than 120 days were omitted from this list. Phosphorus-32 (P-32) and P-33 each have a half-life of less than 30 days.

Note 2: The screening values for unrestricted use of building surfaces are provided in NUREG 1757 and NUREG 5512 such that the potential radiation dose to the critical population is less than 25 millirem per year.<sup>18,19</sup>

<sup>18</sup> U.S. Nuclear Regulatory Commission, *Consolidated Decommissioning Guidance Characterization, Survey, and Determination of Radiological Criteria*, Table H.1, NUREG 1757, Volume 2, Rev 1, September, 2006.

<sup>19</sup> U.S. Nuclear Regulatory Commission, *Residual Radioactive Contamination From Decommissioning - Parameter Analysis*, Table 5.19, NUREG 5512, Volume 3, Draft, October, 1999.

**Table 6.3 - Survey Instrument Descriptions**

<b>Make</b>	<b>Rate Meter Model</b>	<b>Detector Model</b>	<b>Detector Type</b>	<b>Radiation Detected<sup>20</sup></b>	<b>Calibration Source</b>	<b>Use</b>
Ludlum	2224	43-68	Gas flow Proportional	Alpha, 1-5 Mev Beta, 65-1,450 Kev	<sup>230</sup> Th, <sup>99</sup> Tc	Direct beta surveys; Beta scan on solid surfaces
Ludlum	2224	239-1F	Gas flow proportional	Alpha, 1-6 Mev Beta, 65-1,450 Kev	<sup>230</sup> Th, <sup>99</sup> Tc	Beta scan on solid surfaces
Packard	NA	NA	Liquid scintillation	Beta, 5-1,500 Kev	<sup>14</sup> C and <sup>3</sup> H	Wipe test analysis

<sup>20</sup> U.S. Nuclear Regulatory Commission, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*, NUREG/CR-1507, December, 1997.



**Table 6.4 - Survey Instrument Detection Limits**

Detector Model	Background <sup>(1)</sup>	Detector Efficiency (c/dia) <sup>(2)</sup>	Sensitivity (dpm/100cm <sup>2</sup> )	
			Scanning	Static Count (1 minute)
43-68	Floor Tile 2.2±0.6 cpm α 175.5±9.8 cpm βγ Concrete 2.8±1.2 cpm α 220±8.2 cpm βγ	0.16 α 0.23 βγ	1,200	900
239-1F	Floor Tile 3.4±1.8 cpm α 516.2±28.4 cpm βγ Concrete 3.0±0.5 cpm α 596.3±6 cpm βγ	0.10 α 0.26 βγ	1,100	400
Liquid Scintillation	8 cpm	0.70 <sup>14</sup> C 0.55 <sup>3</sup> H	n.a.	12 dpm <sup>14</sup> C 18 dpm <sup>3</sup> H

(1) Average of the beginning of shift and end of shift values over the course of the survey effort.

(2) Average of the daily efficiencies over the course of the survey effort.

**Table 6.5 - Stationary (Static) Count Results**

Room Number <sup>1</sup>	Number Static Counts Floor	Number Static Counts Wall	MDA dpm/100 cm <sup>2</sup> ( $\alpha/\beta/\gamma$ )	Highest Static Readings Floor dpm/100 cm <sup>2</sup> ( $\alpha/\beta/\gamma$ )	Highest Static Readings Wall dpm/100 cm <sup>2</sup> ( $\alpha/\beta/\gamma$ )
305	9	6	29/139.2	4.3/-17	4.3/-38
307	5	4	40.1/196	-0.9/2.2	-0.9/2.2
309	6	4	40.1/196	-0.9/-11	-0.9/0.0
311	4	4	34.3/140	-6.4/76	-3.2/74
400	15	4	59.2/220 floor 34.7/142 walls	0.0/97	0.0/42
406	12	9	34.7/142	0.0/-70	0.0/-79
408	5	4	34.3/140	-3.2/157	-6.4/83
410	5	4	34.3/140	-6.4/67	-3.2/65
501	5	4	40.1/196	-0.9/86	-4.1/86
505	6	4	38.3/199	-3.2/57	-3.2/55
505A	5	4	38.3/199	-3.2/62	-3.2/64
507	3	4	40.1/196	-0.9/-31	-0.9/-35
509	3	4	40.1/196	-4.1/-57	-0.9/-68
511	8	4	38.3/199	-3.2/62	-3.2/59
511A	6	4	39.9/204	-4.1/40	-0.9/37
600	6	4	38.3/199	-3.2/70	0.0/68
602	5	4	38.3/199	0.0/158	-2.2/62
604	6	4	38.3/199	0.0/75	-2.2/68
606	6	6	38.3/199	0.0/79	0.0/73
608	4	4	40.1/196	-0.9/75	-4.1/79
801	5	N/A	57.8/221	2.2/42	N/A
801A	5	4	39.9/204	-0.9/-17.6	-0.9/-8.8
801B	5	4	39.9/204	-0.9/55	-4.1/20

Room Number <sup>1</sup>	Number Static Counts Floor	Number Static Counts Wall	MDA dpm/100 cm <sup>2</sup> (α/β-γ)	Highest Static Readings Floor dpm/100 cm <sup>2</sup> (α/β-γ)	Highest Static Readings Wall dpm/100 cm <sup>2</sup> (α/β-γ)
Waste Building	15	8	58.5/218	0.0/41	0.0/56

1 - Survey results for the counter tops in the rooms were all below the applicable DCGL. See Appendix 8.4 for results.

**Table 6.6 - Removable (Gross Alpha/Beta) Contamination Results**

<b>Room Number<sup>1</sup></b>	<b>Number Smears Floor</b>	<b>Number Smears Wall</b>	<b>Highest Smear Result Floor dpm/100 cm<sup>2</sup> (<math>\alpha/\beta</math>-<math>\gamma</math>)</b>	<b>Highest Smear Result Wall dpm/100 cm<sup>2</sup> (<math>\alpha/\beta</math>-<math>\gamma</math>)</b>
305	9	6	0.7/11.8	2.1/9.9
400	5	4	1.2/14.3	2.6/2.8
406	6	4	1.2/20.1	1.2/18.2
Waste Building	4	4	2.5/18.6	1.1/18.6

1 - Survey results for the counter tops in the rooms were all below the applicable DCGL. See Appendix 8.4 for results.

**Table 6.7 - Removable Contamination Results for Sinks and Fume Hoods**

<b>Room Number</b>	<b>Location</b>	<b>Smear Result dpm/100 cm<sup>2</sup> (<math>\alpha/\beta</math>-<math>\gamma</math>)</b>	<b>LSC Smear Result dpm/100 cm<sup>2</sup> (H-3/C-14)</b>
305	sink trap	-1.8/-1.5	2.49/0.0
305	hood drain	-1.8/-7.2	0.0/1.37
305	hood exhaust	-0.8/-15.1	0.1/0.0
307	sink trap	N/A	1.46/2.95
307	north hood drain	N/A	0.0/1.38
307	north hood exhaust	N/A	0.0/0.0
307	west hood drain	N/A	0.0/0.0
307	west hood exhaust	N/A	0.0/1.13
309	left sink trap	N/A	0.88/0.49
309	right sink trap	N/A	3.69/0.0
309	hood drain	N/A	5.19/2.67
309	hood exhaust	N/A	0.0/0.0
311	sink trap	N/A	0.13/0.0
408	sink trap	N/A	4.45/1.56
408	hood drain	N/A	5.05/1.72
408	hood exhaust	N/A	1.02/3.22
505	left sink trap	N/A	1.78/2.0
505	right sink trap	N/A	1.46/4.19
505	hood drain	N/A	0.0/0.67
505	hood exhaust	N/A	3.32/0.27
505A	sink trap	N/A	0.0/0.45
507	left sink trap	N/A	1.58/2.97
507	right sink trap	N/A	0.46/0.0
507	hood drain	N/A	0.0/0.11

Room Number	Location	Smear Result dpm/100 cm <sup>2</sup> ( $\alpha/\beta-\gamma$ )	LSC Smear Result dpm/100 cm <sup>2</sup> (H-3/C-14)
507	hood exhaust	N/A	1.16/1.98
509	sink trap	N/A	0.0/0.0
511	left sink trap	N/A	1.5/0.0
511	right sink trap	N/A	2.22/0.34
511	hood drain	N/A	0.07/0.9
511	hood exhaust	N/A	1.56/0.0
511A	left sink trap	N/A	3.18/0.0
511A	right sink trap	N/A	3.54/0.0
600	left sink trap	N/A	0.0/0.0
600	right sink trap	N/A	3.31/1.68
600	hood drain	N/A	0.0/0.0
600	hood exhaust	N/A	0.0/1.12
604	sink trap	N/A	0.79/0.0
606	sink trap	N/A	0.0/2.23
606	hood drain	N/A	0.0/0.0
606	hood exhaust	N/A	2.17/0.0
608	left sink trap	N/A	4.19/0.0
608	right sink trap	N/A	0.0/3.13

**Table 6.8 - Scan Results (Hand-held Instruments)**

Room Number <sup>1</sup>	Number Floor Scans	Number Wall Scans	Scanning MDA dpm/100 cm <sup>2</sup> α/βγ	Highest Scan Readings Floor dpm/100 cm <sup>2</sup> (α/β-γ)	Highest Scan Readings Wall dpm/100 cm <sup>2</sup> (α/β-γ)
305	4	8	674/4403	4/-211	4/-211
307	2	2	725/4437	-29/-114	-29/-465
309	2	2	725/4437	-29/-114	-29/-465
311	1	2	847/4426	-38/-130	-38/217
400	2	4	1178/5017 floor 858/4512 wall	-73/1585	-39/220
406	5	10	858/4512	-39/-150	-39/-150
408	1	2	847/4426	-38/-478	-38/-478
410	1	2	847/4426	-38/-130	-38/-130
501	2	2	725/4437	-29/-114	-29/-465
505	1	2	689/4512	-25/-159	-25/-159
505A	1	1	689/4512	-25/-159	-25/-159
507	1	2	725/4437	-29/-114	-29/-114
509	1	1	725/4437	-29/-114	-29/-465
511	1	2	689/4512	-25/194	-25/-159
511A	1	1	732/4625	-29/-238	-29/-238
600	1	2	689/4512	-25/-511	-25/-159
602	1	2	689/4512	-25/-159	-25/-159
604	1	2	689/4512	-25/-159	-25/-159
606	2	2	689/4512	-25/-159	-25/-159
608	2	2	725/4437	-29/-114	-29/-114
801	N/A	N/A	N/A	N/A	N/A
801A	1	1	732/4625	-29/-590	-29/-590
801B	3	1	732/4625	-29/-238	-29/-238

<b>Room Number<sup>1</sup></b>	<b>Number Floor Scans</b>	<b>Number Wall Scans</b>	<b>Scanning MDA dpm/100 cm<sup>2</sup> α/βγ</b>	<b>Highest Scan Readings Floor dpm/100 cm<sup>2</sup> (α/β-γ)</b>	<b>Highest Scan Readings Wall dpm/100 cm<sup>2</sup> (α/β-γ)</b>
Waste Building	2	2	1175/4979	-72/1565	-72/1913

1 - Survey results for the counter tops in the rooms were all below the applicable DCGL. See Appendix 8.4 for results.



**Table 6.9 - Removable (Liquid Scintillation) Contamination Results**

Room Number <sup>1</sup>	Number Smears Floor	Number Smears Wall	Highest Smear Result Floor dpm/100 cm <sup>2</sup> (H-3/C-14)	Highest Smear Result Wall dpm/100 cm <sup>2</sup> (H-3/C-14)
305	9	6	5/1.9	3.9/1.27
307	5	4	0.62/0.0	0.24/0.75
309	6	4	2.24/0.0	2.03/0.0
311	4	4	2.51/2.68	3.79/3.83
400	15	4	3.73/2.87	1.85/0.99
406	12	9	9.46/1.39	2.52/0.0
408	5	4	4.83/0.0	5.23/1.21
410	5	4	1.29/2.04	1.45/0.85
501	5	4	3.89/0.77	4.05/0.47
505	6	4	3.33/0.0	5.57/0.0
505A	5	4	3.02/0.0	4.63/1.25
507	3	4	0.0/3.0	0.33/3.7
509	3	4	0.0/0.0	1.53/0.38
511	8	4	5.59/1.45	2.07/4.2
511A	6	4	5.83/0.0	1.55/0.0
600	6	4	0.62/0.0	2.52/0.0
602	5	4	6.95/0.0	4.97/0.0
604	6	4	2.64/1.17	9.08/1.0
606	6	6	0.0/1.38	2.88/3.54
608	4	4	3.63/0.0	3.59/1.17
801	5	N/A	1.4/2.44	
801A	5	4	0.0/3.55	1.88/3.19
801B	5	4	0.71/0.37	2.59/0.0
Waste Building	15	8	0.0/1.85	0.0/0.64

Room Number <sup>1</sup>	Number Smears Floor	Number Smears Wall	Highest Smear Result Floor dpm/100 cm <sup>2</sup> (H-3/C-14)	Highest Smear Result Wall dpm/100 cm <sup>2</sup> (H-3/C-14)
Corridors	23	N/A	2.79/2.80	N/A

1 - Survey results for the counter tops in the rooms were all below the applicable DCGL. See Appendix 8.4 for results.

**Table 6.10 - Scan Results (Floor Monitor)**

<b>Room Number</b>	<b>Number Observed Readings</b>	<b>Scanning MDA dpm/100 cm<sup>2</sup> (<math>\alpha/\beta/\gamma</math>)</b>	<b>Highest Scan Readings dpm/100 cm<sup>2</sup> (<math>\alpha/\beta/\gamma</math>)</b>
305	11	253/1369	-27/-416
307	11	224/1223	-24/-344
309	14	224/1223	-24/-244
311	7	206/1203	-20/-459
400	11	233/1413	-27/15
406	11	358/1281	-62/-208
408	6	206/1203	-20/-450
410	6	206/1203	-20/-245
501	6	224/1223	-24/-414
505	6	210/1210	-22/-385
505A	2	210/1210	-22/-385
507	8	224/1223	-24/-414
509	3	224/1223	-24/-555
511	6	210/1210	-22/-385
511A	3	216/1221	-23/-481
600	7	210/1210	-22/-455
602	4	210/1210	-22/-525
604	4	210/1210	-22/-525
606	6	210/1210	-22/-455
608	6	224/1223	-24/-414
801	9	224/1307	-26/-200
801A	4	216/1221	-23/-692
801B	N/A	N/A	N/A
Waste Building	10	233/1268	-27/-331
Corridors	121	216/1221	-23/-481

**7 FIGURES**



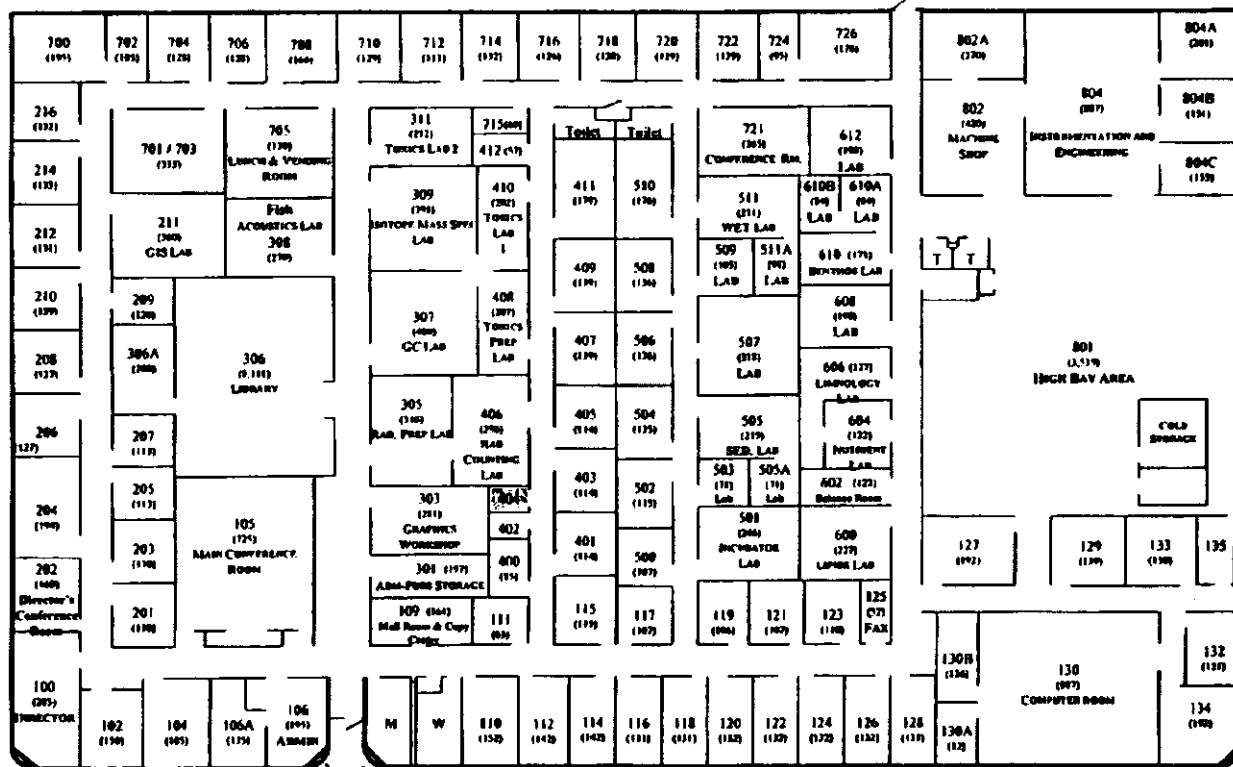
NORTH →

Rev 6/99

# Great Lakes Environmental Research Laboratory

2205 Commonwealth Boulevard, Ann Arbor, MI 48105

Figure 7.1 - Building Floor Plan



MAIN ENTRANCE

(NUMBERS IN PARENTHESES SHOW APPROXIMATE AREA IN SQUARE FEET)



## 8 APPENDICES

**Appendix 8.1 - Qualifications of Project Personnel**

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## **R. Alan Duff - Project Manager**

### **Professional Qualifications**

Mr. Duff has over 27 years of experience in nuclear and hazardous materials project management, design support, surveillance, operational health physics, training, and decommissioning activities. He has prepared numerous plans, procedures, and license documents for U. S. Department of Energy facilities, U. S. Department of Defense facilities, U. S. Nuclear Regulatory Commission licensees, and commercial client facilities that are regulated by agreement states. Mr. Duff is well versed in the area of civilian and government radioactive and mixed waste transport and disposal requirements. He is registered by the National Registry of Radiation Protection Technologists (NRRPT).

### **Education**

Advanced Mixed Waste Shipper Certification Training, 2003.

Confined Space Entry Training, 1998

CNSI Advanced Radioactive Material Transportation and Disposal Class, 1989 and 1993

IT Corporation Project Management Course (40 hours), 1992.

40-Hour OSHA HAZWOPER (29 CFR 1910.120) Training, 1987.

Eight-hour Supervisor Training, 1990

Eight-hour OSHA Annual Refresher (29 CFR 1910.120), 2005.

Canberra Multichannel Analyzer Operations Class, 1988.

Operational Water Chemistry and Radiological Controls, U.S. Navy, 1982

Engineering Laboratory Technician School, U.S. Navy, 1980.

Nuclear Power Training Unit (prototype), U.S. Navy, 1980.

Naval Nuclear Power School, U.S. Navy, 1978.

### **Registrations/Certifications**

Registered Radiation Protection Technologist (RRPT), National Registry of Radiation Protection Technologists



Radiation Safety Officer - MDE Radioactive Materials License No. MD-31-281-01.

Authorized User - MDE Radioactive Materials License No. MD-31-281-01.

### **Experience and Background**

2002-Present *Vice President of Nuclear Services, Integrated Environmental Management, Inc., Knoxville, Tennessee* - As the director of IEM's Nuclear Services Division, which operates as a compliment to our consulting capability by providing support services and on-site project management for major client initiatives, Mr. Duff is responsible for turn-key decontamination and decommissioning of nuclear facilities - including the preparation of all planning documentation, characterization surveys and sampling - facility and equipment decontamination, final status survey performance, waste packaging/transport/disposal coordination, routine facility surveillance services, emergency response, leak testing of sealed sources, instrument rental, employee monitoring services for internal and/or external exposures, training, and a host of other applied health physics operations.) Mr. Duff also serves as the Radiation Safety Officer (RSO) for IEM operations pursuant to Maryland Department of the Environment Radioactive Materials License No. MD-31-281-01.

1995-2002 *Program/Project Manager, Integrated Environmental Management, Inc., Knoxville, Tennessee* - Provided high-quality project management and remediation services to commercial and government clients. As a member of the client's response team, worked with clients to: Develop scopes-of-work and bid packages for specialty subcontractors handling highly focused assignments; identify those subcontractors who will provide the greatest value to the client; manage teams of specialty subcontractors to ensure that the client's goals and expectations (technical, regulatory, and financial) are met from the beginning until project completion; provide insights into future regulatory issues and their impact as input to the client's long-range business planning and cost forecasting process; provide site remediation/decommissioning services for radioactive and hazardous materials; advise and train clients on waste transportation and disposal issues; and develop project specific plans and procedures to conduct on site activities.

1994-1995 *Senior Environmental Specialist, AWK Consulting Engineers, Inc., Pittsburgh, Pennsylvania* While assigned to the Oak Ridge, Tennessee office, was responsible for performing technical and administrative duties required to satisfy customer needs on site characterization and pre-remedial design support projects and for all aspects of D&D projects. Responsible for preparing project plans, project work plans, task specific Health & Safety Plans, and budgets/schedules for these projects. Also responsible for identifying and implementing decommissioning and decontamination methods for these projects.

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- 1987-1994 *Project Manager, Health Physics Supervisor, Nuclear/Mixed Waste Engineering Services, IT Corporation, Knoxville, Tennessee.* Provided project management and health physics support services for nuclear and mixed waste projects throughout the United States.
- 1978-1987 *Engineering Laboratory Technician (ELT), Leading Petty Officer, Radiological Controls Shift Supervisor, United States Navy* Supervised a division of 40 personnel, provided support for nuclear powered submarines, and performed over 250 error-free shipments of radioactive materials. Served as Leading ELT and Engine Room Supervisor on the USS Grayling, SSN 646.

### **Professional Society Memberships**

Health Physics Society (Plenary Member)

American Nuclear Society

Conference of Radiation Control Program Directors (Advisor to the Radioactive Waste Management Committee E-5 and to the D&D Committee E-24)

### **Awards**

Navy Achievement Medal for conducting the first Trident Class submarine ion exchange resin discharge and solidification.

IT Corporation Project Management Associate

### **Example Project Descriptions**

Project Manager for health physics field activities during characterization, remediation and survey of several oil production sites with soil contaminated with Naturally-Occurring Radioactive Materials (NORM) for multiple clients in support of litigation defense.

Project Manager for the radiological characterization (MARSSIM surveys) of a facility that manufactured thorium fluoride for use as an optical surfacing product. Conducted radiation and contamination surveys and obtained analytical samples of building materials. Returned to the facility to conduct surveys in support of property ownership transfer. Supervised radiological remediation of facility including floor and wall contamination, underground tank removal, drain line removal, roof decontamination, and equipment demolition including ventilation systems, fume hoods, and scrubber systems. Responsible for coordination for treatment and disposal of radioactive and mixed wastes generated during the project and conducted final status surveys at the facility upon completion of work.

Project Manger for Phase 1 Environmental Assessments conducted at five radioactive waste processing and disposal facilities.

Project Manager and Health Physicist for the remediation and final status surveys/sampling of a former oilfield pipe scale facility. Supervised the demolition of the site building, excavation and disposal of ten truckloads of NORM- contaminated soil, and excavation and release of over 20 truckloads of clean soil. Interfaced with the client and state regulators on the planning and final release of the facility. Work performed under the terms/conditions of License No. MD-31-281.01.

Project Manager and Health Physicist for the remediation and final status survey of a pharmaceutical company's radiological laboratories contaminated with Hydrogen-3 and Carbon-14. Supervised the on site demolition of the labs including fume hoods, lab furniture and ventilation systems. Supervised the disposal of radioactive and mixed wastes from the site and the performance of the final status survey of the facility.

Project Manager for the decommissioning of an oven contaminated with mercury and thorium (mixed waste). Arranged for subcontractors to conduct decontamination and disposal activities, prepared project plans, supervised all field activities, and conducted all radiological surveys during the decommissioning. Responsible for coordination for treatment and disposal of mixed and hazardous wastes generated during the project. Later conducted removal of a central vacuum system that was contaminated with mercury and thorium at the same facility.

Conducted audits of a client's radiation protection program including tour of the site, interviews with employees to verify radiological and respirator training, review of shipping, waste disposal, sealed source, training, and survey records. Also conducted leak tests of client's radioactive sealed sources.

Project Manager for escalated decommissioning a State-licensed site that manufactured, tested, and distributed gauging devices in anticipation of the sale of the company and the possibility of its moving its operations to another location. Responsible for preparation of work plans, negotiations with regulatory agencies, decontamination of indoor and outdoor areas, performance and documentation of a final status survey, shipment of waste, and project-specific health and safety.

Project Manager and health physicist for the remediation of a building foundation drainage system and the processing of over 100,000 gallons of water contaminated with cobalt-60 up to levels of one (1) microcurie per liter for a commercial client. Responsible for coordination of a water processing subcontractor, an excavation subcontractor, and off-site analytical laboratory activities. Also interfaced with on-site U. S. Nuclear Regulatory Commission, U. S. Environmental Protection Agency, and a variety of state and local agencies. Follow up work at the same facility included development of decommissioning funding plans and site decommissioning plans.

Technical writer for the development of a logic flow diagram for identifying radioactive and mixed wastes at the U. S. Department of Energy's Portsmouth (Ohio) Gaseous Diffusion Plant.

Technical writer for the Fernald Remedial Investigation/Feasibility Study (RI/FS). Provided technical guidance to engineering staff, generated reports on radioactive and mixed waste packaging, transport, and disposal.

Site Manager for the characterization survey of an EPA Superfund site three story warehouse that had been used in the past as a lantern mantle manufacturing facility and had been contaminated with thorium. Assisted in the development of project plans and final reports, supervised a crew of Health Physics technicians performing characterization surveys, interfaced with the facility owner and EPA personnel while on site.

Project Manager for the decommissioning and decontamination of three facilities at Sandia National Laboratory contaminated with radioactive and mixed waste. Responsible for the coordination of resources for the development of project plans, development of Project Work Plan, and maintaining project budget and schedule commitments.

Health Physics Supervisor for a transuranic (TRU) waste repackaging project. Supervised the characterization, repackaging and shipment of 130 containers of high-activity americium-241 and plutonium-238 hot cell waste. The waste was packaged to meet the WIPP waste acceptance criteria and was transported (highway route controlled quantity) to the Idaho National Engineering Laboratory (INEL) for storage.

Project Manager for the excavation and disposal of radium waste cells for the Corps of Engineers at Bergstrom Air Force Base in Austin, TX. Developed all project plans, supervised field efforts, and coordinated waste transport and disposal activities.

Project Manager for the decontamination and final release survey of a 70,000 ft<sup>2</sup> facility that manufactured cesium-137 level gauges. Decontamination efforts involved overhead areas, work area concrete floors, and removal of soil under the floor slab. Facility was released from their license following a verification survey by the state radiological licensing agency. Developed state approved decommissioning plan and final status survey report.

Project Manager for the packaging and disposal of 55,000 Curies of cobalt-60 teletherapy sources. Sources were loaded into cask liners in the facility hot cell and loaded into Type B casks for shipment for disposal. Also supported the packaging and disposal of several low level waste drums and HEPA filters that required the use of shielded Type A and B shipping containers.

Project Manager for the decommissioning and decontamination of IT Corporation's Oak Ridge Mixed Waste Analytical Laboratory. Developed the decommissioning and decontamination plan that was approved by the State of Tennessee. Also supervised the field crew during final surveys of facility.

Project Manager for the decommissioning and decontamination of a magnesium-thorium waterfall grinding booth at Tinker Air Force Base in Oklahoma. Responsible for the development of project plans, schedule and budget management, and disposal of radioactive and mixed wastes.

Project Manager for the decommissioning of a commercial facility which had previously processed ores containing uranium and thorium. Generated the decommissioning plan submitted to and approved by the U. S. Nuclear Regulatory Commission, and was responsible for schedule, budget, and on site activities.

Project Manager for the removal of a 22 MeV particle accelerator from a major university medical center. Developed State-approved decommissioning and decontamination plans, arranged for waste disposal and transfer of the accelerator to a university in Beijing, China, and was responsible for budget, schedule and all on site activities.

Project Manager for the decommissioning and decontamination of two radioactive source manufacturing laboratories at Chevron Research and Technology. The laboratories housed a neutron generator and were contaminated with tritium, carbon-14, cesium-134, and cobalt-60. Negotiated plan approvals with the State agency, and was responsible for budget, schedule, and all on site activities including waste transport and disposal.

Project Manager for the routine quarterly surveillance and special radiological projects at a metallurgical facility licensed by the NRC. Conducted radiation, contamination, and airborne radioactivity surveys as well as personnel bioassay and dosimetry program and environmental monitoring program each quarter. Provided health physics coverage for non-routine activities such as baghouse and stack testing, heats of specialty materials, final release surveys of an excavated road area, storage yard, and a warehouse formerly used for storage of radioactive materials, and recovery of radioactively contaminated equipment improperly released from site. Responsible for the generation of quarterly surveillance reports.

Project Manager for the development of a conceptual decommissioning plan for a maintenance facility located in South Carolina. The plan was generated to provide support for the facility's decommissioning funding plan.

Health and Safety Manager/Project Manager at the U. S. Department of Energy's Fernald site thorium silo and bins decommissioning and decontamination project. Developed the

project-specific health and safety plan, and interfaced with the client on health physics and health/safety issues. This project received safety and quality awards from the client.

Health Physics Supervisor responsible for the sampling of underground storage tanks with radioactive and mixed wastes at Brookhaven National Laboratory.

Health and Safety Manager for the U. S. Department of Energy's Fernald Plant K-65 Silo sampling project. Developed the health/safety and sampling plans. The silos contained up to 0.5 microcurie of Radium-226 per gram and were the largest single source of radon gas in the U.S.

D&D Technical Manager for the decommissioning of the U. S. Department of Energy's LEHR facility at the University of California at Davis. Developed project decommissioning and decontamination plans and field procedures.

Health Physics Supervisor for the excavation of waste materials which included mixtures of uranium and explosives.

Project Manager for the MARSSIM type final status survey of a potentially contaminated 10 acre property on Staten Island, New York. Developed site characterization/survey plans, supervised the on site characterization survey and soil sampling at the site, and developed the project report for submittal to regulators.

Developed numerous business proposals for nuclear decommissioning and decontamination projects including job walk downs, cost estimation, scheduling, and technical content of proposals.

While in the US Navy, acted as radioactive materials shipper for the Trident Submarine Refit Facility. Performed over 250 error-free shipments of radioactive materials including Type B quantity radiography source shipments and radioactive waste shipments to the naval shipyard.

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## **Jeffery W. Sumlin - Health Physics Technician**

### **Professional Qualifications**

Mr. Sumlin has over 25 years of experience in the radiation protection field, with emphasis on decontamination, site surveillance and applied health physics. His extensive field and management experience, interpersonal skills, and technical abilities in the decontamination, decommissioning, and radiation protection fields are accompanied by excellent qualifications in project coordination, regulatory compliance, site characterization and radiological oversight and verification.

### **Education**

AA, Nuclear Technology - University of Phoenix, 1991  
AS, Liberal Arts - University of the State of New York, 1989  
BS, Sociology and Nuclear Technology - University of the State of New York, 1990  
Naval Nuclear Power School, 1980  
Nuclear Power Training Unit (prototype), 1981  
40-Hour OSHA HAZWOPER Training (29 CFR 1910.120), 1996  
8-Hour OSHA Annual Refresher (29 CFR 1910.120), 2005  
Confined Space Training, 2003  
Fall Protection Training, 2005

### **Certifications and Licenses**

Registered Radiation Protection Technologist (RRPT), National Registry of Radiation Protection Technologists  
Qualified U. S. Department of Energy Health Physics Technician  
Authorized User - Maryland Department of the Environment Radioactive Materials License No. MD-31-281-01.

### **Experience and Background**

- 2006-Present *Project Manager and Health Physics Technician, Integrated Environmental Management, Inc., Knoxville, Tennessee* - Duties include surveillance activities, instrumentation usage/control, decontamination, site characterization, documentation, report preparation, cost/schedule assessment, research/analysis, and general health physics duties. Mr. Sumlin is also qualified as a Health Physics Technician pursuant to Radiation Safety Procedure No. RSP-006, "Training and Qualification of Radiation Protection Personnel".
- 2004-2005 *Lead Radiological Controls Technician, Oak Ridge National Laboratory, Oak Ridge, Tennessee* - Duties involved environmental remediation and transuranic legacy waste recovery.

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- 2001-2004 *Radiological Controls Technician, Sandia National Laboratory, Albuquerque, New Mexico* - Duties included support for decommissioning and decontamination activities and the Mixed Waste Management Facility.
- 1995-2001 *Senior Health Physics Technician, Pacific Northwest National Laboratory, Hanford, Washington* - Served in the Hanford Site Health Physics Department as an ALARA Coordinator, Radioactive Source Custodian, and first-line supervisor for various USDOE contractors and projects.
- 1980-1995 *U. S. Navy Nuclear Propulsion Program* - Duties included positions as Mechanical Operator, Engine Room Supervisor, Engineering Watch Supervisor, Radiological Controls Shift Supervisor, and Quality Assurance Supervisor.

### **Example Accomplishments**

Senior Health Physics Technician during the initial emergency response, subsequent recovery and decontamination of the Hanford Plutonium Reclamation Facility after it was damaged from an explosion, Plutonium Finishing Plant, Hanford Nuclear Reservation, 1997.

Senior Health Physics Technician for the start up of Hanford Plutonium Finishing Plant Muffle Furnace for plutonium waste stabilization, Plutonium Finishing Plant, Hanford Nuclear Reservation, 1998.

Senior Health Physics Technician for the decontamination, decommissioning, and turn over of Hanford B Plant Canyon, Hanford Nuclear Reservation, 1998.

After selection as the ALARA Coordinator for the Hanford Plutonium Finishing Plant, rebuilt the ALARA program after five years of neglect resulting in an annual exposure reduction of 35%, Hanford Nuclear Reservation, 1997.

Radiological Controls Supervisor for the Hanford Tank Farms Required Surveillance Program and Radioactive Liquid Waste Cross-Site Transfer System at the Hanford Nuclear Reservation, 1999.

Extensive experience with alpha, low energy beta, beta and gamma contamination, high energy beta, gamma and neutron radiation, and airborne radioactivity.

As Radiological Control First Line Supervisor, revised and administered Hanford Tank Farms Environmental Surveillance Program, including stack emissions monitoring, contamination control and workplace air monitoring at the Hanford Nuclear Reservation, 1999.



Radiological Controls First Line Supervisor for several ground water migration wells at the Hanford Nuclear Reservation, 1999.

Lead Senior Health Physics Technician for the decommissioning and decontamination of several Cold War era plutonium producing reactors at the Hanford Nuclear Reservation, 2000.

Senior Radiological Controls Technician for the decommissioning and decontamination and final release of over 500,000 ft<sup>2</sup> of structures at Sandia National Laboratories, 2004.

Sandia National Laboratories Decommissioning and Decontamination Radiological Controls Technician authorized to act independently at the Tonopah Test Range, Nevada Test Site, 2003.

Lead Radiological Controls Technician for the remediation of radioactive injection wells and equipment at Oak Ridge National Laboratory, Tennessee, 2005.

Radiological Controls Technician for the recovery of 202 containers of transuranic waste buried over 30 years ago at Oak Ridge National Laboratory, Tennessee, 2005.

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## **Billy R. Thomas - Project CHP**

### **Professional Qualifications**

Mr. Thomas has over 28 years of senior-level experience in radiological and industrial hygiene activities with emphasis on systems to minimize personnel exposures to radioactive and hazardous materials, compliance with federal and state regulations, site and facility audits. Mr. Thomas has developed and implemented comprehensive programs for radiation and chemical protection programs. Mr. Thomas is actively involved in all aspects of health and safety including regulatory compliance, site decommissioning, program evaluation, applied health physics, occupational safety, training and project management.

### **Education**

M.S., Environmental Health, University of Oklahoma, 1981  
B.S., Health Physics, Oklahoma State University, 1976

### **Certifications**

Certified Health Physicist (Comprehensive Practice), American Board of Health Physics, 1988. Recertified: 1992, 1996, 2000 and 2004.

Certified Industrial Hygienist (Comprehensive Practice), American Board of Industrial Hygiene, 1984. Recertified : 1990, 1996 and 2002.

OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Training. Initial training 1987 and updated each year.

Lead Abatement Training for Supervisors, University of Cincinnati. 1996.

Asbestos Abatement Supervisor Course, Asbestos Consulting and Training Systems, 1997.

Authorized User - Maryland Department of the Environment Radioactive Materials License No. MD-31-281-01.

### **Experience and Background**

2002-  
Present *Vice President, Consulting Division, Integrated Environmental Management, Inc. Findlay, Ohio.* As the director of the company's consulting division, Mr. Thomas is responsible for selecting and coordinating the services of senior-level consultants in the areas of radiation safety and industrial hygiene. In addition, he maintains and ensures all members of the division maintain a track record of technical excellence, cost and schedule control, and innovation in solving environmental and health/safety problems for both government and commercial clients.

1999-  
2002      *Senior Health Physicist, Integrated Environmental Management, Inc.  
Findlay, Ohio.* Provides high-quality radiation protection services to commercial and government clients. As a member of the client's response team, works with clients to promote an understanding of what is required to achieve and/or maintain compliance in the eyes of all pertinent regulatory agencies, individually or jointly; develop and overall strategy for achieving compliance and reduce liabilities in a technically-sound, legally defensible, and fiscally-conservative business manner; recommend specific solutions that are compatible with the client's operating philosophy; and provide insights into future regulatory issues and their impact as input to the client's long-range business planning and cost forecasting process.

Mr. Thomas served as the task manager to develop a baseline human health risk assessment for a confidential client who previously processed enriched uranium and manufactured fuel pellets. The risk assessment was developed for potential exposures both hazardous chemicals and radioactive materials found in soil and groundwater. The assessment incorporated the requirements of the USEPA Risk Assessment Guidance for Superfund (RAGS) as well as requirements established by the State authorities.

Mr. Thomas developed a Emergency Response and Preparedness Manual for a Canadian client who manufactured uranium pellets for nuclear power reactors. The manual was prepared in accordance with the guidance provided by the Canadian Nuclear Safety Commission (CNSC) and the U.S. Nuclear Regulatory Commission (USNRC). The manual addressed the resources to mobilize to an emergency, involving both hazardous chemicals and radioactive uranium in several different chemical forms. The manual was implemented by the client and approved by the CNSC.

A commercial client, licensed by the Nuclear Regulatory Commission, required an evaluation of their internal dosimetry program. Mr. Thomas prepared a procedure to measure both internal and external exposure. The procedure satisfied the recommendations established by the NCRP and ANSI as well as requirements established by the USNRC.

Mr. Thomas worked as part of a project team to develop decommissioning plans for four (4) different facilities licensed to process radioactive materials. The decommissioning plans established the derived concentration guidelines levels for a variety of radioactive isotopes, including enriched uranium, thorium and byproduct radioactive materials. The potential exposures to future residents were limited to less than twenty-five millirem per year and evaluated over a period of 1,000 years. The plans were compliant with the requirements established by the USNRC and NUREG 1757. Each plan was approved by the USNRC and implemented by the client in order to decommission the facility and terminate the license.

A commercial client required a plan to survey, remediate and ultimately release the building surfaces for unrestricted use. Mr. Thomas established the release criteria using and developed a procedure to complete the radiation survey. The procedure was consistent with the requirements established by the USNRC and NUREG 1575, MARSSIM.

Mr. Thomas completed radiation surveys to evaluate potential exposures to electromagnetic frequency (EMF) radiation in commercial manufacturing facilities. The evaluation of personal exposures were compared to recommendations published by the ACGIH and OSHA. Recommendations were provided to the clients to limit personnel radiation exposures and verify that exposures were acceptable.

1993-  
1999

*Director of Health and Safety, The IT Group, Findlay, Ohio.* Originally joined OHM Remediation Services in 1993. The IT Group purchased OHM in 1998. Duties including conducting site and facility health and safety audits, determination of personal protective equipment and respiratory protection equipment, supervising the development and implementation of site specific health and safety plans, and providing industrial hygiene training and services. He had direct accountability for health and safety compliance, including regulatory compliance with federal, state and local agencies. He implemented a comprehensive health and safety program for demolition and remediation activities by the Midwest region, which accumulated 2.3 million man-hours from March, 1994 to July, 1997 without a single lost time injury.

Safety and Health Manager, Kansas City PRAC II, Kansas City District. Duties on this HTRW contract included the development of safety and health plans as well as procedures to be implemented at each of the KC PRAC projects. Developed SSHP for specific KC PRAC projects including, Ottawa, Illinois, Galena, Kansas, Mead Nebraska, and Fort Riley, Kansas. Mr. Thomas provided specific support on the KC PRAC projects including:

Project CIH, Project CHP, Ottawa Radiation Sites, Ottawa, Illinois September 1994 – August 1997. Developed the site specific health and safety plan and radiation protection plan to excavate soil contained radioactive radium generated by a luminous processing company. This project involved the excavation of radioactive contamination from nearby residences and selected sites in the city. Worked with State of Illinois and the EPA to implement an effective contamination control program, including air sampling and personnel monitoring for radium. Provided radiation worker training for the work crew and directed the on-site health physics and industrial hygiene program for the initial phases of the project. Conducted site inspections and project audits on a periodic basis.

Safety and Health Manager, USACE, Omaha District Rapid Response II. Duties on this HTRW contract included the development of program procedures and policies to

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work on multiple USACE projects. Developed SSHP for specific Rapid projects, including work at Joliet, Illinois, Ames, Iowa and Des Moines, Iowa. Mr. Thomas conducted site inspections and provided technical support for the implementation of the site safety and health program for RR/IR task orders. Mr. Thomas provided support on each Rapid project, including:

Project CIH, Project CHP; Ames Laboratory Chemical Disposal Site, Ames, Iowa. July 1994 – November 1994. Developed the site specific health and safety plan for the excavation and disposal of approximately 1,000 cubic yards of radioactive uranium wastes and contaminated soils. Developed the radiation protection program to be implemented by project employees to reduce exposures to ionizing radiation to as low as reasonable achievable. Contaminated materials were packaged and shipped for disposal in Clive, Utah.

Safety and Health Manager, USACE, TERC Number 1. Duties on this contract included the development of SSHP for work at Ellsworth AFB in Rapid City SD and KI Sawyer AFB in Michigan. Mr. Thomas provided support for some of the TERC projects including:

Project CIH, Ellsworth AFB, OU2 and OU7, Rapid City South Dakota. November 1996 – September 1997. Developed the site specific health and safety plan to excavate radioactive materials from disposal trenches at OU2 and OU 7. Developed radiation protection plan as well as the release criteria to be implemented to document that the site was free of contamination. Worked with the USAF Radiation Safety Committee to establish protocols to identify plutonium in soil and verify that debris was handled correctly.

Project CIH, Tarracorp Industries, Granite City, Illinois April, 1993 – May, 1997. USACE Omaha PRAC II. Developed the site specific safety and health plan for this project to excavate and treat lead-contaminated soil from smelter emissions. Treatment was completed by stabilizing the soil using a pugmill. This process delists the soils to a "special waste" classification, resulting in key cost savings in disposal. To date, over 300 residential sites have been remediated, and over 100,000 tons of soil have been processed. Excavation, transportation, and disposal of wastes containing battery chips have also taken place. Developed the elements of the air monitoring program. The air monitoring program was sufficient to evaluate the personnel exposures to airborne lead dust, as well as the fugitive emission from the exclusion zone. Performed periodic site visits to review results of the air sampling program and confirm that exposures were acceptable.

Health and Safety Manager, Department of Energy, Weldon Spring Site Remedial Action Program (WSSRAP), April 1993 – July, 1995. OHM was contracted to excavate contaminated construction debris from the WSSRAP quarry. Materials in the

quarry were accumulated from a munitions manufacturing facility at Weldon Spring, as well as the demolition of buildings from the Mallinckrodt site used during the Manhattan project. Personnel exposures to uranium and thorium were documented, as well as nitroaromatics and asbestos. Mr. Thomas completed site inspections to evaluate the effectiveness of the health and safety plan and review the results of employee exposure monitoring.

Health and Safety Manager during the demolition of selected manufacturing buildings at the WSSRAP. The demolition projects involved the controlled demolition of nine buildings. Employees encountered radioactive uranium as well as asbestos containing materials and cadmium based paints. Mr. Thomas evaluated the construction safety program as well as industrial hygiene program during the demolition tasks.

Health and Safety Manager during the remediation of facilities at the Piketon Gaseous Diffusion Plant in Portsmouth, Ohio. OHM was contracted to remediate a chromic acid tank, including the removal of the lead liner in Building X700. OHM also demolished the incinerator in Building X705A. Mr. Thomas prepared the health and safety plan to document the methods necessary to reduce employee exposure to hazardous materials, both chemical and radiation exposures. OHM employees encountered hot environments in Building X700 where chromic acid and uranium were present.

Health and Safety Manager during the remediation of mixed waste that was buried in several burial pits at the Ames Laboratory in Ames, Iowa. Mr. Thomas participated in the planning and execution of the project, including presentations at the public hearings that were provided by the DOE to the public. The waste in the burial pits contained a variety of hazardous materials, including radioactive uranium, thorium, and asbestos as well as volatile organics including methyl ethyl ketone and trichloroethylene. Mr. Thomas prepared the health and safety plan for the project which described the industrial hygiene practice, the construction safety requirements, and the elements of the health physics program. Mr. Thomas evaluated the controls that were implemented and verified that employee exposures were reduced to as low as reasonably achievable.

1990 - *Health and Safety Manager, IT Corporation, St. Louis, Missouri.*

1993 Provided direction day-to-day for laboratory operations in the areas of health physics, industrial hygiene, hazardous waste management, and laboratory safety. Served as the Radiation Safety Officer for the USNRC Broad Scope license for the use of by-product and source material at the laboratory .

Collateral assignment as Department Manager of a radiochemistry laboratory to analyze samples from a variety of commercial and government facilities, including facilities operated by the DOE. Services were provided to a variety of DOE facilities including Fernald, Idaho National Energy Laboratory, Lawrence Livermore National Laboratory, Nevada Test Site, Oak Ridge National Laboratory, Paducah Gaseous

Diffusion Plant, Rocky Flats, WSSRAP, and the Y12 Production Facility. Supervised the analysis of various environmental media to be analyzed for specific radioactive isotopes including uranium, plutonium, thorium, and radium. Other analyses were performed for fission products and gross methods including alpha and beta analysis. Served as the RSO for the broad-scope license issued to the laboratory by the NRC.

Performed waste management assessment for four different DOE facilities. Principal investigator for hazardous and mixed waste policies, procedures and practices. Recommended program changes and upgrades. Worked at the following facilities, including: Portsmouth Gaseous Diffusion Plant, Piketon, Ohio; K25 Gaseous Diffusion Plant, Oak Ridge, Tennessee; Paducah Gaseous Diffusion Plant, Paducah, Kentucky; and Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Served as project manager for the Industrial Hygiene department at Los Alamos National Laboratory (HSE-5). Responsibilities included reviewing and making recommendations for several of the programs being implemented by HSE-5 for the National Laboratory. These programs included asbestos controls, carcinogen control, sampling strategies and hazardous waste site characterization. Mr. Thomas also developed a sampling strategy to evaluate personnel exposures to hazardous materials. Mr. Thomas evaluated the asbestos management program at Los Alamos Laboratory. He reviewed the work performed by the IH department, including project oversight and air monitoring. He inspected work sites established by contractors including Pan American Services to assess compliance with LANL procedures and OSHA regulations.

Served as project manager to prepare mixed waste and radiative waste management plans and programs for waste generated during the remedial investigation at the Nevada Test Site. The programs required coordination between the Remedial Investigation contractor, the DOE Operations Area office and the facility receiving the waste for disposal.

1988 - *Director of Corporate Health and Safety, Burlington Environmental,*  
1990 Columbia, Illinois. Responsible for designing and implementing health and safety programs to limit exposures to hazardous chemicals and radioactive material during sampling and remediation activities. Developed procedures and conducted training classes for field service personnel to correctly use personal protective equipment and perform air monitoring to evaluate personnel exposures.

Mr. Thomas also served on several audit teams to review the health physics programs at DOE site, including Rocky Flats, Los Alamos and the Nevada Test Site. The criteria for the audits were based on the DOE Technical Safety Appraisal objectives. Mr. Thomas worked with the program personnel to correct deficiencies and measure the effectiveness of the programs.

Member of Technical Advisory Group for Martin-Marietta Energy Systems. The Advisory Group provided oversight of the Federal Facility Agreement regarding the operation of the Low Level Radioactive Waste Tank Systems implemented for Oak Ridge National Laboratory. Made recommendations to implement standard industry practices for the purposes of reducing personnel exposures to hazardous and radioactive materials. Reviewed the elements of the industrial hygiene relating to the engineering controls and administrative controls implemented to reduce exposures to hazardous materials. Evaluated the effectiveness of the health physics programs for the purposes of reducing personnel exposures to radiation to as low as reasonably achievable.

Mr. Thomas reviewed the industrial hygiene and health physics programs being implemented at each facility. Used the Technical Safety Appraisal guidelines developed by DOE to critique the effectiveness of the programs being implemented. Worked with each respective program managers, responsible for the H&S program, to develop an action plan to upgrade the program and track the progress of the changes.

Member of the Management Advisory Team for Martin Marietta Energy Systems Gaseous Diffusion Plants. The Advisory team reviewed the effectiveness of the Health and safety programs being implemented including the health physics and industrial hygiene programs. The Advisory Group was responsible for reviewing each of the health and safety programs and making recommendations for areas of improvement.

1983 - *Senior Health Physicist, IT Corporation, Oak Ridge, Tennessee.* Provided  
1988 health physics and industrial hygiene consulting to government and commercial clients. Served as the project manager for several remedial decontamination projects involving hazardous and radioactive materials. His experience included:

Project CIH, Fernald Feed Materials Production Center, US Department of Energy Cincinnati, Ohio. May, 1987 – June, 1988. Performed health-and-safety review of engineering improvements at DOE uranium metals production facility. Improvements included new ventilation systems, radioactive materials handling systems, and decontamination of the facility. Recommended health physics and industrial hygiene controls to minimize worker's exposure, and updated air monitoring programs for both workplace exposures and effluent sampling.

Task Manager, Fernald Feed Materials Production Center, US Department of Energy Cincinnati, Ohio. August, 1985 – June, 1986. Mr. Thomas developed and implemented the collection and analysis of radiation measurement to assess the concentration of uranium in the soil surrounding the manufacturing facility. This work was performed as part of the site wide Remedial Investigation/ Feasibility study.

Health Physics Supervisor, Joliet, Illinois, Commonwealth Edison, September, 1984 – December, 1985. Provided support for the chemical cleaning of the primary cooling



system at Dresden Nuclear Power Station, Unit 1. Mr. Thomas was responsible for assessment of engineering controls to reduce personnel exposures to radiation. The techniques were successful to remove more than 750 curies of cobalt-60 and other activation corrosion products. Personnel exposures were less than 7 man-Rems for the total project.

Health Physics Supervisor, Confidential Client, August 1983 - July, 1984. Provided support to decommission a facility that manufactured neutron sources (Am-Be) for nuclear power plants and radiography applications. The hot cells and glove boxes were segmented and packages in Type B shipping containers; the TRU waste shipped to Idaho Falls for storage and ultimate disposal by the USDOE. Drums of remote handled TRU were repackaged and characterized in order to satisfy the waste acceptance criteria for the USDOE. All work was performed in containments designed to minimize the spread of radioactive contamination, both airborne and surface contamination. Exposures to remediation workers was maintained below 1,000 millirem per person for the 15 month project; external exposures to gamma and neutron radiation were minimized. Internal exposures to TRU, including plutonium and americium were evaluated and verified to satisfy the requirements of the USNRC.

1976-1983 *Senior Research Industrial Hygienist, Dow Chemical, Midland, Michigan and Tulsa, Oklahoma.* Provided health and safety support for employees in manufacturing facilities, including plastic and other intermediate chemical production. Assigned as lead health physicist for decontamination projects at several nuclear power plants. From 1977 to 1980, Mr. Thomas served as the radiation safety officer for a NRC broad scope license to authorize the use of mixed fission products and special nuclear material used in manufacturing and research applications at Dow Chemical. The program included a TRIGA reactor, two small accelerators, sealed radioactive sources and tracers for a variety of research programs. Mr. Thomas directed all elements of the health physics program including training, standard operating procedures, exposure assessment and documentation. Mr. Thomas later (1981 - 1983) served as the radiation safety officer for the field services division where sealed sources and mixed fission products were used in treatment systems. This assignment had responsibilities in 22 states for approximately 3,000 employees. Mr. Thomas directed the use of radioactive materials licenses in 16 different states and a NRC license for the use of these radioactive materials.

#### **Professional Society Membership**

Health Physics Society (Plenary member)

American Academy of Health Physics

American Industrial Hygiene Association

American Academy of Industrial Hygiene

***Bibliography***

Mr. Thomas has authored/coauthored a number of papers and technical reports. In addition, he has developed/presented training courses in the field of health physics, industrial hygiene and safety.

***Other Appointments/Awards***

Ohio Radiation Advisory Council. Appointed by Governor Taft in 2002. Elected Chair of the Council in 2004 and 2005.

Ohio Utility Radiological Safety Board, Citizen's Advisory Council. Elected Chair in 2001 and 2002.

Director of the State of Ohio Low Level Radioactive Waste Facility Development Authority Board. Appointment by the Speaker of the Ohio State Legislature in 1997.

Chairman's Award for Safety Excellence, OHM Remediation Services, 1996, 1997

Senior Technical Associate, International Technology Corporation, 1991.

Member of the People to People Ambassador Delegation visiting the People's Republic of China, 1987. Invited speaker to review health physics practices.

**Appendix 8.2 - Field Activity Daily Logs**





INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
FIELD ACTIVITY DAILY LOG

Facility: Great Lakes Environmental Research Laboratory	
Date: <u>6/20/07</u>	Job/Task Number: 2005006.003
Client Name: BMT Entech	
Address of Work Site: 2205 Commonwealth Blvd, Ann Arbor, MI 48105-2945	
Description of Work: Final Status Survey	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS

Arrived on site at (insert date and time): 6/20/07 / 0730

0730 ON SITE, BEGAN INSTRUMENT SET UP

0815 TOOK SAMPLES TO BE USED AS BACKGROUND IN CORRIDOR 2

0900 BEGAN SURVEY OF ROOM 406

0930 TOOK FOUR MUNCH ROOMINGS IN CORRIDOR 2 TO BE USED AS  
BACKGROUND

1230 COMPLETED SURVEY OF ROOM 406

1300 BEGAN SURVEY OF ROOM 400

1500 COMPLETED SURVEY OF ROOM 400

1600 SURVEYED ROOM 401 AT REQUEST OF KIM AND ROOM  
OCCUPANT. BRIGGS' RAD MATERIAL WITH UP TO 15' DPM Pu210  
WAS IN THERE AT ONE TIME

1650 COMPLETED END OF SHIFT INSTRUMENT CHECKS, OFF SITE

Departed site at (insert date and time): 6/20/07 / 1650

Changes from Plans and Specifications, and Other Special Orders and Important Decisions:

Weather Conditions:	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name (print): Jeffrey W. Sumlin	Signature: <u>[Signature]</u>







**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
FIELD ACTIVITY DAILY LOG**

Page 1 of 1

Facility: Great Lakes Environmental Research Laboratory	
Date: 6/25/07	Job/Task Number: 2005006.003
Client Name: BMT Entech	
Address of Work Site: 3205 Commonwealth Blvd, Ann Arbor, MI 48105-2945	
Description of Work: Final Status Survey	

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS**

Arrived at site at (insert date and time): 6/25/07 / 0745

0745 ON SITE, PERFORMING UTILITY INSTRUMENT CHECKS

0830 WAS REQUESTED TO ADD ALPHA SURVEYS TO SURVEY OF ROOM 602 BY KIM KULPANOWSKI

0850 BEGAN SURVEYS OF ROOM 600

1005 COMPLETED SURVEY OF ROOM 600, BEGAN SURVEY OF ROOM 602

1055 COMPLETED SURVEY OF ROOM 602, BEGAN SURVEY OF ROOM 604

1155 COMPLETED SURVEY OF ROOM 604, BEGAN SURVEY OF ROOM 606

1315 COMPLETED SURVEY OF ROOM 606

1345 BEGAN SURVEY ROOM 505

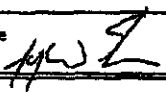
1455 COMPLETED SURVEY OF ROOM 505, BEGAN SURVEY OF ROOM 505A

1500 COMPLETED SURVEY OF ROOM 505A, BEGAN SURVEY ROOM 511

1700 COMPLETED SURVEY OF ROOM 511, PERFORMING END OF SHIFT INSTRUMENT CHECKS

1710 OFF SITE

Departed site at (insert date and time): 6/25/07/1710

Change from Plans and Specifications, and Other Special Orders and Important Decisions: GROSS ALPHA SURVEYS NOT TAKEN IN ROOM 602, ONLY SURVEYS FOR LSC 8/11/07 14.0	
Weather conditions: CLOUDY, HOT, WINDY	Important Telephone Calls and Interactions:
Personnel on Site: Jeffrey Sumlin	
Name: Jeffrey W. Sumlin	Signature: 







### Appendix 8.3 - Instrumentation Records



**GRIFFIN INSTRUMENTS**  
Calibration Certificate

Serial #	B296W	Model	Micro Rem	Owner	IEM
Probe #	N/A	Model	N/A	PO #	IEM
Source Used	10250	Model	28-6A	Cert Date	6/25/04
Pulser Serial	1000	Model	MP-2	Cal Due	7/5/07
Temperature	76.3	Pressure	29.96	Humidity	32%

Batteries: Sat (✓) Unsat ( )      Desiccant: Sat ( ) Unsat ( ) N/A (✓)

Saturation: Sat (✓) Unsat ( )      Geotropism: Sat (✓) Unsat ( )

Mechanical Zero: As Found: 0      As Left: 0      Reset Switch: Sat

\*Pulsed

Scale	Units	Set Point	As Found	As Left
X0.1	μR/hr	4*	2	3.8
X0.1	μR/hr	16*	11	17
X1	μR/hr	40*	40	A.F.
X1	μR/hr	160*	160	A.F.
X10	mR/hr	0.5	0.45	0.5
X10	mR/hr	1.0	0.8	1.0
X10	mR/hr	1.6	1.3	1.6
X100	mR/hr	4	3.2	3.8
X100	mR/hr	10	9	10
X100	mR/hr	16	15.25	16
X1000	mR/hr	40	35	38
X1000	mR/hr	100	95	100
X1000	mR/hr	160	155	160

Are As Left readings w/in 10% of the Set Point? Yes No

Remarks: Red markings are >20% error.

Performed/Reviewed By: *Jane Hesse* Date: 10/10/06

Calibration Due Date: 10/10/07

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
EXPOSURE RATE SURVEY INSTRUMENT DATA SHEET**

Project No. 2005006.003	Detector		Meter		
Site Location/Background Location: GLRL	Type:	Serial No.	Type:	Serial No:	Operating Voltage:
			BICRON	B296W	N/A

Check Source Number 3347	Radionuclide: Cs-137	Calibration Activity and Date: 1uCi 11/97
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Date	Units	Start of Shift Background				End of Shift Background				Daily Response ( )	Initials
		1	2	3	Avg.	1	2	3	Avg.		
6/14/07	uR/hr	10	10	10	10	10	10	10	10	500	✓
6/20/07	uR/hr	10	10	10	10	10	10	10	10	520	✓
6/21/07	uR/hr	10	10	10	10	10	10	10	10	520	✓
6/22/07	uR/hr	10	10	10	10	10	10	10	10	520	✓
6/25/07	uR/hr	10	10	10	10	10	10	10	10	500	✓
6/26/07	uR/hr	10	10	10	10	10	10	10	10	520	✓

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
CONTAMINATION SURVEY INSTRUMENT DATA SHEET**

Project No: 2005006.003				Detector				Meter			
Site Location/Background Location: Great Lakes Environmental Research Laboratory				Type: Ludlum Model 43-10-1	Serial No. 132238	Probe Area (cm <sup>2</sup> ) 17		Type: Ludlum Model 2929	Serial No: 126126	Operating Voltage: 700	
Check Source No: 2349-98				Check Source No: 2400-98				Check Source No: N/A			
Radionuclide: Tc-99	Activity: 20,000	Date: 8/10/98	Radionuclide: Th-230	Activity: 12,700	Date: 8/6/98	Radionuclide: N/A	Activity: N/A	Date: N/A	Radionuclide: N/A	Activity: N/A	Date: N/A

Date	Start of SHM Background (cpm for a 60 minute count)								End of SHM Background (cpm for a _____ minute count)								Daily Source Check (A)		Daily Source Check (B)		MDA - Scaler Mode (dpm)		Bat. OK	HV OK	Initials	
	Alpha				Beta				Alpha				Beta				Source (cpm)	E.F.	Source (cpm)	E.F.	α	β				
	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>										
6/14/98	46			0.8	3296			55	3286			4428	34.9	5255	26.3									✓	S	
4/20/98	36			0.6	3197			53				4316.1	34	5240.6	26.2									✓	S	
4/26/98	38			0.6	3100			52				4347.8	34.2	5261.8	26.3									✓	S	
4/27/98	41			0.7	3186			53				4396.3	34.6	5249.2	26.2									✓	S	
6/24/98	37			0.6	3203			53				4401.4	34.7	5267.7	26.3									✓	S	

$$MDA = \frac{2.71 + 4.65 \sqrt{BKG_{avg} \times t}}{1 \times E \times \frac{A}{100}}$$

where MDA = the activity level (dpm/100 cm<sup>2</sup>), BKG<sub>avg</sub> = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm<sup>2</sup>).





GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 2929 SERIAL# 126126

Owner: IEM

DATE: 04/02/07 LOCATION: Griffin Inst  
 TECH: Joanna Glenn DATE LAST CAL EXPIRES: 04/30/07  
 Reason For Calibration:  Due For Calibration  Repair (See Remarks)  
 CABLE LENGTH: 39'  Other (See Remarks)  Due and Repair (See Remarks)

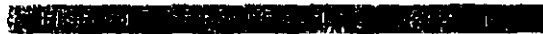
NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500 SERIAL #: 114512 CAL DUE: 12/11/07  
 MODEL: SERIAL #: CAL DUE:

Condition:  Sat  Unsat AF Mechanical Zero: 0  
 AL Mechanical Zero: 0



Beta Channel Window (4-50 mV): 4-50 A.F.  
 Alpha Channel Window (175 mV, 120 for 3030): 175 A.F.  
 Alpha Counts w/Pulsar @ 10,000 CPM: 9,978 A.F. % Error: 0.2%  
 Beta Counts w/Pulsar @ 10,000 CPM: 9,987 A.F. % Error: 0.1%



1 KV Reading (R-5 on HV Board): 1 A.F.  
 Max HV (1500 V +):  Sat  Unsat

REMARKS: Calibrated w/43-10-1 #PR132238.

Does Instrument Meet Final Acceptance Criteria?:  Yes  No  
 Calibration Sticker Attached?:  Yes  No  
 Date Instrument is Due For Next Calibration: 04/02/08

Performed/Reviewed by: Joanna Glenn Date: 4/2/2007 Entered by: JG Initials

Calibrations performed to ANSI N323A-1997 standards.



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 43-10-1 PROBE # PR132238

Owner: IEM

DATE: 04/02/07

LOCATION: Griffin Inst

TECH: Joanne Glenn

DATE LAST CAL EXPIRES: 04/30/07

REASON FOR CALIBRATION:

- Due For Calibration
- Repair (See Remarks)
- Other (See Remarks)
- Due and Repair

CABLE LENGTH: 39"

INPUT SENSITIVITY: dual

NIST TRACEABLE EQUIPMENT AND STANDARDS USED DURING CALIBRATION

MODEL: 2929 SERIAL #: 126126 CAL. DUE: 04/02/08  
 MODEL: SERIAL #: CAL. DUE:

NIST TRACEABLE SOURCES USED

SOURCE #: 2695-00 SOURCE #:  
 ISOTOPE: Tc99 ISOTOPE:  
 ACTIVITY(dpm): 18400 ACTIVITY:  
 ASSAY DATE: 03/01/00 ASSAY DATE:

Condition:  Sat  Unsat Efficiency from last cal.: Pu: 35.84% Tc Ni: 34.58%  
 Th: 32.71% C-14:

	<u>HV</u>	<u>Vernier</u>		
Setpoints from last cal.:	700	2.92		
<u>Source</u>	<u>Alpha Response CPM</u>	<u>Beta Response CPM</u>		
Background:	2	71		
Pu-239:	6603	340	A-B XTLK:	3.9%
Tc-99 Ni:	3	6448	B-A XTLK:	<1%
As Found Efficiencies Pu, Tc:	35.68%	34.66%		
Th-230 / C-14	9863 /		32.87%	/
Background:				
Pu-239:			A-B XTLK:	
Tc-99 Ni:			B-A XTLK:	
As Found Efficiencies Pu, Tc:				
Th-230 / C-14	/			/

Is as found efficiency within 20% of the efficiency from the last cal?  Yes  No (See Remarks)

Note: If the as found data is within 10% of the last calibration and the B-A Xtalk is <1% and the A-B Xtalk is <10%, then the technician may N/A the plateau section and go directly to remarks.



GRIFFIN INSTRUMENTS



PROBE #: PR132238

Date: 04/02/07

PLATEAU AND SET POINT DATA

HV / Vernier:	Tc-99 Source Response (CPM):			Pu-239 Source Response (CPM):			Background (CPM):		Net A to B Xtalk: <10%	B to A Xtalk: <1%
	A ch.	B ch.	Net Eff.	A ch.	B ch.	Net Eff.	A ch.	B ch.		
N/A										

Alpha / Beta Bkg (cpm) 2 71

HV / Vernier	Pu-239	Tc-99 Ni	Tc-99 SS	Th-230	C-14	Sr-90
700 / 2.92	CPM:		8543			4154
	AL Efficiencies:		22.71%			39.69%
Th-230 Source #99TH470-1815 4/11/06 30,000 dpm Pu-239 Source #2696-00 7/18/06 18,500dpm						
Tc-99 on Stainless Steel Source #98TC470-1814 8/3/99 37,300 dpm, Sr90 Source #2697-00 3/1/00 12,200 dpm						

REMARKS: Calibrated w/2929 #126126.

Does Instrument Meet Final Acceptance Criteria?  Yes  No

Calibration Sticker Attached?  Yes  No

Date Instrument is Due For Next Calibration: 04/02/08

Performed/Reviewed by:

*Hanna Glenn*

Date: 4/2/2007

Entered by: *H* Initials

Calibrations performed to ANSI N323A-1997 standards.

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**CONTAMINATION SURVEY INSTRUMENT DATA SHEET**

Project No: 2005006.003			Detector				Meter		
Site Location/Background Location: Great Lakes Environmental Research Laboratory			Type: Ludlum Model -13-37	Serial No. 78217747C	Probe Area (cm <sup>2</sup> ) 430	Type: Ludlum Model 2224	Serial No. 170347	Operating Voltage: 1650	
Check Source No: 2399-98			Check Source No: 2400-98			Check Source No: N/A			
Radionuclide: Tc-99	Activity: 20,000	Date: 4/10/98	Radionuclide: Tl-230	Activity: 12,700	Date: 8/6/98	Radionuclide: M/A	Activity: M/A	Date: N/A	

Date	Start of SMR Background (cpm for a <u>1</u> minute count)								End of SMR Background (cpm for a <u>1</u> minute count)								Daily Source Check (A)		Daily Source Check (B)		MDA - Sealed Mode (dpm)		Bat. OK	HV OK	Initials
	Alpha				Beta				Alpha				Beta				Source (cpm)	EFF.	Source (cpm)	EFF.	α	β			
	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.									
4/19/98	6	2	0	2.7	521	539	518	526	4	3	3	3.3	529	535	521	528	1185	9.3	4736	23.7			✓	✓	S
4/20/98	6	9	6	7	499	491	494	495	5	8	7	6.7	502	493	497	497	1338	10.5	4919	24.6			✓	✓	S
4/21/98	4	2	1	2.3	525	526	514	522	3	4	2	3	536	524	539	533	1329	10.5	5469	27.3			✓	✓	S
4/22/98	4	1	3	2.7	519	528	506	518	2	3	3	2.7	521	508	517	515	1336	10.5	5302	26.5			✓	✓	S
4/25/98	4	2	2	2.7	496	521	514	510	3	3	2	2.7	515	504	512	510	1717	11.2	5316	26.6			✓	✓	S
4/27/98	3	2	3	2.7	509	518	525	517	3	1	3	2.3	518	504	511	514	1386	10.9	5307	26.5			✓	✓	S

$$MDA = \frac{2.71 + 4.65 \sqrt{BKG_{avg} \times t}}{1 \times E \times \frac{A}{100}}$$

where MDA = the activity level (dpm/100 cm<sup>2</sup>), BKG<sub>avg</sub> = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm<sup>2</sup>).



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 2224 SERIAL# 170347

Owner: IEM

DATE: 06/07/07 LOCATION: Griffin Inst

TECH: Joanne Glenn DATE LAST CAL EXPIRES: 04/26/06

Reason For Calibration: [X] Due For Calibration [ ] Repair (See Remarks) [ ] Other (See Remarks) [ ] Due and Repair (See Remarks)

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500 SERIAL #: 114512 CAL. DUE: 12/11/07

MODEL: SERIAL #: CAL DUE:

[X] Fast/Slow Switch working properly [X] Audio Response [X] Geotropism CABLE LENGTH: 6'

CONDITION: Good AF MECHANICAL ZERO: 0 AL MECHANICAL ZERO: 0

NEW BATTERIES: [ ] Yes [X] No BATTERY CHECK: Sat

Table with columns: HV, AS FOUND HV, AS LEFT HV, WINDOW SETTINGS, A.F., A.L. Rows include 500 V, 1000 V, 1500 V and window settings BT, BW, AT.

SCALE RATE CPM AS FOUND % ERROR AS LEFT % ERROR AS FOUND % ERROR AS LEFT % ERROR

Table with 10 columns: SCALE, RATE CPM, AS FOUND, % ERROR, AS LEFT, % ERROR, AS FOUND, % ERROR, AS LEFT, % ERROR. Rows include scales x.1, x1, x10, x100, x1000.

Is the As Found Data Within 20% of the Set Point? [X] Yes [ ] No

Overload Light: [X] Adjusted [ ] Not Adj. Low Battery (2.2 V): [X] Sat [ ] Unsat

REMARKS: Calibrated w/43-37 #PR177476..

Does Instrument Meet Final Acceptance Criteria?: [X] Yes [ ] No

Calibration Sticker Attached?: [X] Yes [ ] No

Date Instrument is Due For Next Calibration: 06/07/08

Performed/Reviewed by: Joanne Glenn

Date: 6/7/2007

Entered by: [Signature] Initials



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 43-37 PROBE # PR177476

Owner: IEM

DATE: 06/07/07 LOCATION: Griffin Inst
TECH: Joanne Glenn DATE LAST CAL EXPIRES: 04/26/06

REASON FOR CALIBRATION:

Due For Calibration Repair (See Remarks) Other (See Remarks) Due and Repair

CABLE LENGTH: 6' INPUT SENSITIVITY: dual

NIST TRACEABLE EQUIPMENT AND STANDARDS USED DURING CALIBRATION

MODEL: 2224 SERIAL #: 170347 CAL. DUE: 06/07/08
MODEL: SERIAL #: CAL. DUE:

NIST TRACEABLE SOURCES USED

SOURCE #: 2695-00 SOURCE #:
ISOTOPE: Tc99 ISOTOPE:
ACTIVITY(dpm): 18400 ACTIVITY:
ASSAY DATE: 03/01/00 ASSAY DATE:

Condition: Sat Unsat Efficiency from last cal.: Pu: Tc Ni:
Th: C-14:

HV Verrier

Setpoints from last cal.: N/A N/A

Source Alpha Response CPM Beta Response CPM

Background: Pu-239: A-B XTLK:
Tc-99 Ni: B-A XTLK:

As Found Efficiencies Pu, Tc: Th-230 / C-14 /

Background: Pu-239: A-B XTLK:
Tc-99 Ni: B-A XTLK:

As Found Efficiencies Pu, Tc: Th-230 / C-14 /

Is as found efficiency within 20% of the efficiency from the last cal? Yes No (See Remarks)

Note: If the as found data is within 10% of the last calibration and the B-A Xtalk is <1% and the A-B Xtalk is <10%, then the technician may N/A the plateau section and go directly to remarks.



GRIFFIN INSTRUMENTS



PROBE #: PR177476

Date: 06/07/07

PLATEAU AND SET POINT DATA

HV / Vernier:	Tc-99 Source Response (CPM):			Pu-239 Source Response (CPM):			Background (CPM):		Net A to B Xtalk: <10%	B to A Xtalk: <1%
	A ch.	B ch.	Net Eff.	A ch.	B ch.	Net Eff.	A ch.	B ch.		
1500	3	2816	13.5%	969	366	5.2%	2	127	19.8%	<1%
1550	3	4227	21.5%	1838	456	9.9%	3	272	9.1%	<1%
1600	1	5749	29.0%	2430	580	13.1%	3	411	6.5%	<1%
1650	0	6244	30.3%	2753	861	14.9%	4	665	6.6%	<1%
1700	9	5576	25.2%	3151	1130	17.0%	3	937	5.8%	<1%

HV / Vernier	Alpha / Beta Bkg (cpm)	Pu-239	Tc-99 NI	Tc-99 SS	Th-230	C-14	Sr-90
1650	3	681					
	CPM:	3097	6375	8807	4877		3948
	4 pi AL Efficiencies:	16.72%	30.95%	21.79%	18.25%		31.89%
	2 pi AL Efficiencies:	32.95%	49.51%	34.88%	32.07%		45.61%

Th-230 Source #99TH470-1815 4/11/06 30,000 dpm Pu-239 Source #2696-00 7/18/06 18,500dpm  
Tc-99 on Stainless Steel Source #99TC470-1814 8/3/99 37,300 dpm, Sr90 Source #2697-00 3/1/00 12,200 dpm

REMARKS: No previous plateau data. Calibrated w/2224 #170347.

Does Instrument Meet Final Acceptance Criteria?  Yes  No

Calibration Sticker Attached?  Yes  No

Date instrument is Due For Next Calibration: 06/07/08

Performed/Reviewed by:

*Leanne Gheno*

Date: 6/7/2007

Entered by: *LG* Initials

2 pi efficiencies denoted in italics.

Calibrations performed to ANSI N323A-1997 standards.

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
CONTAMINATION SURVEY INSTRUMENT DATA SHEET**

Project No: 2005006.003				Detector				Meter			
Site Location/Background Location: Great Lakes Environmental Research Laboratory				Type: Ludlum Model 43-68	Serial No. P2190483	Probe Area (cm <sup>2</sup> ) 100	Type: Ludlum Model 2224	Serial No. 116239	Operating Voltage: 1000		
Check Source No: 2399-98				Check Source No: 2400-98				Check Source No: N/A			
Radionuclide: Tc-99	Activity: 20,000	Date: 8/10/98	Radionuclide: Th-230	Activity: 12,700	Date: 8/6/98	Radionuclide: N/A	Activity: N/A	Date: N/A			

Date	Start of Shift Background (cpm for a 2 minute count)								End of Shift Background (cpm for a 2 minute count)								Daily Source Check (A)		Daily Source Check (B)		MDA <sup>-</sup> - Scatter Mode (dpm)		Bat. OK	HV OK	Status	
	Alpha				Beta				Alpha				Beta				Source (cpm)	EFF.	Source (cpm)	EFF.	α	β				
	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>	1	2	3	A <sub>v</sub>										
6/18/97	1	3	1	1.7	190	172	193	185	1	1	2	1.3	178	184	176	179	1917	15.1	4747.5	23.7	29	139.2	✓	✓	5	
6/4/97	2	2	1	1.7	152	160	159	157	1	2	1	1.3	161	154	157	157	1819	14.3	4481	22.4	39.5	190	✓	✓	5	
6/2/97	3	4	2	3	185	173	173	177	2	3	3	2.7	174	182	177	178	1973	15.5	4540	22.7	<del>34.3</del> 34.3	142	✓	✓	5	
6/6/97	4	2	3	3	171	180	174	175	3	4	1	2.7	181	173	176	177	1998	15.7	4596.5	23	34.3	140	✓	✓	5	
6/22/97	2	3	2	2.3	168	177	175	173	3	2	3	2.7	173	165	174	172	2008	15.8	4560	22.8	40.1	196	✓	✓	5	
6/29/97	1	2	3	2	185	173	177	178	2	4	1	2.3	190	174	171	178	1988	15.7	4539	22.7	38.3	199	✓	✓	5	
6/24/98	2	2	3	2.3	191	184	185	187	3	1	2	2	189	187	179	185	2013	15.9	456.5	22.7	39.9	204	✓	✓	5	

$$MDA = \frac{2.71 + 4.65 \sqrt{BKG_{avg}} \times t}{1 \times E \times \frac{A}{100}}$$

where MDA = the activity level (dpm/100 cm<sup>2</sup>), BKG<sub>avg</sub> = the background count rate for this measurement type (cpm), t = the measurement duration (min), E = instrument efficiency, and A = probe area (cm<sup>2</sup>).





GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 2224 SERIAL# 116239

Owner: IEM

DATE: 10/13/06 LOCATION: Griffin Inst

TECH: Joanne Glenn DATE LAST CAL EXPIRES: 10/05/06

Reason For Calibration: [X] Due For Calibration [ ] Repair (See Remarks) [ ] Other (See Remarks) [ ] Due and Repair (See Remarks)

NIST TRACEABLE EQUIPMENT USED DURING CALIBRATION

MODEL: M-500 SERIAL #: 114512 CAL. DUE: 11/14/06

MODEL: SERIAL #: CAL DUE:

[X] Fast/Slow Switch working properly [X] Audio Response [X] Geotropism CABLE LENGTH: 39"

CONDITION: Sat AF MECHANICAL ZERO: 0 AL MECHANICAL ZERO: 0

NEW BATTERIES: [ ] Yes [X] No BATTERY CHECK: Sat

Table with columns: HV, AS FOUND HV, AS LEFT HV, WINDOW SETTINGS, A.F., A.L. Rows include 500 V, 1000 V, 1500 V and window settings BT, BW, AT.

Table with columns: SCALE, RATE CPM, AS FOUND, % ERROR, AS LEFT, % ERROR, AS FOUND, % ERROR, AS LEFT, % ERROR. Rows include scales x1, x10, x100, x1000.

Is the As Found Data Within 20% of the Set Point?: [X] Yes [ ] No

Overload Light: [ ] Adjusted [X] Not Adj. Low Battery (2.2 V): [X] Sat [ ] Unsat

Remarks: Calibrated w/43-68 #PR190483.

Does Instrument Meet Final Acceptance Criteria?: [X] Yes [ ] No

Calibration Sticker Attached?: [X] Yes [ ] No

Date Instrument is Due For Next Calibration: 10/13/07

Performed/Reviewed by:

Joanne Glenn

Date: 10/13/2006

Entered by: Initials



GRIFFIN INSTRUMENTS



CALIBRATION CERTIFICATE FOR 43-68 PROBE # PR190483

Owner: IEM

DATE: 10/13/06  
TECH: Joanne Glenn

LOCATION: Griffin Inst  
DATE LAST CAL EXPIRES: 10/05/06

REASON FOR CALIBRATION:  
 Due For Calibration  Repair (See Remarks)  Other (See Remarks)  Due and Repair

CABLE LENGTH: 39"

INPUT SENSITIVITY: dual

NIST TRACEABLE EQUIPMENT AND STANDARDS USED DURING CALIBRATION

MODEL: 2224 SERIAL #: 116239 CAL. DUE: 10/13/07  
MODEL: SERIAL #: CAL. DUE:

NIST TRACEABLE SOURCES USED

SOURCE #: 2695-00 SOURCE #:  
ISOTOPE: Tc99 ISOTOPE:  
ACTIVITY(dpm): 18400 ACTIVITY:  
ASSAY DATE: 03/01/00 ASSAY DATE:

Condition:  Sat  Unsat

Efficiency from last cal.:

Pu:  
Th:  
Tc Ni:  
C-14:

HV

Vernier

Setpoints from last cal.:

N/A

Source

Alpha Response CPM

Beta Response CPM

Background:

Pu-239:

Tc-99 Ni:

A-B XTLK:

B-A XTLK:

As Found Efficiencies Pu, Tc:

Th-230 / C-14

Background:

Pu-239:

Tc-99 Ni:

A-B XTLK:

B-A XTLK:

As Found Efficiencies Pu, Tc:

Th-230 / C-14

Is as found efficiency within 20% of the efficiency from the last cal?

Yes  No (See Remarks)

Note: If the as found data is within 10% of the last calibration and the B-A Xtalk is <1% and the A-B Xtalk is <10%, then the technician may N/A the plateau section and go directly to remarks



GRIFFIN INSTRUMENTS



PROBE #: PR190483

Date: 10/13/06

PLATEAU AND SET POINT DATA

HV / Vernier:	Tc-99 Source Response (CPM):			Pu-239 Source Response (CPM):			Background (CPM):		Net A to B Xtalk: <10%	B to A Xtalk: <1%
	A ch.	B ch.	Net Eff.	A ch.	B ch.	Net Eff.	A ch.	B ch.		
1500	10	2555	13.7%	1479	245	8.0%	1	34	12.5%	<1%
1550	8	4291	23.0%	2371	275	12.8%	1	63	8.2%	<1%
1600	15	5624	30.0%	3325	324	16.0%	2	113	6.0%	<1%
1650	16	5556	29.2%	3534	364	19.1%	1	187	4.8%	<1%
1700	87	4193								2.07%

Alpha / Beta Bkg (cpm) 2 100

HV / Vernier		Pu-239	Tc-99 NI	Tc-99 SS	Th-230	C-14	Sr-90
1600	CPM:	3071	5436	7845	4888		
	AL Efficiencies:	16.59%	29.00%	20.76%	16.29%		
Th-230 Source #99TH470-1815 4/11/06 30,000 dpm Pu-239 Source #2696-00 7/18/06 18,500dpm							
Tc-99 on Stainless Steel Source #99TC470-1814 8/3/99 37,300 dpm							

REMARKS: No previous plateau data. Calibrated w/2224 #116239.

Does Instrument Meet Final Acceptance Criteria?:  Yes  No

Calibration Sticker Attached?:  Yes  No

Date Instrument is Due For Next Calibration: 10/13/07

Performed/Reviewed by: Jeanne Glenn

Date: 10/13/2006

Entered by: \_\_\_\_\_ Initials

Calibrations performed to ANSI N323A-1997 standards.



**PerkinElmer**  
precisely.

PerkinElmer LAS, Inc.  
710 Bridgeport Avenue  
SHELTON CT 06484-4794  
TEL: (800) 762-4000 FAX: (203) 944-4983

## FIELD SERVICE REPORT

SERVICE ORDER NO:	320402147
TYPE:	ZM02

PAGE 1 OF 1

<b>FUNCTIONAL LOC.</b>	US100521472	<b>EQUIPMENT NO.</b>	10367672
<b>ADDRESS</b>	GREAT LAKES ENVIRO RES LABS 2205 COMMONWEALTH BLVD ANN ARBOR MI 48105 USA	<b>DESCRIPTION</b>	TRICARB2500 / 403636
		<b>JOB TYPE</b>	Planned Maintenance
		<b>SHIP-TO NO.</b>	100521472
		<b>PAYER NO.</b>	4521098
		<b>PURCHASE ORDER</b>	CRCARD
<b>CONTACT TELEPHONE</b>	DUANE GOSSIAUX 734-741-2390	<b>CONTRACT NO.</b>	
<b>FAX</b>		<b>LINE ITEM</b>	
<b>EMAIL</b>	DUANE.GOSSIAUX@NOAA.GOV	<b>DESCRIPTION</b>	
<b>START DATE</b>	05.07.2007	<b>COVERAGE</b>	
<b>END DATE</b>	05.07.2007		
<b>SOFTWARE</b>			
<b>HARDWARE</b>	RRD		

**PROBLEM DESCRIPTION**  
HW-BILLABLE PM VISIT

**WORK DESCRIPTION**

- Travel - Billable  
Travel - Billable
- Billable P.M. Service  
I decontaminated, cleaned & lubricated as required. I checked a alignments, connections, & voltages. I replaced the dual low voltage power supply due to +4vdc on the +5vdc line & 700mvac ripple on the +5vdc line. I checked & reset system error log & I.P.A. baselines. I ran chkdsk/f & defrag on the hard drive. I ran I.P.A. & backed up user data files to disk. H.V.R. = 3373, H.V. L. = 2986  
3H EFF = 60.2, BKG = 12.7, 14C EFF = 96.4 BKG = 19.7

Cycles: 669 elevator cycles since 27 Jun. 2005

MATERIAL	DESCRIPTION	QTY	UNIT
7401286	DUAL POWER SUPPLY ASSY	1	PC

ACTIVITY	CSE	START	FINISH	DURATION	UNIT
1	Travel - Billable	05.14.2007	05.14.2007	1.0	HR
2	Repair-BillableLabor	05.14.2007	05.14.2007	4.0	HR

**Appendix 8.4 - Field Survey Records**

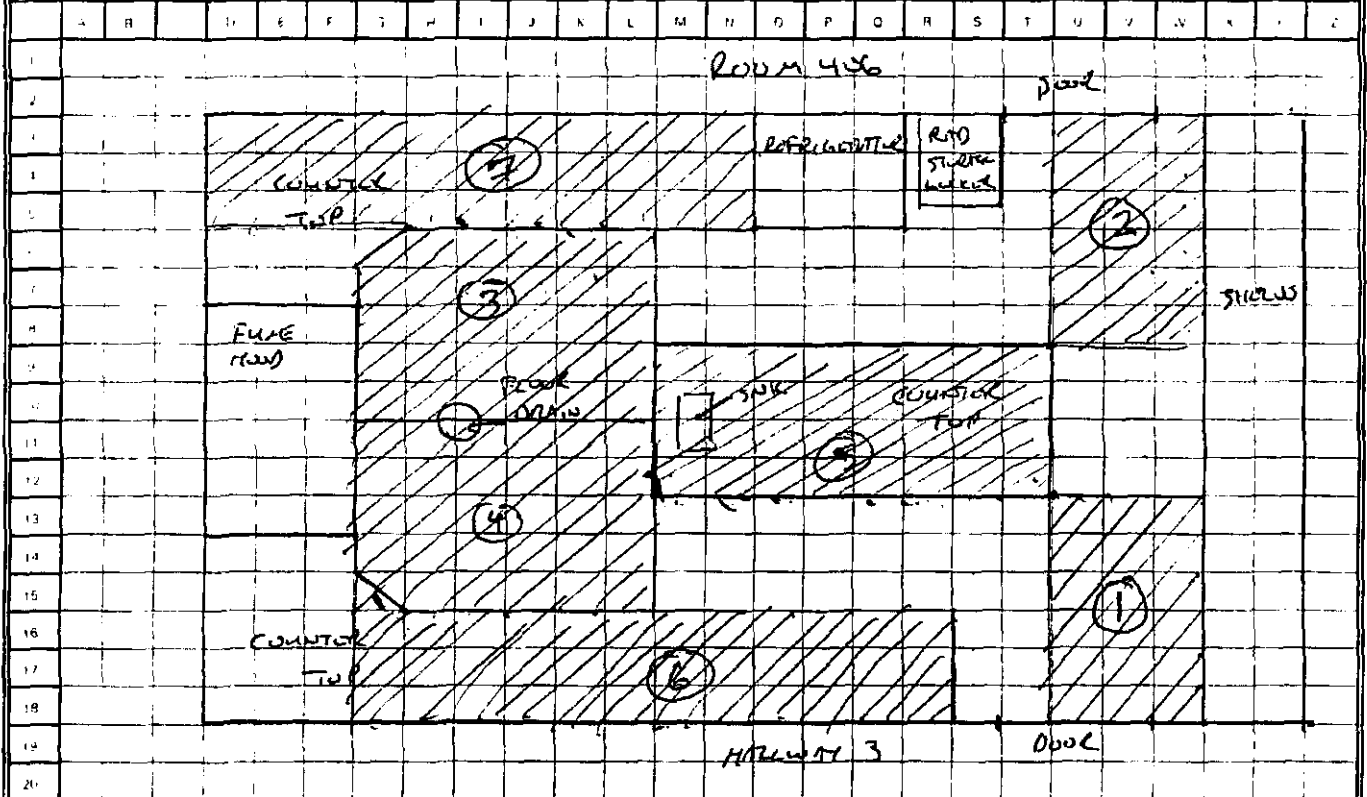
SURVEYS  
BY ROOM

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 061807-1

Page 1 of 1

Instrument/SN: <b>2224 / 116239</b>	Calibration Due: <b>10/13/07</b>	Site Name: <b>GLERL</b>	Date: <b>6/5/07</b>	Time: <b>1400</b>
Instrument SN: <b>43-681 P2 190483</b>	Calibration Due: <b>10/13/07</b>	Location: <b>Room 305</b>		
Instrument SN: <b>N/A</b>	Calibration Due: <b>N/A</b>	Purpose: <b>FSS</b>		
Survey Performed By (Print): <b>JUFFREY W JENNINGS</b>		Survey Performed By (Signature): <i>[Signature]</i>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: PERFORMED SURFACE SCAN OF ~50% OF HORIZONTAL SURFACES, HIGHEST SCAN RESULTS: (α/B <sup>CPM</sup> ~~DPH~~ 100cm<sup>2</sup>)

- ① 1160
- ② 1180
- ③ 1160
- ④ 1180
- ⑤ 1180
- ⑥ 1160
- ⑦ 1160

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number CG1807-2

Page 1 of 1

Instrument/SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERK</u>	Date: <u>9/14/07</u>	Time: <u>1500</u>
Instrument/SN: <u>43-68/P2190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 305</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F-55</u>		
Survey Performed By (Print): <u>Jerry W. Smith</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										

*Handwritten notes on grid:*  
 - Room 305 area (rows 2-5, columns 3-6): SHELVES, WALL ADJACENT TO HALLWAY 3  
 - Room 406 area (rows 7-10, columns 3-6): SHELVES, WALL ADJACENT TO ROOM 406  
 - Room 303 area (rows 12-15, columns 3-6): SHELVES, WALL ADJACENT TO ROOM 303  
 - Room 307 area (rows 12-15, columns 17-20): SHELVES, WALL ADJACENT TO ROOM 307

Notes: PERFORMED SURFACE SCANS OF ~50% OF WALLS, HIGHEST SCAN RESULTS (A/B compliance)  
 ① 1/50      ⑥ 1/60  
 ② 1/60      ⑦ 1/80  
 ③ 1/80      ⑧ 1/60  
 ④ 1/80  
 ⑤ 1/60



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 061807-3

Page 1 of 9

Instrument/SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/15/07</u>	Time: <u>1600</u>
Instrument/SN: <u>43-68/P2190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 305</u>		
Instrument/SN: <u>0/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JOSEPH W SURCO</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										

*Handwritten notes on grid: ROOM 406, REFRIGERATOR, RND SWAP, FLOOR DRAIN, SINK, COUNTING TOP, FUSE (FLOOR), COUNTER TOP, SHOWS, HALLWAY 3, DOOR.*

**Notes:** PERFORMED 2 MINUTE STATIC COUNTS. TOOK SMUDGES FOR A/B AND LSC AT SAME LOCATION AS STATIC

Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

Room 305

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+4.5, 0+1.0	0/170
2 B+2.5, 0+4.5	2/140
3 C+0.5, 0+1.5, 2.5	1/125
4 C+4.5, 0+4.5	1/146
5 C+2.5, 1+1.5	1/155
6 C+5.0, 1+2.0	3/177
7 D+1.5, 1+2.0, 3.0	2/103
8 C+5.5, 1+5.5	1/130
9 C+4.5, 2+2.0, 3.0	2/106
10 B+3.5, 2+1.5, 5.0	1/153
11 B+2.5, 1+5.0	1/143
12 A+4.0, 2+0.5	2/164
13 A+3.0, 1+3.0	2/149
14 B+0.0, 1+1.0, 3.0	0/155
15 B+3.0, 1+3.0, 3.0	1/167
16 C+0.5, 1+0.5, 3.0	0/156
17 C+0.5, 1+2.0, 2.5	2/172
18 B+3.0, 0+0.0, 4.0	3/126
19 C+5.5, 0+0.0, 5.0	1/154
20 D+4.0, 0+3.5, 4.0	1/161
21 D+1.5, 2+4.0, 6.0	2/148
22 B+5.5, 2+4.0, 4.0	2/159
23 A+0.0, 1+2.0, 7.5	2/167
24 B+1.0, 2+3.0, 0.5	2/150
25 D+3.0, 1+2.0, 8.0	Smear only

061507-3  
30F9

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

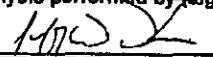
Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

061807-3  
4/09

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CERTIFICATE OF ANALYSIS - SMEARS

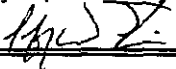
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007	Report Date:				
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 128128/132236	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	44280	10	4427	0.35	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
46		60		1			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	1	2	-0.3	-0.8	0.5	1.5	a
2	1	2	-0.3	-0.8	0.5	1.5	a
3	0	2	-0.8	-2.2	0.0	1.5	a
4	1	2	-0.3	-0.8	0.5	1.5	a
5	0	2	-0.8	-2.2	0.0	1.5	a
6	2	2	0.2	0.7	0.7	1.5	a
7	1	2	-0.3	-0.8	0.5	1.5	a
8	1	2	-0.3	-0.8	0.5	1.5	a
9	1	2	-0.3	-0.8	0.5	1.5	a
10	0	2	-0.8	-2.2	0.0	1.5	a
11	2	2	0.2	0.7	0.7	1.5	a
12	3	2	0.7	2.1	0.9	1.5	a
13	1	2	-0.3	-0.8	0.5	1.5	a
14	0	2	-0.8	-2.2	0.0	1.5	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):	Notes: Room 305						
Analysis performed by (print): Jeffrey W. Sumlin, RRPT		Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01		

061807-3  
5069

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## CERTIFICATE OF ANALYSIS - SMEARS

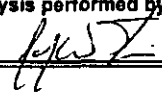
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007			Report Date:		
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008			
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	44280	10	4427	0.35	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
46		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	2	2	0.2	0.7	0.7	1.5	a
16	3	2	0.7	2.1	0.9	1.5	a
17	0	2	-0.8	-2.2	0.0	1.5	a
18	0	2	-0.8	-2.2	0.0	1.5	a
19	1	2	-0.3	-0.8	0.5	1.5	a
20	3	2	0.7	2.1	0.9	1.5	a
21	2	2	0.2	0.7	0.7	1.5	a
22	1	2	-0.3	-0.8	0.5	1.5	a
23	0	2	-0.8	-2.2	0.0	1.5	b
24	1	2	-0.3	-0.8	0.5	1.5	a
25	1	2	-0.3	-0.8	0.5	1.5	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 305					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

061807-3  
6099

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**CERTIFICATE OF ANALYSIS - SMEARS**

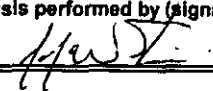
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52550	10	5200	0.26	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
	3296		60		55		
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	116	2	3.1	11.8	5.4	6.7	a
2	98	2	-5.9	-22.8	5.0	6.7	a
3	112	2	1.1	4.1	5.3	6.7	a
4	106	2	-1.9	-7.4	5.1	6.7	a
5	109	2	-0.4	-1.7	5.2	6.7	a
6	115	2	2.6	9.9	5.4	6.7	a
7	102	2	-3.9	-15.1	5.1	6.7	a
8	95	2	-7.4	-28.6	4.9	6.7	a
9	99	2	-5.4	-20.9	5.0	6.7	a
10	104	2	-2.9	-11.3	5.1	6.7	a
11	107	2	-1.4	-5.5	5.2	6.7	a
12	114	2	2.1	7.9	5.3	6.7	a
13	101	2	-4.4	-17.1	5.0	6.7	a
14	105	2	-2.4	-9.4	5.1	6.7	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 305					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52550	10	5200	0.26	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
	3296		60		55		
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	119	2	4.6	17.6	5.5	6.7	a
16	104	2	-2.9	-11.3	5.1	6.7	a
17	102	2	-3.9	-15.1	5.1	6.7	a
18	113	2	1.6	6.0	5.3	6.7	a
19	108	2	-0.9	-3.6	5.2	6.7	a
20	99	2	-5.4	-20.9	5.0	6.7	a
21	115	2	2.6	9.9	5.4	6.7	a
22	107	2	-1.4	-5.5	5.2	6.7	a
23	111	2	0.6	2.2	5.3	6.7	a
24	98	2	-5.9	-22.8	5.0	6.7	a
25	102	2	-3.9	-15.1	5.1	6.7	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 305					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

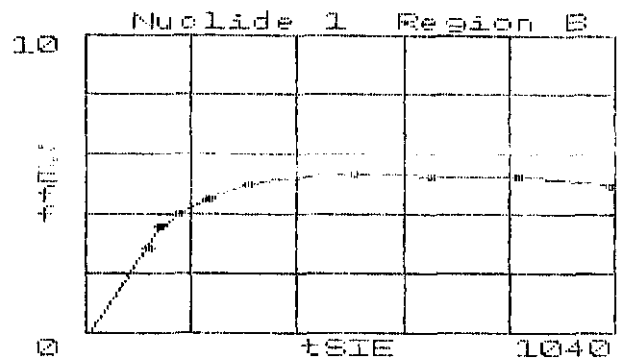
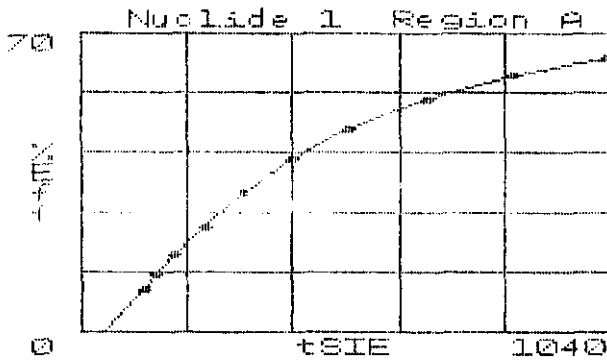
Quench Sets

Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

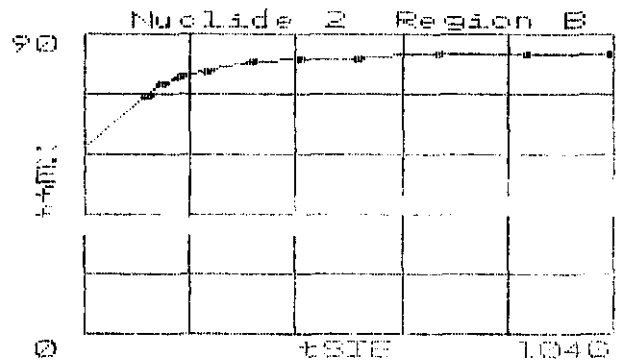
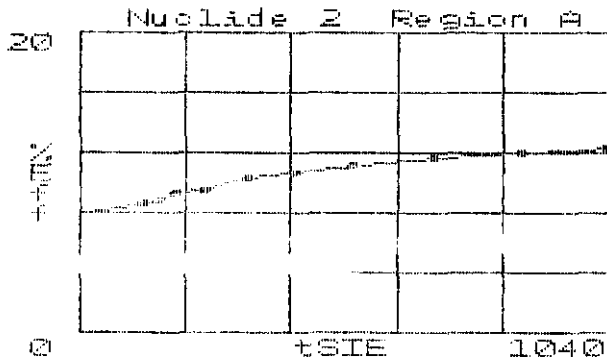
	LL	UL	LCR	25%	BKG
Region A:	0.0 - 12.0		0	0.0	13.97
Region B:	12.0 - 156		0	0.0	12.73
Region C:	0.0 - 0.0		0	0.0	0.00

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	11.99
697.16	11.62	538.87	11.12
426.87	10.69	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55



Room 305

061807-3

20 Jun 2007 17:41  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

9009 Page #2  
User : KIM

239.94	9.55	188.56	9.31	239.94	79.05	188.56	77.31
152.93	8.75	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	13.97	12.73			72.569	754.51	B
2	10.00	1.53	1.07	2.47	1.11	0.000	754.69	
3	10.00	0.00	1.17	0.00	1.41	0.000	758.12	
4	10.00	0.00	0.00	0.00	0.00	0.000	745.83	
5	10.00	0.00	0.00	0.00	0.00	0.000	747.87	
6	10.00	0.00	0.11	0.00	0.13	0.000	742.05	
7	10.00	0.60	0.00	1.07	0.00	0.000	754.16	
8	10.00	0.06	0.00	0.10	0.00	0.000	744.39	
9	10.00	0.00	0.00	0.00	0.00	0.000	743.46	
10	10.00	0.57	1.63	0.61	1.90	78.471	745.35	
11	10.00	0.36	0.54	0.51	0.61	0.000	742.98	
12	10.00	2.10	0.00	3.79	0.00	0.000	734.13	
13	10.00	2.82	0.28	5.00	0.02	0.000	741.03	
14	10.00	1.10	0.00	1.97	0.00	78.378	753.03	
15	10.00	0.00	0.00	0.00	0.00	0.000	744.68	
16	10.00	0.00	0.76	0.00	0.91	0.000	742.37	
17	10.00	3.09	1.61	5.22	1.59	0.000	720.58	
18	10.00	0.00	0.40	0.00	0.49	0.000	727.11	
19	10.00	2.22	0.00	4.05	0.00	0.000	719.50	
20	10.00	0.00	0.60	0.00	0.72	0.000	730.10	
21	10.00	0.00	0.00	0.00	0.00	0.000	722.24	
22	10.00	0.00	0.00	0.00	0.00	0.000	702.55	
23	10.00	1.32	1.18	2.12	1.27	0.000	713.72	
24	10.00	2.16	0.14	3.90	0.00	0.000	720.44	
25	10.00	0.00	0.91	0.00	1.09	0.000	704.88	
26	10.00	0.00	0.00	0.00	0.00	0.000	688.96	

SYSTEM NORMALIZED

C14 IPA DATA PROCESSED - 20-Jun-2007 22:27  
 C14 Eff (0-156 keV) = 95.79 %  
 C14 CHI SQUARE IPA DATA PROCESSED - 20-Jun-2007 22:38  
 C14 Chi Square = 19.52  
 H3 IPA DATA PROCESSED - 20-Jun-2007 22:39  
 H3 Eff (0-18.6 keV) = 60.22 %  
 H3 CHI SQUARE IPA DATA PROCESSED - 20-Jun-2007 22:49  
 H3 Chi Square = 24.08  
 BKG IPA DATA PROCESSED - 20-Jun-2007 23:50  
 Bkg (0-18.6 keV) = 13.38 cpm  
 Bkg (0-156 keV) = 21.42 cpm  
 C14 E^2/B (1-156 keV) = 524.56  
 H3 E^2/B (1-18.6 keV) = 270.84

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 061907-1

Page 1 of 1

Instrument/SN: <u>BICRON / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLCRL</u>	Date: <u>10/19/07</u>	Time: <u>1000</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 305</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JUSTIN W JONES</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
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Notes - BKGD = 10 10  $\mu$ Ran/h  
 - WALKED ROOM WITH MOTOR WHIST HIGH, NO ROTATIONS ABOVE BKGD  
 - CONTACT WITH SINK DRAIN, FLOOR DRAIN AND FUME HOOD ARE BACKGROUND

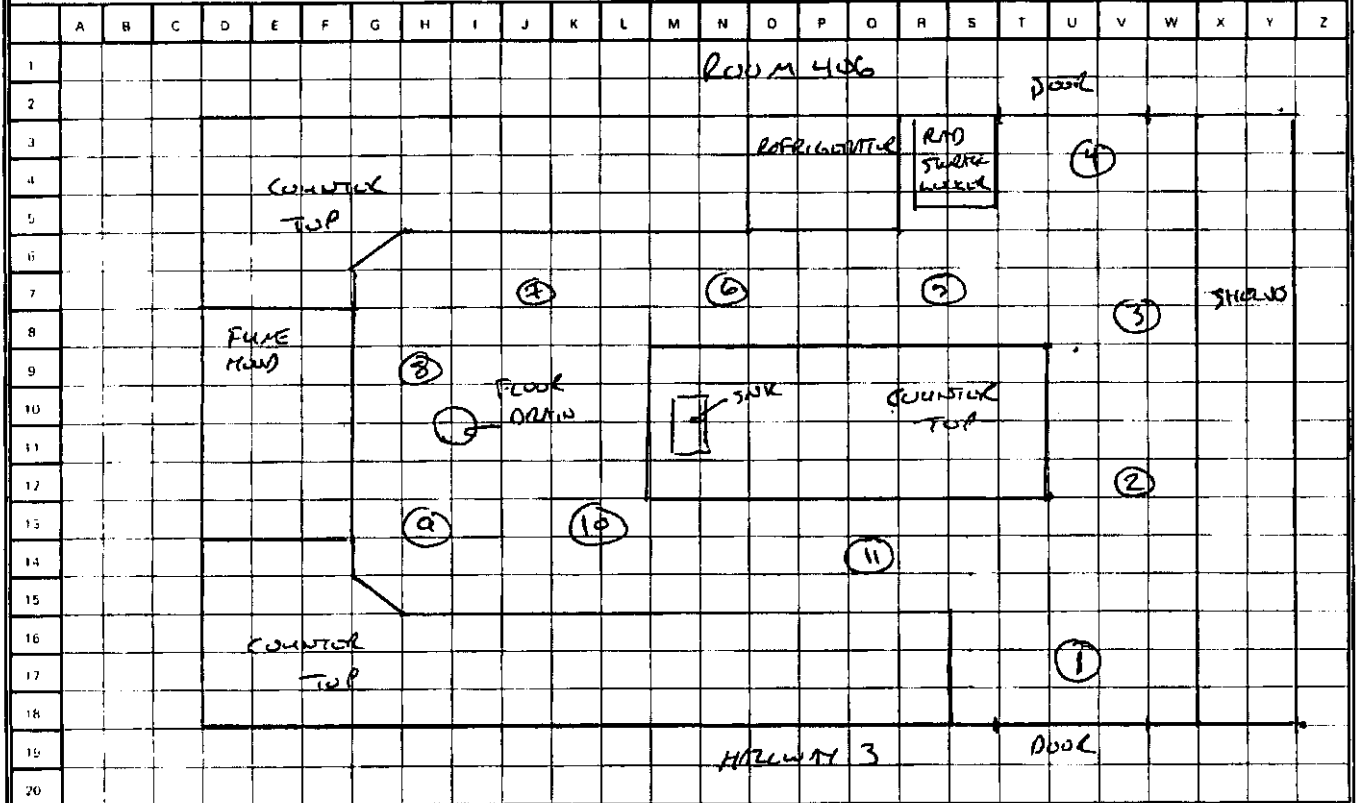
**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 061907-2

Page 1 of 1

Instrument/SN: <b>2224/170347</b>	Calibration Due: <b>6/7/08</b> <del>6/7/08</del>	Site Name: <b>CELL</b>	Date: <b>6/19/07</b>	Time: <b>1200</b>
Instrument/SN: <b>43-37120177476</b>	Calibration Due: <b>6/7/08</b>	Location: <b>ROOM 305</b>		
Instrument/SN: <b>01A</b>	Calibration Due: <b>01A</b>	Purpose: <b>FSS</b>		
Survey Performed By (Print):		Survey Performed By (Signature): <i>[Signature]</i>		

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u>
			<input type="checkbox"/> meters <input checked="" type="checkbox"/> feet <input type="checkbox"/> inches <input type="checkbox"/> centimeters



Notes: FLOOR MONITORING RESULTS, SCANNED 100% OF FLOOR, NO READING ABOVE BKGD. OBSERVED COUNT RATE ~ EVERY 6 FEET. RESULTS IN CPM a/b

① 01300	④ 01400
② 01400	⑤ 01350
③ 01350	⑥ 01420
④ 01400	⑦ 01400
⑤ 01400	⑧ 01340
⑥ 01350	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number: 062209-6

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CELL</u>	Date: <u>6/22/07</u>	Time: <u>0950</u>
Instrument SN: <u>4337 / 02177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 307</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W. SWANSON</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2		D																								
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20																										

Notes: SCANNED 100% OF FLOOR. TOOK READINGS ~ 6 FEET. RESULTS IN 2/B CPM

① 01400	⑦ 04420
② 01420	⑧ 01400
③ 01350	⑨ 01400
④ 01360	⑩ 01420
⑤ 01400	⑪ 01400
⑥ 01700	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-7

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELL</u>	Date: <u>6/24/07</u>	Time: <u>1005</u>
Instrument SN: <u>43-68 / P2190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 307</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JURGEN W. SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input checked="" type="checkbox"/> feet <input type="checkbox"/> inches <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
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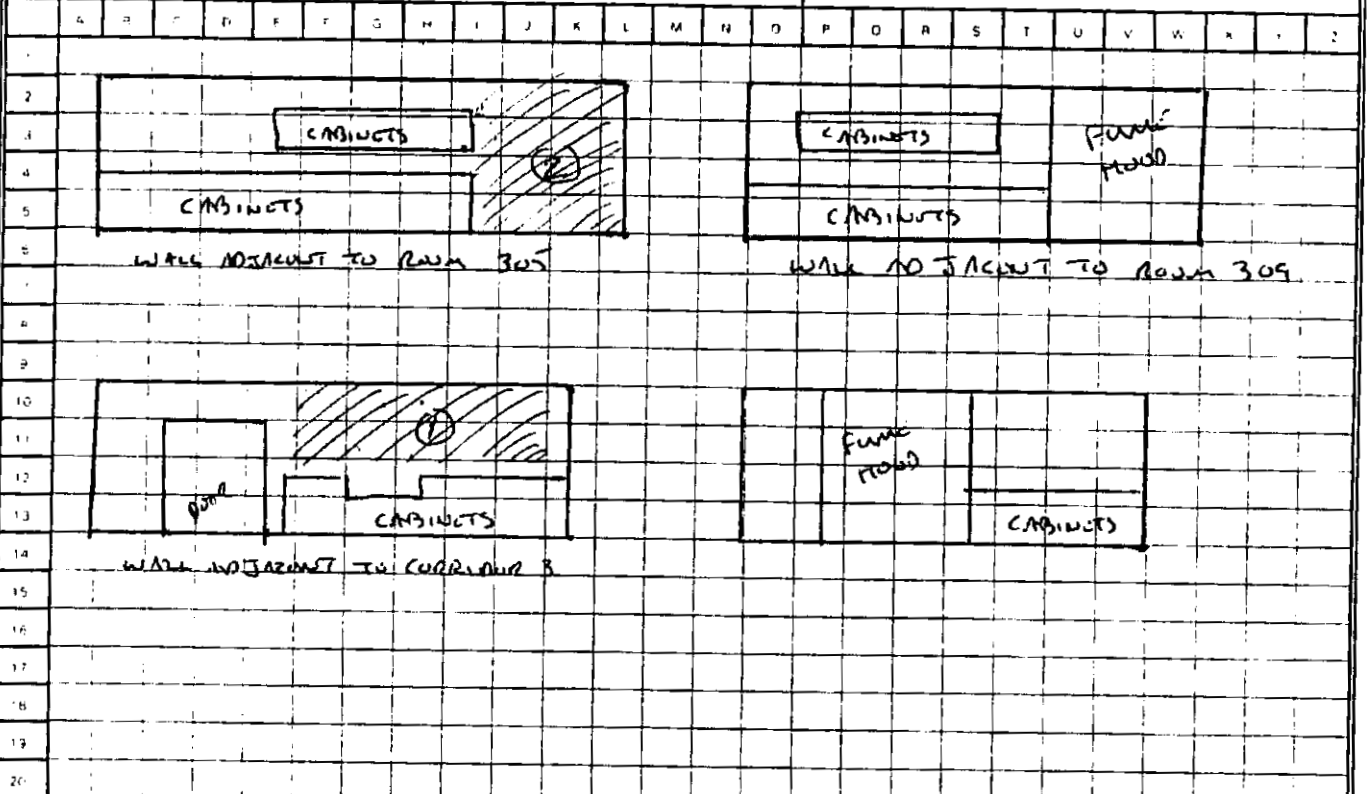
**Notes**  
 SCANNED 2 FLOOR GRID. HIGHEST READINGS IN 0.13 CPM/ HOUR  
 INCLUDED SOME COUNTERTOP  
 ① 0/80  
 ② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-8

Page 1 of 1

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERL</u>	Date: <u>6/24/07</u>	Time: <u>1015</u>
Instrument SN: <u>43-68/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 307</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Smead</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u>	
		<input type="checkbox"/> meters <input checked="" type="checkbox"/> feet		<input type="checkbox"/> inches <input type="checkbox"/> centimeters



Notes: OPPOSITE WALLS ARE NOT THE SAME LENGTH DUE TO OPEN AREA BETWEEN ROOMS 409, 410, 307, 309  
 SCANNED 2 WALL GRIDS. RESULTS IN 0/60 CPM/100CM<sup>2</sup>

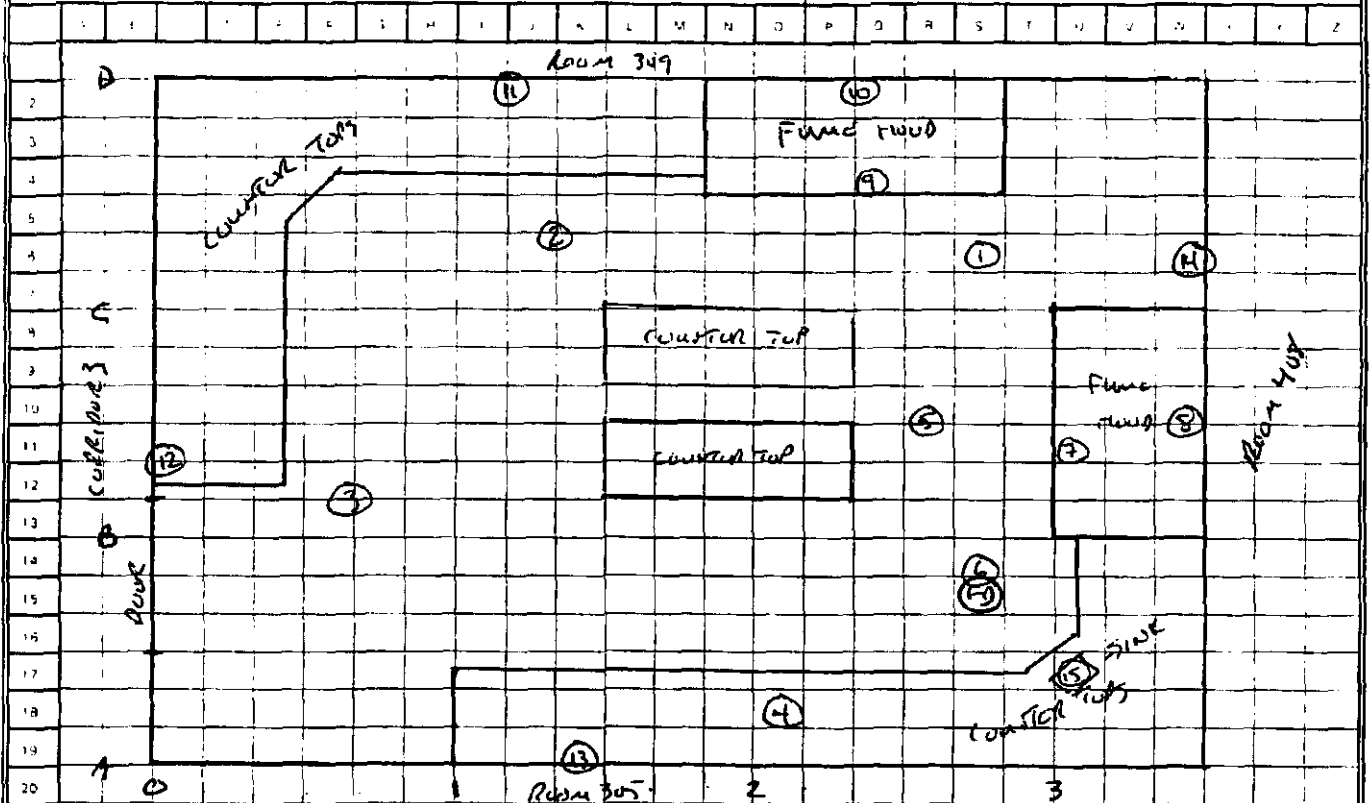
① 0/60  
 ② 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-9

Page 1 of 5

Instrument SN: <u>2224-116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELLER</u>	Date: <u>6/22/07</u>	Time: <u>1050</u>
Instrument SN: <u>43-68/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 307</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W. SWAN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u>	
		<input type="checkbox"/> meters	<input type="checkbox"/> inches	
		<input checked="" type="checkbox"/> feet	<input type="checkbox"/> centimeters	



Notes: TOOK 2 MINUTE STATIC COUNTS RESULTS IN CPM & B/100CM<sup>2</sup>.  
 TOOK LSC SHEETS IN SAME LOCATION

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 307**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 C+2.5, 2+4.5	1/174
2 C+2.0, 0+4.0	0/162
3 B+1.0, 0+4.0	1/177
4 A+1.5, 2+0.5, 3.0	2/171
5 B+3.0, 2+3.5	1/169
6 A+4.5, 2+4.5	1/163
7 B+2.5, 3+0.5, 3.0	1/176
8 B+3.0, 3+2.5, 6.0	Smear only
9 C+3.5, 2+2.5, 3.0	2/174
10 C+5.5, 2+3.0, 6.0	Smear only
11 D+0.0, 1+1.0, 4.0	0/157
12 B+2.0, 0+0.0, 4.0	1/154
13 A+0.0, 1+2.5, 6.0	1/142
14 C+1.5, 3+3.0, 2.0	2/150
15 A+2.5, 3+0.5, 2.5	0/171



062207-9

3055

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

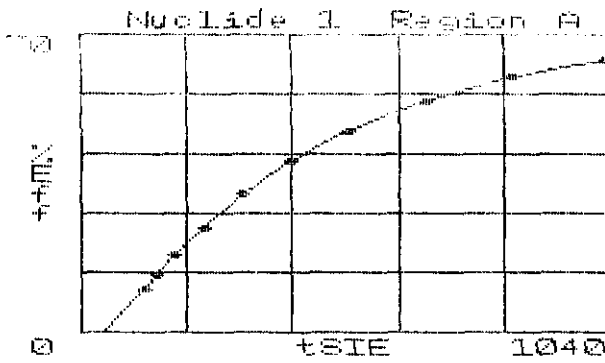
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

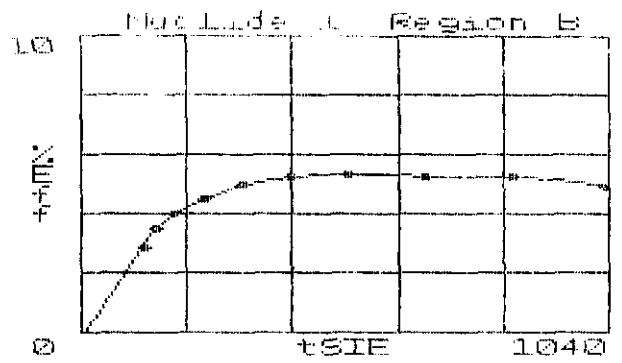
	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.49
Region B:	12.0 - 156		0	0.0	13.91
Region C:	0.0 - 0.0		0	0.0	0.00

Room 307

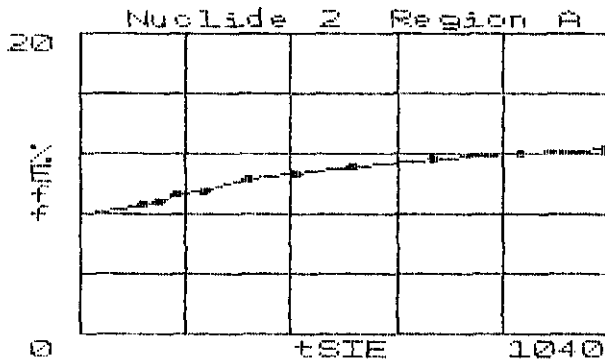
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



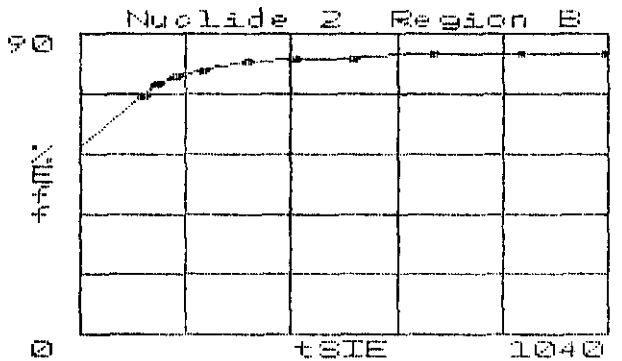
tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10



tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31



tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

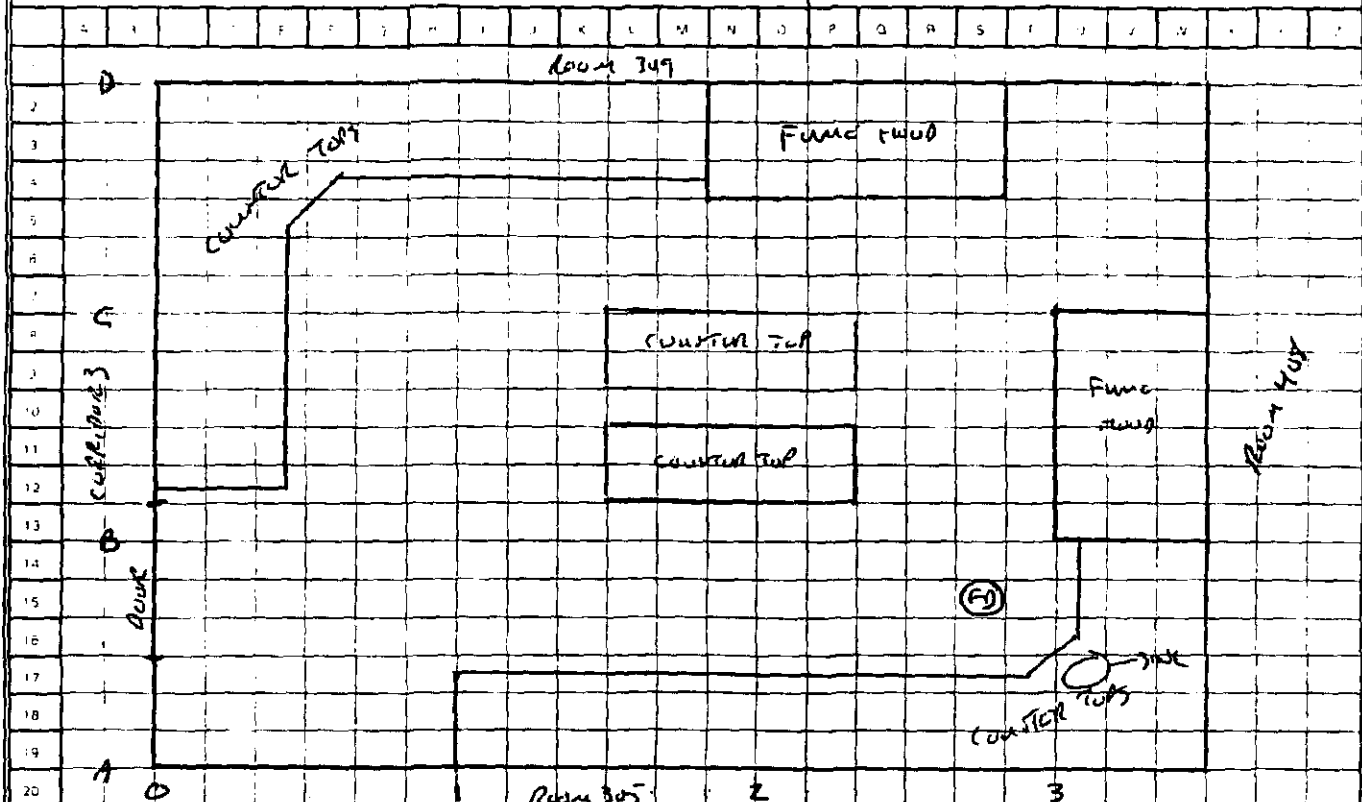
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	11.49	13.91			65.754	721.27	B
2	10.00	0.00	0.00	0.00	0.00	0.000	701.02	
3	10.00	0.00	0.00	0.00	0.00	0.000	703.89	
4	10.00	0.00	0.00	0.00	0.00	0.000	704.83	
5	10.00	0.00	0.00	0.00	0.00	0.000	714.45	
6	10.00	0.26	0.00	0.48	0.00	0.000	722.52	
7	10.00	0.34	0.00	0.62	0.00	0.000	708.37	
8	10.00	0.00	0.00	0.00	0.00	0.000	717.70	
9	10.00	0.00	0.00	0.00	0.00	0.000	697.15	
10	10.00	0.00	0.00	0.00	0.00	0.000	702.84	
11	10.00	0.00	0.94	0.00	1.13	0.000	705.39	
12	10.00	0.00	0.00	0.00	0.00	0.000	718.36	
13	10.00	0.13	0.00	0.24	0.00	0.000	714.29	
14	10.00	0.00	0.00	0.00	0.00	0.000	717.41	
15	10.00	0.00	0.00	0.00	0.00	0.000	723.94	
16	10.00	0.00	0.63	0.00	0.75	0.000	708.99	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number 062207-10

Page 1 of 1

Instrument SN: <u>BICRON / B2966</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLORL</u>	Date: <u>4/22/07</u>	Time: <u>1055</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 307</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W. SWAN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes

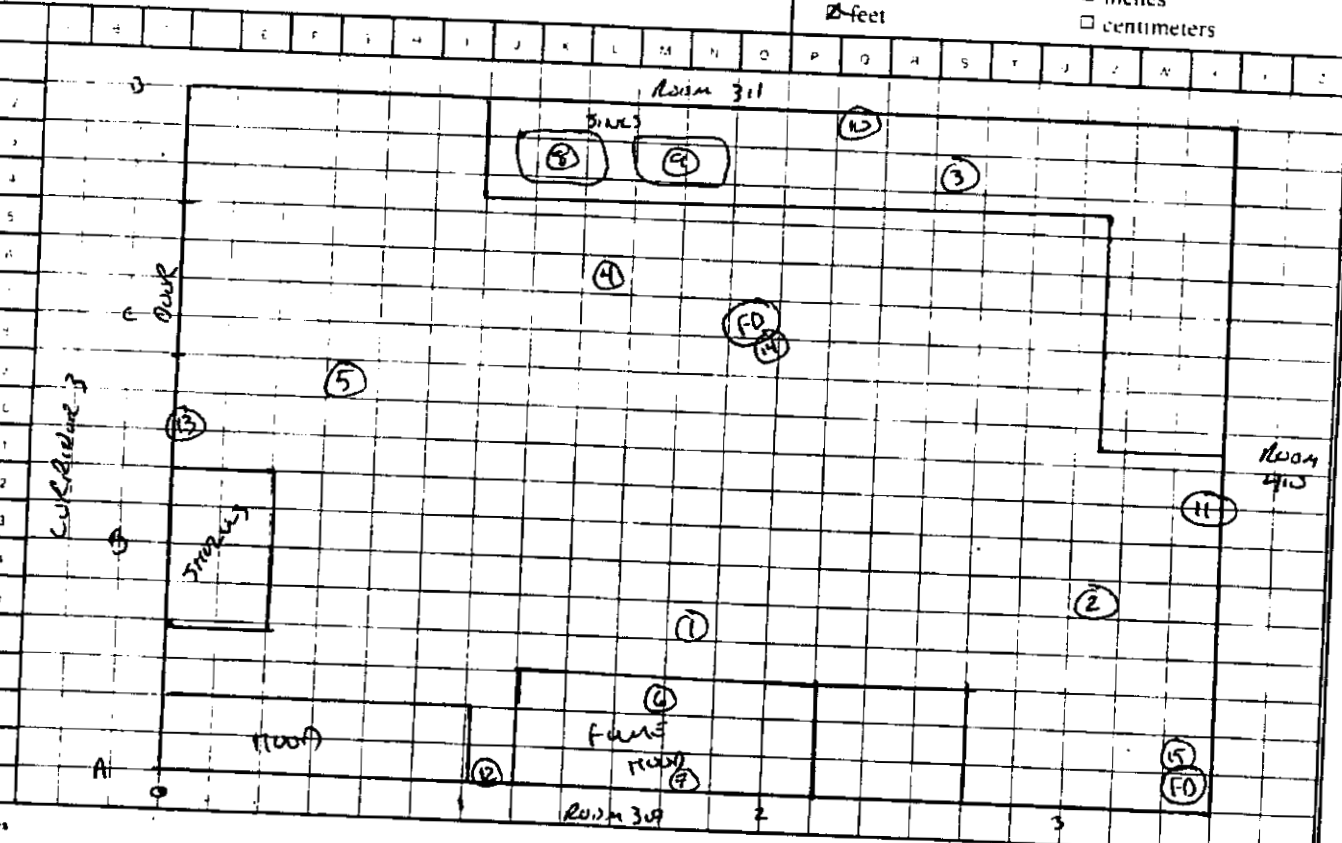
BKGD = 15 uRm/h WALKED ROOM WITH METER WAIST HIGH,  
NO READINGS ABOVE BACKGROUND. CONTACT WITH SINK  
DRAIN = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062207-4

Page 1 of 5

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLRCL</u>	Date: <u>6/22/07</u>	Time: <u>0930</u>
Instrument SN: <u>43-68 / PR190453</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 309</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Sumlin</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		
Grid Dimensions: <u>1 x 1</u>		<input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		



Notes

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 309**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+4.5, 1+4.5	1/168
2 A+5.5, 3+0.5	1/161
3 C+4.5, 2+3.5, 3.0	0/172
4 C+1.5, 1+2.5	2/156
5 B+4.5, 0+3.5	0/166
6 A+2.5, 1+4.0, 3.0	0/170
7 A+1.0, 1+4.5, 6.0	Smear only
8 C+4.5, 1+1.5, 2.5	1/169
9 C+4.5, 1+4.0, 2.5	1/158
10 D+0.0, 2+1.5, 4.0	2/163
11 B+2.0, 3+3.0, 6.0	0/172
12 A+0.0, 1+0.5, 2.0	0/166
13 B+3.0, 0+0.0, 6.0	1/153
14 C+0.5, 1+5.5	0/169
15 A+0.5, 3+2.5	1/173

062207-4  
3045

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

High Energy: 14C

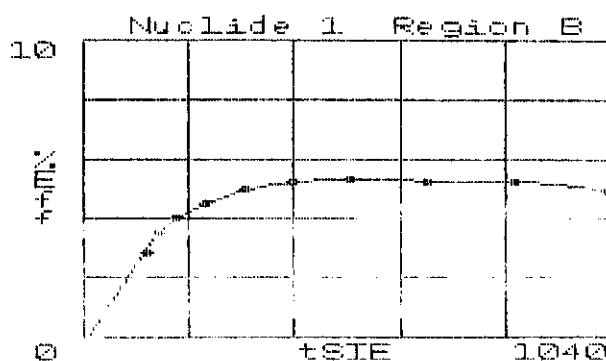
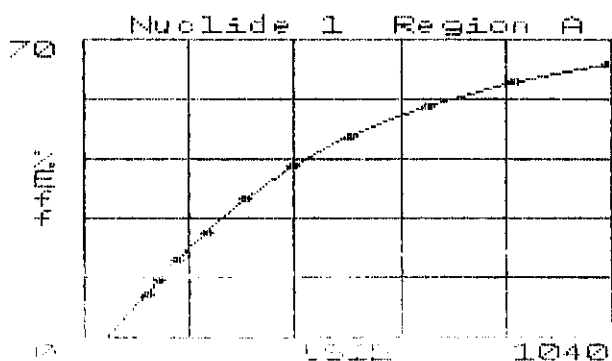
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.68
Region B:	12.0 - 156		0	0.0	15.02
Region C:	0.0 - 0.0		0	0.0	0.00

Room 309

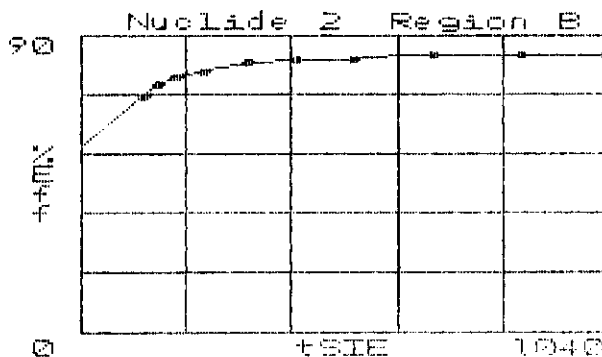
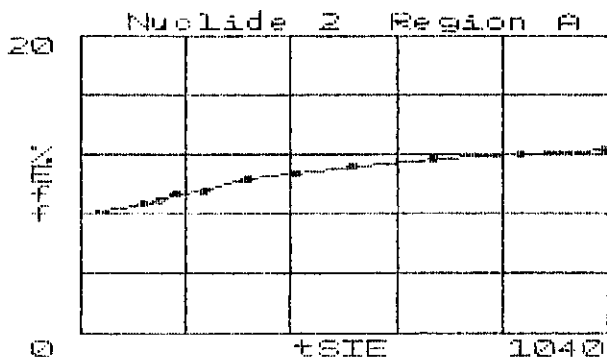
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count



tSIE	%E <sub>ffA</sub>	tSIE	%E <sub>ffA</sub>
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%E <sub>ffB</sub>	tSIE	%E <sub>ffB</sub>
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%E <sub>ffA</sub>	tSIE	%E <sub>ffA</sub>
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%E <sub>ffB</sub>	tSIE	%E <sub>ffB</sub>
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54



239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.51

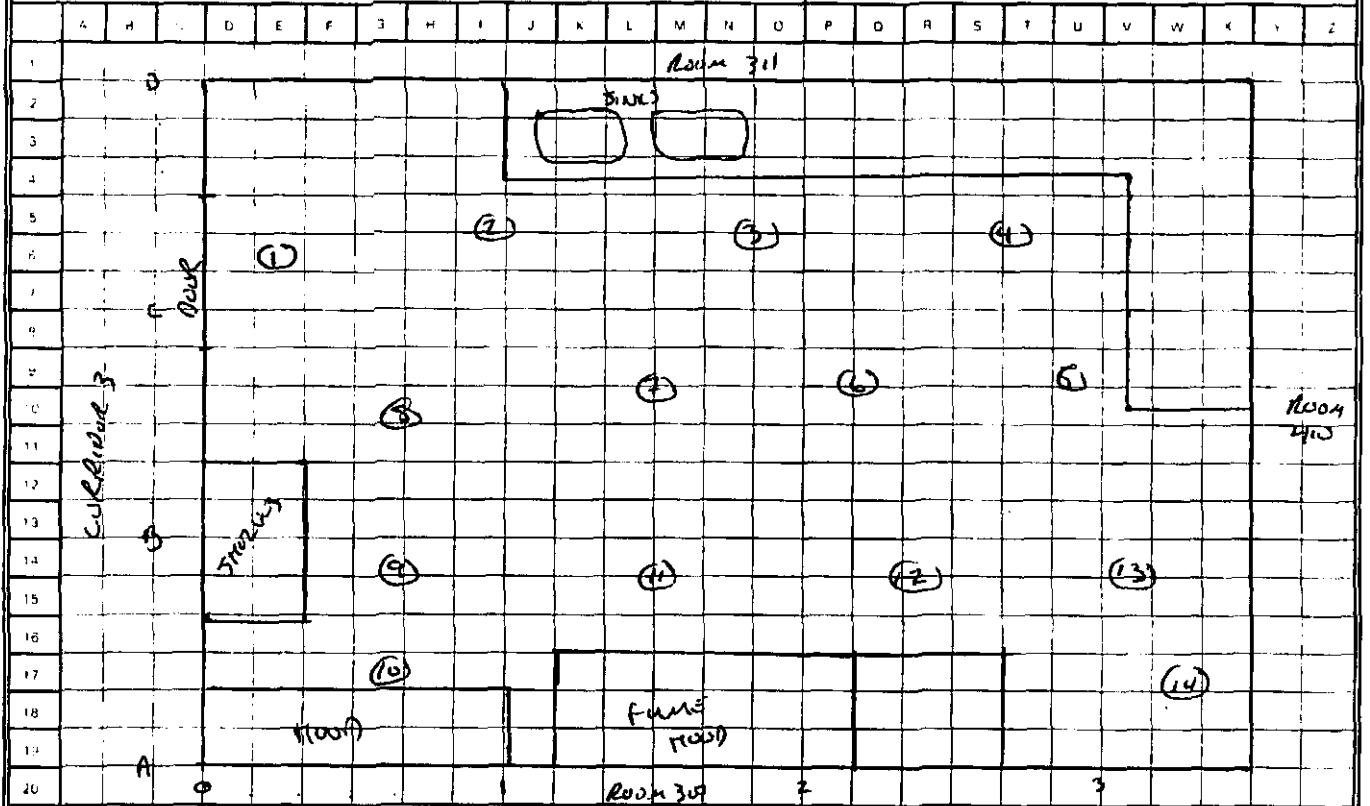
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.68	15.02			72.811	722.71	B
2	10.00	0.39	0.00	0.71	0.00	0.000	714.21	
3	10.00	0.30	0.00	0.54	0.00	0.000	737.75	
4	10.00	0.00	0.00	0.00	0.00	0.000	724.50	
5	10.00	0.00	0.00	0.00	0.00	0.000	706.48	
6	10.00	1.22	0.00	2.24	0.00	0.000	708.08	
7	10.00	0.00	0.00	0.00	0.00	0.000	712.32	
8	10.00	0.00	0.00	0.00	0.00	0.000	709.92	
9	10.00	0.00	0.00	0.00	0.00	0.000	720.54	
10	10.00	0.00	0.00	0.00	0.00	0.000	713.83	
11	10.00	0.00	0.00	0.00	0.00	0.000	715.87	
12	10.00	0.00	0.00	0.00	0.00	0.000	716.87	
13	10.00	1.11	0.00	2.03	0.00	0.000	723.42	
14	10.00	0.22	0.00	0.39	0.00	0.000	714.64	
15	10.00	0.00	0.00	0.00	0.00	0.000	713.25	
16	10.00	0.12	0.00	0.22	0.00	0.000	715.09	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-1

Page 1 of 1

Instrument/SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLDCL</u>	Date: <u>6/24/07</u>	Time: <u>0830</u>
Instrument SN: <u>43-37/PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 309</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMNER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED 100% OF FLOOR, TOOK READINGS ~ 6 FEET. RESULTS IN  
u/B CPM

① 0/400	⑧ 0/420
② 0/380	⑨ 0/400
③ 0/380	⑩ 0/380
④ 0/400	⑪ 0/400
⑤ 0/400	⑫ 0/400
⑥ 0/420	⑬ 0/380
⑦ 0/380	⑭ 0/400

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-2

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/22/07</u>	Time: <u>0845</u>
Instrument SN: <u>43-68 / PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 309</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W SUMIN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
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16																										
17																										
18																										
19																										
20																										

Notes: SCANNED 2 FLOOR GRIDS. HIGHEST READING IN 4/B COM / 100 CM<sup>2</sup> INCLUDED SOME COUNTER TOP

① 0/80

② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
RADIOLOGICAL SURVEY FORM

Survey Number 062207-3

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLURE</u>	Date: <u>6/29/07</u>	Time: <u>0900</u>
Instrument SN: <u>43-68 / 22190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 309</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFROY W. SUMER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

1																				
2																				
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18																				
19																				
20																				

**Notes** SENSORS 2 WALL GRIDS HIGHEST READING IN Q/B CPM/LOUCLZ  
① 0/60  
② 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-5

Page 1 of 1

Instrument SN: <u>BICRON / B296W</u>	Calibration Due: <u>10/14/07</u>	Site Name: <u>CLUEL</u>	Date: <u>6/27/07</u>	Time: <u>0935</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 309</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMNER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	P	Q	R	S	T	U	V	W	X	Y	Z	

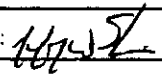
*Hand-drawn diagram of Room 309 on a grid. The room is roughly rectangular, spanning from grid line 10 to 18 horizontally and 2 to 12 vertically. Inside the room, there are two rectangular shapes labeled 'SINK' at the top. On the left side, there is a vertical line labeled 'Door'. At the bottom, there are two rectangular shapes labeled 'FURNITURE'. The grid is labeled with letters A through Z across the top and numbers 1 through 20 down the left side. The text 'Room 309' is written in the top right corner of the diagram area.*

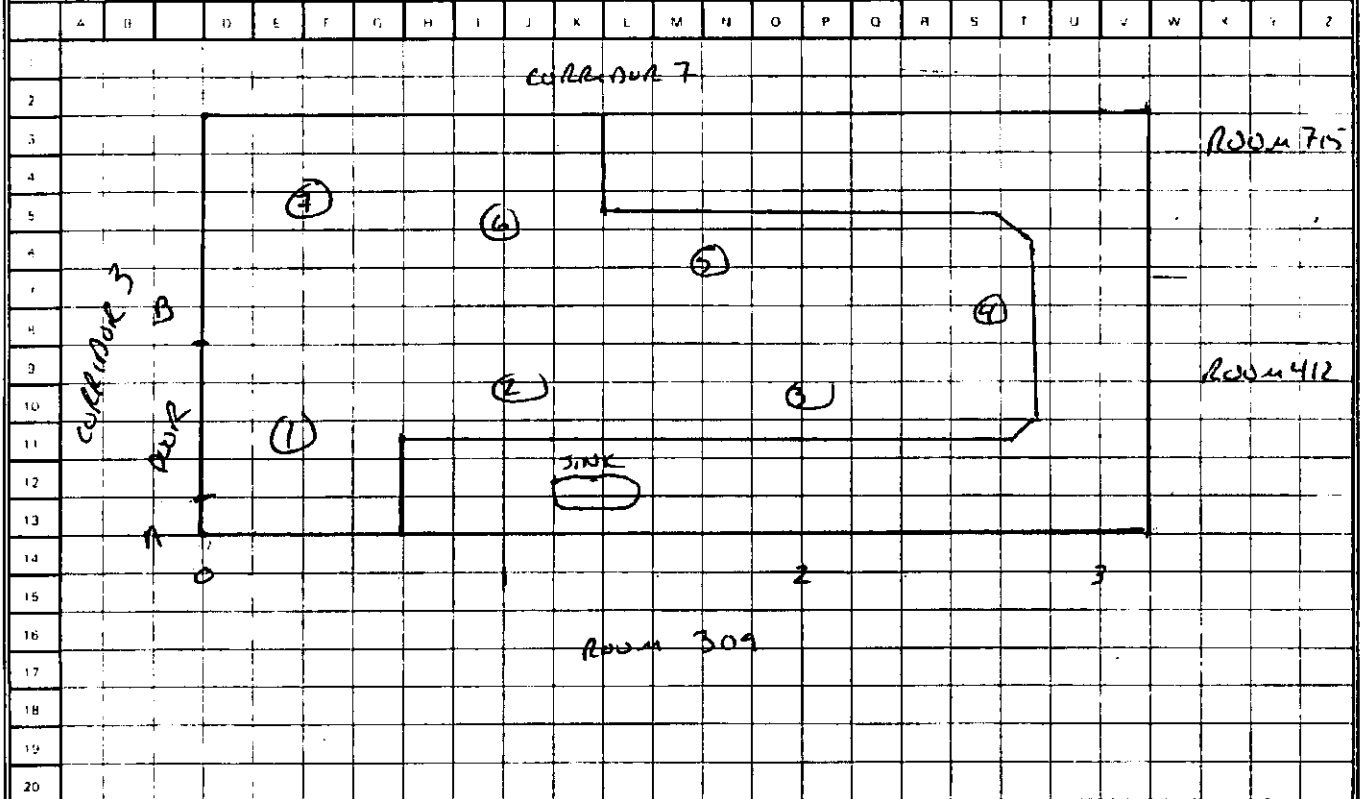
Notes: BKGD = 15 mPm/h. WORKED ROOM WITH METER WAIST HIGH. NO READINGS ABOVE BACKGROUND. CONTACT WITH SINK DIRM = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-17

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>ALERT</u>	Date: <u>6/24/07</u>	Time: <u>1535</u>
Instrument SN: <u>43-37 / PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 311</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>		Survey Performed By (Signature): 		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SURVEYED 100% OF FLOOR, 700IC READINGS ~ 6 FEET. RESULTS IN CPM d/B

- ① 0/350
- ② 0/400
- ③ 0/400
- ④ 0/400
- ⑤ 0/400
- ⑥ 0/350
- ⑦ 0/400

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number: 062107-18

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>ALERT</u>	Date: <u>6/2/07</u>	Time: <u>1545</u>
Instrument SN: <u>4368 / P12190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 311</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMNER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>(x)</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	
CURR. AVE 7 ROOM 715 ROOM 412 ROOM 309 SINK CURR. AVE 3 AVE B AVE A				
Notes: SCANNED ONE FLOOR AREA, HIGHEST READING IN CURR AVE B / ROOM 2 INCLUDED SOME COUNTER TOP ① 0/80				

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062107-19

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CYLER</u>	Date: <u>6/24/07</u>	Time: <u>1600</u>
Instrument SN: <u>43-68 / PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 311</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Surcin</u>		Survey Performed By (Signature):		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z				
2				
1				
3				
5				
4	WALL ADJACENT TO CORRIDOR 7		WALL ADJACENT TO ROOMS 715, 412	
4				
3				
10				
11				
12				
13				
14	WALL ADJACENT TO CORRIDOR 3		WALL ADJACENT TO ROOMS 715, 412	
15				
16				
17				
18				
19				
20				
Notes				
SCANNED 2 WALL GRIDS, HIGHEST READINGS IN COM #1A/100CM				
① 0/100 ② 0/80				





**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-20

Page 1 of 5

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLTRL</u>	Date: <u>10/2/07</u>	Time: <u>1630</u>
Instrument SN: <u>43-68 / PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 311</u>		
Instrument SN: <u>WIK</u>	Calibration Due: <u>U/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Samuels</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>12</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

COLLECTOR 7

ROOM 705

ROOM 412

ROOM 309

COLLECTOR 3

AIR

SINK

1 2 3 4 5 6 7 8 9 10

NOTES: TOOK 2 MINUTE STATIC READINGS. TOOK SMears FOR LSC IN SAME LOCATIONS

06210720  
2005

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

### Room 311

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.5, 0+2.5	0/198
2 B+1.5, 0+3.5	1/206
3 A+5.5, 1+1.5	1/203
4 B+3.5, 1+5.5, 3.0	0/210
5 A+5.5, 2+3.5	1/196
6 B+5.0, 1+1.5, 4.0	1/205
7 A+5.5, 3+1.0, 4.0	0/209
8 A+0.0, 2+0.5, 6.0	1/201
9 B+1.5, 0+0.0, 2.0	2/209
10 A+1.0, 1+2.0, 2.0	1/202
11 B+3.0, 2+5.0, 0.5	1/196

062107-20  
30FS

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

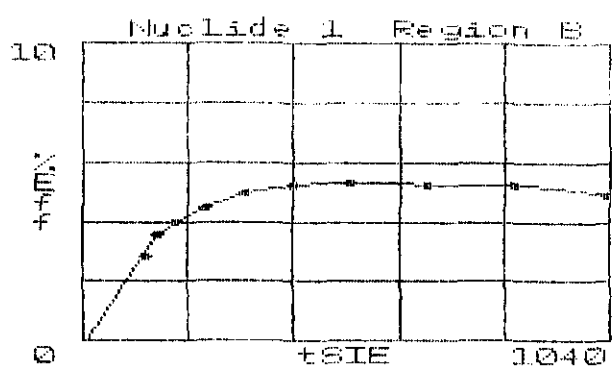
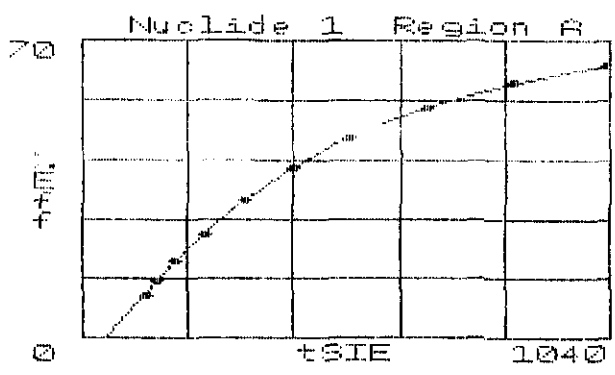
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.96
Region B:	12.0 - 156		0	0.0	11.24
Region C:	0.0 - 0.0		0	0.0	0.00

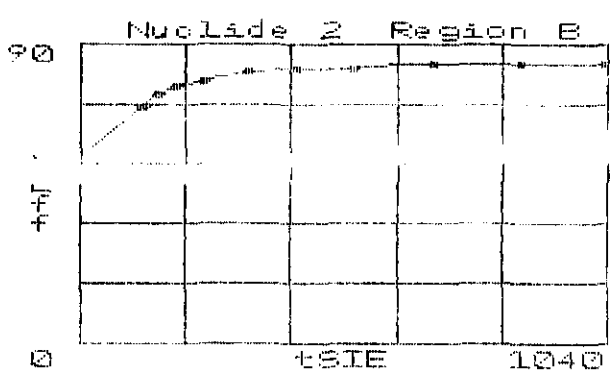
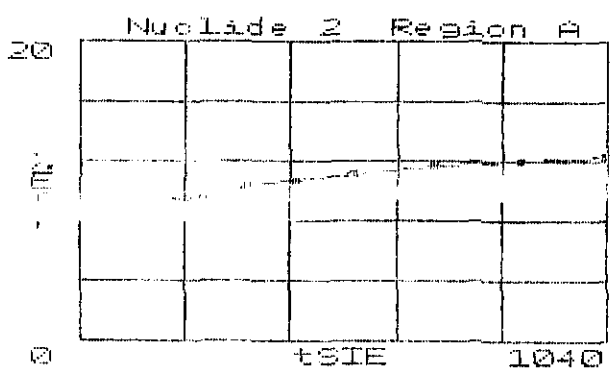
*Room 311*

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.28	526.12	5.37
416.09	5.24	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

25 Jun 2007 13:40 TRI-CARB - 1.09  
 Protocol #:2B SURVEY

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

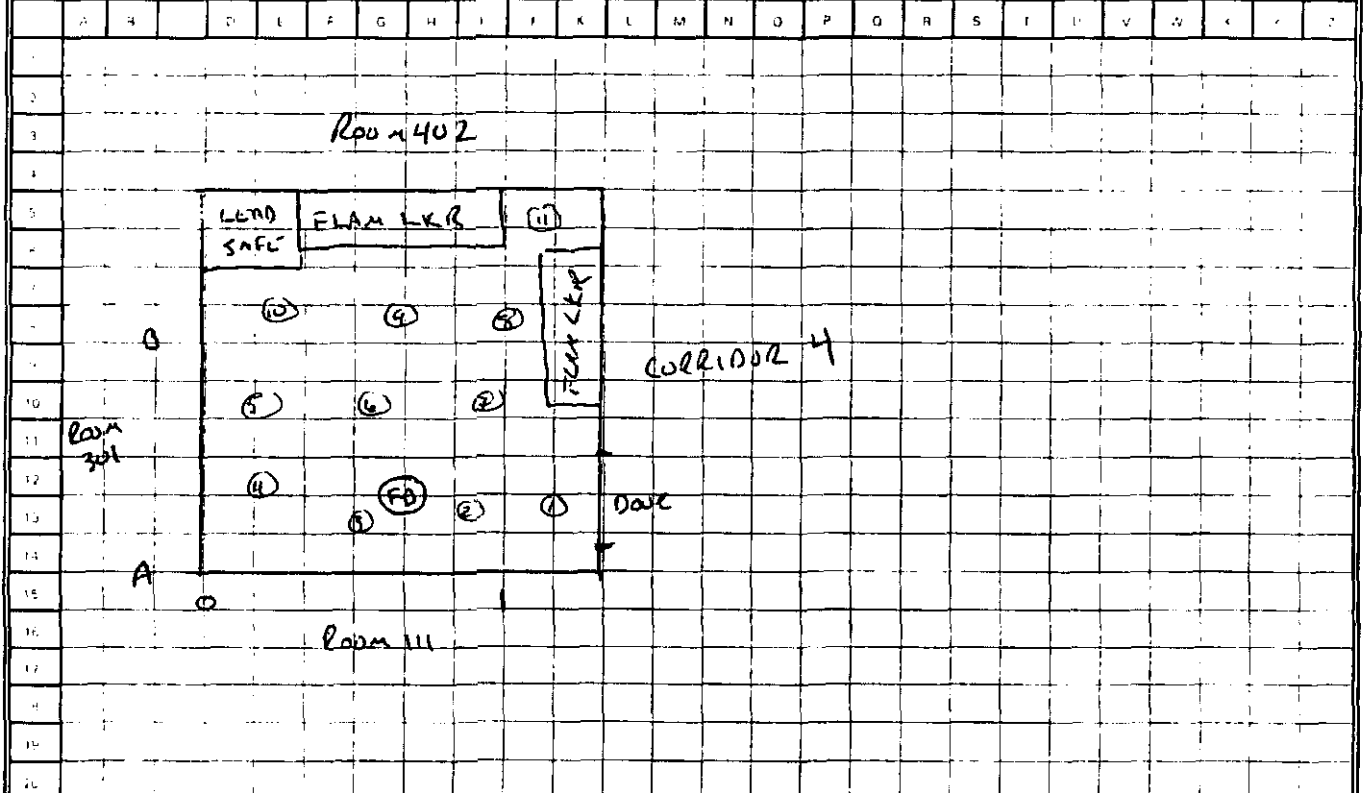
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.96	11.24			74.914	715.76	B
2	10.00	0.00	0.34	0.00	0.41	0.000	718.48	
3	10.00	0.35	0.00	0.65	0.00	0.000	711.56	
4	10.00	0.42	2.27	0.19	2.68	3.537	706.28	
5	10.00	2.62	2.18	4.32	2.32	14.819	683.85	
6	10.00	1.56	1.34	2.51	1.43	0.000	719.47	
7	10.00	0.00	1.80	0.00	2.16	0.000	707.88	
8	10.00	0.57	1.83	0.57	2.14	0.000	716.00	
9	10.00	0.00	0.81	0.00	0.97	0.000	717.06	
10	10.00	0.00	3.19	0.00	3.83	68.958	709.73	
11	10.00	2.39	2.21	3.79	2.39	53.875	719.59	
12	10.00	0.00	1.39	0.00	1.67	297.93	719.73	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-8

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CELL</u>	Date: <u>4/24/08</u>	Time: <u>1315</u>
Instrument SN: <u>43-371 PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 400</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNING 100% OF FLOOR TOOK READINGS EVERY 3 FEET RESULTS ARE IN CPM a/b FLOOR IS PAINTED CONCRETE

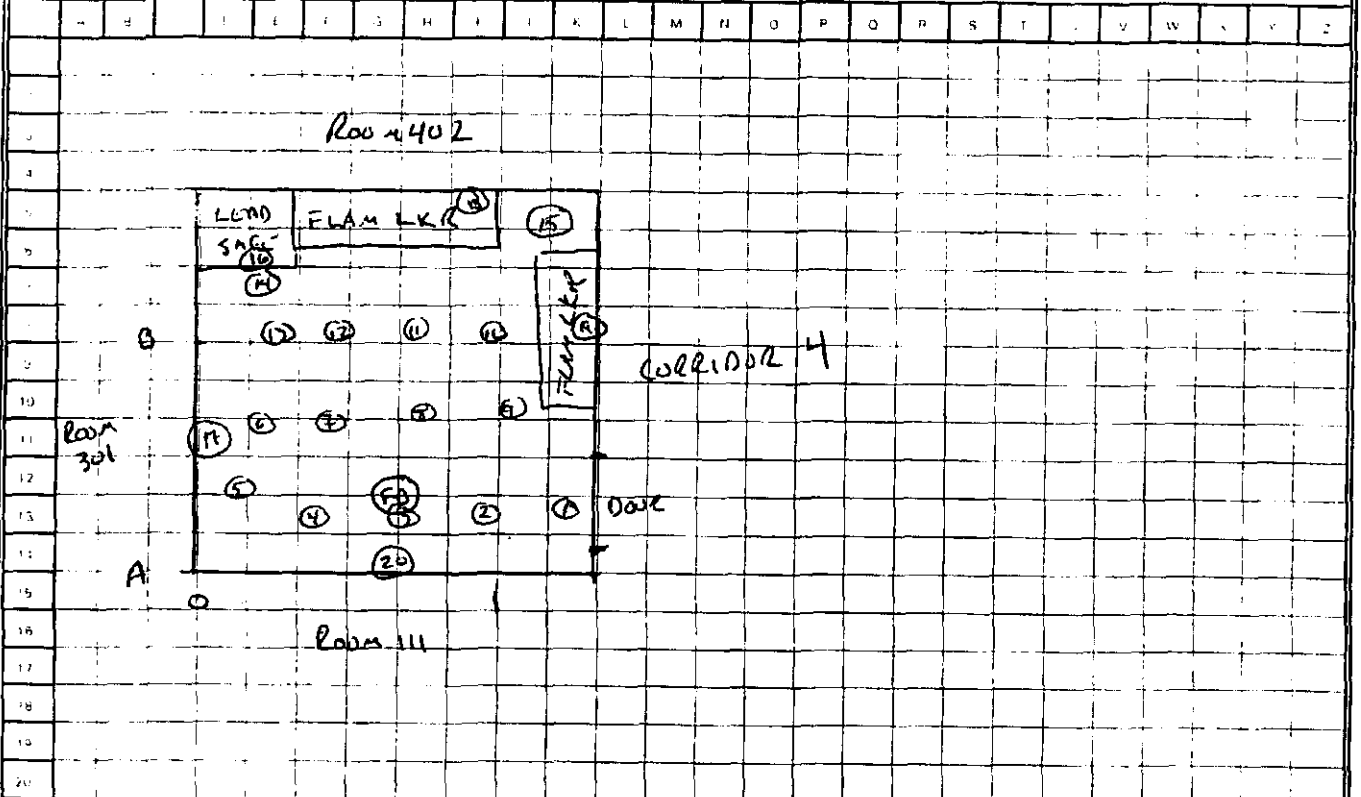
① 0/500	⑦ 0/500
② 0/400	⑧ 0/600
③ 0/500	⑨ 0/400
④ 0/500	⑩ 4/500
⑤ 0/500	⑪ 0/500
⑥ 0/600	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number C62007-10

Page 1 of 9

Instrument SN: <u>2224/116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLCRL</u>	Date: <u>4/24/07</u>	Time: <u>1430</u>
Instrument SN: <u>4368/PR K0483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 400</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Sumlin</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: PERFORMED 2 MINUTE STATIC COUNT. COLLECTED SWIPES FOR GROSS A & B AND LSC AT SAME LOCATIONS.



Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

Room 400

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+1.5, 1+1.5	2/223
2 A+1.5, 0+5.5	2/231
3 A+2.0, 0+4.0	2/244
4 A+1.5, 0+2.5	2/227
5 A+2.0, 0+1.0	1/219
6 A+4.0, 0+1.5	2/233
7 A+4.0, 0+2.5	1/218
8 A+4.0, 0+4.5	1/226
9 A+4.0, 1+0.5	2/236
10 B+0.0, 1+0.0	2/219
11 B+0.5, 0+4.5	3/222
12 B+0.5, 0+2.5	2/208
13 B+0.5, 0+1.5	2/217
14 B+1.5, 0+1.5	3/323
15 B+3.0, 1+1.0	2/231
16 B+2.0, 0+1.0, 0.5	1/196
17 A+3.5, 0+0.0, 4.0	1/114
18 B+4.0, 0+5.5, 5.0	2/126
19 B+0.5, 1+2.0, 6.0	2/119
20 A+0.0, 0+4.0, 2.0	1/124

062007-10  
3059

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.


Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

062007-10  
4059

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	2400-98	12700	43161	10	4316	0.34	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	1	2	-0.1	-0.3	0.5	1.3	a
2	1	2	-0.1	-0.3	0.5	1.3	a
3	0	2	-0.6	-1.8	0.0	1.3	a
4	2	2	0.4	1.2	0.7	1.3	a
5	1	2	-0.1	-0.3	0.5	1.3	a
6	1	2	-0.1	-0.3	0.5	1.3	a
7	1	2	-0.1	-0.3	0.5	1.3	a
8	1	2	-0.1	-0.3	0.5	1.3	a
9	0	2	-0.6	-1.8	0.0	1.3	a
10	0	2	-0.6	-1.8	0.0	1.3	a
11	2	2	0.4	1.2	0.7	1.3	a
12	0	2	-0.6	-1.8	0.0	1.3	a
13	2	2	0.4	1.2	0.7	1.3	a
14	0	2	-0.6	-1.8	0.0	1.3	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 400.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

062007-10  
5499

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RSP-019 (Rev. 003) - Attachment 4

**CERTIFICATE OF ANALYSIS - SMEARS**

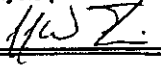
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007			Report Date:		
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 128128/132238		Calibration Due: April 2, 2008			
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43161	10	4316	0.34	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	0	2	-0.6	-1.8	0.0	1.3	a
16	2	2	0.4	1.2	0.7	1.3	a
17	2	2	0.4	1.2	0.7	1.3	a
18	3	2	0.9	2.6	0.9	1.3	a
19	1	2	-0.1	-0.3	0.5	1.3	a
20	0	2	-0.6	-1.8	0.0	1.3	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 400.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

062057-10  
6099

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CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52406	10	5187	0.26	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3197		60		53			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	103	2	-1.8	-6.9	5.1	6.6	a
2	98	2	-4.3	-16.5	5.0	6.6	a
3	102	2	-2.3	-8.8	5.1	6.6	a
4	110	2	1.7	6.6	5.2	6.6	a
5	114	2	3.7	14.3	5.3	6.6	a
6	107	2	0.2	0.8	5.2	6.6	a
7	96	2	-5.3	-20.4	4.9	6.6	a
8	101	2	-2.8	-10.7	5.0	6.6	a
9	99	2	-3.8	-14.6	5.0	6.6	a
10	108	2	0.7	2.8	5.2	6.6	a
11	102	2	-2.3	-8.8	5.1	6.6	a
12	114	2	3.7	14.3	5.3	6.6	a
13	112	2	2.7	10.5	5.3	6.6	a
14	103	2	-1.8	-6.9	5.1	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 400.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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7 of 9

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**CERTIFICATE OF ANALYSIS - SMEARS**

<b>Client Name:</b> GLERL		<b>IEM Project No.:</b> 2005006.003					
<b>Sample Collection Date:</b> June 18, 2007	<b>Sample Ship Date:</b> N/A	<b>Sample Analysis Date:</b> June 19, 2007	<b>Report Date:</b>				
<b>DATA ACQUISITION</b>							
<b>Instrument Manufacturer:</b> Ludlum	<b>Instrument Model:</b> 2929 Scaler w/43-10-1 Probe	<b>Instrument Serial No.:</b> 126126/132238	<b>Calibration Due:</b> April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	<b>Source Identifier/SN</b>	<b>Source Activity - 4π (dpm)</b>	<b>Gross Counts</b>	<b>Count Time (min)</b>	<b>Net Count Rate (cpm)</b>	<b>Efficiency (cpm/dpm)</b>	
	2399-98	20000	52406	10	5187	0.26	
	<b>Instrument Background</b>						
	<b>Gross Counts</b>		<b>Count Time (min)</b>		<b>Background Count Rate (cpm)</b>		
3197		60		53			
<b>RESULTS</b>							
<b>Smear No.</b>	<b>Gross Counts</b>	<b>Count Time (min)</b>	<b>Net Count Rate (cpm)</b>	<b>Activity (dpm)</b>	<b>+/- (dpm)</b>	<b>MDA (dpm)</b>	<b>Codes</b>
15	105	2	-0.8	-3.0	5.1	6.6	a
16	99	2	-3.8	-14.6	5.0	6.6	a
17	103	2	-1.8	-6.9	5.1	6.6	a
18	103	2	-1.8	-6.9	5.1	6.6	a
19	108	2	0.7	2.8	5.2	6.6	a
20	101	2	-2.8	-10.7	5.0	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Room 400.					
<b>Analysis performed by (print):</b> Jeffrey W. Sumlin, RRPT			<b>Analysis performed by (signature):</b> 			<b>License No.:</b> MDE License No: MD-31-281-01	

21 Jun 2007 07:45  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

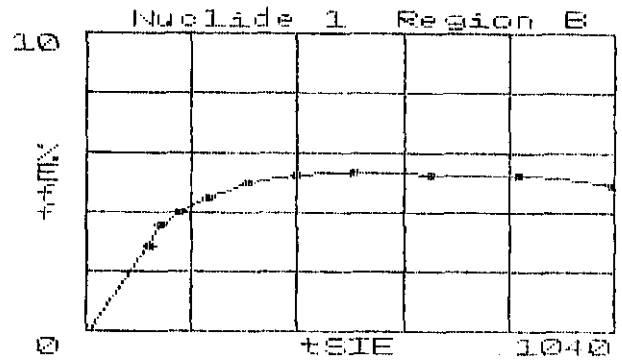
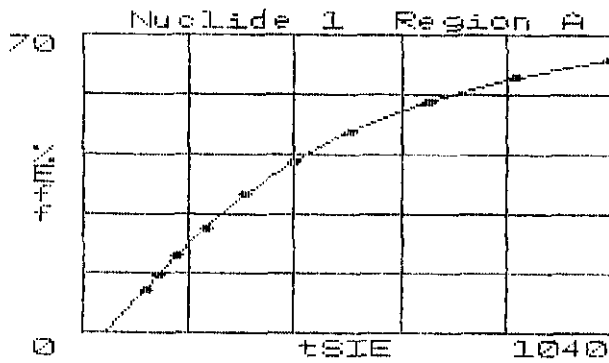
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.65
Region B:	12.0 - 156		0	0.0	12.25
Region C:	0.0 - 0.0		0	0.0	0.00

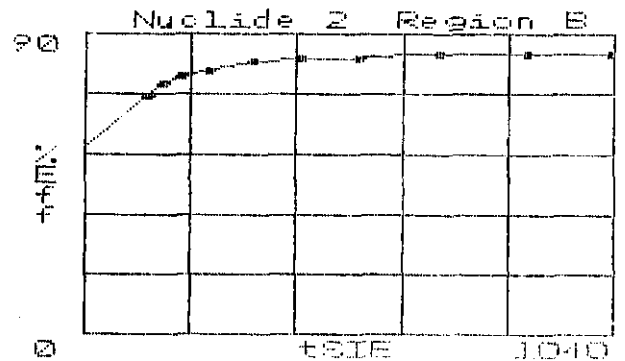
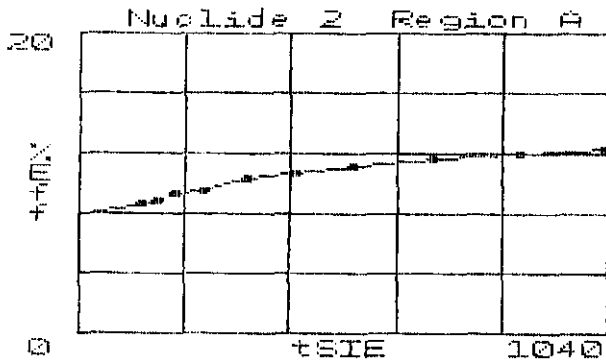
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count

Rm 400



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

21 Jun 2007 07:46  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

06 2007-10  
9 084  
Page #2  
User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

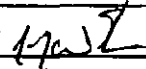
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.65	12.25			65.287	674.38	B
2	10.00	0.93	0.00	1.75	0.00	0.000	670.40	
3	10.00	0.00	0.46	0.00	0.56	*****	667.56	
4	10.00	1.56	2.54	2.24	2.87	86.494	694.30	
5	10.00	0.14	0.96	0.02	1.14	177.50	688.49	
6	10.00	0.35	1.15	0.36	1.34	91.110	701.27	
7	10.00	0.48	1.12	0.59	1.30	121.28	706.83	
8	10.00	0.00	1.80	0.00	2.17	1168.4	688.38	
9	10.00	0.00	1.12	0.00	1.34	136.83	682.10	
10	10.00	2.19	1.31	3.73	1.32	41.845	691.22	
11	10.00	0.00	0.00	0.00	0.00	0.000	676.32	
12	10.00	2.04	1.66	3.36	1.76	78.912	692.87	
13	10.00	0.00	0.00	0.00	0.00	0.000	686.38	
14	10.00	1.37	1.63	2.14	1.80	110.99	679.10	
15	10.00	0.00	0.81	0.00	0.98	*****	686.48	
16	10.00	0.00	1.36	0.00	1.64	744.72	688.27	
17	10.00	0.00	0.21	0.00	0.25	0.000	684.82	
18	10.00	0.00	0.00	0.00	0.00	0.000	696.59	
19	10.00	0.71	1.29	0.99	1.47	157.77	691.65	
20	10.00	0.00	1.57	0.00	1.89	0.000	673.17	
21	10.00	0.51	1.85	0.47	2.16	117.70	697.99	

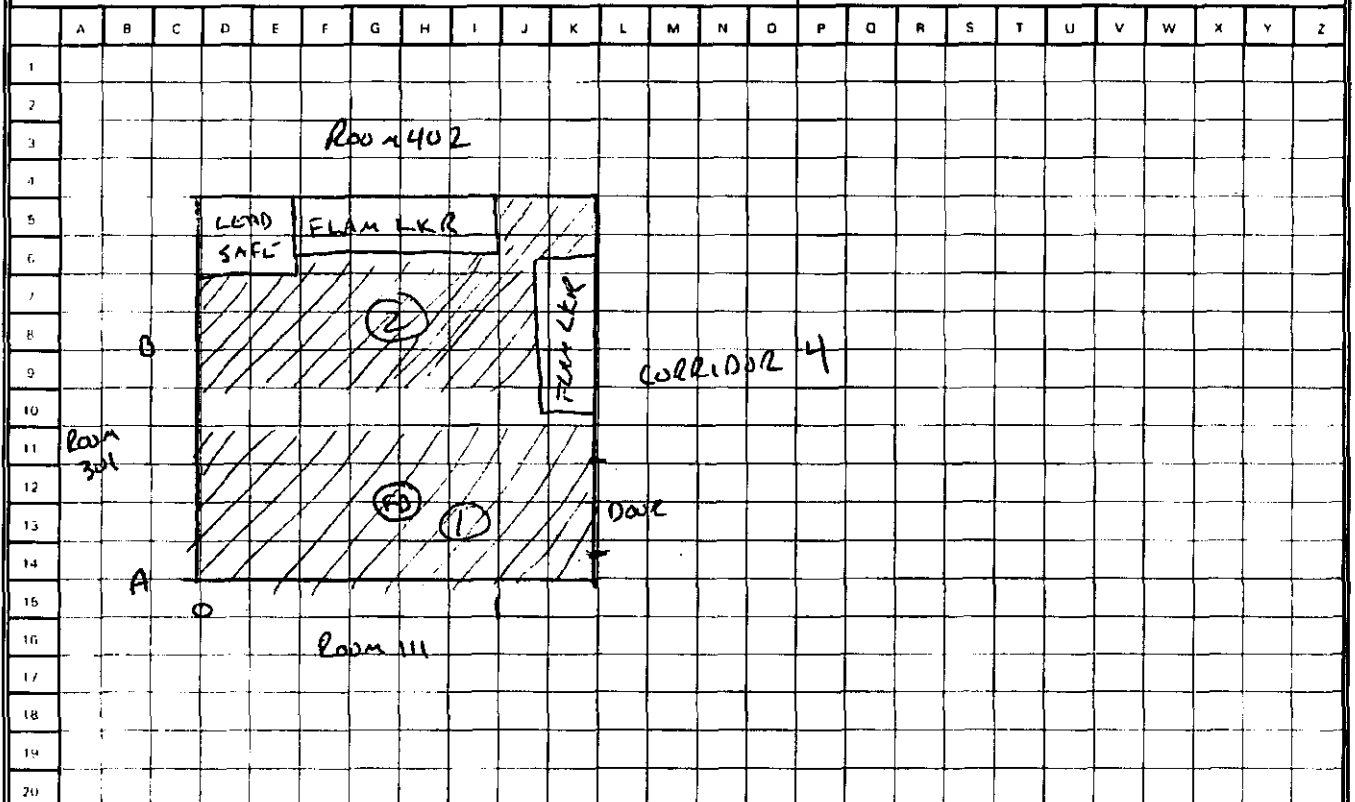


**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-9

Page 1 of 1

Instrument/SN: <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLLRL</u>	Date: <u>4/24/07</u>	Time: <u>1330</u>
Instrument/SN: <u>43-68 / PL 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 400</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>		Survey Performed By (Signature): 		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED ~ 50% OF FLOOR AREA, HIGHEST READING FOR GRID IN  
 a/b  $\mu\text{Sv CPM} / 100 \text{ cm}^2$   
 ① 0/200  
 ② 0/200

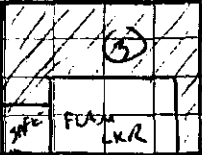
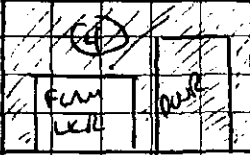

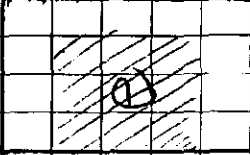
**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-12

Page 1 of 1

Instrument/SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERK</u>	Date: <u>4/24/07</u>	Time: <u>1500</u>
Instrument/SN: <u>43-68/12190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 400</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print):		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z									
1																																			
2																																			
3																																			
4												WALL ADJACENT TO ROOM 402																							
5																WALL ADJACENT TO CORNER 4																			
6																																			
7								WALL ADJACENT TO ROOM 311																											
8																																			
9																WALL ADJACENT TO ROOM 301																			
10				WALL ADJACENT TO CORNER 4																															
11								WALL ADJACENT TO CORNER 4																											
12												WALL ADJACENT TO CORNER 4																							
13																WALL ADJACENT TO CORNER 4																			
14				WALL ADJACENT TO CORNER 4																															
15								WALL ADJACENT TO CORNER 4																											
16												WALL ADJACENT TO CORNER 4																							
17																WALL ADJACENT TO CORNER 4																			
18				WALL ADJACENT TO CORNER 4																															
19								WALL ADJACENT TO CORNER 4																											
20												WALL ADJACENT TO CORNER 4																							

Notes: SCANNED ~ 50% OF WALLS HIGHEST RATING IN 4/3 CP4/100 C/R

① 0/50

② 0/100

③ 0/50

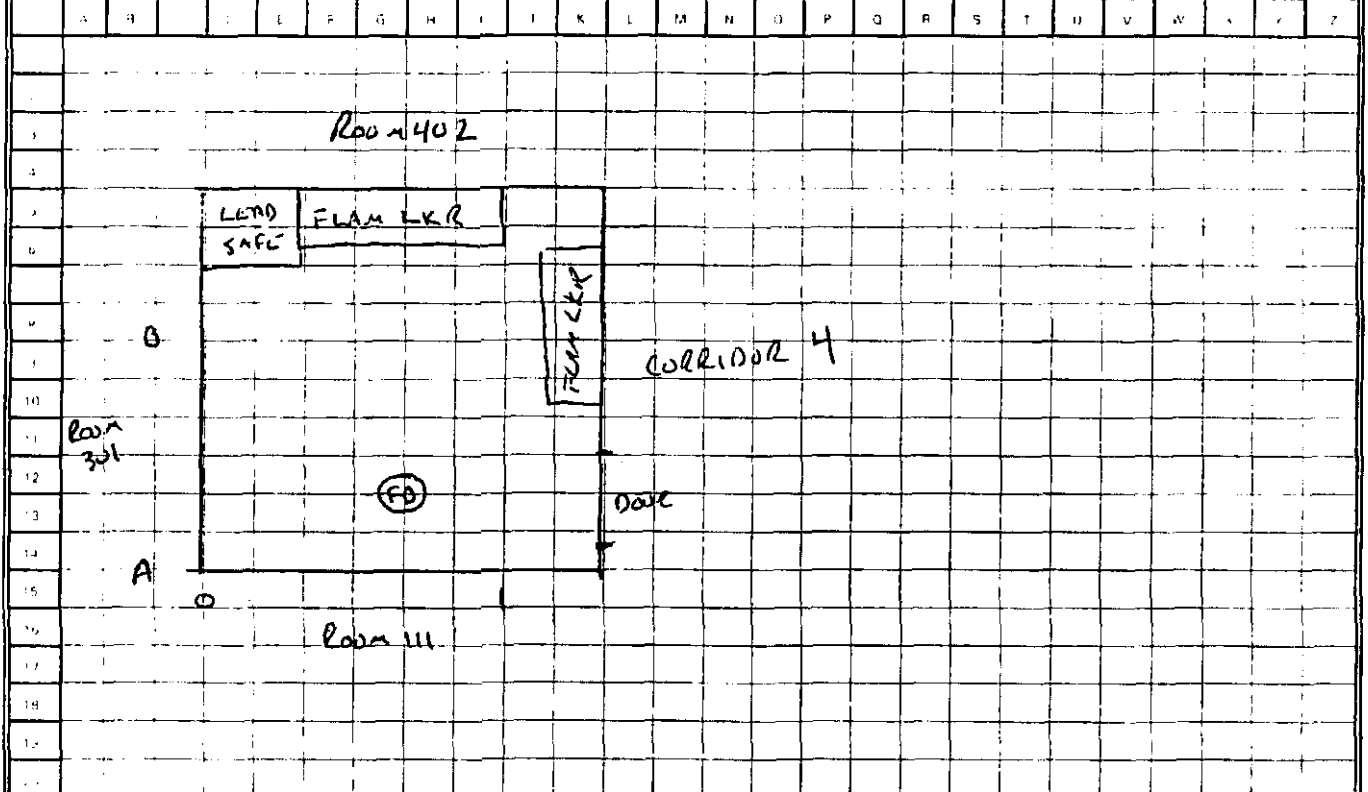
④ 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number C62007-11

Page 1 of 1

Instrument SN: <u>BICRON / 296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLORL</u>	Date: <u>4/24/07</u>	Time: <u>1435</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 400</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SWAIN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



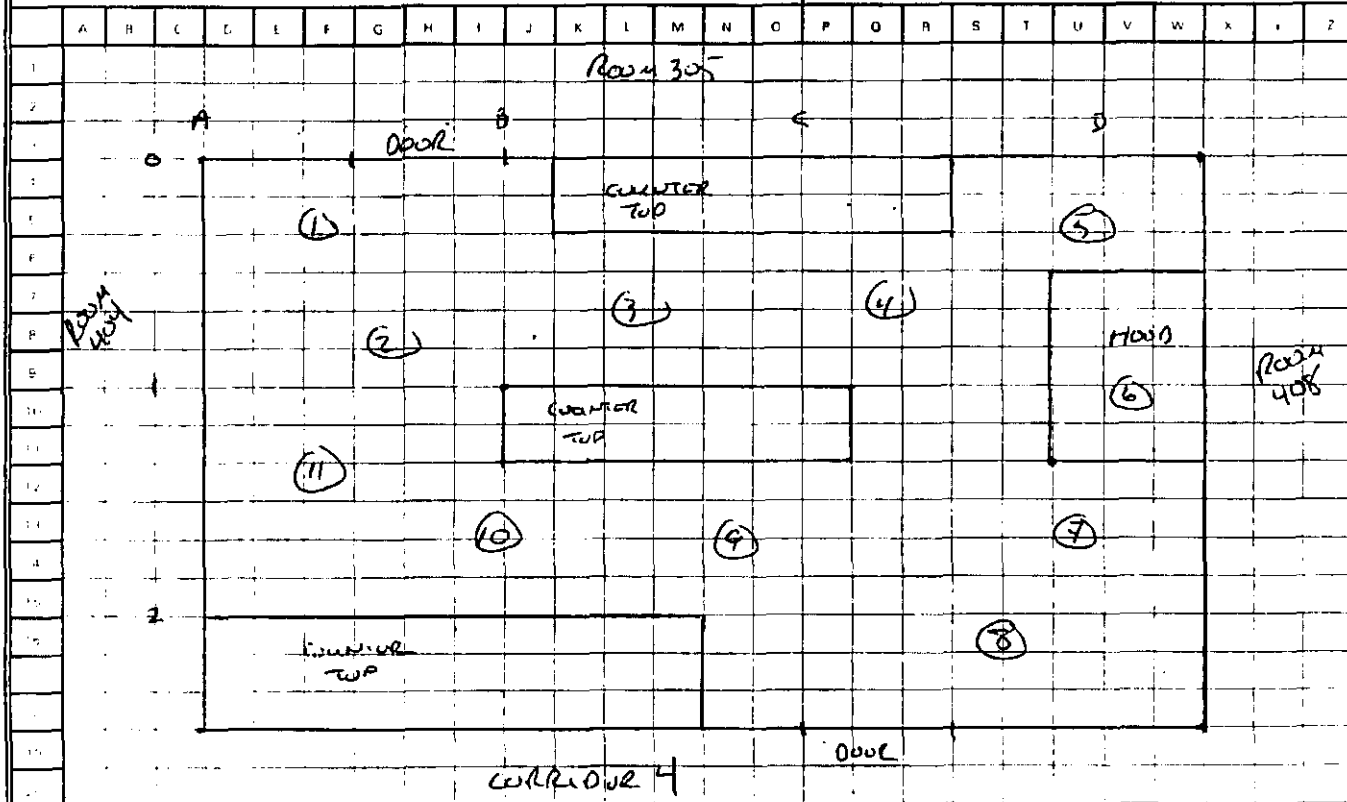
Notes: BKGD = 15 uRcm/h. READINGS AT WAIST HIGH ARE BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-5

Page 1 of 1

Instrument/SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLERL</u>	Date: <u>6/24/08</u>	Time: <u>1130</u>
Instrument/SN: <u>43-37/PR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 406</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W. SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Note: SCANNED 100% OF FLOOR. TOOK READINGS ~ EVERY 6 FEET. RESULTS ARE IN CPM w/b footcandle

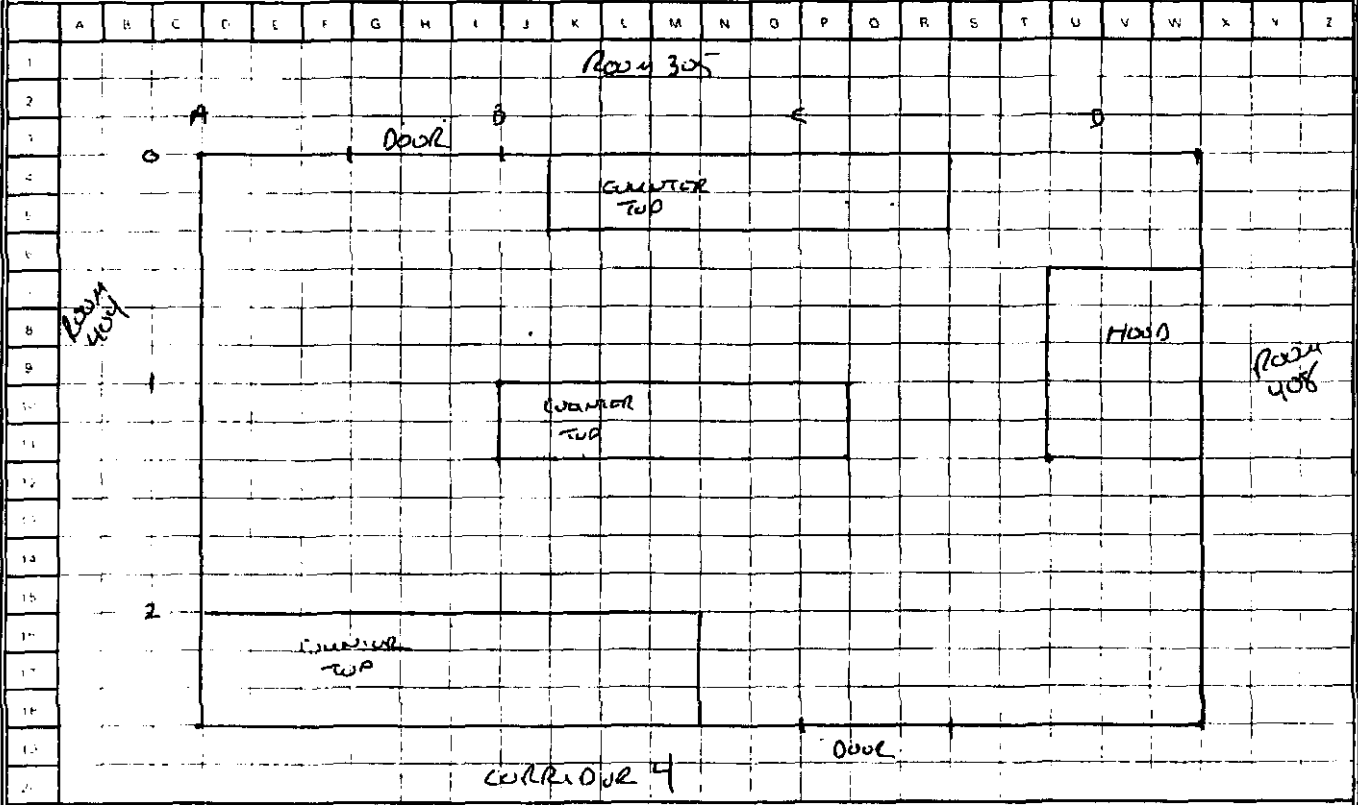
- |         |         |         |
|---------|---------|---------|
| ① 0/420 | ⑥ 0/400 | ⑪ 0/400 |
| ② 0/400 | ⑦ 0/420 |         |
| ③ 0/400 | ⑧ 0/440 |         |
| ④ 0/360 | ⑨ 0/400 |         |
| ⑤ 0/420 | ⑩ 0/420 |         |

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-6

Page 1 of 1

Instrument/SN: <u>BICRON / 246W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GILERL</u>	Date: <u>9/24/07</u>	Time: <u>1135</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 406</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumlin</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: BKGD = 15  $\mu$ Rom/h, WALK THRU OF ROOM WITH METER AT WAIST HEIGHT AND NO READINGS ABOVE BKGD

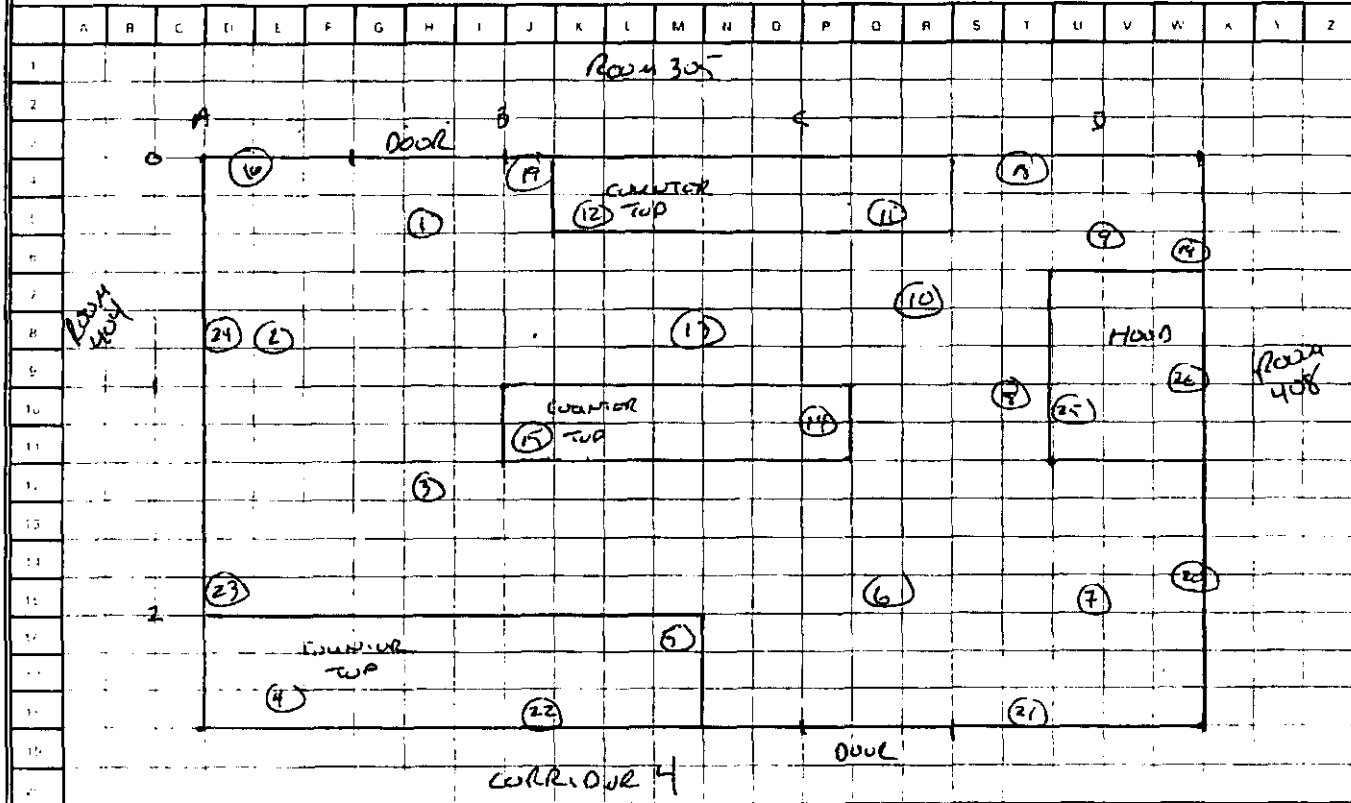
**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-7

Page 1 of 9

Instrument/SN: <u>22241/116239</u>	Calibration Due: <u>14/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>9/24/07</u>	Time: <u>1230</u>
Instrument SN: <u>43-68/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 406</u>		
Instrument/SN: <u>w/it</u>	Calibration Due: <u>w/it</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u>
			<input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters



Notes: PERFORMED 2 MINUTE STATIC COUNTS. TOOK SMears FOR CROSS  
 A + B AND LSC AT SAME LOCATION AS STATIC COUNTS

Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

Room 406

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+4.5, 0+1.5	2/142
2 A+1.5, 0+4.5	3/112
3 A+4.5, 1+2.5	3/145
4 A+1.5, 2+2.5	2/118
5 B+3.5, 2+0.5, 2.5	2/126
6 C+1.5, 1+5.5	3/138
7 D+0.0, 1+5.5	3/122
8 C+4.0, 1+0.0	2/117
9 D+0.0, 1+2.0	2/124
10 C+2.5, 1+3.5	3/119
11 C+1.5, 0+1.5	2/141
12 B+1.5, 0+1.5, 3.0	2/138
13 B+4.0, 0+4.5	2/117
14 C+0.5, 1+0.0, 3.0	3/144
15 B+0.5, 1+1.5, 3.0	3/146
16 A+1.0, 0+0.0, 4.0	3/130
17 B+0.5, 0+0.0, 3.0	2/126
18 C+4.5, 0+0.0, 5.0	2/141
19 D+2.0, 0+2.5, 4.0	2/136
20 D+2.0, 1+5.0, 3.0	2/119
21 C+4.5, 2+3.0, 6.0	2/124
22 B+0.5, 2+3.0, 4.0	2/132
23 A+0.0, 1+5.5, 3.0	2/128
24 A+0.0, 0+4.5, 6.0	2/134
25 C+5.5, 1+0.5, 3.0	2/121
26 D+2.0, 1+0.0, 5.0	Smear only

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3059

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.




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4049

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RSP-019 (Rev. 003) - Attachment 4

**CERTIFICATE OF ANALYSIS - SMEARS**

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43161	10	4316	0.34	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	2	2	0.4	1.2	0.7	1.3	a
2	0	2	-0.6	-1.8	0.0	1.3	a
3	0	2	-0.6	-1.8	0.0	1.3	a
4	1	2	-0.1	-0.3	0.5	1.3	a
5	1	2	-0.1	-0.3	0.5	1.3	a
6	2	2	0.4	1.2	0.7	1.3	a
7	0	2	-0.6	-1.8	0.0	1.3	a
8	0	2	-0.6	-1.8	0.0	1.3	a
9	1	2	-0.1	-0.3	0.5	1.3	a
10	0	2	-0.6	-1.8	0.0	1.3	a
11	3	2	0.9	2.6	0.9	1.3	a
12	1	2	-0.1	-0.3	0.5	1.3	a
13	1	2	-0.1	-0.3	0.5	1.3	a
14	0	2	-0.6	-1.8	0.0	1.3	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 408.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43161	10	4316	0.34	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	1	2	-0.1	-0.3	0.5	1.3	a
16	2	2	0.4	1.2	0.7	1.3	a
17	1	2	-0.1	-0.3	0.5	1.3	a
18	1	2	-0.1	-0.3	0.5	1.3	a
19	0	2	-0.6	-1.8	0.0	1.3	a
20	0	2	-0.6	-1.8	0.0	1.3	a
21	2	2	0.4	1.2	0.7	1.3	a
22	1	2	-0.1	-0.3	0.5	1.3	a
23	1	2	-0.1	-0.3	0.5	1.3	a
24	0	2	-0.6	-1.8	0.0	1.3	a
25	1	2	-0.1	-0.3	0.5	1.3	a
26	1	2	-0.1	-0.3	0.5	1.3	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 406.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT		Analysis performed by (signature): <i>JWS</i>			License No.: MDE License No: MD-31-281-01		

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CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007			Report Date:		
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238			Calibration Due: April 2, 2008		
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52406	10	5187	0.26	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3197		60		53			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	112	2	2.7	10.5	5.3	6.6	a
2	116	2	4.7	18.2	5.4	6.6	a
3	110	2	1.7	6.8	5.2	6.6	a
4	98	2	-4.3	-16.5	5.0	6.6	a
5	113	2	3.2	12.4	5.3	6.6	a
6	104	2	-1.3	-4.9	5.1	6.6	a
7	97	2	-4.8	-18.4	4.9	6.6	a
8	100	2	-3.3	-12.7	5.0	6.6	a
9	108	2	0.7	2.8	5.2	6.6	a
10	114	2	3.7	14.3	5.3	6.6	a
11	108	2	0.7	2.8	5.2	6.6	a
12	111	2	2.2	8.5	5.3	6.6	a
13	117	2	5.2	20.1	5.4	6.6	a
14	109	2	1.2	4.7	5.2	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 406.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007			Report Date:		
DATA ACQUISITION							
Instrument Manufacturer: Ludlum		Instrument Model: 2929 Scaler w/43-10-1 Probe		Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008	
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):		Instrument Efficiency					
Analysis Type: <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):		Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)
		2399-98	20000	52406	10	5187	0.26
		Instrument Background					
		Gross Counts		Count Time (min)		Background Count Rate (cpm)	
		3197		60		53	
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	118	2	5.7	22.0	5.4	6.6	a
16	103	2	-1.8	-6.9	5.1	6.6	a
17	109	2	1.2	4.7	5.2	6.6	a
18	116	2	4.7	18.2	5.4	6.6	a
19	106	2	-0.3	-1.1	5.1	6.6	a
20	97	2	-4.8	-18.4	4.9	6.6	a
21	113	2	3.2	12.4	5.3	6.6	a
22	109	2	1.2	4.7	5.2	6.6	a
23	111	2	2.2	8.5	5.3	6.6	a
24	104	2	-1.3	-4.9	5.1	6.6	a
25	101	2	-2.8	-10.7	5.0	6.6	a
26	113	2	3.2	12.4	5.3	6.6	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 406.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

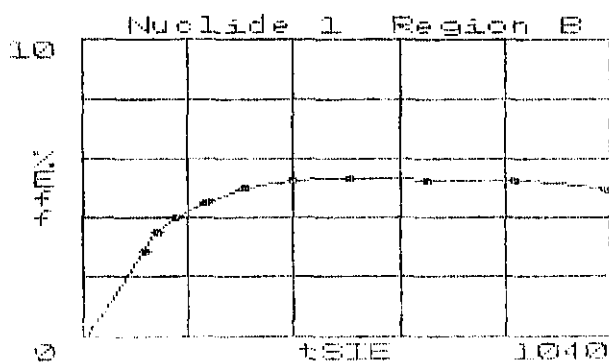
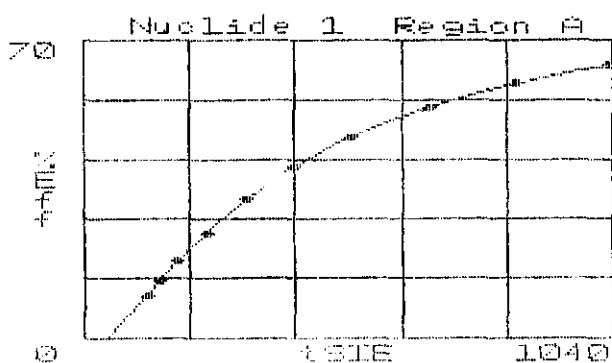
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.16
Region B:	12.0 - 156		0	0.0	13.94
Region C:	0.0 - 0.0		0	0.0	0.00

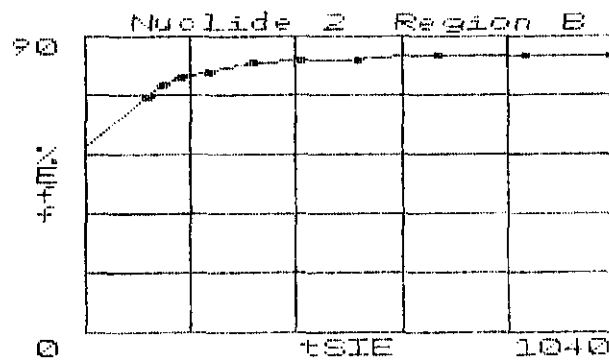
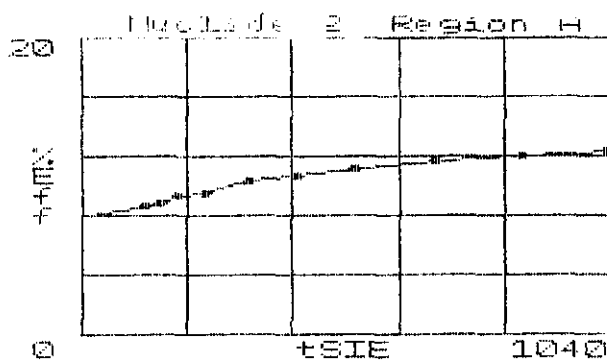
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count

A 406



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.16	13.94			70.768	706.62	B
2	10.00	0.00	0.48	0.00	0.58	0.000	690.19	
3	10.00	0.17	0.00	0.31	0.00	0.000	697.91	
4	10.00	0.00	1.16	0.00	1.39	727.07	691.80	
5	10.00	0.48	0.22	0.83	0.21	0.000	688.88	
6	10.00	0.94	0.00	1.73	0.00	0.000	697.61	
7	10.00	0.00	0.00	0.00	0.00	0.000	671.28	
8	10.00	0.00	0.00	0.00	0.00	0.000	714.36	
9	10.00	1.51	0.39	2.70	0.29	33.071	692.28	
10	10.00	5.12	0.00	9.46	0.00	25.648	698.08	
11	10.00	0.00	0.00	0.00	0.00	0.000	679.54	
12	10.00	0.00	0.00	0.00	0.00	0.000	686.53	
13	10.00	0.45	0.00	0.84	0.00	0.000	680.64	
14	10.00	0.02	0.00	0.04	0.00	0.000	685.79	
15	10.00	0.00	0.00	0.00	0.00	0.000	688.33	
16	10.00	0.00	0.00	0.00	0.00	0.000	692.29	
17	10.00	0.48	0.00	0.89	0.00	0.000	688.40	
18	10.00	0.00	0.00	0.00	0.00	0.000	689.28	
19	10.00	0.00	0.00	0.00	0.00	0.000	684.38	
20	10.00	0.05	0.00	0.08	0.00	0.000	691.92	
21	10.00	0.00	0.00	0.00	0.00	0.000	710.46	
22	10.00	0.43	0.00	0.79	0.00	0.000	688.65	
23	10.00	0.00	0.00	0.00	0.00	0.000	698.88	
24	10.00	1.35	0.00	2.52	0.00	0.000	684.79	
25	10.00	0.61	0.00	1.15	0.00	0.000	675.30	
26	10.00	0.00	0.00	0.00	0.00	0.000	689.66	
27	10.00	0.23	0.00	0.43	0.00	0.000	676.80	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-3

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/27/07</u>	Time: <u>1035</u>
Instrument/SN: <u>43-68 / PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 406</u>		
Instrument/SN: <u>w/v</u>	Calibration Due: <u>w/v</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> AHV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input checked="" type="checkbox"/> feet <input type="checkbox"/> inches <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
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19																										
20																										

*Handwritten notes on grid: Room 305, Door, Room 406, Counter Top, Corridor H, Room 406.*

Notes: PERFORMED SCAN OF ~50% OF HORIZONTAL SURFACES. HIGHEST SCAN RESULTS IN 0/180 CPM/100CM<sup>2</sup>. AREA UNDER HOOD IS OPEN, FLOOR WAS SCANNED. WHERE GRID CROSSES COUNTER TOP, THE COUNTER TOP WAS SURVEYED.

- ① 0/180
- ② 0/60
- ③ 0/60
- ④ 0/60
- ⑤ 0/180

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-4

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>		Calibration Due: <u>10/13/07</u>		Site Name: <u>CLLRL</u>		Date: <u>9/24/07</u>	Time: <u>1100</u>
Instrument/SN: <u>43-68 / PR 150483</u>		Calibration Due: <u>10/13/07</u>		Location: <u>ROOM 406</u>			
Instrument/SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>F55</u>			
Survey Performed By (Print): <u>JERRY W. SUMMERS</u>				Survey Performed By (Signature): <u>[Signature]</u>			
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>2 x 2</u>	
				<input type="checkbox"/> meters		<input type="checkbox"/> inches	
				<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
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18																										
19																										
20																										

Notes: SCANNED ~ 50% OF WALLS. HIGHEST READING IN 0/3 CPM/100CM<sup>2</sup>

① 0/80	④ 0/80
② 0/60	⑤ 0/80
③ 0/60	⑥ 0/60
⑦ 0/80	⑩ 0/60
⑧ 0/80	
⑨ 0/60	
⑪ 0/60	



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-10

Page 1 of 5

Instrument: SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/24/07</u>	Time: <u>1400</u>																											
Instrument: SN: <u>43-68/PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 408</u>																													
Instrument: SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>																													
Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>																													
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																													
<table border="1" style="width:100%; border-collapse: collapse; font-size: 8px;"> <tr> <td></td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>I</td><td>J</td><td>K</td><td>L</td><td>M</td><td>N</td><td>O</td><td>P</td><td>Q</td><td>R</td><td>S</td><td>T</td><td>U</td><td>V</td><td>W</td><td>X</td><td>Y</td><td>Z</td> </tr> </table>						A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z					
Notes																															

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 408**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+4.5, 1+3.5	0/202
2 A+5.5, 0+3.5	1/211
3 B+3.5, 1+3.5, 3.0	1/206
4 C+3.0, 1+0.5	0/198
5 C+4.5, 0+1.5	2/211
6 C+2.5, 1+5.0, 2.0	0/204
7 A+0.0, 0+2.5, 4.0	1/202
8 C+2.5, 0+0.0, 6.0	1/210
9 D+1.0, 0+4.5, 4.0	1/213
10 C+0.0, 0+1.0, 3.0	2/216
11 C+1.5, 0+5.5	1/203
12 C+4.5, 1+1.5, 3.0	0/202
13 D+1.0, 1+1.0, 6.0	Smear only

062107-10  
30FS

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

062107-10  
4055

21 Jun 2007 16:32

TRI-CARB - 1.09

Page #1

Protocol #:18

SURVEY

User : KIM

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

High Energy: 14C

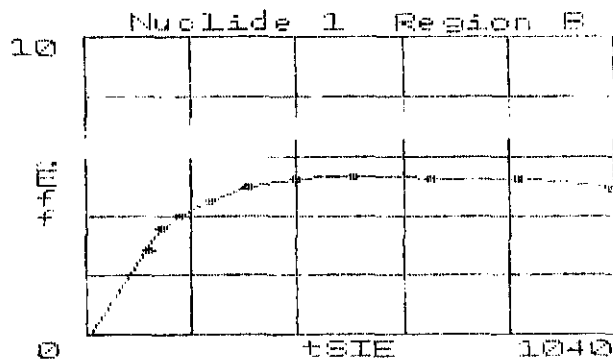
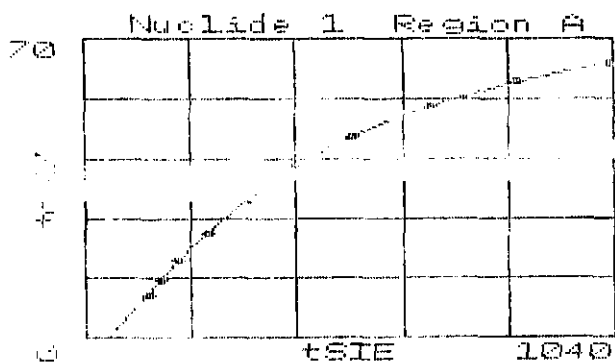
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	9.72
Region B:	12.0 - 156		0	0.0	13.08
Region C:	0.0 - 0.0		0	0.0	0.00

Room 408

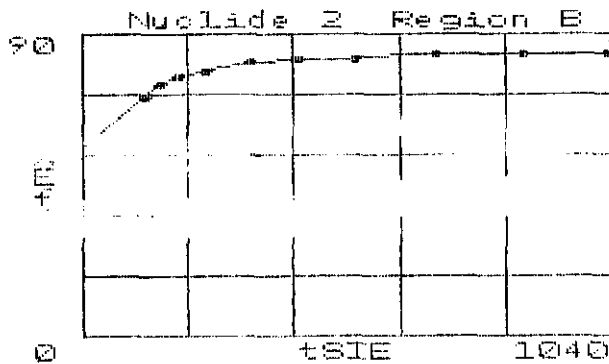
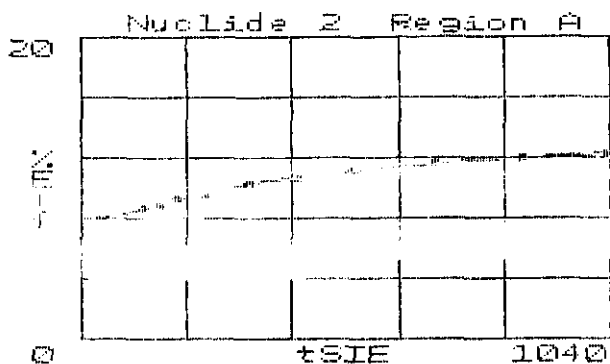
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.67
426.87	82.43	329.70	81.55

21 Jun 2007 16:32  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

062107-10  
SUC <

Page #2  
User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.60	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	9.72	13.02			80.063	758.37	B
2	10.00	1.57	0.00	2.81	0.00	0.000	746.11	
3	10.00	0.43	0.00	0.77	0.00	0.000	752.47	
4	10.00	1.62	0.00	2.91	0.00	0.000	746.26	
5	10.00	2.68	0.00	4.83	0.00	0.000	734.21	
6	10.00	1.37	0.00	2.47	0.00	0.000	734.41	
7	10.00	0.00	0.57	0.00	0.68	34.828	742.18	
8	10.00	2.89	0.00	5.23	0.00	0.000	729.16	
9	10.00	2.39	0.00	4.33	0.00	0.000	731.88	
10	10.00	0.36	1.04	0.40	1.21	0.000	707.64	
11	10.00	0.69	0.00	1.26	0.00	0.000	710.89	
12	10.00	1.31	0.00	2.37	0.00	0.000	733.10	
13	10.00	1.82	0.36	3.24	0.23	0.000	705.88	
14	10.00	0.91	2.76	1.02	3.22	51.656	649.70	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

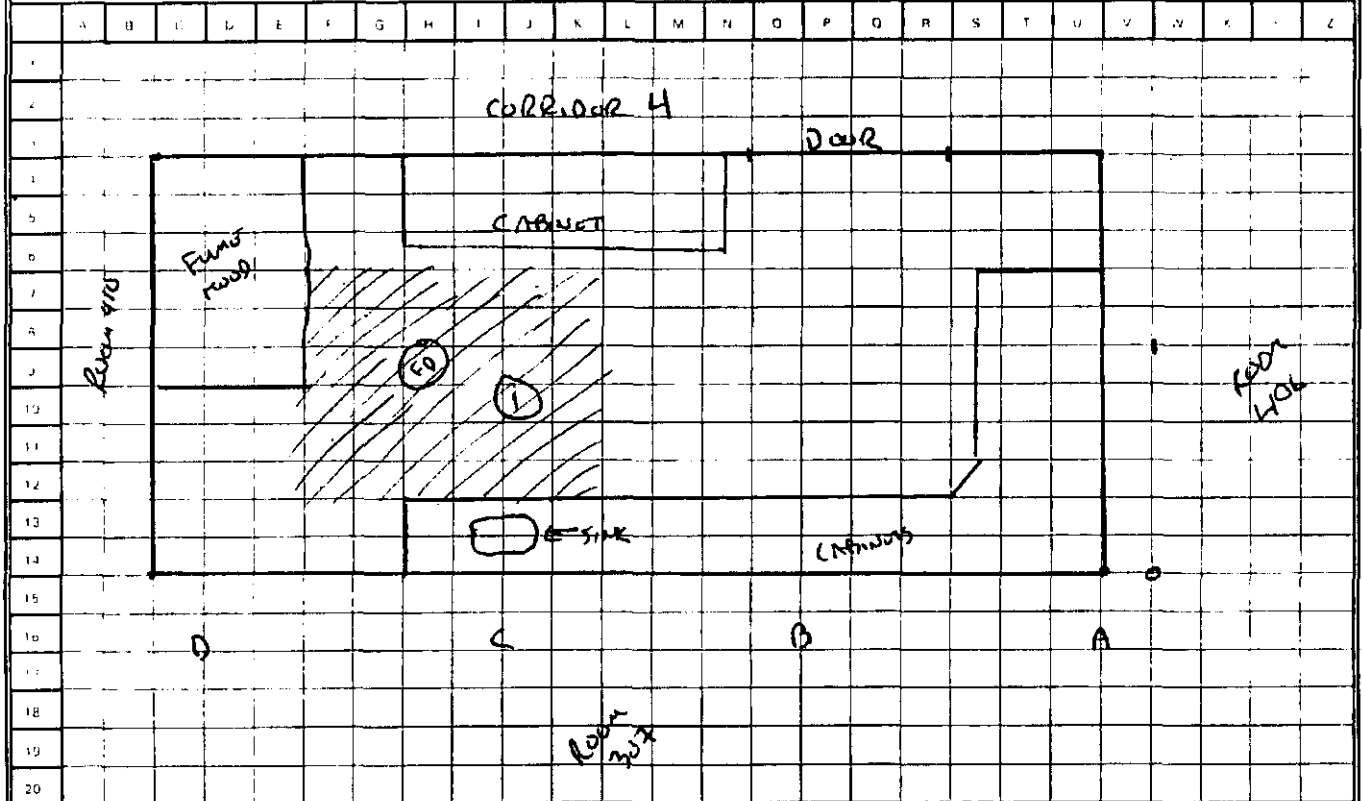
Survey Number 062107-8

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/2/07</u>	Time: <u>1300</u>
Instrument SN: <u>43-68 / PR 190583</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 408</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		

Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>	Survey Performed By (Signature): <u>[Signature]</u>
---	---

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK
Grid Dimensions: <u>1 x 1</u>		
<input type="checkbox"/> meters	<input type="checkbox"/> inches	
<input checked="" type="checkbox"/> feet	<input type="checkbox"/> centimeters	



Notes: SCANNED ONE FLOOR GRID. HIGHEST READING IS LPM @ B / 100CM  
① 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-9

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERL</u>	Date: <u>6/21/07</u>	Time: <u>1315</u>
Instrument/SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 408</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Samuel</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: OPPOSITE WALLS ARE OF DIFFERENT LENGTH DUE TO OPEN AREA BETWEEN ROOMS 408, 410, 307, 309

SCANNED 2 WALL CR.O.S. HIGHEST READING IN CPM a/B/100cR2


① 0/60

② 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-11

Page 1 of 1

Instrument/SN: <u>BICRON / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/24/07</u>	Time: <u>1405</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 408</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): 		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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**Notes** BKGD = 15 uRough. WORKED ROOM WITH METER WAIST HIGH. NO READINGS ABOVE BACKGROUND. CONTACT WITH SINK DRAIN = BKGD



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-7

Page 1 of 1

Instrument/SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLERL</u>	Date: <u>6/24/07</u>	Time: <u>1245</u>
Instrument/SN: <u>43-37 / IR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 408</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: SCANNED 100% OF FLOOR. HTS READINGS TAKEN ~ 6 FT. RESULTS IN  
CPM @ 18

- ① 0/360
- ② 0/380
- ③ 0/360
- ④ 0/400
- ⑤ 0/360
- ⑥ 0/360

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

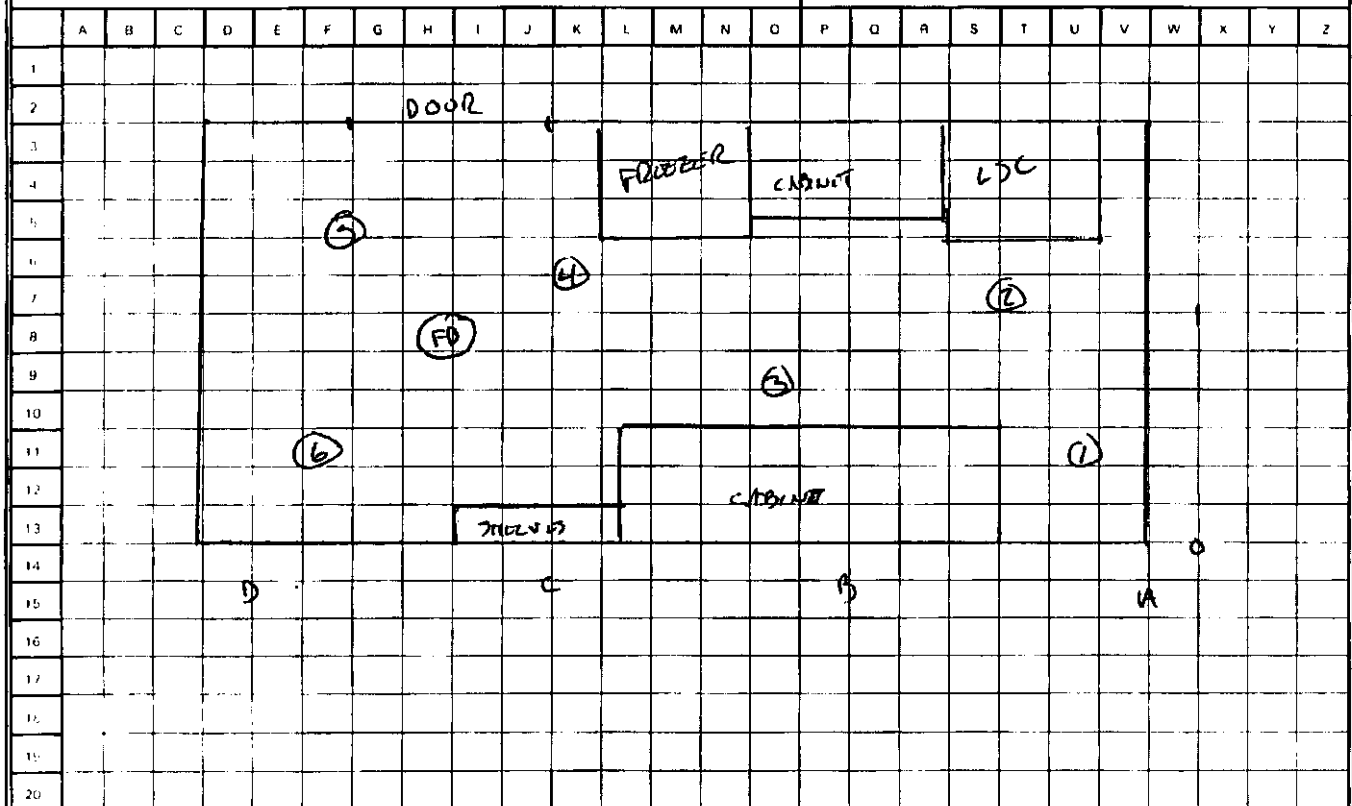
Survey Number 062107-12

Page 1 of 1

Instrument/SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CLORL</u>	Date: <u>6/21/07</u>	Time: <u>1415</u>
Instrument/SN: <u>43-37 / PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 410</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W. SIMON</u>		Survey Performed By (Signature): <u>[Signature]</u>		

Battery OK     
  HV OK     
  Source Check OK

Grid Dimensions: 1 x 1  
 meters       inches  
 feet       centimeters



Notes: SCANNED 100% OF FLOOR. TOOK READINGS ~ 6 FT. RESULTS IN  
CPM @ 1B

- ① 0/400
- ② 0/440
- ③ 0/460
- ④ 0/420
- ⑤ 0/460
- ⑥ 0/440

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-13

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>10/21/07</u>	Time: <u>1430</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 410</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W SULLIVAN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: SCANNED ONE FLOOR GRID, HIGHEST READING IN CPM  $\alpha$ /B/100CM<sup>2</sup>  
INCLUDED SOME COUNTER TOP IN SCAN  
① 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

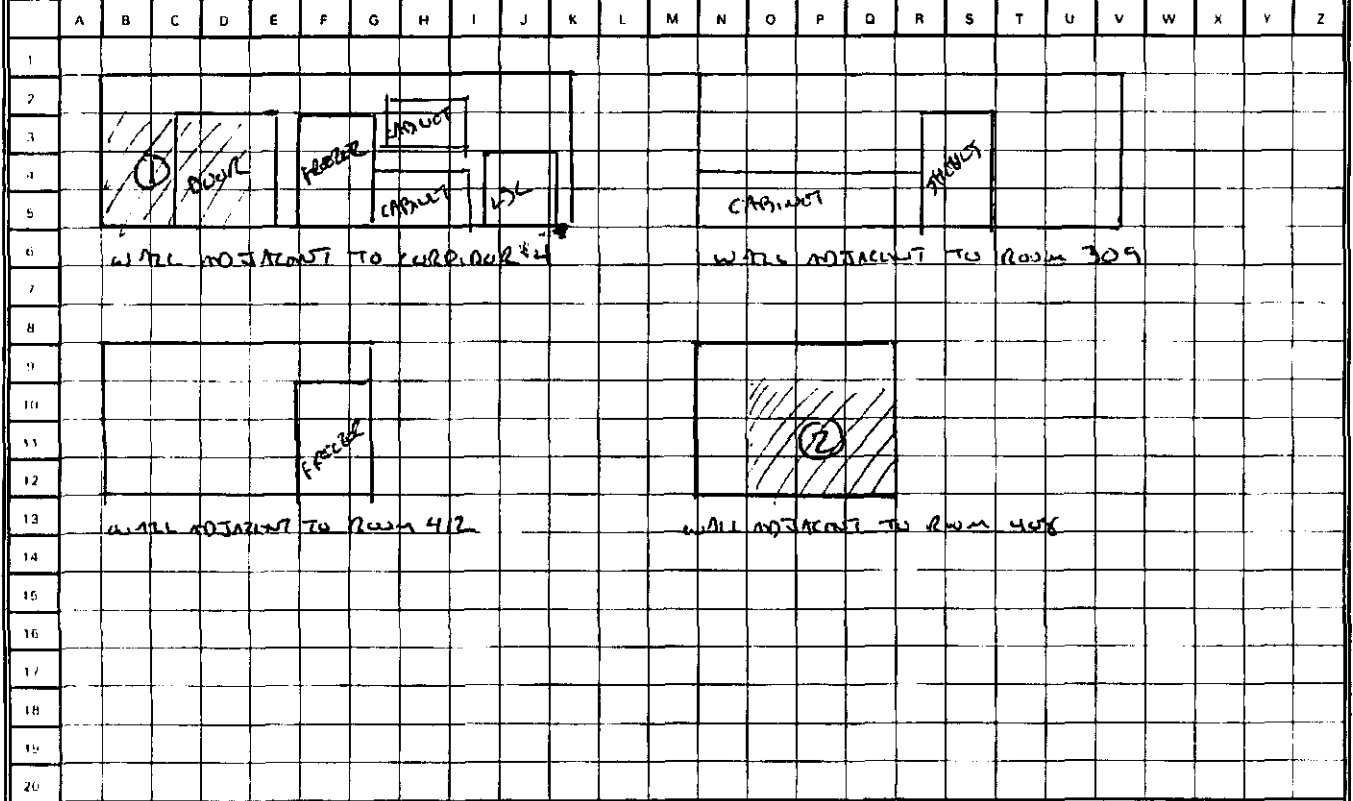
Survey Number 062107-14

Page 1 of 1

Instrument/SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/21/07</u>	Time: <u>1445</u>
Instrument/SN: <u>43-68/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 410</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		

Survey Performed By (Print): JEFFREY W. JAMES      Survey Performed By (Signature): \_\_\_\_\_

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u>
			<input type="checkbox"/> meters
			<input type="checkbox"/> inches
			<input checked="" type="checkbox"/> feet
			<input type="checkbox"/> centimeters



Notes: OPPOSITE WALLS ARE OF DIFFERENT LENGTHS DUE TO OPEN AREA BETWEEN ROOMS 408, 410, 307, 309

SCANNED 2 WALL GRIDS. HIGHEST READINGS IN CPM a/B/100cm<sup>2</sup>

① 0/90

② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-16

Page \_\_\_\_\_ of \_\_\_\_\_

Instrument SN: <u>BICRON / B2962</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CLCRL</u>	Date: <u>6/21/07</u>	Time: <u>1520</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 410</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>JAMES W. SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes: BKGD = 15 uRm/h. WALKED ROOM WITH METER WAIST HIGH.  
NO READINGS ABOVE BACKGROUND

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

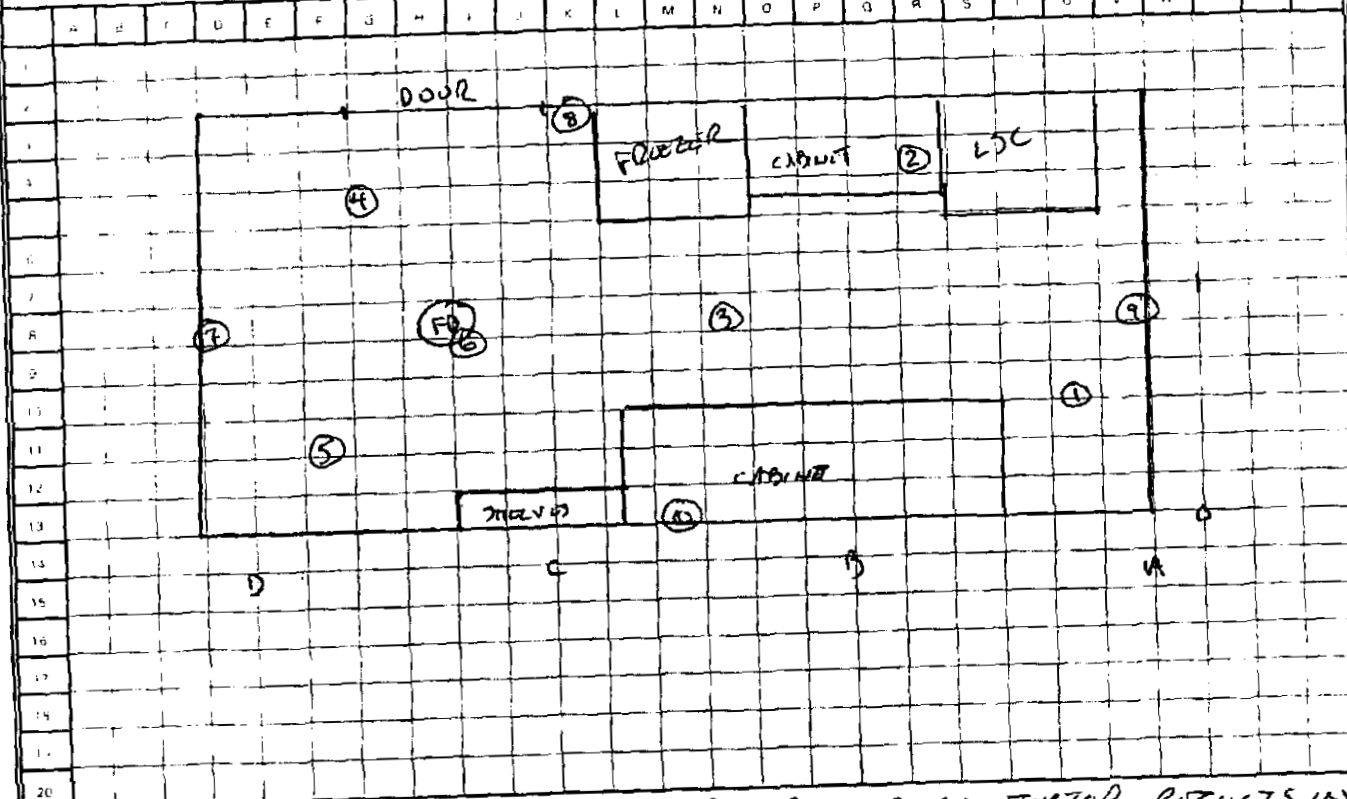
Survey Number 062107-15

Page 1 of 5

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>6/21/07</u>	Time: <u>1515</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>14/13/07</u>	Location: <u>Room 410</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JUSTIN W. SMITH</u>		Survey Performed By (Signature): <u>[Signature]</u>		

Battery OK     
  HV OK     
  Source Check OK

Grid Dimensions: 1x1  
 meters       inches  
 feet       centimeters



Notes: PERFORMED 2 MINUTE COUNT ON FLOOR AND COUNTERTOP RESULTS IN CPM 0.13/100CM<sup>2</sup>. TOOK SAMPLES FOR LSC IN SAME LOCATION

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 410**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+1.5, 0+3.0	1/196
2 A+4.5, 1+3.5, 3.0	0/202
3 B+2.5, 0+5.5	1/198
4 C+4.0, 1+2.5	0/206
5 C+4.5, 0+2.0	0/203
6 C+2.0, 0+5.5	1/205
7 D+1.0, 0+5.0, 6.0	1/200
8 B+5.5, 1+5.0, 4.0	1/197
9 A+0.0, 0+5.5, 2.0	2/204
10 B+3.5, 0+0.0, 4.0	0/205

62107-15  
345

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.



Time: 10.00  
 Data Mode: Dual DPM

Nuclides: 3H-14C

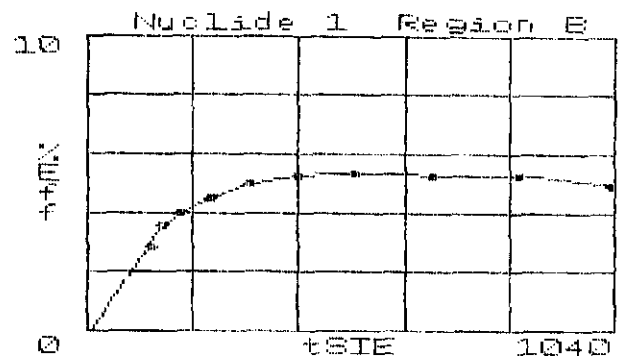
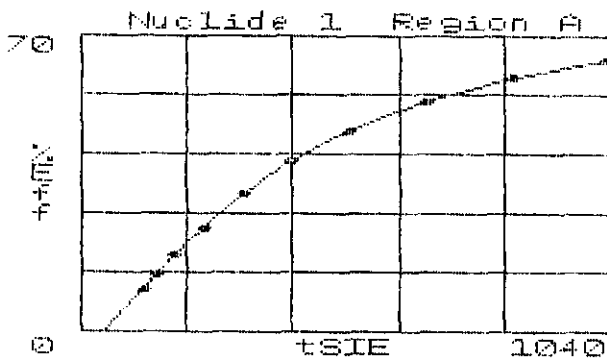
Quench Sets  
 Low Energy: 3H  
 High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.36
Region B:	12.0 - 156		0	0.0	13.04
Region C:	0.0 - 0.0		0	0.0	0.00

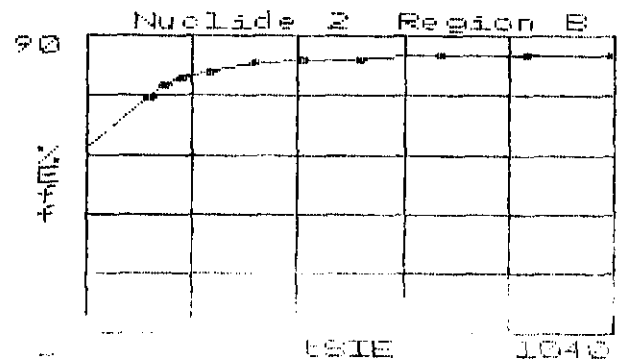
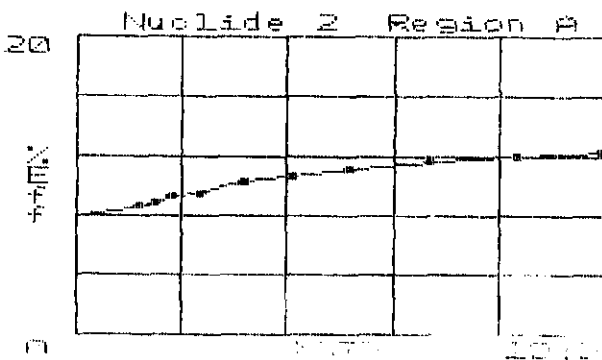
*Room 410*

Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

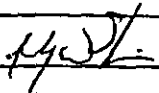
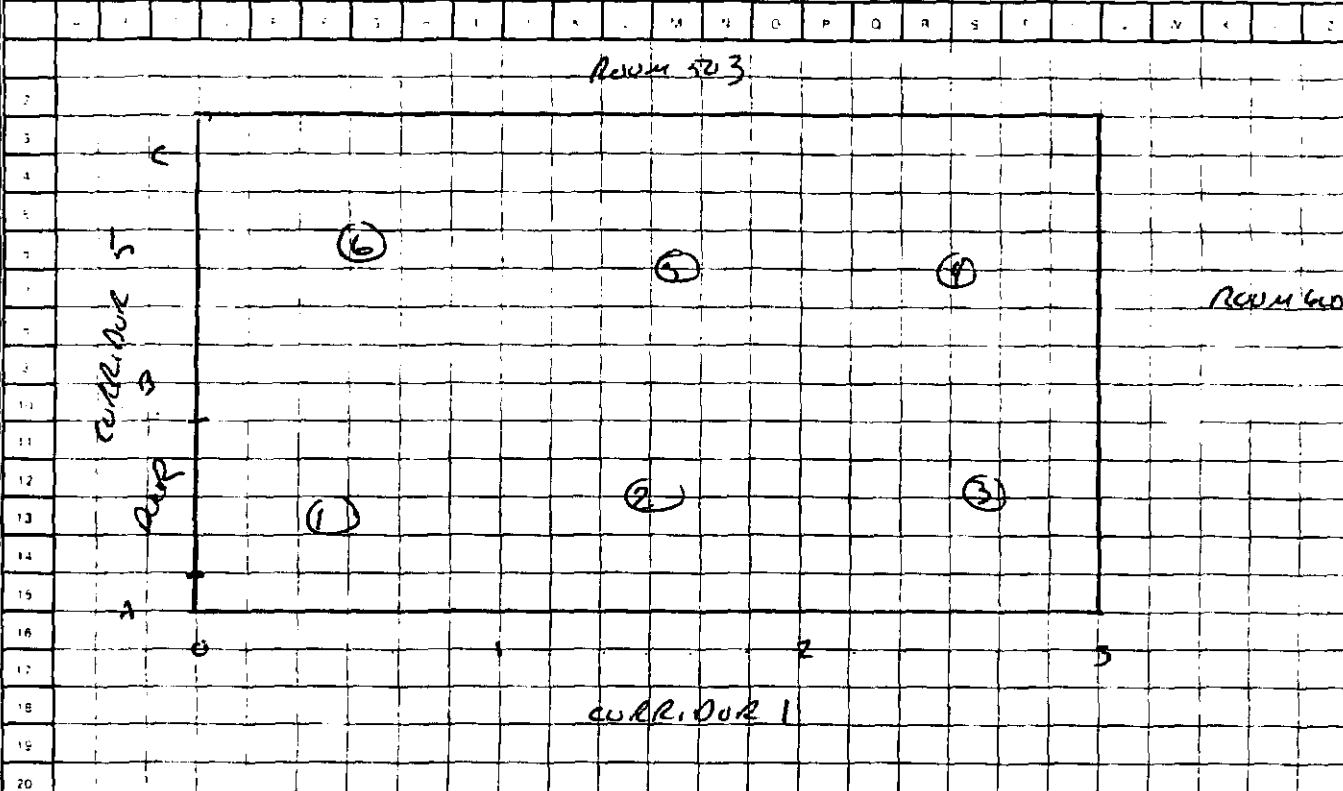
239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.36	13.04			65.802	736.18	B
2	10.00	0.00	0.15	0.00	0.18	0.000	711.70	
3	10.00	1.07	0.00	1.92	0.00	12.038	738.32	
4	10.00	0.00	0.00	0.00	0.00	0.000	725.88	
5	10.00	0.10	1.70	0.00	2.04	204.89	717.06	
6	10.00	0.22	0.00	0.40	0.00	0.000	721.28	
7	10.00	0.71	0.00	1.29	0.00	0.000	719.08	
8	10.00	0.30	0.00	0.54	0.00	0.000	716.80	
9	10.00	0.00	0.00	0.00	0.00	0.000	713.82	
10	10.00	0.90	0.80	1.45	0.85	123.82	715.38	
11	10.00	0.00	0.00	0.00	0.00	0.000	704.86	

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number 062207-11

Page 1 of 1

Instrument SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLEBL</u>	Date: <u>6/22/08</u>	Time: <u>1110</u>								
Instrument SN: <u>43-37/PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 501</u>										
Instrument SN: <u>n/a</u>	Calibration Due: <u>n/a</u>	Purpose: <u>FSS</u>										
Survey Performed By (Print): <u>JURROD W SUMM</u>		Survey Performed By (Signature): 										
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters									
<u>ROOM 503</u>												
												
<p>Notes</p> <p>SCANNED 100% OF FLOOR. REMOVED DETECTOR FROM CURT TO ACCESS UNDER SOME EQUIPMENT. READINGS TAKEN ~ 6 FT. RESULTS IN d/B CPA</p> <table><tr><td>① 0/360</td><td>⑧ 0/350</td></tr><tr><td>② 0/380</td><td>⑨ 0/380</td></tr><tr><td>③ 0/360</td><td></td></tr><tr><td>④ 0/MU</td><td></td></tr></table>					① 0/360	⑧ 0/350	② 0/380	⑨ 0/380	③ 0/360		④ 0/MU	
① 0/360	⑧ 0/350											
② 0/380	⑨ 0/380											
③ 0/360												
④ 0/MU												

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

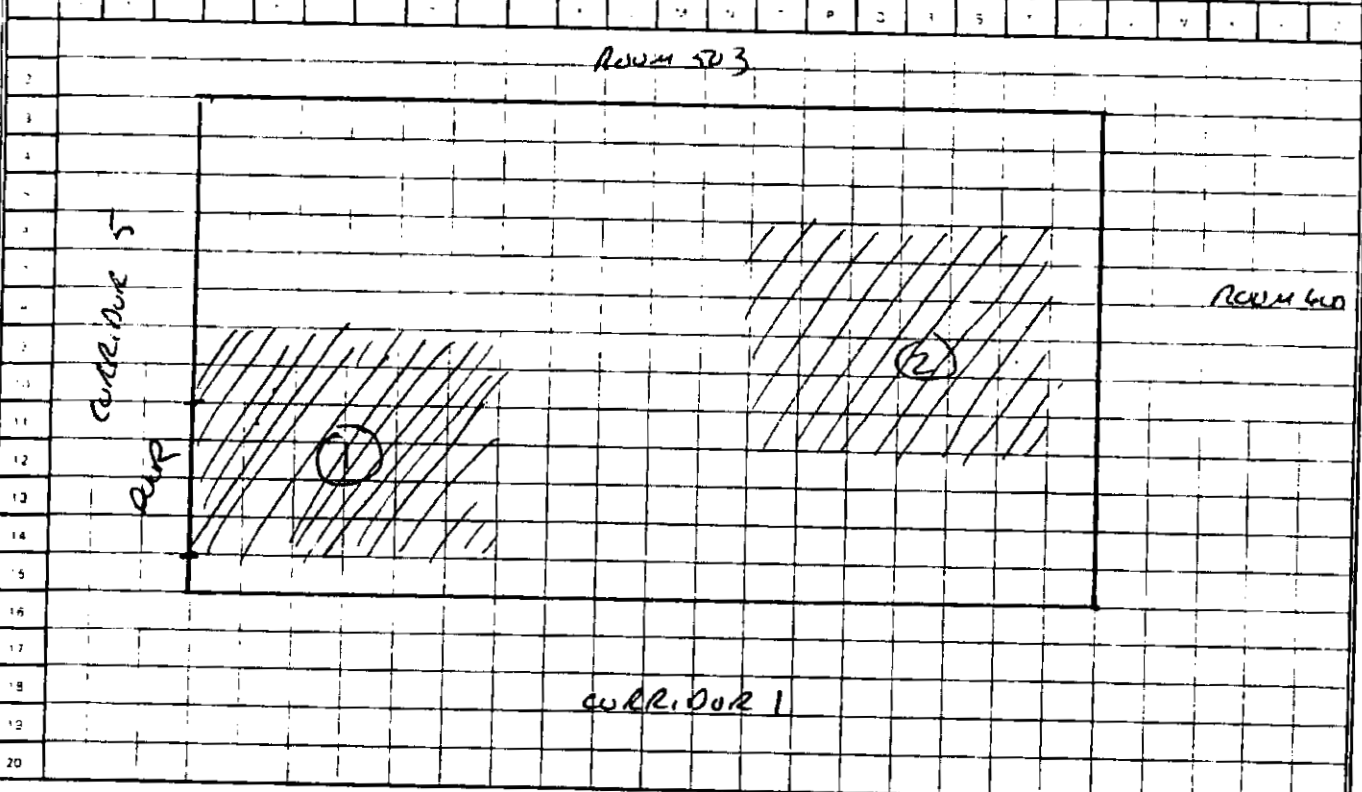
Survey Number 062207-12

Page 1 of 1

Instrument SN: <b>2224/116239</b>	Calibration Due: <b>10/13/07</b>	Site Name: <b>GLLRL</b>	Date: <b>6/22/07</b>	Time: <b>1120</b>
Instrument SN: <b>43-68/PR190483</b>	Calibration Due: <b>10/13/07</b>	Location: <b>ROOM 501</b>		
Instrument SN: <b>N/A</b>	Calibration Due: <b>N/A</b>	Purpose: <b>FSS</b>		

Survey Performed By (Print): JERRON W SIMON      Survey Performed By (Signature): [Signature]

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u>
			<input type="checkbox"/> meters
			<input type="checkbox"/> inches
			<input checked="" type="checkbox"/> feet
			<input type="checkbox"/> centimeters



Notes  
 SCANNED 2 FLOOR GRIDS HIGHEST READINGS IN 0.13 cpm/100cph  
 (1) 0/30  
 (2) 0/30

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062207-13

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>12/13/07</u>	Site Name: <u>GLUELL</u>	Date: <u>6/24/07</u>	Time: <u>1135</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>12/13/07</u>	Location: <u>ROOM 501</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Seward</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2																				
3																				
4																				
5																				
6	WALL ADJACENT TO ROOM 503					WALL ADJACENT TO CORR. PUL 1														
10																				
11																				
12																				
13																				
14	WALL ADJACENT TO CORRIDOR 5					WALL ADJACENT TO ROOM 600														
15																				
16																				
17																				
18																				
19																				
20																				

Notes: SCANNED 2 WALL GRIDS. HIGHEST READINGS IN #13 CPM/100CMR

① 0/60

② 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-15

Page 1 of 1

Instrument SN: <u>BIGON (B2964)</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLLRL</u>	Date: <u>6/22/07</u>	Time: <u>1200</u>
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 501</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jesse W. Jones</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	
<u>Room 503</u>				
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19	<u>CORRIDOR 1</u>			
20				
<p>Notes: <u>BKGD = 15 mRom/h. WALKED ROOM WITH METER WAIST HIGH. NO READINGS ABOVE BKGD</u></p>				

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062207-14

Page 1 of 5

Instrument SN: <u>2224 / 14239</u>		Calibration Due: <u>10/13/07</u>		Site Name: <u>GLE RL</u>		Date: <u>06/22/07</u>		Time: <u>1155</u>	
Instrument SN: <u>43-68 / P2 K0183</u>		Calibration Due: <u>10/13/07</u>		Location: <u>ROOM 501</u>					
Instrument SN: <u>N/A</u>		Calibration Due: <u>N/A</u>		Purpose: <u>FSS</u>					
Survey Performed By (Print): <u>JERRY W SWEIN</u>				Survey Performed By (Signature): <u>[Signature]</u>					
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters			

					ROOM 503															
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CORRIDOR 5

7

3

4

8

6

2

1

3

9

CORRIDOR 1

Notes: TOOK 2 MINUTE STATIC COUNT. PAUSE LSC SURVEYS IN SAME LOCATION

062207-14  
2055

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

### Room 501

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.5, 0+1.5	1/206
2 A+4.5, 1+4.0	1/209
3 A+2.5, 2+4	2/206
4 B+4.0, 2+2.0	1/195
5 B+3.5, 0+4.0	1/212
6 B+1.0, 0+5.0, 6.0	0/203
7 C+1.0, 1+3.0, 4.0	1/209
8 B+2.5, 3+0.0, 4.0	0/206
9 A+0.0, 1+3.5, 2.0	1/212



062207-14  
3085

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

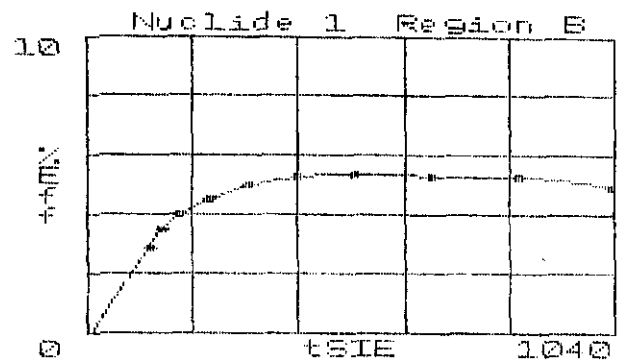
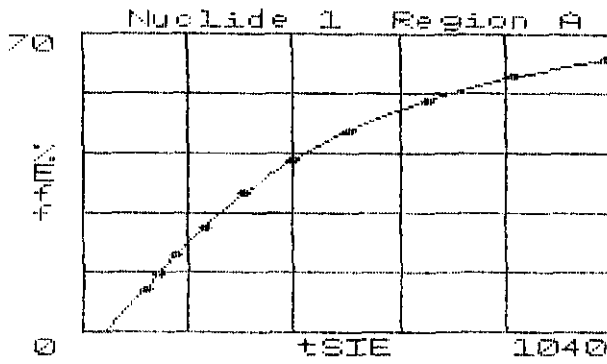
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.93
Region B:	12.0 - 156		0	0.0	13.37
Region C:	0.0 - 0.0		0	0.0	0.00

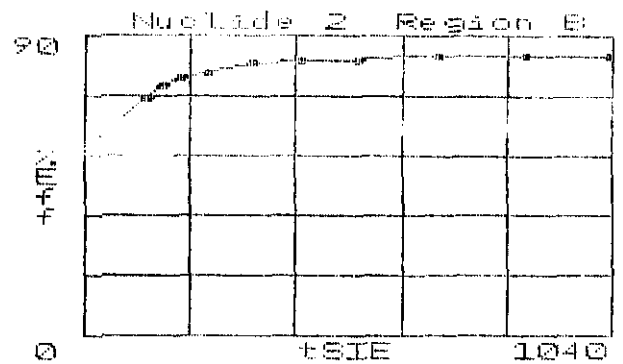
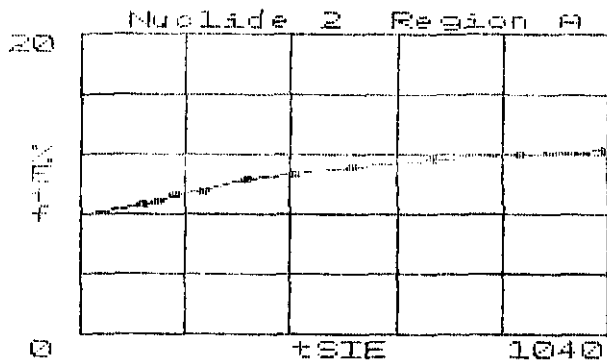
Room 501

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

25 Jun 2007 11:50 TRI-CARB - 1.09  
Protocol #:18 SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.93	13.37			74.269	739.06	B
2	10.00	1.35	0.00	2.48	0.00	0.000	699.44	
3	10.00	0.00	0.00	0.00	0.00	0.000	718.99	
4	10.00	0.00	0.00	0.00	0.00	0.000	714.75	
5	10.00	2.25	0.85	3.89	0.77	0.000	712.93	
6	10.00	0.00	0.00	0.00	0.00	0.000	704.87	
7	10.00	0.00	0.09	0.00	0.11	0.000	719.52	
8	10.00	2.29	0.61	4.05	0.47	0.000	702.25	
9	10.00	1.06	0.00	1.94	0.00	0.000	714.41	
10	10.00	1.41	0.10	2.55	0.00	87.014	717.81	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-24

Page 1 of 5

Instrument SN: <u>2224/16239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CALLER</u>	Date: <u>10/30/07</u>	Time: <u>1450</u>
Instrument SN: <u>43-681 PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 505</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Smith</u>		Survey Performed By (Signature):		
<input checked="" type="checkbox"/> Batteries OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>18/</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters

Room 507

ROOMS 503, 505A

NOTES: PERFORMED 2 MINUTE STATIC COUNTS, RESULTS IN CPM & B/100CM<sup>2</sup>.  
 TOOK SAMPLES FOR LSC IN SAME LOCATIONS

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 505**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 B+3.5, 0+2.5	1/194
2 A+4.5, 1+1.5	0/197
3 B+1.5, 1+4.5	0/201
4 A+4.5, 2+3.5	1/193
5 B+2.5, 3+0.5	0/196
6 B+0.5, 2+5.5	1/204
7 B+5.0, 2+1.0, 2.0	1/202
8 B+5.0, 2+2.0, 2.0	1/197
9 B+4.5, 1+2.5, 2.5	0/206
10 A+1.0, 0+3.5, 2.5	0/202
11 B+3.5, 2+5.0, 2.5	0/199
12 C+0.0, 2+5.0, 6.0	Smear only
13 A+2.5, 3+1.0, 3.0	1/203
14 A+0.0, 1+2.5, 4.0	1/198
15 A+4.5, 0+0.0, 4.0	0/201
16 C+0.0, 1+1.5, 4.0	1/201

062507-24  
3055

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00  
 Data Mode: Dual DPM

Nuclides: 3H-14C

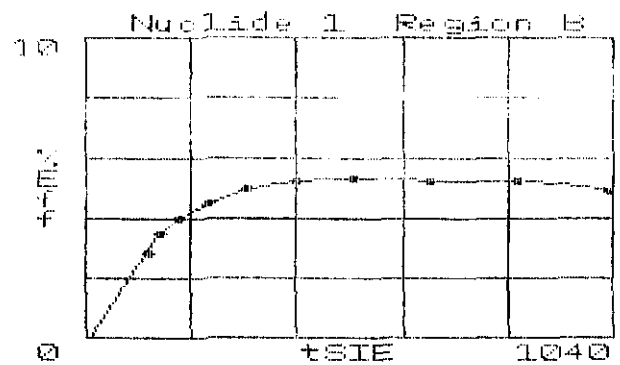
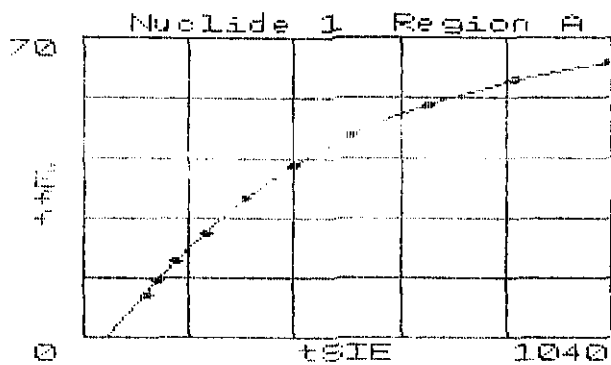
Quench Sets  
 Low Energy: 3H  
 High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.11
Region B:	12.0 - 156		0	0.0	13.29
Region C:	0.0 - 0.0		0	0.0	0.00

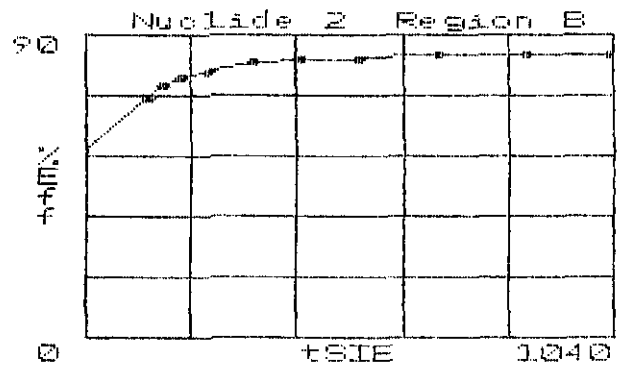
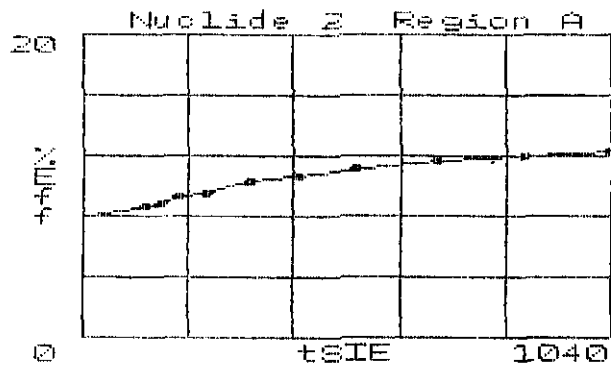
*Room 505*

Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

239.94 9.55 188.56 9.32 239.94 79.05 188.56 77.31  
152.93 8.76 122.58 8.60 152.93 75.21 122.58 71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.11	13.29			74.125	734.13	B
2	10.00	0.00	0.00	0.00	0.00	0.000	726.04	
3	10.00	1.76	0.00	3.17	0.00	0.000	739.55	
4	10.00	0.00	0.00	0.00	0.00	0.000	745.38	
5	10.00	1.30	0.00	2.36	0.00	0.000	725.17	
6	10.00	1.51	0.00	2.75	0.00	0.000	726.85	
7	10.00	0.75	0.00	1.36	0.00	49.354	734.59	
8	10.00	1.85	0.00	3.33	0.00	0.000	744.21	
9	10.00	0.61	0.00	1.11	0.00	0.000	734.16	
10	10.00	0.68	0.00	1.23	0.00	0.000	722.77	
11	10.00	1.09	0.00	1.95	0.00	0.000	745.66	
12	10.00	1.23	0.00	2.21	0.00	0.000	741.89	
13	10.00	1.88	0.40	3.32	0.27	112.18	723.66	
14	10.00	0.00	0.00	0.00	0.00	0.000	729.66	
15	10.00	3.08	0.00	5.57	0.00	65.943	734.90	
16	10.00	1.77	0.00	3.17	0.00	0.000	742.11	
17	10.00	1.46	0.04	2.60	0.00	144.45	745.11	

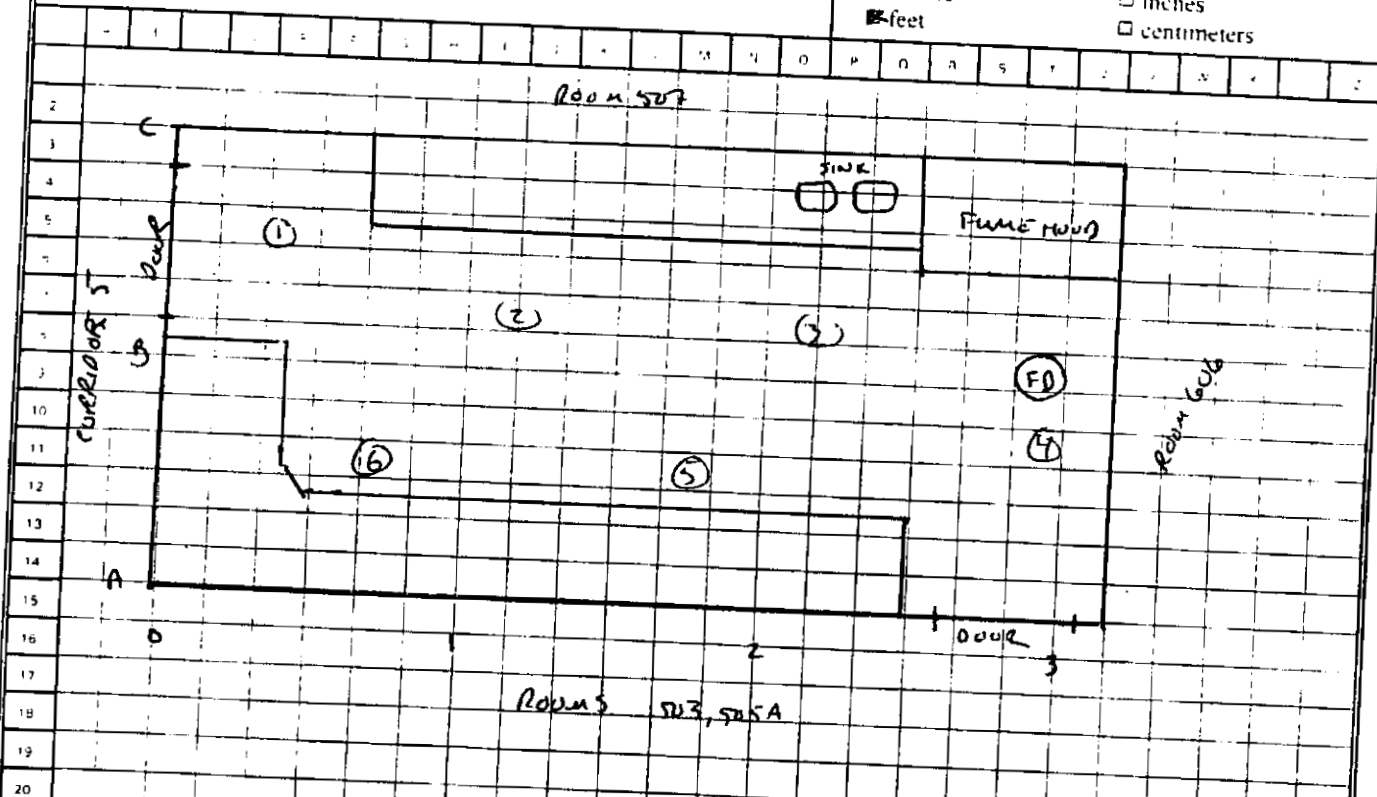


INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number 062507-21

Page 1 of 1

Instrument SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLEZL</u>	Date: <u>6/5/07</u>	Time: <u>1355</u>
Instrument SN: <u>43-371 PR 117476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 505</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. J...</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED 100% OF FLOOR ROOM 505 AT 6 FT. INCR. IN CPM/DIB

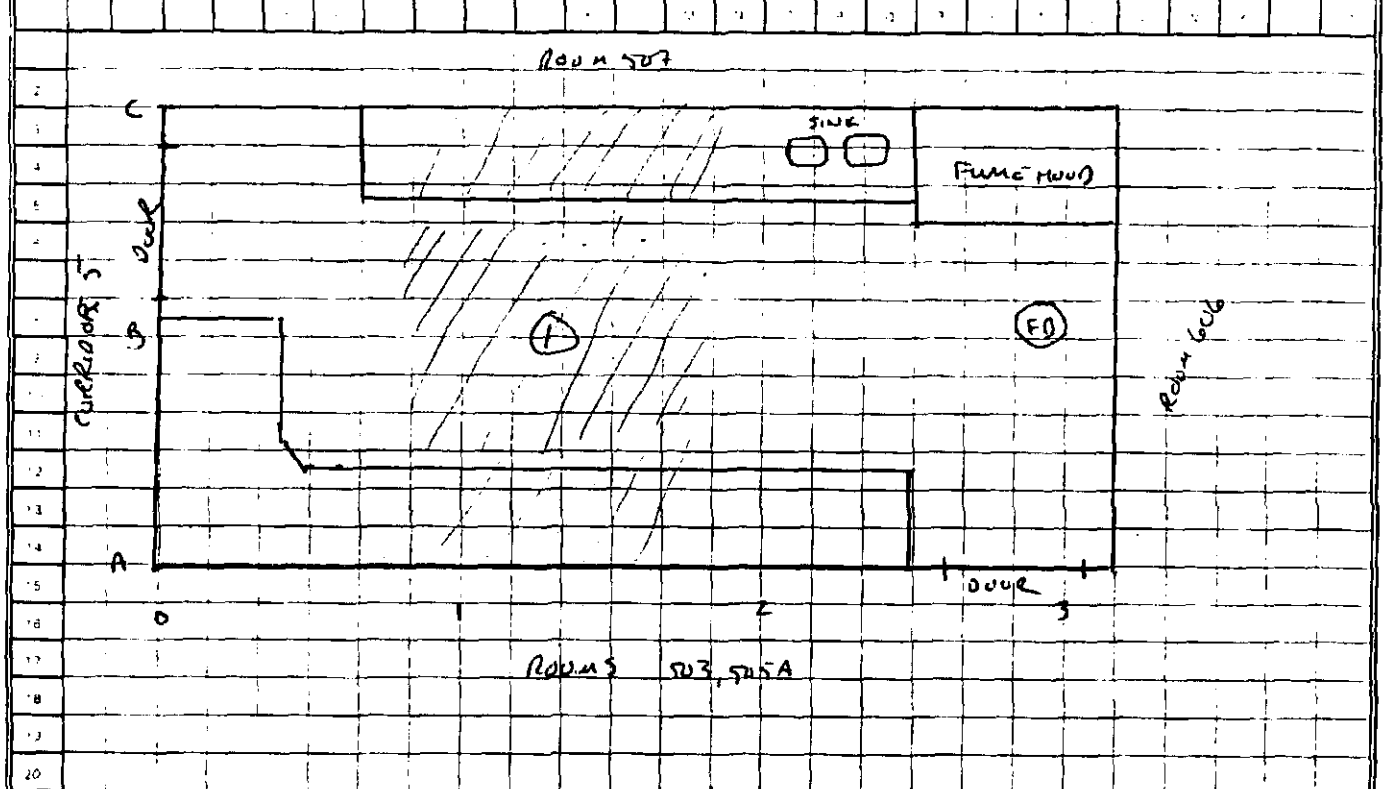
- ① 0/400
- ② 0/400
- ③ 0/400
- ④ 0/350
- ⑤ 0/350
- ⑥ 0/400

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Form Number 062507-22

Page 1 of 1

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CILCORL</u>	Date: <u>9/25/07</u>	Time: <u>1405</u>
Instrument SN: <u>43-551 PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 505</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W JAMES</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Batteries OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED ONE FLOOR GRID AND SOME COUNTERTOP. HIGHEST READING IN CPM a/B/100 C/L

① 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062567-23

Page 1 of 1

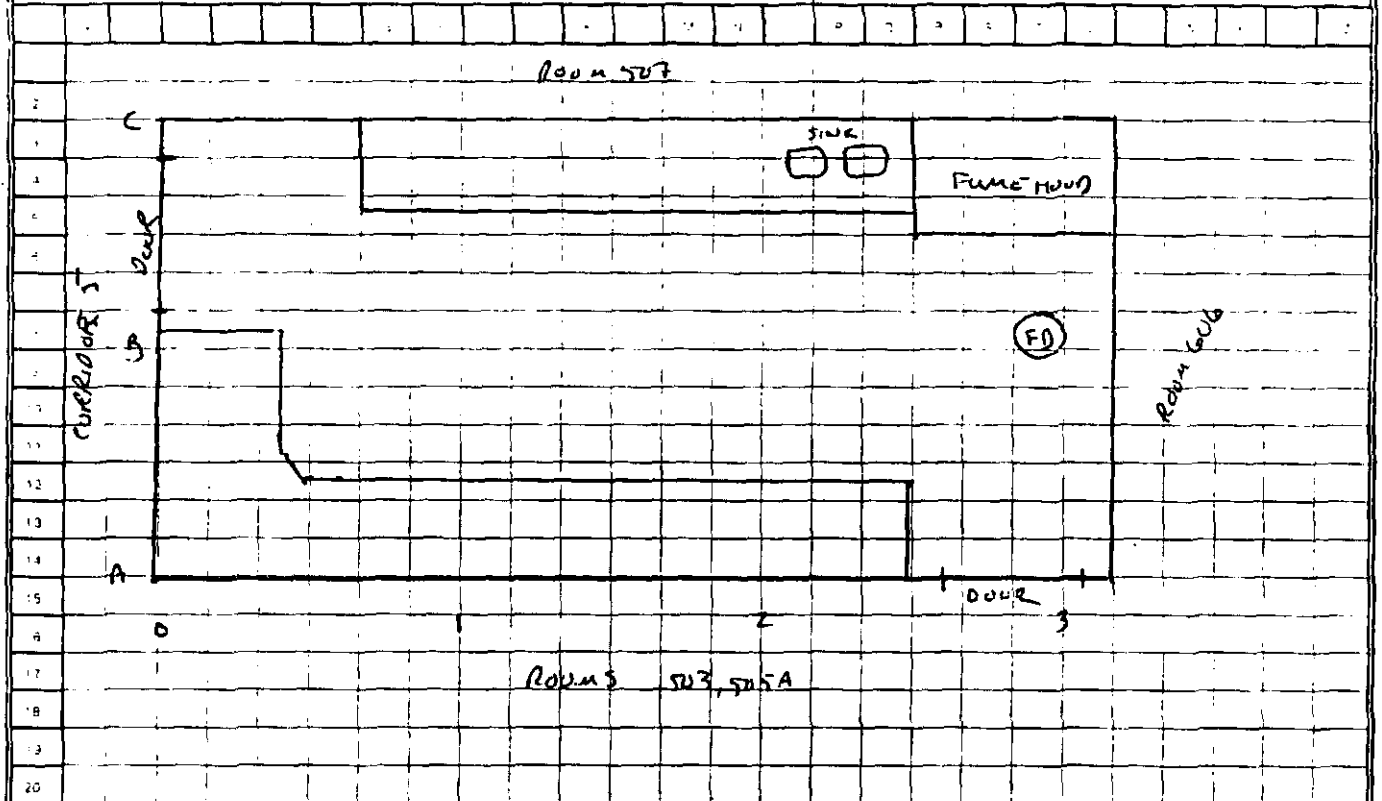
Instrument SN: <b>2224 / 116239</b>	Calibration Due: <b>12/13/07</b>	Site Name: <b>GLDRL</b>	Date: <b>4/2/08</b>	Time: <b>1415</b>																				
Instrument SN: <b>43-68 / PR190183</b>	Calibration Due: <b>12/13/07</b>	Location <b>ROOM 205</b>																						
Instrument SN: <b>N/A</b>	Calibration Due: <b>N/A</b>	Purpose <b>F-55</b>																						
Survey Performed By (Print): <b>JERRY W. SHERMAN</b>		Survey Performed By (Signature): <i>[Signature]</i>																						
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <b>2 x 2</b> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																					
<table border="1" style="width:100%; height: 30px;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
<p>Notes: <b>SCANNED TWO WALL CLIPS. HIGHEST READINGS IN CPM @ 1B / 100CM<sup>2</sup></b></p> <p><b>① 0/80</b></p> <p><b>② 0/80</b></p>																								

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-25

Page 1 of 1

Instrument SN: <u>BICRON / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CALLER</u>	Date: <u>6/25/07</u>	Time: <u>1455</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 505</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose <u>F-55</u>		
Survey Performed By (Print): <u>Jeffrey W. Smith</u>		Survey Performed By (Signature):		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>181</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters



Notes: BKGD = 15  $\mu$ Rm/h. WORKED ROOM WITH METRIC WAIST HIGH. NO READINGS ABOVE BKGD. CONTACT WITH SINK DRAINS = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-26

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CLORE</u>	Date: <u>6/2/07</u>	Time: <u>1500</u>
Instrument SN: <u>43-37 / PR 117476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 505A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Surrain</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u>	
		<input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

Room 505

**Notes** RANDED 100% OF FLOOR. TOOK READINGS ~6 FT. ROBERTS IN CPMA1B

① 0/400

② 0/400

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-27

Page 1 of 1

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CILCOR</u>	Date: <u>6/2/07</u>	Time: <u>1510</u>
Instrument SN: <u>43-68/PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 505A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Suncid</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

Notes: SCANNED 1 FLOOR GRID AND SOME CONTROL AREA. MICROST  
READING IN CPM @ 1B / 100 CM  
(1) 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-28

Page 1 of 1

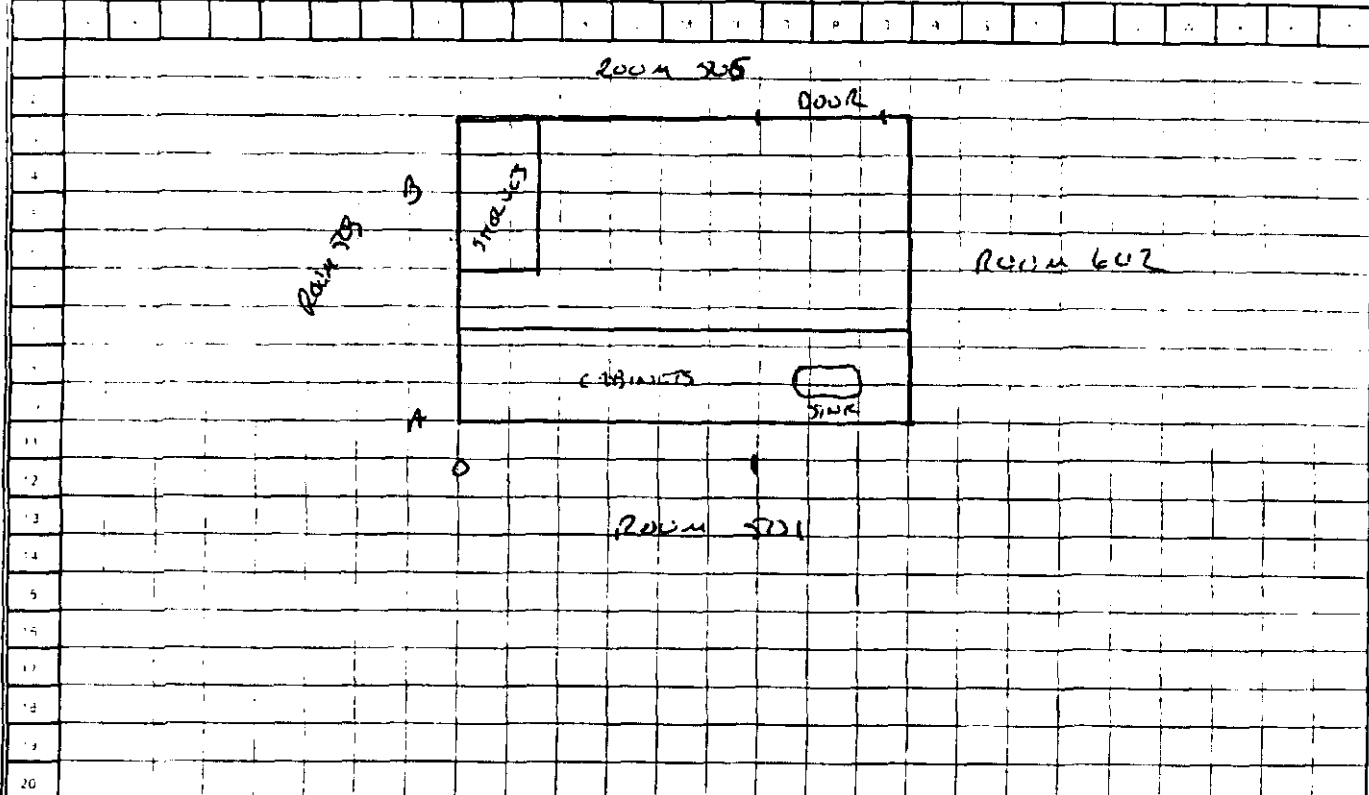
Instrument SN <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CALREL</u>	Date: <u>4/2/07</u>	Time: <u>1520</u>																				
Instrument SN <u>43-08/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 505A</u>																						
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>																						
Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>		Survey Performed By (Signature): <i>[Signature]</i>																						
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																					
<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
<table border="1" style="width: 100%; height: 150px; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> </td> <td style="width: 50%; vertical-align: top;"> </td> </tr> <tr> <td style="vertical-align: top;"> </td> <td style="vertical-align: top;"> </td> </tr> </table>																								
<p>Notes: <u>SCANNED 1 WALL GRID. HIGHEST READING 10 CPM @ 1B/100CM</u></p> <p><u>① 0/90</u></p>																								

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062527-30

Page 1 of 1

Instrument SN <u>BEGON / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CILCOR</u>	Date: <u>6/2/07</u>	Time: <u>1550</u>
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 505A</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 BEGD = 15 uPa/h. WORKED ROOM WITH METER WAIST HIGH. NO READINGS ABOVE BEGD. CONTACT WITH SINK DRAINS - BEGD



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-9

Page 1 of 5

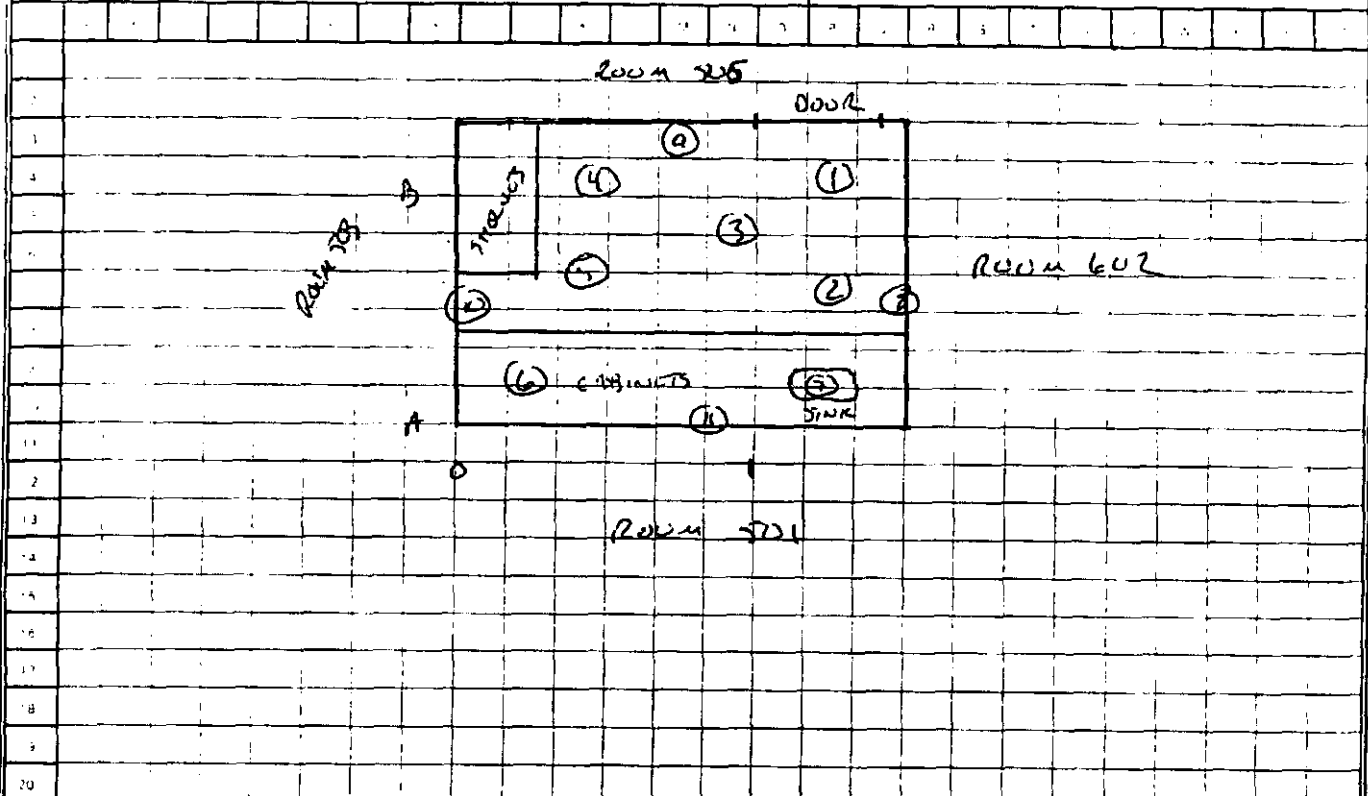
Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CILCOR</u>	Date <u>6/27/07</u>	Time: <u>1545</u>
Instrument SN <u>43-68/92 190483</u>	Calibration Due: <u>10/13/07</u>	Location <u>Room 505A</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		

Survey Performed By (Print): Jeffrey W. Sumard      Survey Performed By (Signature): \_\_\_\_\_

Battery OK     
  HV OK     
  Source Check OK

Grid Dimensions: 1x1

meters       inches  
 feet       centimeters



NOTES: TOOK 2 MINUTE STATIC READINGS. RESULTS IN CPM d/B /100CM<sup>2</sup>.  
TOOK SURCHS FOR LSC IN SAME LOCATIONS

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 505A**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 B+0.5, 1+1.5	0/195
2 A+3.5, 1+1.5	0/202
3 A+5.0, 0+5.5	0/199
4 B+0.5, 0+2.5	1/206
5 A+4.0, 0+2.5	1/201
6 A+1.0, 0+1.5, 2.5	1/203
7 A+1.0, 1+1.5, 2.0	1/205
8 A+3.5, 1+3.0, 4.0	1/200
9 B+2.0, 0+4.5, 4.0	0/207
10 A+3.0, 0+0.0, 6.0	0/201
11 A+0.0, 0+5.0, 6.0	1/197

062507-29  
7055

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

062507-29  
4085

26 Jun 2007 10:06  
Protocol #:27

TRI-CARB - 1.09  
SURVEY

Page #1  
User : KIM

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

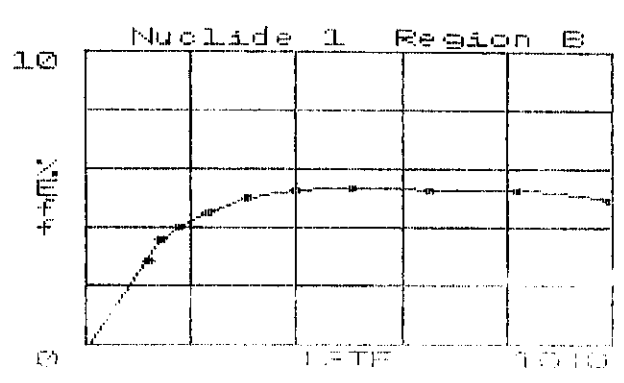
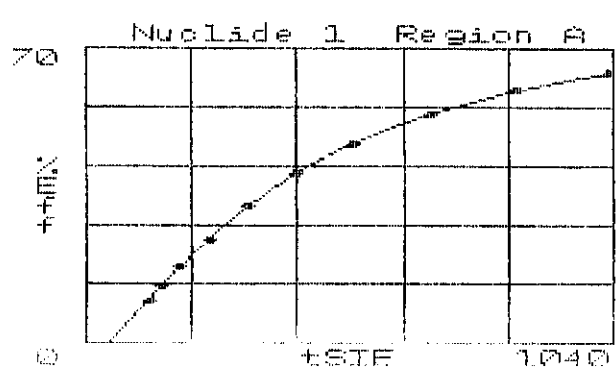
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	9.69
Region B:	12.0 - 156		0	0.0	13.01
Region C:	0.0 - 0.0		0	0.0	0.00

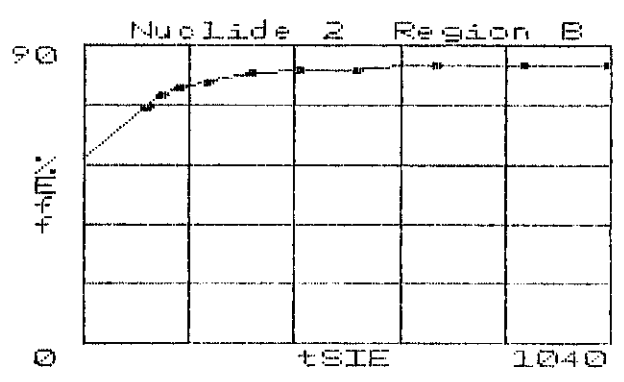
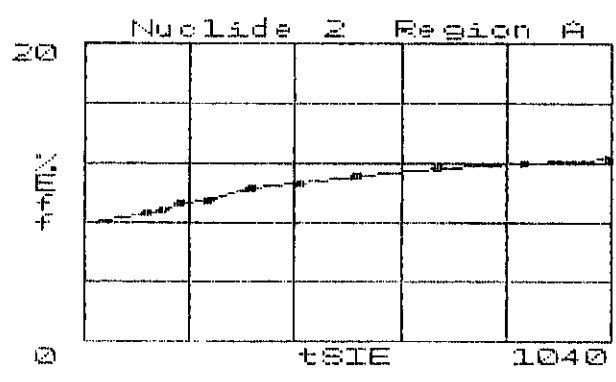
**Room 505A**

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

26 Jun 2007 10:06

TRI-CARB - 1.09

Protocol #:27

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.60	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	9.69	13.01			73.402	723.36	B
2	10.00	1.71	0.00	3.06	0.00	74.632	748.41	
3	10.00	1.39	0.00	2.52	0.00	0.000	734.00	
4	10.00	1.09	0.00	1.96	0.00	0.000	736.21	
5	10.00	1.03	0.07	1.84	0.00	131.54	734.92	
6	10.00	1.67	0.00	3.02	0.00	27.100	731.30	
7	10.00	2.85	0.00	5.16	0.00	88.589	730.83	
8	10.00	0.00	0.00	0.00	0.00	0.000	728.99	
9	10.00	1.65	0.00	2.96	0.00	125.55	740.06	
10	10.00	1.91	0.49	3.33	0.38	58.114	731.85	
11	10.00	2.58	0.00	4.63	0.00	49.889	749.60	
12	10.00	1.61	1.19	2.60	1.25	113.98	739.48	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-24

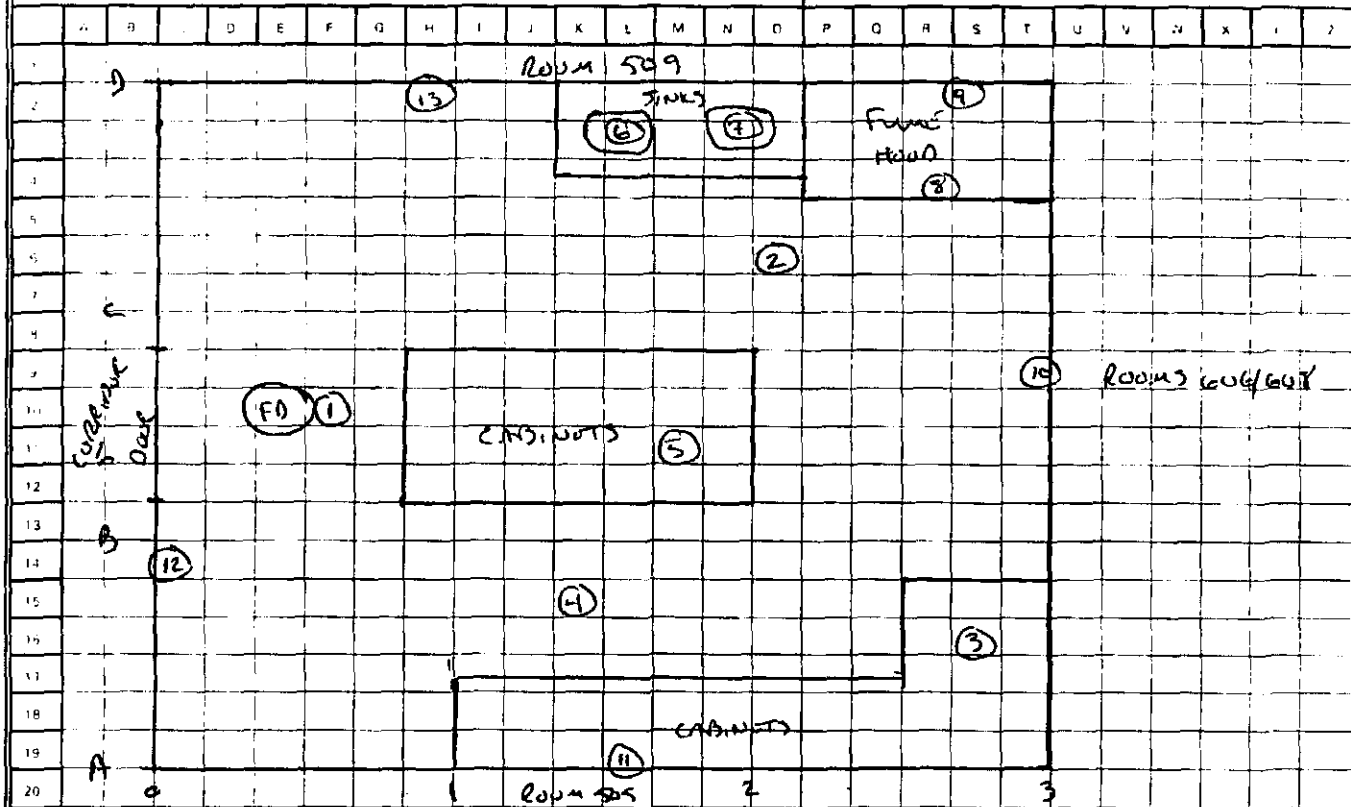
Page 1 of 2

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLCRL</u>	Date: <u>4/24/07</u>	Time: <u>1500</u>
Instrument SN: <u>43-68 / PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 507</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		

Survey Performed By (Print): Jeffrey W. Sullivan      Survey Performed By (Signature): [Signature]

Battery OK       HV OK       Source Check OK

Grid Dimensions: 1 x 1  
 meters       inches  
 feet       centimeters



Notes: TOOK 2 MINUTE STATIC COUNT. TOOK LSC READINGS IN SAME LOCATIONS.

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 507**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 B+3.5, 0+3.5	1/148
2 C+1.5, 2+0.5	0/159
3 A+3.5, 2+4.5, 3.0	1/152
4 A+4.5, 1+2.5	1/147
5 B+2.5, 1+4.5, 3.0	2/151
6 C+4.5, 1+3.5, 2.5	1/153
7 C+4.5, 1+5.5, 2.5	0/147
8 C+3.5, 2+3.5, 3.0	1/143
9 C+5.5, 2+4.0, 6.0	Smear only
10 B+5.5, 3+0.0, 4.0	2/144
11 A+0.0, 1+3.5, 4.0	1/156
12 A+5.5, 0+0.0, 2.0	1/157
13 D+0.0, 0+5.5, 6.0	0/153

062207-24

3055

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.



25 Jun 2007 07:15

TRI-CARB - 1.09

Protocol #:18

SURVEY

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

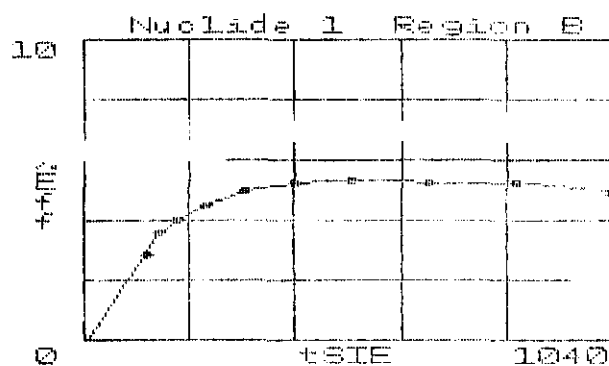
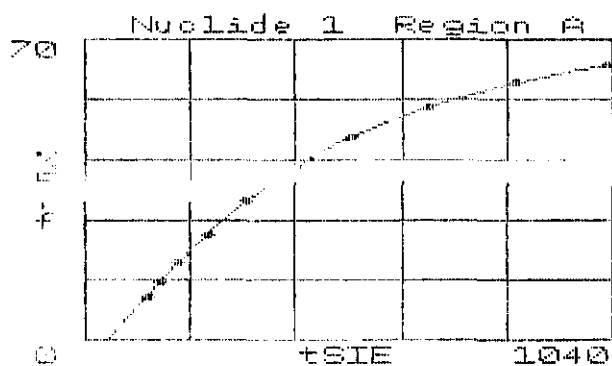
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.62
Region B:	12.0 - 156		0	0.0	11.48
Region C:	0.0 - 0.0		0	0.0	0.00

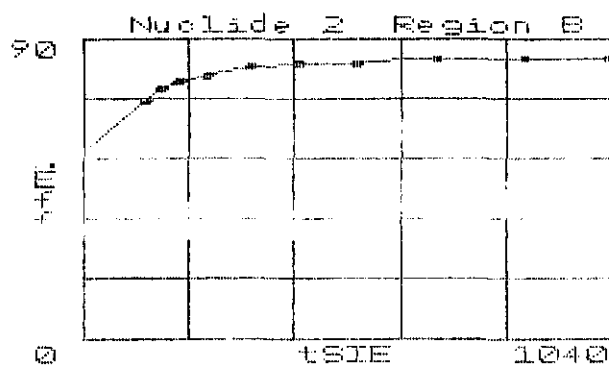
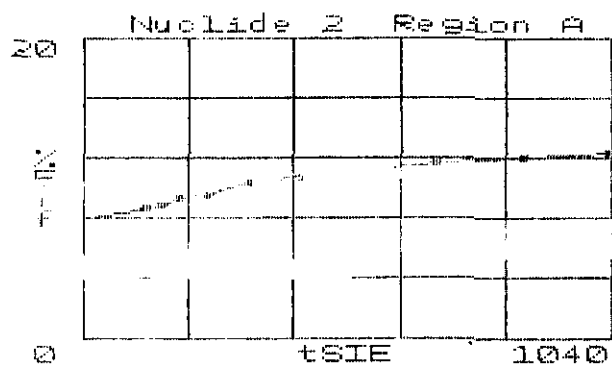
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count

Rm 507



tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.28	526.12	5.37
416.09	5.23	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

06 22 07 - 74

Page #2

User : KIM

25 Jun 2007 07:16

TRI-CARB - 1.09

Protocol #:18

SURVEY

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

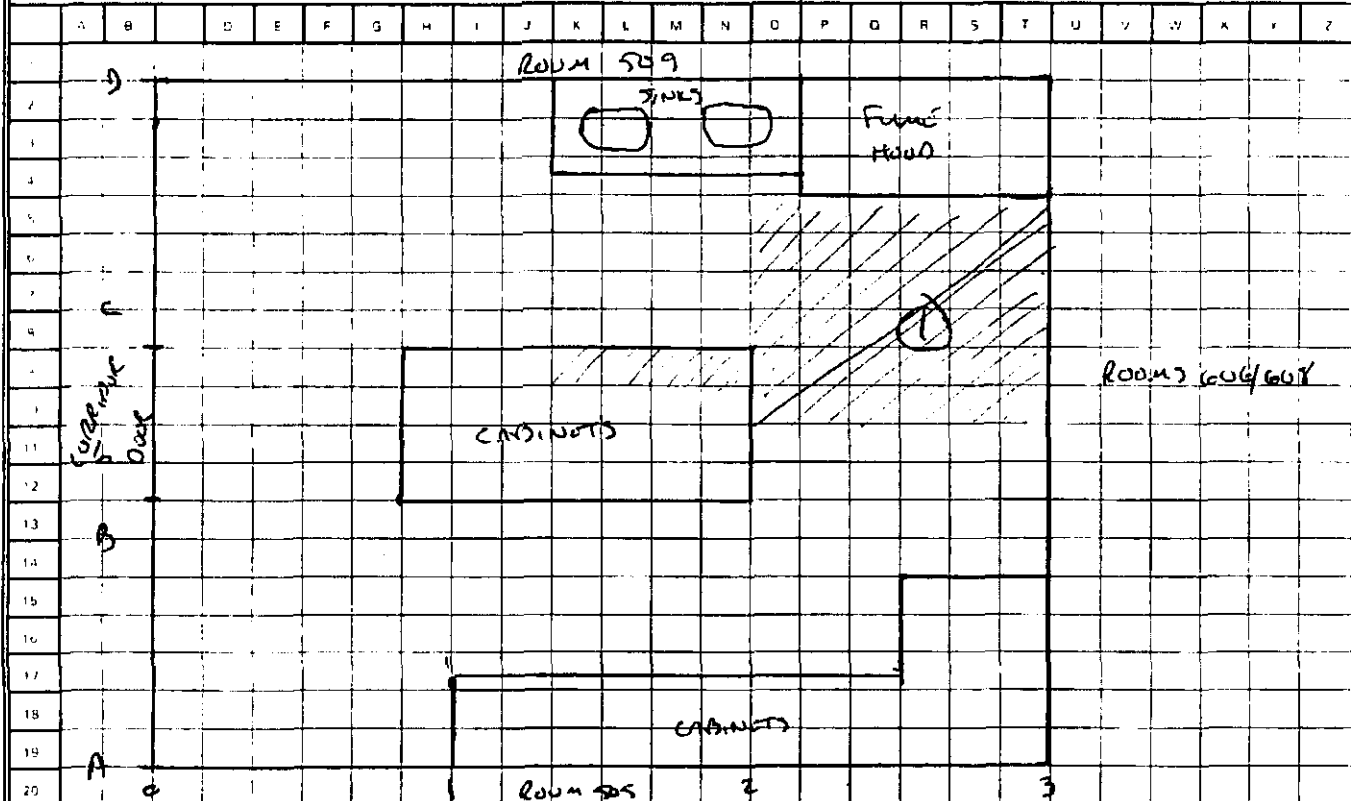
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.62	11.48			67.975	726.98	B
2	10.00	0.00	2.49	0.00	3.00	117.46	727.88	
3	10.00	0.00	0.00	0.00	0.00	0.000	717.53	
4	10.00	0.39	0.01	0.71	0.00	13.000	727.71	
5	10.00	0.00	1.77	0.00	2.13	135.76	707.74	
6	10.00	0.00	2.53	0.00	3.04	279.54	716.32	
7	10.00	0.09	2.34	0.00	2.80	46.483	714.88	
8	10.00	0.00	2.54	0.00	3.06	178.86	713.45	
9	10.00	0.00	0.97	0.00	1.17	0.000	706.97	
10	10.00	0.87	1.73	1.16	1.98	73.444	708.59	
11	10.00	0.00	0.55	0.00	0.66	105.77	722.73	
12	10.00	0.00	0.23	0.00	0.28	0.000	722.16	
13	10.00	0.00	0.28	0.00	0.34	0.000	719.08	
14	10.00	0.62	3.14	0.33	3.70	58.829	712.02	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-22

Page 1 of 1

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLRL</u>	Date: <u>4/24/07</u>	Time: <u>1410</u>
Instrument SN: <u>43-68/PR19483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 507</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W JONES</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 SURVIVED 1 FLOOR GRID AND SOME COUNTER TOP. HIGHEST  
 READING IN CPM 018/100CM2  
 (1) 0180

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-23

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLEERL</u>	Date: <u>4/22/07</u>	Time: <u>1420</u>
Instrument/SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 507</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jerry W. Jones</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> ONLY OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
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17																										
18																										
19																										
20																										

Notes: SEANON 2 WALL GRID. HIGHEST READING IN CPM @ 13/100cm

① 0/60

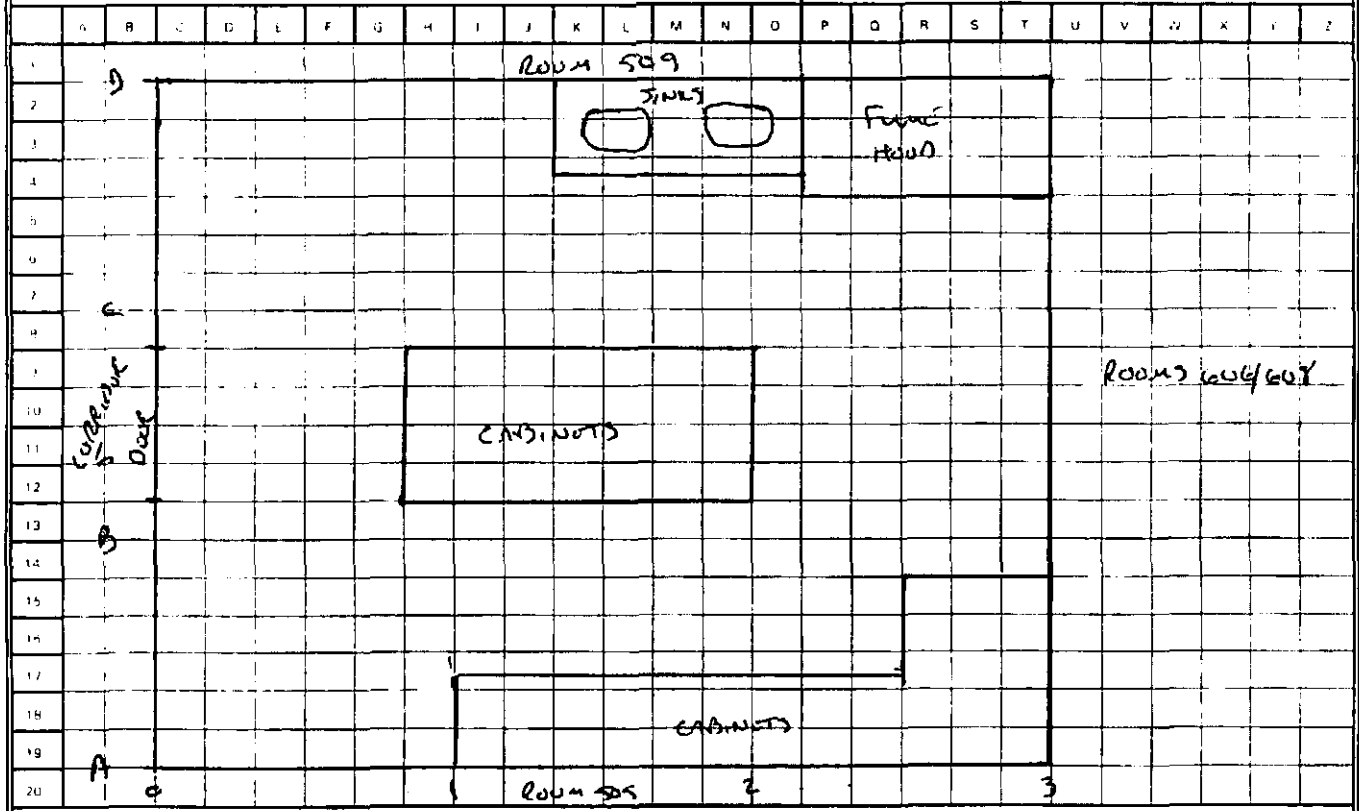
② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-25

Page 1 of 1

Instrument SN: <u>BICRON / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CLLRL</u>	Date: <u>4/22/07</u>	Time: <u>1905</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 507</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jerry W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 BKGD - 15 uR/h. MARKED ROOM WITH METAL WAIST HIGH.  
 NO READINGS ABOVE BKGD. CONTACT WITH SINK DRAINS  
 = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-21

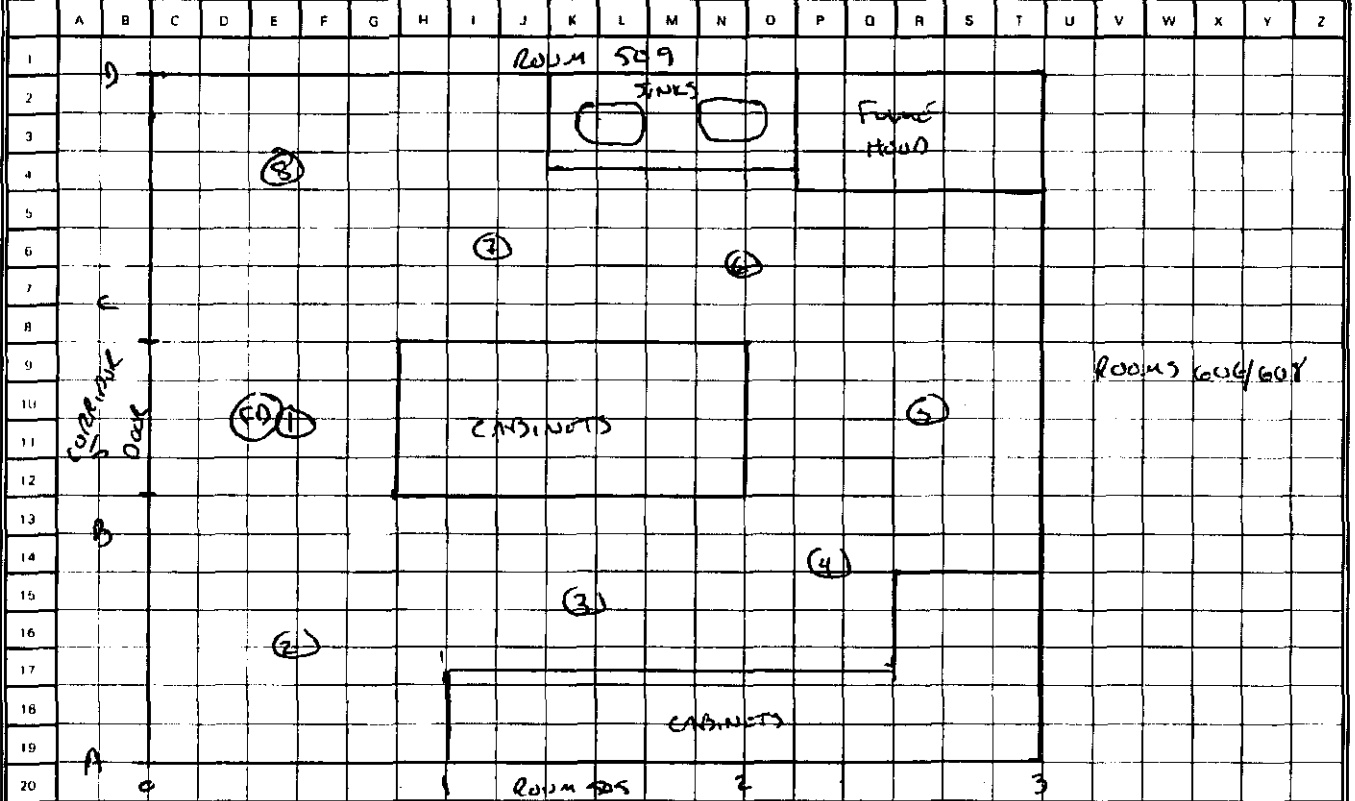
Page 1 of 1

Instrument/SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLERL</u>	Date: <u>6/22/07</u>	Time: <u>1400</u>
Instrument/SN: <u>43-37 / PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 507</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		

Survey Performed By (Print): Joselyn W. Sincere      Survey Performed By (Signature): [Signature]

Battery OK       HV OK       Source Check OK

Grid Dimensions: 12' /  
 meters       inches  
 feet       centimeters



Notes: Scanned 100% of floor, took readings ~ 6 ft. Results in CPM a/B

① 0/340	④ 0/400
② 0/350	⑤ 0/360
③ 0/340	
⑥ 0/400	
⑦ 0/380	
⑧ 0/350	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-26

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLCRL</u>	Date: <u>6/22/07</u>	Time: <u>1515</u>
Instrument SN: <u>43-37 / PR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 509</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jarrod W. Smith</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Notes: SCANNED 100% OF FLOOR. TOOK READINGS ~ 6 FT. RESULTS IN CPM & 13

- (1) 0/360
- (2) 0/320
- (3) 0/340

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062267-27

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>6/22/07</u>	Time: <u>1525</u>
Instrument SN: <u>43-68 / PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 509</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Smith</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u>	
		<input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Notes: SCANNED 1 FLOOR GRID AND SOME COUNTER TOP. HIGHEST READING cpm @ B / 100CM

① 0/80



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-28

Page 1 of 1

Instrument SN: <u>2724 / 114239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERL</u>	Date: <u>6/22/07</u>	Time: <u>1540</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 509</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W SUMERIN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters

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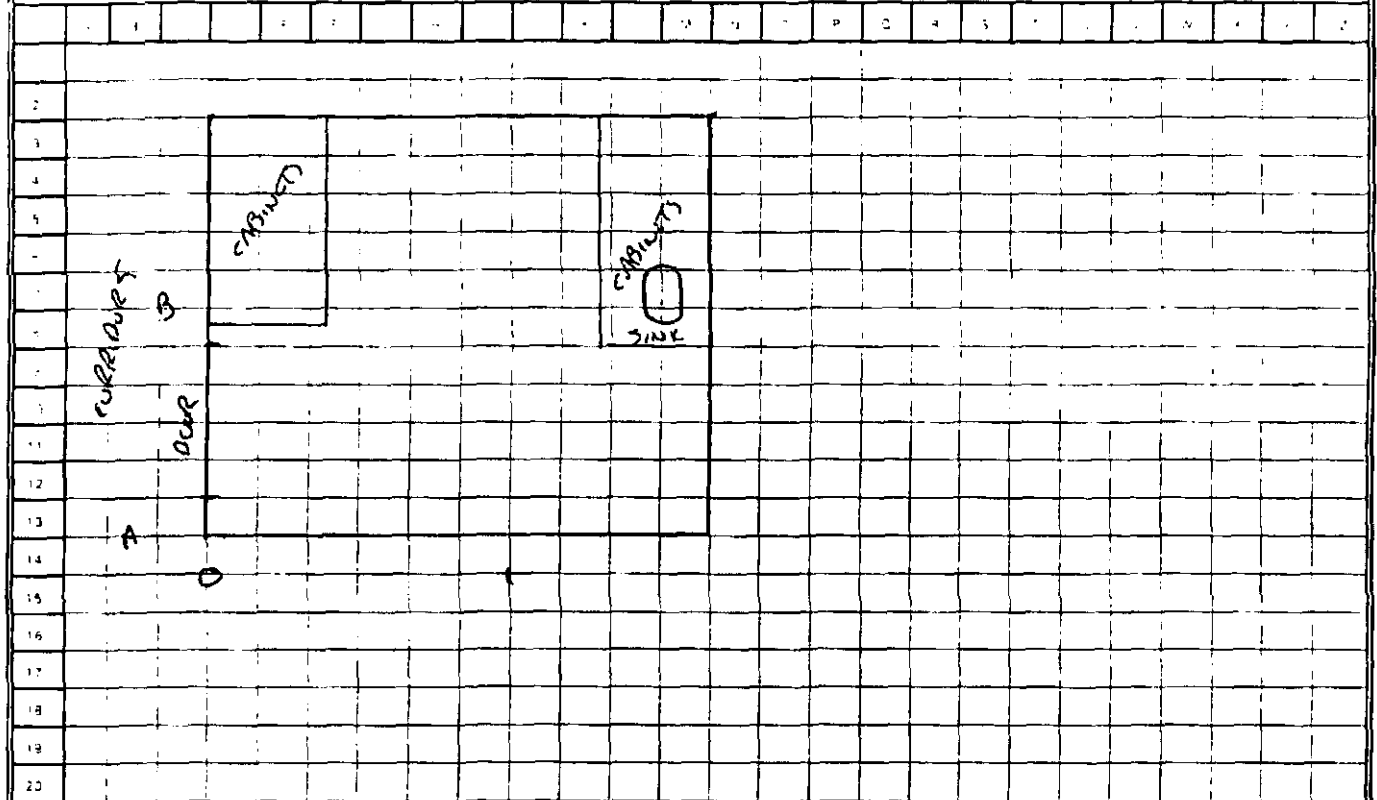
Notes: SCANNED ONE WALL GRID. HIGHEST READING IN CPM α/β / HOUR  
① 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-30

Page 1 of 1

Instrument SN: <u>BKPD213296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLWR</u>	Date: <u>6/22/07</u>	Time: <u>1615</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 509</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 BKGD = 15 mRem/h. WALKED ROOM WITH METER WAIST HIGH.  
 NO READINGS ABOVE BKGD. CORRECT WITH SINK DRAINING  
 = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-29

Page 1 of 5

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLLRL</u>	Date: <u>6/27/07</u>	Time: <u>1610</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 509</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print) <u>Jeffrey W. Smith</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input type="checkbox"/> Source Check OK		Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
<p>The diagram is drawn on a grid with rows 2-20 and columns 5-10. It shows a rectangular area with a door on the left side (row 13, column 5) and two cabinets (rows 3-4, columns 6-7 and rows 4-5, columns 8-9). Ten survey points are marked with circled numbers: 1 (row 3, col 6), 2 (row 4, col 6), 3 (row 4, col 8), 4 (row 5, col 8), 5 (row 6, col 8), 6 (row 6, col 9), 7 (row 10, col 6), 8 (row 10, col 9), 9 (row 13, col 6), and 10 (row 13, col 9). Labels include 'CABINETS', 'DOOR', and 'SINK'.</p>																			

Notes

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 509**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+3.5, 0+3.5	1/143
2 A+2.5, 1+3.5	0/147
3 B+1.5, 0+5.5	1/141
4 B+1.5, 0+1.5, 3.0	1/132
5 B+3.5, 1+2.5, 3.0	1/145
6 B+0.5, 1+3.0, 2.5	1/142
7 B+5.0, 1+0.0, 6.0	0/139
8 A+3.5, 1+4.0, 4.0	1/142
9 A+0.0, 0+5.5, 2.0	2/140
10 B+0.5, 0+0.0, 4.0	1/138

062207-29  
3JF 5

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

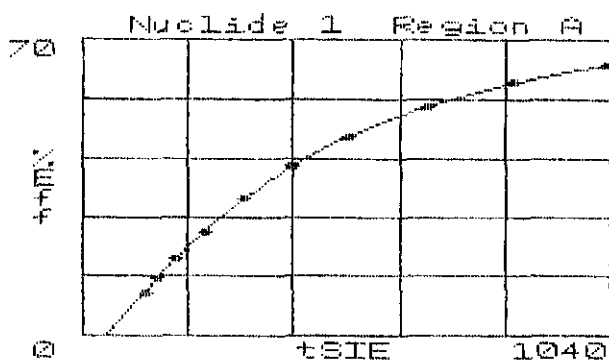
25 Jun 2007 09:49 TRI-CARB - 1.09  
Protocol #:26 SURVEY

Time: 10.00  
Data Mode: Dual DPM Nuclides: 3H-14C Quench Sets  
Background Subtract: 1st Vial Low Energy: 3H High Energy: 14C

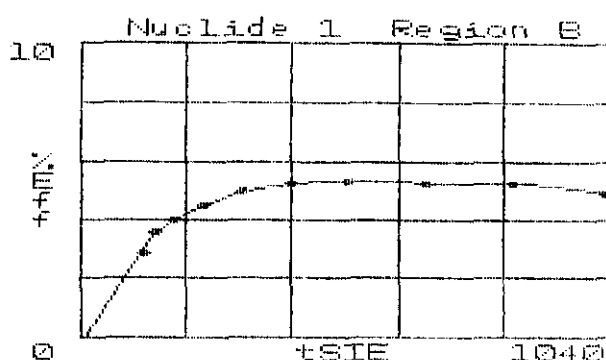
	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.95
Region B:	12.0 - 156		0	0.0	13.08
Region C:	0.0 - 0.0		0	0.0	0.00

Rm 509

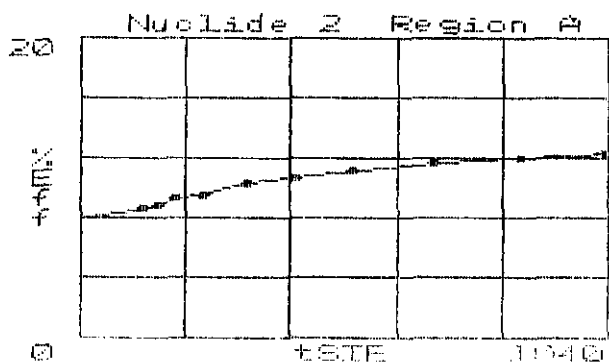
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



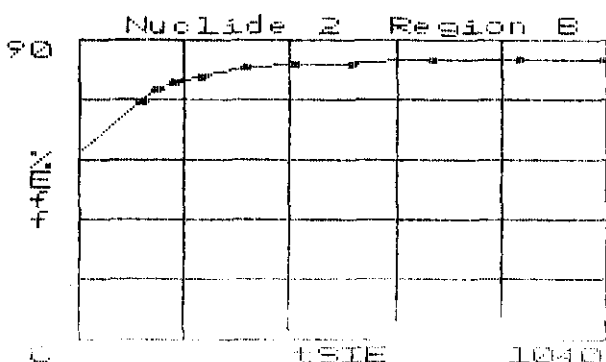
tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10



tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31



tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

067707-29  
5085  
Page #2  
User : KIM

25 Jun 2007 09:49 TRI-CARB - 1.09  
Protocol #:26 SURVEY

239.94 9.55 188.56 9.32 239.94 79.05 188.56 77.31  
152.93 8.76 122.58 8.59 152.93 75.21 122.58 71.52

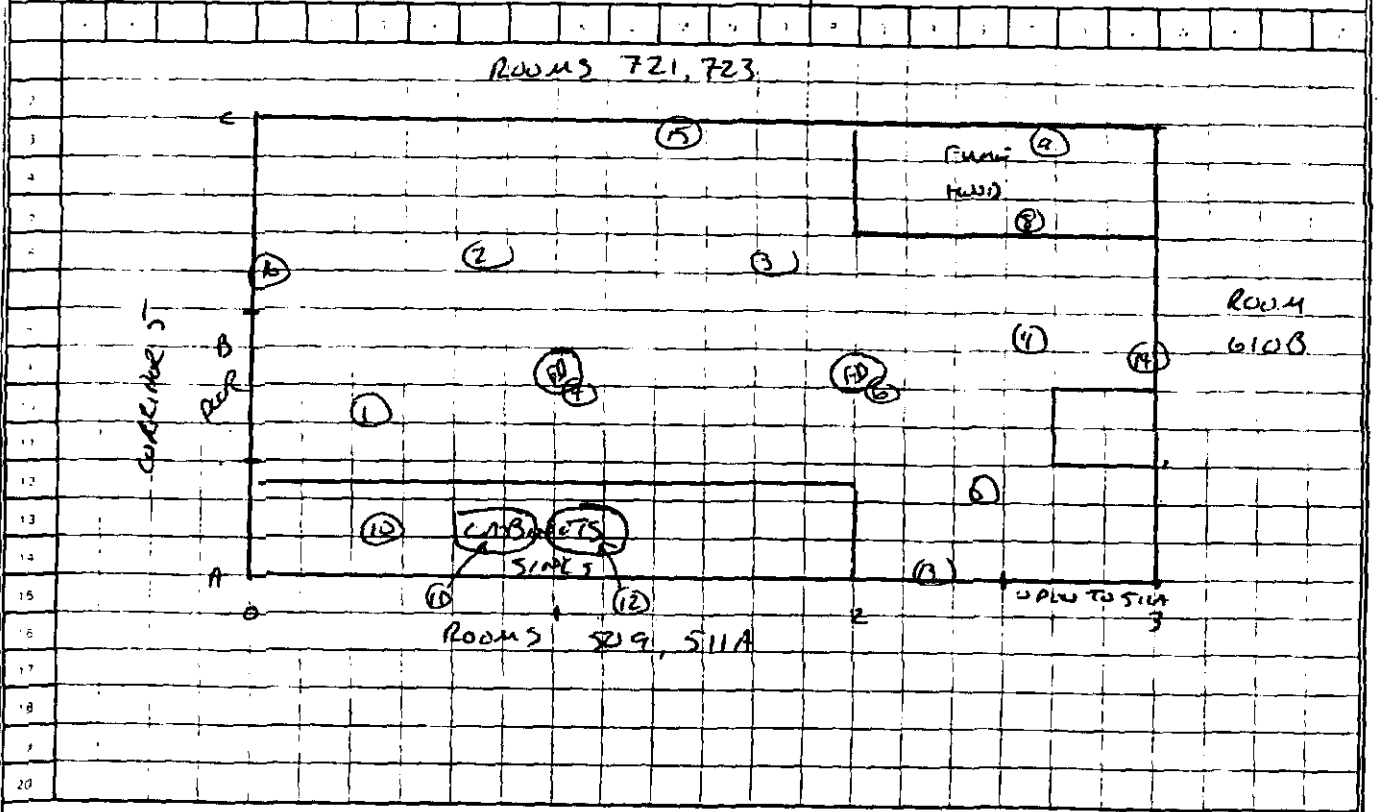
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	10.95	13.08			71.755	732.53	B
2	10.00	0.00	0.00	0.00	0.00	0.000	722.16	
3	10.00	0.00	0.00	0.00	0.00	0.000	715.38	
4	10.00	0.00	0.00	0.00	0.00	0.000	717.57	
5	10.00	0.00	0.00	0.00	0.00	0.000	719.00	
6	10.00	0.67	0.89	1.00	0.99	56.335	727.55	
7	10.00	0.00	0.37	0.00	0.44	0.000	718.20	
8	10.00	0.83	0.00	1.53	0.00	0.000	711.52	
9	10.00	0.00	0.00	0.00	0.00	0.000	724.45	
10	10.00	0.00	0.32	0.00	0.38	0.000	716.58	
11	10.00	0.00	0.00	0.00	0.00	0.000	715.65	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-34

Page 1 of 5

Instrument SN: <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date <u>9/19/07</u>	Time <u>1655</u>
Instrument SN: <u>43-68/PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 511</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F 55</u>		
Survey Performed By (Print): <u>Jerry W Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> NIV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		



Notes



**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 511**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+4.5, 0+2.5	1/206
2 B+2.5, 0+4.5	0/202
3 B+2.5, 1+4.5	0/206
4 B+0.5, 2+3.5	1/198
5 A+2.5, 2+2.5	0/193
6 A+5.0, 2+0.0	0/204
7 A+5.0, 1+0.0	0/200
8 B+3.5, 2+3.5, 3.0	1/199
9 C+0.0, 2+4.0, 6.0	Smear only
10 A+1.5, 0+2.5	0/204
11 A+1.0, 0+5.0, 2.0	1/205
12 A+1.0, 1+0.5, 2.0	1/201
13 A+0.0, 2+1.5, 6.0	0/199
14 B+0.0, 3+0.0, 4.0	1/205
15 C+0.0, 1+2.5, 6.0	0/203
16 B+2.0, 0+0.0, 2.0	0/200

062507-74  
3 of 5

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

High Energy: 14C

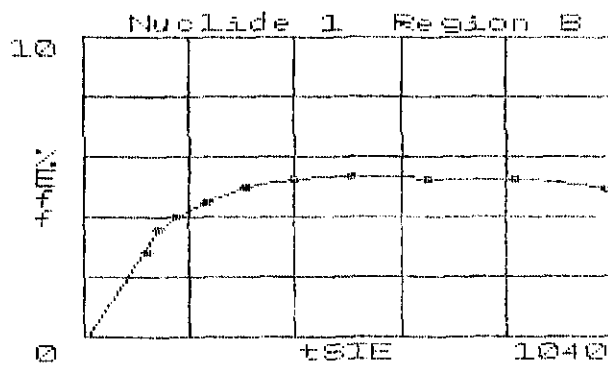
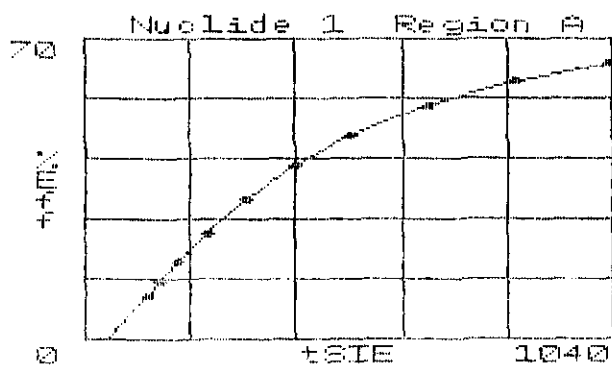
Background Subtract: 1st Vial

	LL	UL	LCR	25%	BKG
Region A:	0.0 - 12.0		0	0.0	11.11
Region B:	12.0 - 156		0	0.0	12.69
Region C:	0.0 - 0.0		0	0.0	0.00

Room 511

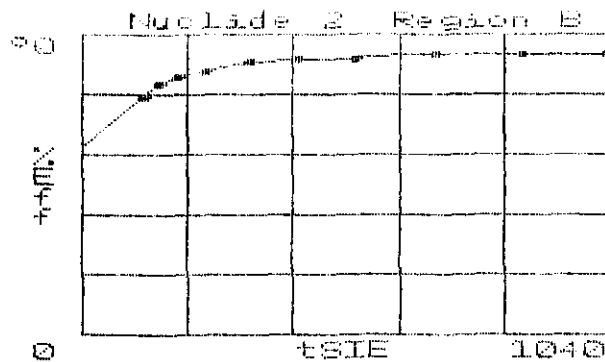
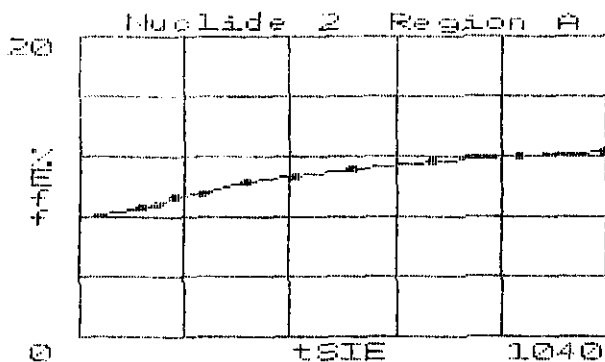
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

062507-34

26 Jun 2007 12:18

TRI-CARB - 1.09

Page #2

Protocol #:28

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	11.11	12.69			66.830	710.96	B
2	10.00	0.00	0.00	0.00	0.00	0.000	712.90	
3	10.00	0.93	0.87	1.47	0.94	209.27	717.47	
4	10.00	0.00	0.86	0.00	1.03	517.08	717.31	
5	10.00	0.00	0.00	0.00	0.00	0.000	717.93	
6	10.00	3.06	0.00	5.59	0.00	29.853	715.85	
7	10.00	0.00	1.20	0.00	1.45	0.000	710.47	
8	10.00	0.00	0.05	0.00	0.06	0.000	729.70	
9	10.00	0.00	0.26	0.00	0.32	0.000	718.54	
10	10.00	0.85	0.00	1.56	0.00	0.000	711.82	
11	10.00	0.68	0.00	1.23	0.00	0.000	723.25	
12	10.00	0.00	0.36	0.00	0.44	0.000	716.43	
13	10.00	0.20	0.00	0.35	0.00	0.000	726.22	
14	10.00	0.00	0.00	0.00	0.00	0.000	723.47	
15	10.00	0.00	0.00	0.00	0.00	0.000	736.40	
16	10.00	1.65	3.65	2.07	4.20	117.73	731.41	
17	10.00	0.00	1.35	0.00	1.62	52.965	716.76	

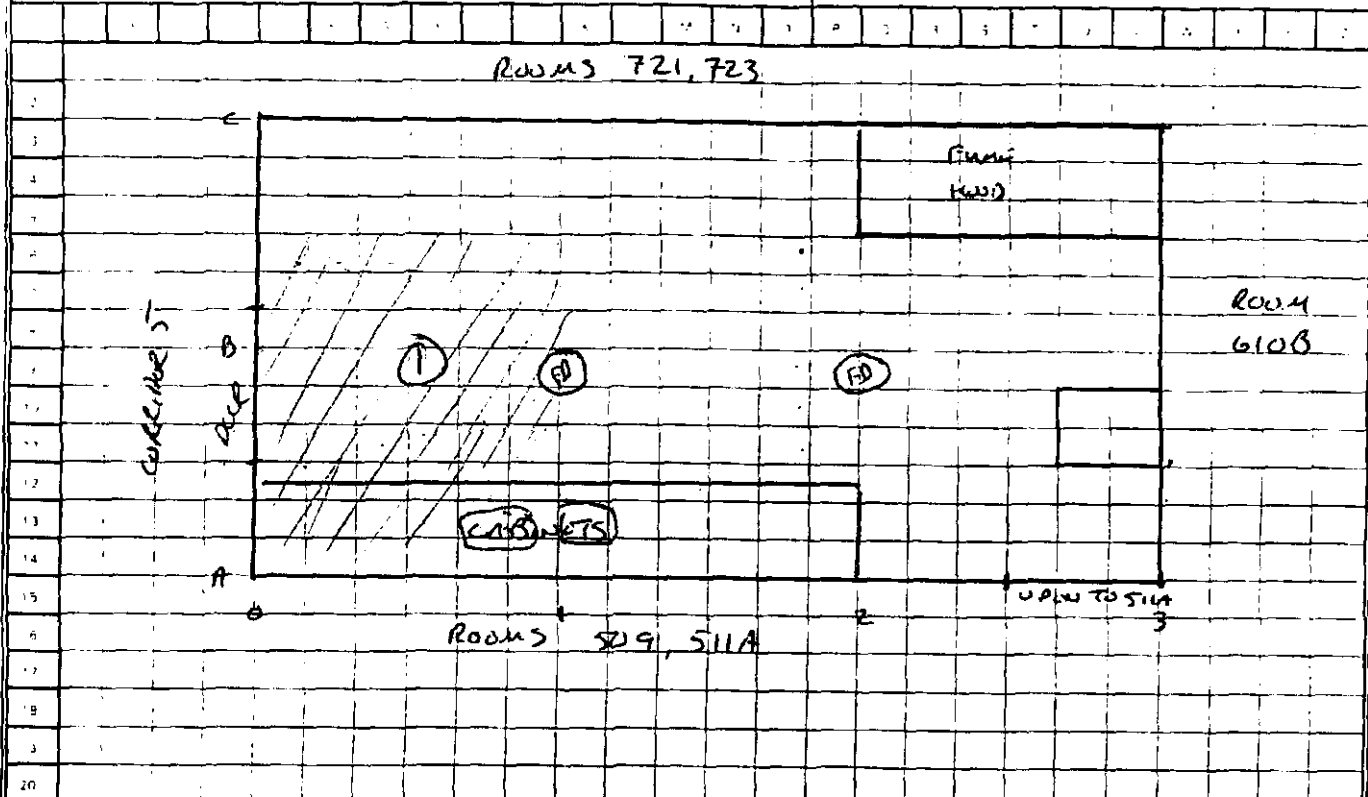


**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-32

Page 1 of 1

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERL</u>	Date: <u>6/27/07</u>	Time: <u>1610</u>
Instrument SN <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 511</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F 55</u>		
Survey Performed By (Print): <u>Jerry W Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
Air Battery OK	SMV OK	R Source Check OK	Grid Dimensions <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED 1 FLOOR GRID AND SOME COUNTER TOP. HIGHEST READING  
 100 CPM @ 18/100CM<sup>2</sup>  
 ① 0/100

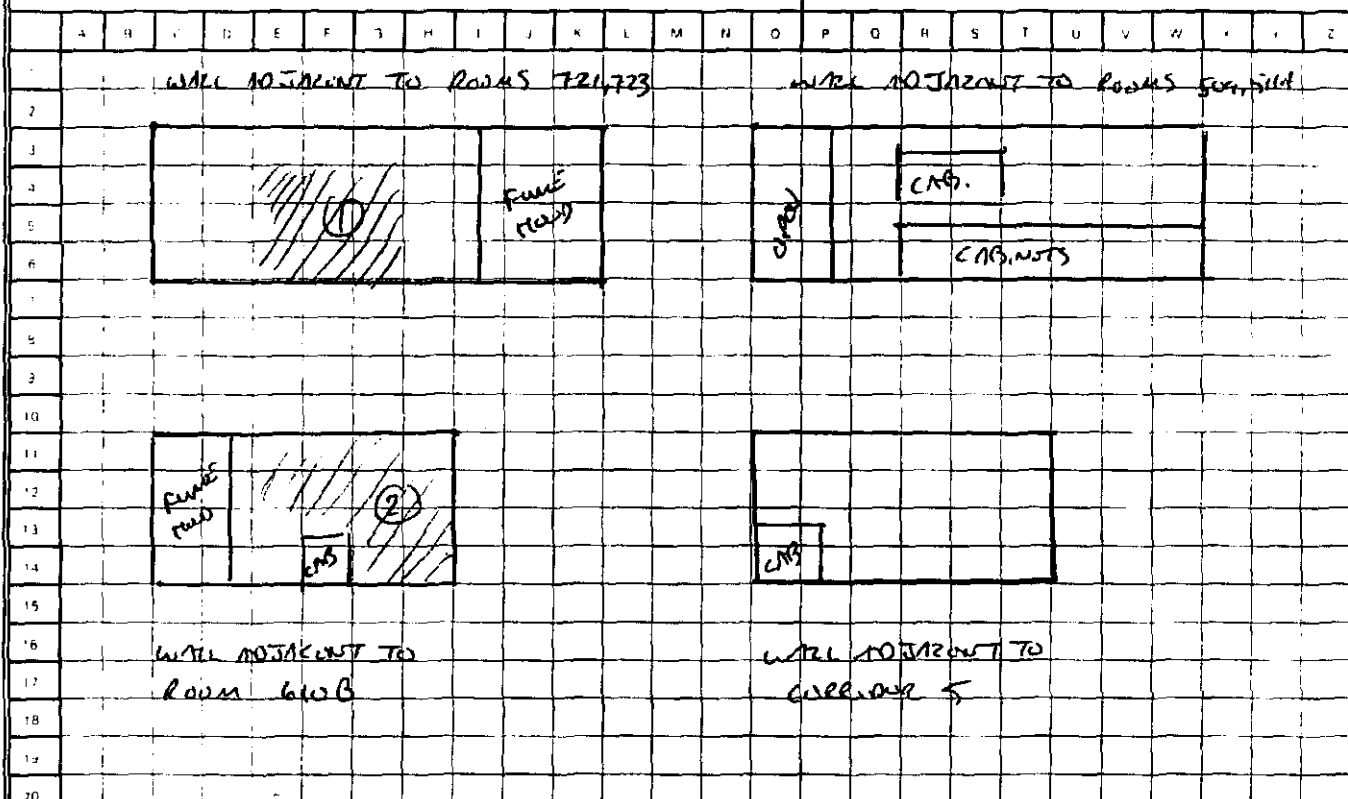
**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-33

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>9/27/07</u>	Time: <u>1620</u>
Instrument SN: <u>4368 / 1190183</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 511</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Suncu</u>		Survey Performed By (Signature): <u>[Signature]</u>		

<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u>
			<input type="checkbox"/> meters <input checked="" type="checkbox"/> inches <input type="checkbox"/> centimeters



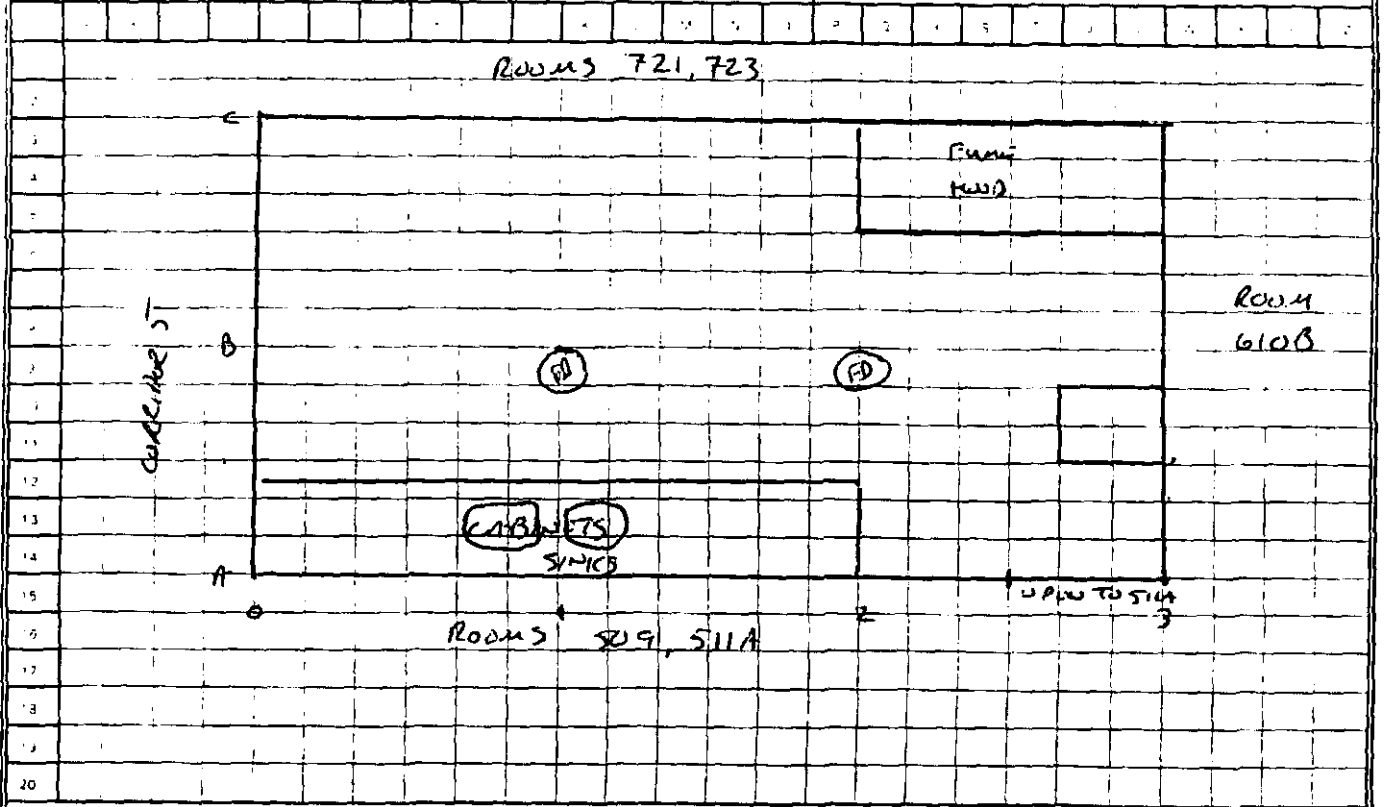
NOTES: SCANNED 2 ~~FEET~~ WALL GRIDS. HIGHEST READINGS IN  
 C P M & B / 100 CMZ  
 (1) 0/30  
 (2) 0/30

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-35

Page 1 of 1

Instrument SN: <u>BICRON/B2460</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLERL</u>	Date <u>6/27/07</u>	Time <u>1700</u>
Instrument SN <u>N/A</u>	Calibration Due. <u>N/A</u>	Location <u>Room 511</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F-55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature)		
Battery OK <u>SHV OK</u>	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		



Notes: BKLD = 10 m Rm/4. W/LED ROOM WITH METER WAIST HIGH, NO READINGS ABOVE BKLD. CONTACT WITH SINK DRAINS = BKLD

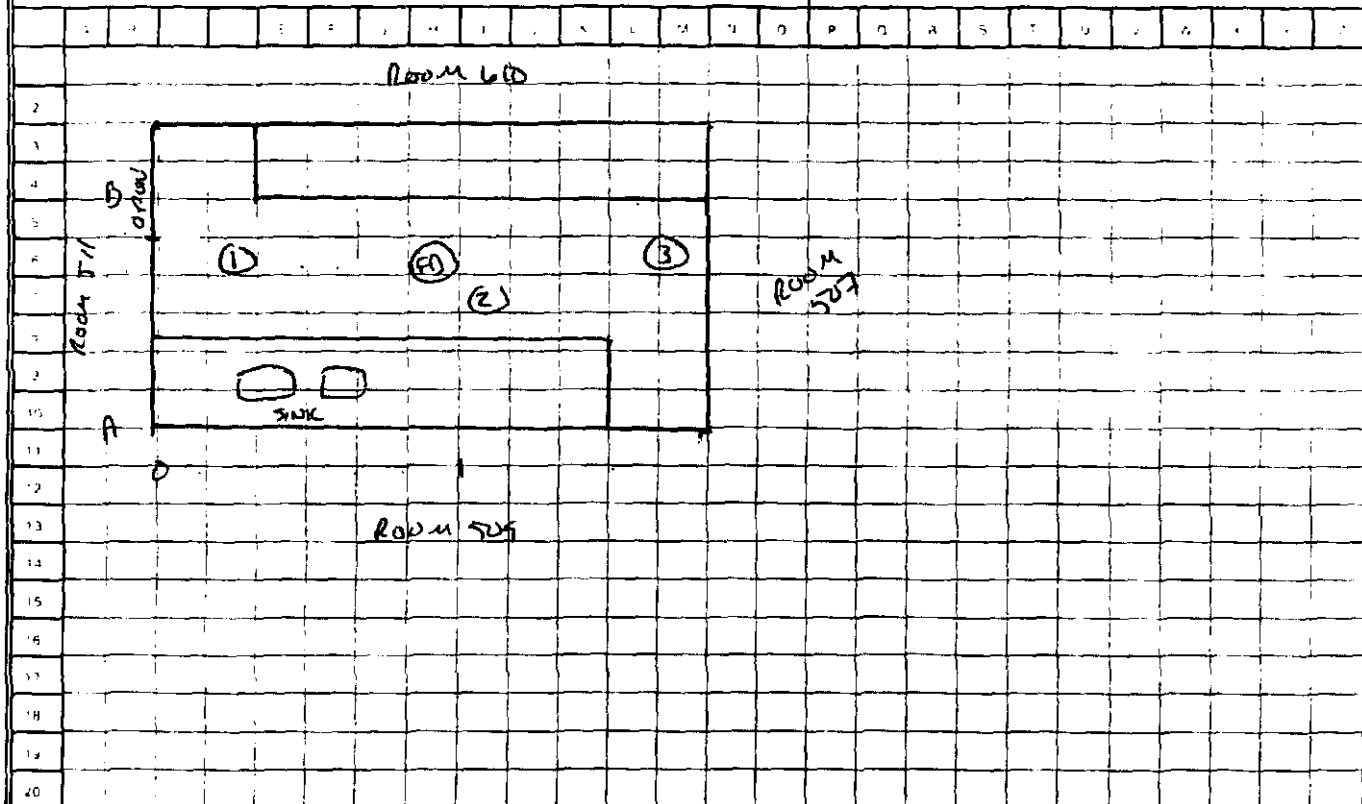


**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 0626057-1

Page 1 of 1

Instrument SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLCRL</u>	Date: <u>6/26/07</u>	Time: <u>0855</u>
Instrument SN: <u>43371PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 511A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F-55</u>		
Survey Performed By (Print): <u>Jeffrey W Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>6x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SUMNER 100% of FLOOR TOOK READINGS ~ 6FT. RESULTS IN CPM @ 8

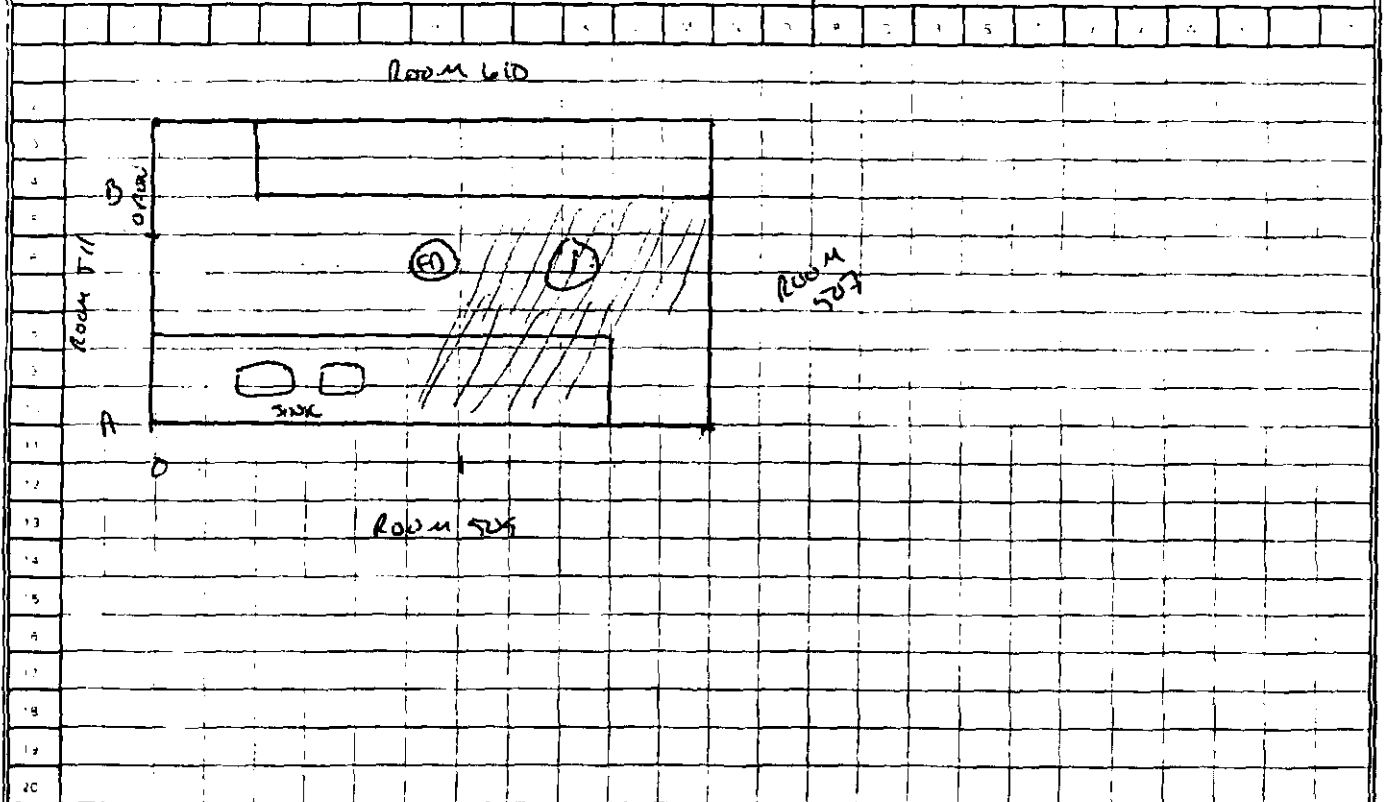
(1) 0/356  
 (2) 0/360  
 (3) 0/360

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-2

Page 1 of 1

Instrument SN: <u>2224/116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GILGRL</u>	Date: <u>10/26/07</u>	Time: <u>0905</u>
Instrument SN: <u>4368/12190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 511A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Joffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Batteries OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>6x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED ONE FLOOR GRID AND SOME CORNER TOP. HIGHEST  
READING IN CPM a/B/100cm  
(1) 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-3

Page 1 of 1

Instrument SN: <u>2224 / 11625</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERL</u>	Date: <u>10/20/07</u>	Time: <u>0915</u>
Instrument SN: <u>43-681 PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 511A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
2																					
3																					
4																					
5																					
6																					
7																					
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16																					
17																					
18																					
19																					
20																					

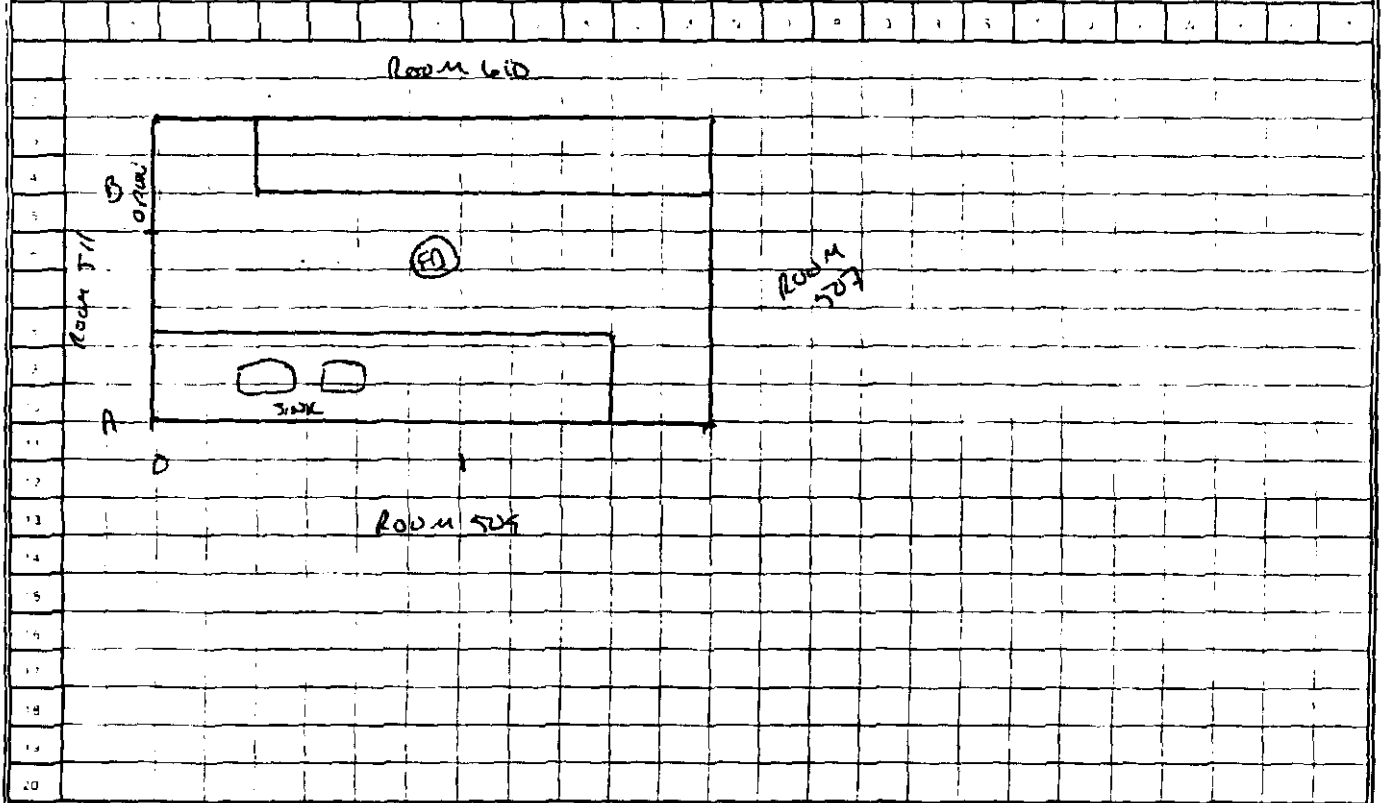
Notes: SCANNED ONE WALL GRID. HIGHEST READING IN CPMD/BLOCKER  
① 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-5

Page 1 of 1

Instrument SN <u>BICLAN / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLTRC</u>	Date <u>9/28/07</u>	Time <u>0955</u>
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 511A</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <i>[Signature]</i>		
<input checked="" type="checkbox"/> Batteries OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 BKGD: 10  $\mu$ Rm/h. WALKED ROOM WITH METER WAIST HIGH.  
 NO READINGS ABOVE BKGD. CONTACT WITH SINK DRAIN  
 = BKGD



**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 511A**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 B+0.0, 0+1.0	0/193
2 A+3.5, 0+1.5	0/204
3 A+3.5, 0+4.5	0/197
4 A+5.0, 1+5.0	1/200
5 A+2.5, 1+4.0	1/205
6 A+4.5, 0+5.5	0/203
7 A+1.5, 1+1.5, 3.0	0/198
8 A+1.5, 0+3.5, 2.5	1/202
9 A+1.5, 0+2.5, 2.5	2/204
10 A+3.0, 0+0.0, 6.0	0/200
11 B+2.0, 0+1.5, 4.0	0/196
12 A+4.5, 1+5.0, 2.0	1/204
13 A+0.0, 1+0.5, 4.0	1/201

062007-4  
30AS

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

062007-4  
4085

27 Jun 2007 02:13  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

Page #1  
User : KIM

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

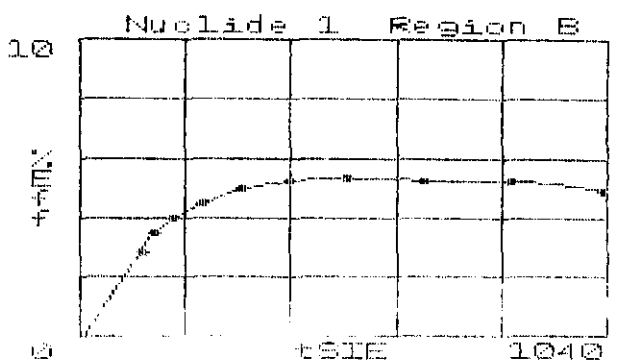
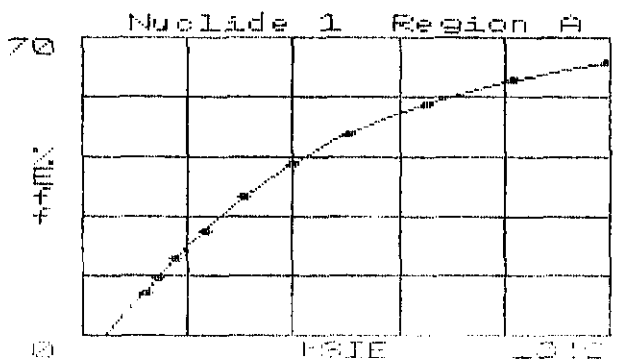
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.56
Region B:	12.0 - 156		0	0.0	13.34
Region C:	0.0 - 0.0		0	0.0	0.00

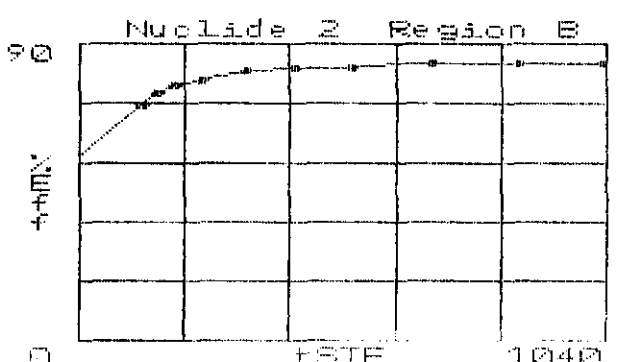
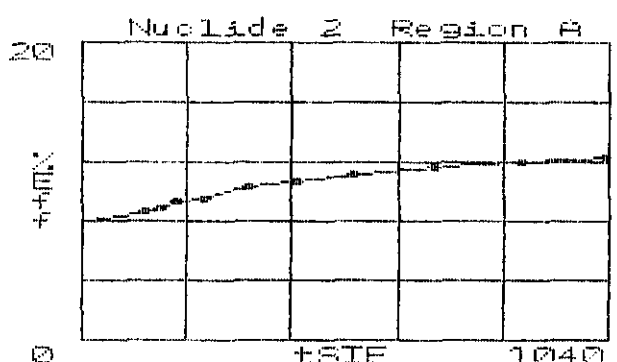
*Room 511A*

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55



239.94 9.55 188.56 9.32 239.94 79.05 188.56 77.31  
152.93 8.76 122.58 8.59 152.93 75.21 122.58 71.52

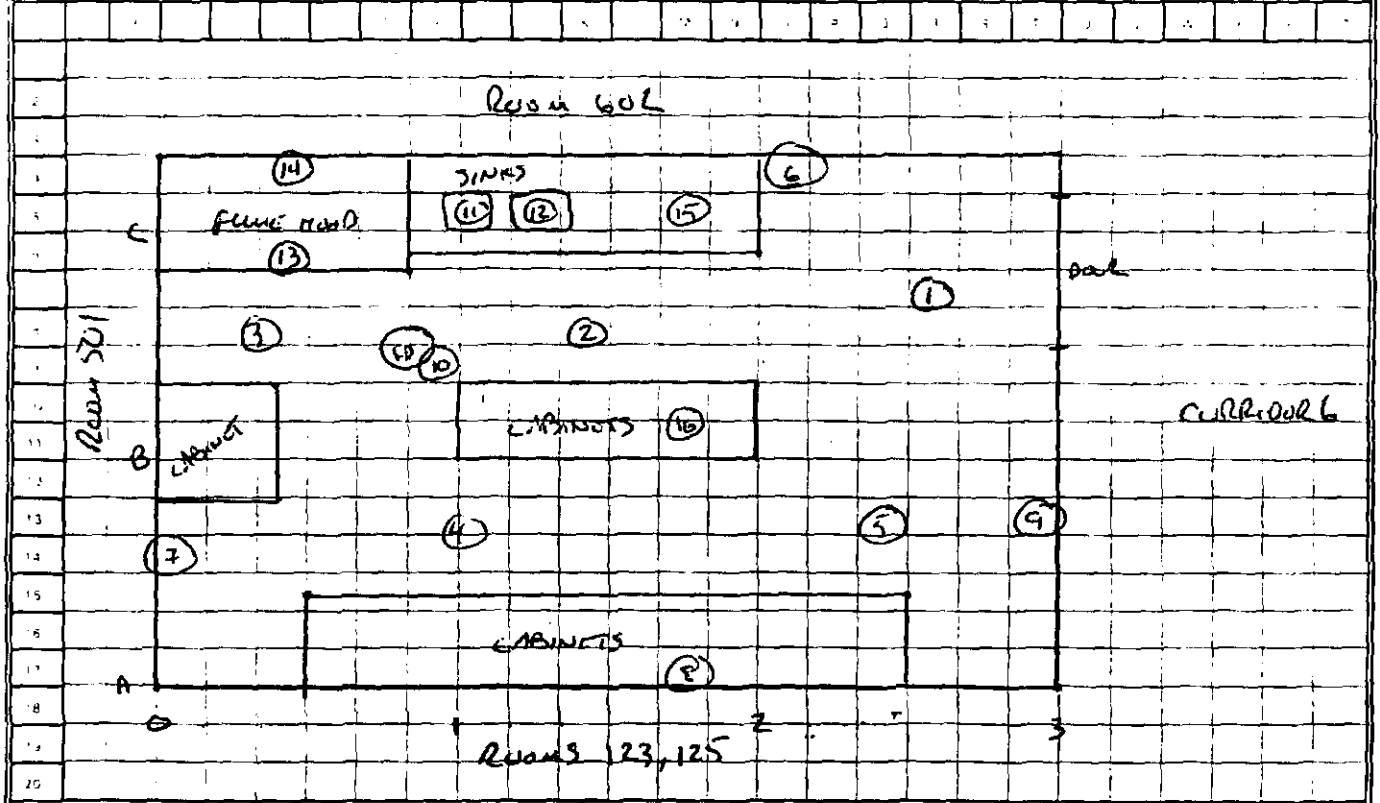
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.56	13.34			71.248	719.55	B
2	10.00	0.06	0.00	0.11	0.00	0.000	729.19	
3	10.00	0.00	0.00	0.00	0.00	0.000	718.07	
4	10.00	0.00	0.00	0.00	0.00	0.000	737.21	
5	10.00	0.00	0.00	0.00	0.00	0.000	706.98	
6	10.00	0.00	0.00	0.00	0.00	0.000	716.12	
7	10.00	3.23	0.17	5.83	0.00	0.000	722.89	
8	10.00	0.00	0.00	0.00	0.00	0.000	713.57	
9	10.00	0.00	0.00	0.00	0.00	0.000	727.44	
10	10.00	1.24	0.00	2.26	0.00	0.000	724.87	
11	10.00	0.00	0.00	0.00	0.00	0.000	730.83	
12	10.00	0.00	0.00	0.00	0.00	0.000	724.19	
13	10.00	0.00	0.00	0.00	0.00	0.000	723.45	
14	10.00	0.85	0.00	1.55	0.00	0.000	715.55	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062807-4

Page 1 of 9

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELL</u>	Date: <u>6/25/07</u>	Time: <u>1000</u>
Instrument SN: <u>43-68/P12190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 600</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sincow</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		



NOTE: PERFORMED 2 MINUTE STATIC COUNTS. RESULTS IN CPM α/β/POUR. TOOK SAMPLES FOR LSC AND GROSS ALPHA/BETA IN SAME LOCATIONS.

06257-4  
ZCF

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

#### Room 600

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 B+4.5, 2+3.5	0/197
2 B+3.5, 1+2.5	1/206
3 B+3.5, 0+2.0	1/210
4 A+4.0, 1+0.0	0/202
5 A+4.5, 2+2.5	0/207
6 C+2.0, 2+0.5, 4.0	1/199
7 A+3.5, 0+0.0, 6.0	2/201
8 A+0.0, 1+4.5, 4.0	1/206
9 A+4.5, 3+0.0, 2.0	0/209
10 B+3.0, 0+5.0	1/193
11 C+0.5, 1+0.5, 2.0	1/207
12 C+0.5, 1+1.5, 2.0	0/210
13 B+5.5, 0+2.5, 3.0	1/198
14 C+2.0, 0+2.5, 6.0	Smear only
15 C+0.5, 1+4.5, 2.5	1/208
16 B+1.0, 1+4.5, 2.5	1/197

062507-4  
3069

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.


Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

062507-4  
7089

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 25, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 25, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132236	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43963	10	4396	0.35	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
41		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	1	2	-0.2	-0.5	0.5	1.4	a
2	1	2	-0.2	-0.5	0.5	1.4	a
3	0	2	-0.7	-2.0	0.0	1.4	a
4	2	2	0.3	0.9	0.7	1.4	a
5	1	2	-0.2	-0.5	0.5	1.4	a
6	0	2	-0.7	-2.0	0.0	1.4	a
7	1	2	-0.2	-0.5	0.5	1.4	a
8	1	2	-0.2	-0.5	0.5	1.4	a
9	1	2	-0.2	-0.5	0.5	1.4	a
10	2	2	0.3	0.9	0.7	1.4	a
11	1	2	-0.2	-0.5	0.5	1.4	a
12	1	2	-0.2	-0.5	0.5	1.4	a
13	2	2	0.3	0.9	0.7	1.4	a
14	0	2	-0.7	-2.0	0.0	1.4	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):	Notes: Room 600.						
Analysis performed by (print): Jeffrey W. Sumlin, RRPT		Analysis performed by (signature): 				License No.: MDE License No: MD-31-281-01	

062507-4  
50A9

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

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RSP-018 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 25, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 25, 2007			Report Date:		
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008			
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43963	10	4396	0.35	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
	41		60		1		
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	1	2	-0.2	-0.5	0.5	1.4	a
16	0	2	-0.7	-2.0	0.0	1.4	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 600.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): <i>JWS</i>			License No.: MDE License No: MD-31-281-01	

062507-4  
6069

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 25, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 25, 2007			Report Date:		
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008			
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52492	10	5196	0.26	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3186		60		53			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	111	2	2.4	9.2	5.3	6.6	a
2	104	2	-1.1	-4.2	5.1	6.6	a
3	107	2	0.4	1.5	5.2	6.6	a
4	98	2	-3.6	-13.9	5.0	6.6	a
5	103	2	-1.6	-6.2	5.1	6.6	a
6	106	2	-0.1	-0.4	5.1	6.6	a
7	105	2	-0.6	-2.3	5.1	6.6	a
8	97	2	-4.6	-17.7	4.9	6.6	a
9	109	2	1.4	5.4	5.2	6.6	a
10	112	2	2.9	11.2	5.3	6.6	a
11	104	2	-1.1	-4.2	5.1	6.6	a
12	104	2	-1.1	-4.2	5.1	6.6	a
13	110	2	1.9	7.3	5.2	6.6	a
14	106	2	-0.1	-0.4	5.1	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 600.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

062507-4  
7059

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 25, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 25, 2007	Report Date:				
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52492	10	5196	0.26	
	Instrument Background						
Gross Counts		Count Time (min)		Background Count Rate (cpm)			
3186		60		53			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	104	2	-1.1	-4.2	5.1	6.6	a
16	101	2	-2.6	-10.0	5.0	6.6	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Room 500.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): <i>JWS</i>			License No.: MDE License No: MD-31-281-01	



Time: 10.00  
 Data Mode: Dual DPM

Nuclides: 3H-14C

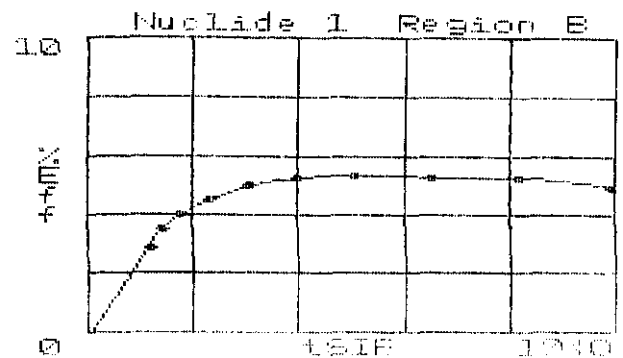
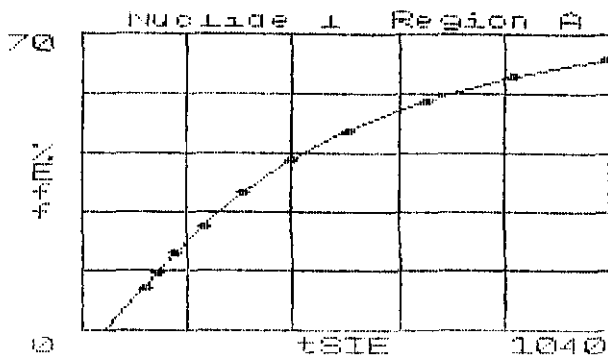
Quench Sets  
 Low Energy: 3H  
 High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.11
Region B:	12.0 - 156		0	0.0	14.19
Region C:	0.0 - 0.0		0	0.0	0.00

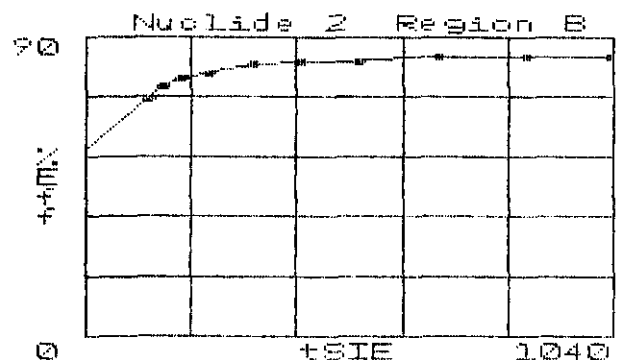
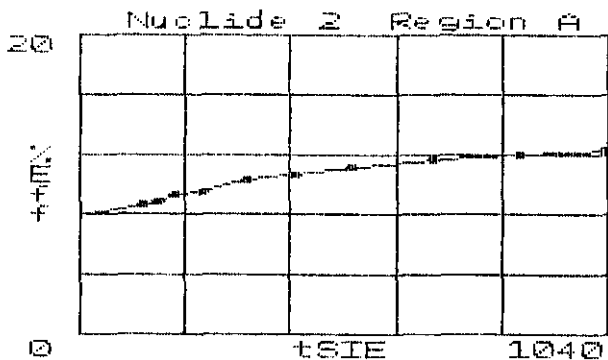
*Room 600*

Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54

062507-4

9069

26 Jun 2007 15:25

TRI-CARB - 1.09

Page #2

Protocol #:26

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.11	14.19			77.335	725.05	B
2	10.00	0.34	0.00	0.62	0.00	0.000	719.36	
3	10.00	0.00	0.00	0.00	0.00	0.000	691.58	
4	10.00	0.00	0.00	0.00	0.00	0.000	695.23	
5	10.00	0.00	0.00	0.00	0.00	0.000	695.41	
6	10.00	0.00	0.00	0.00	0.00	0.000	707.81	
7	10.00	0.65	0.00	1.18	0.00	0.000	715.94	
8	10.00	0.00	0.00	0.00	0.00	0.000	704.82	
9	10.00	1.38	0.00	2.52	0.00	0.000	713.53	
10	10.00	1.22	0.00	2.23	0.00	0.000	706.51	
11	10.00	0.00	0.00	0.00	0.00	0.000	716.01	
12	10.00	0.00	0.00	0.00	0.00	0.000	717.98	
13	10.00	3.32	0.00	6.06	0.00	0.000	717.66	
14	10.00	0.00	0.00	0.00	0.00	0.000	700.65	
15	10.00	0.00	0.93	0.00	1.12	3.611	700.04	
16	10.00	0.00	0.00	0.00	0.00	0.000	706.13	
17	10.00	0.47	0.00	0.85	0.00	0.000	721.05	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-1

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CELL</u>	Date: <u>6/27/07</u>	Time: <u>0855</u>
Instrument SN: <u>43-37 / R177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 600</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Simeon</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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**Notes:** SCANNED 100% OF FLOOR TOXIC READINGS ~ 6 FT. RESULTS IN CMAB

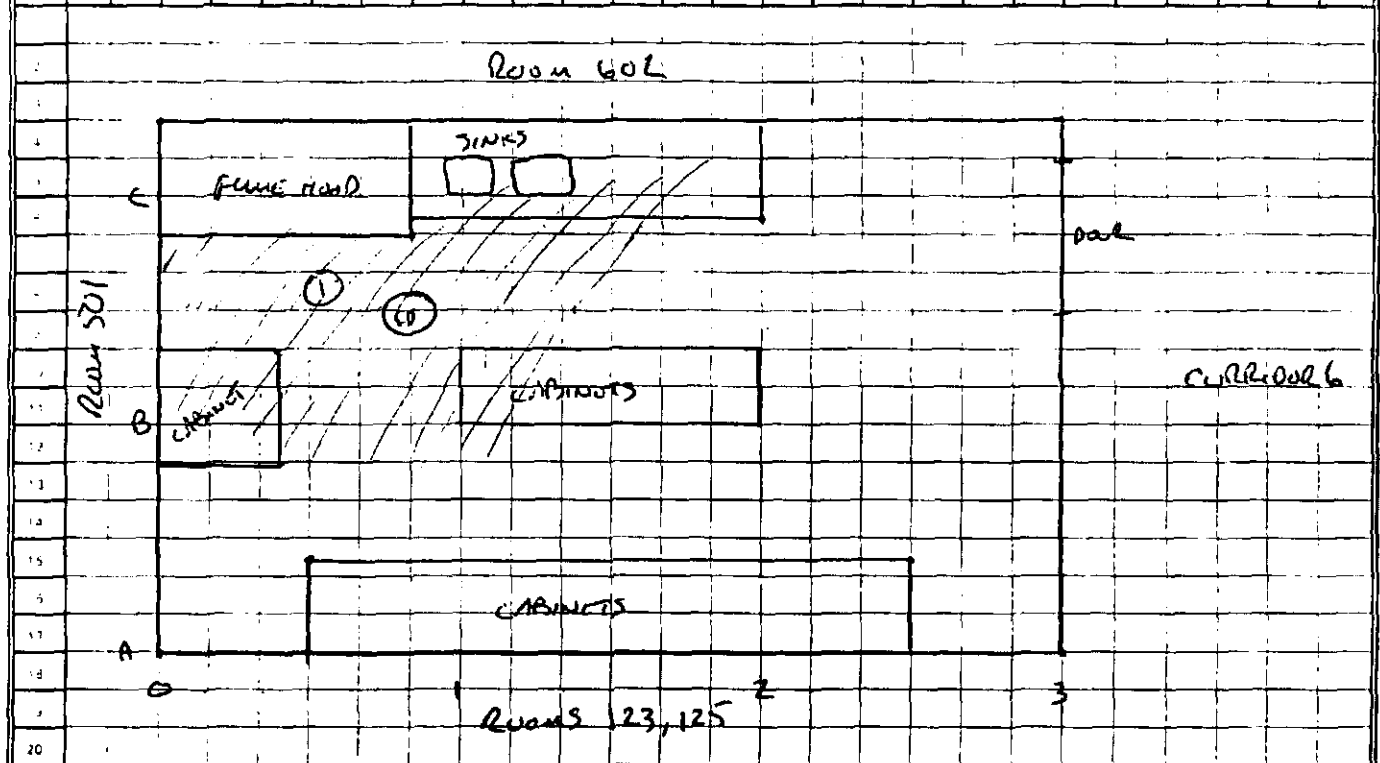
- ① 0/360
- ② 0/350
- ③ 0/380
- ④ 0/360
- ⑤ 0/360
- ⑥ 0/360
- ⑦ 0/360

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-2

Page 1 of 1

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERK</u>	Date: <u>6/29/07</u>	Time: <u>0905</u>
Instrument SN <u>43-68 / PL190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 600</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FS</u>		
Survey Performed By (Print): <u>JERRY W. SIMON</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions <u>101</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED ON FLOOR GRID AND INCLUDED SOME COUNTER TOP. HIGHEST READING IN CPM 013/103CM  
 ① 0/60

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-3

Page 1 of 1

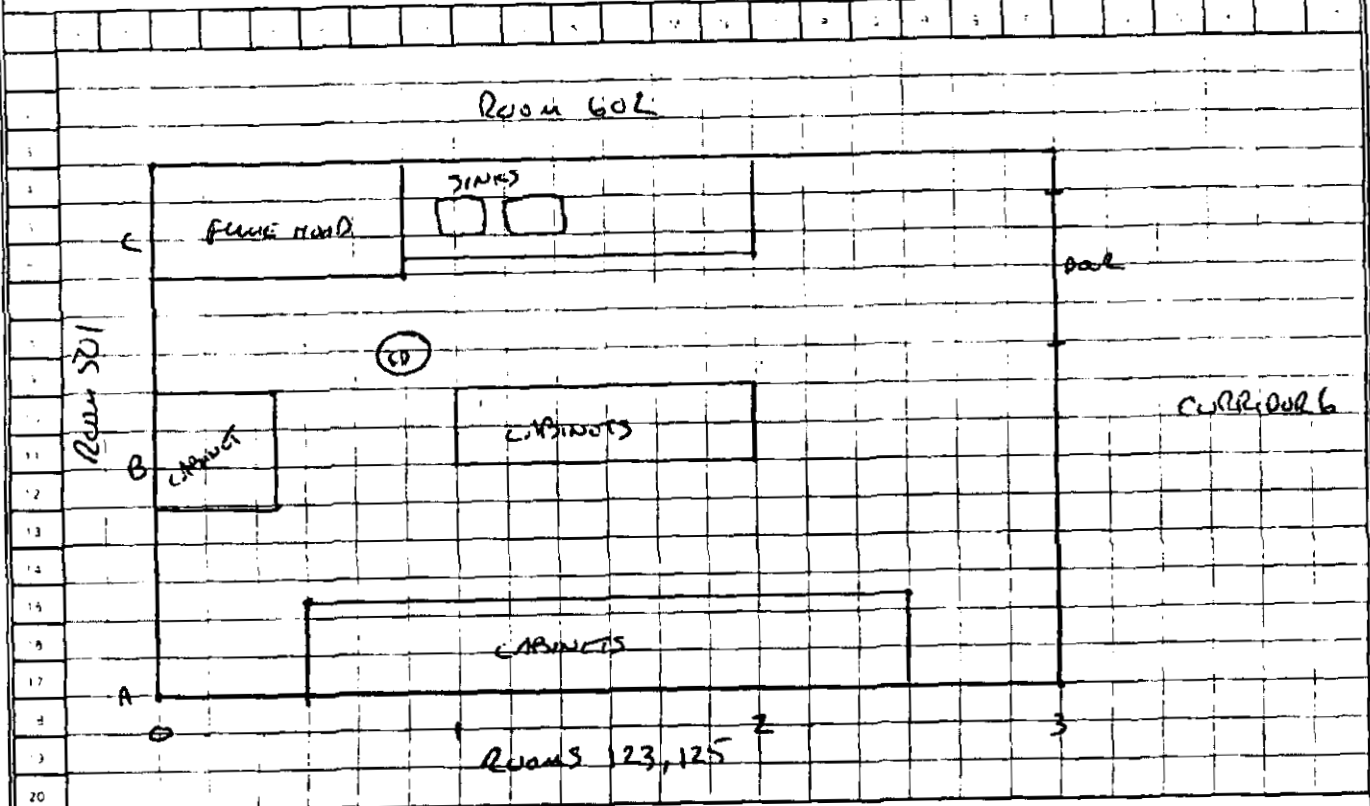
Instrument SN: <b>2224/116239</b>		Calibration Due: <b>10/13/07</b>		Site Name: <b>GLERL</b>		Date: <b>10/5/07</b>	Time: <b>0920</b>																																																																																																																																																																
Instrument SN <b>4368/PR190483</b>		Calibration Due <b>10/13/07</b>		Location: <b>ROOM 600</b>																																																																																																																																																																			
Instrument SN <b>N/A</b>		Calibration Due: <b>N/A</b>		Purpose: <b>F55</b>																																																																																																																																																																			
Survey Performed By (Print) <b>Jeffrey W. Jurek</b>				Survey Performed By (Signature) <i>[Signature]</i>																																																																																																																																																																			
<input checked="" type="checkbox"/> Battery OK		<input checked="" type="checkbox"/> HV OK		<input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <b>2 x 2</b> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																																																																																																																																																																	
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WALL ADJACENT TO CORRIDOR 6				WALL ADJACENT TO ROOM 501																																																																																																																																																																			
<p>Notes: <b>SCANNED 2 WALL GRIDS. HIGHEST READING IN CPM @ 1/3</b></p> <p>① 0/80</p> <p>② 0/60</p>																																																																																																																																																																							

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number: 062207-5

Page 1 of 1

Instrument SN: <u>BICR20 / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CELL</u>	Date: <u>6/27/07</u>	Time: <u>1005</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 602</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMNER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters	



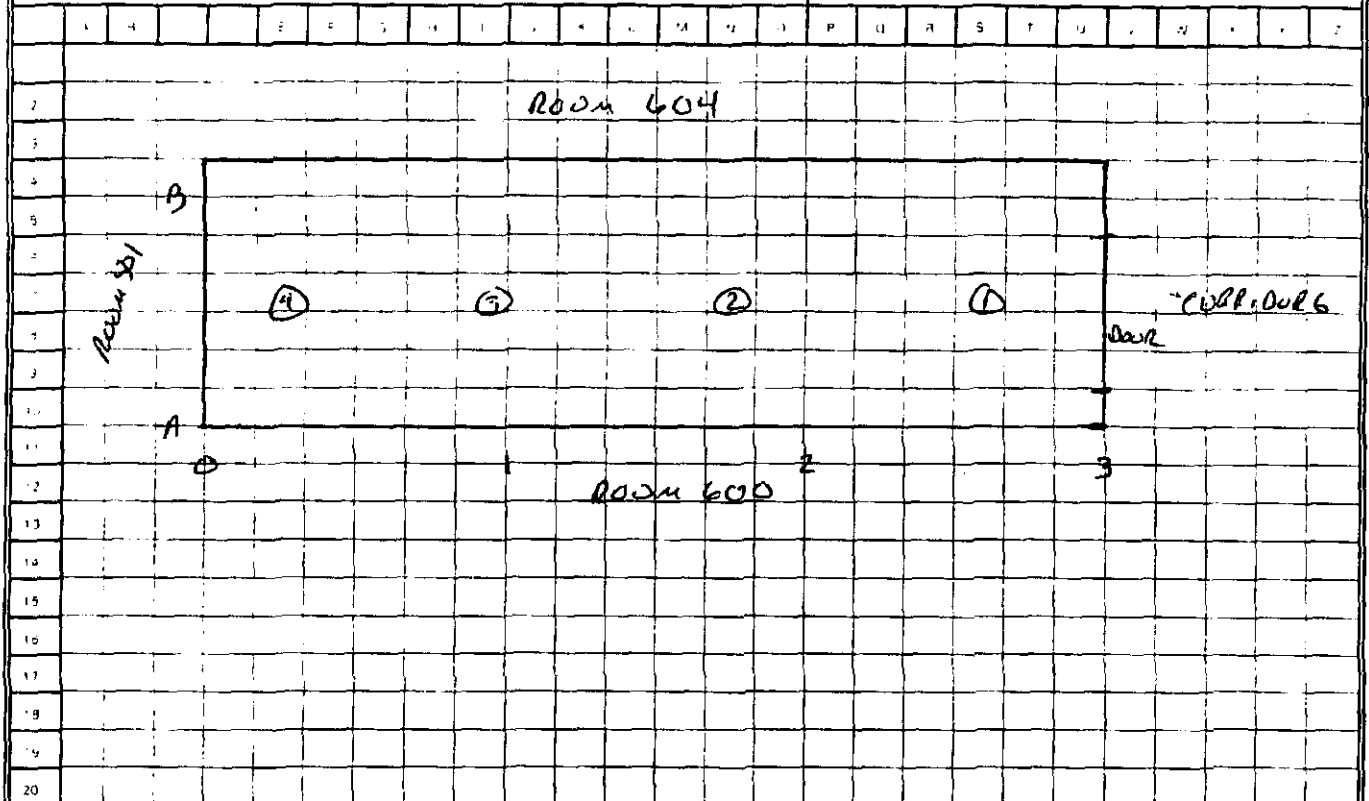
Notes: BKGD = 10 uRm/h. WALKED ROOM WITH MOTOR WAIST HIGH. NO READINGS ABOVE BKGD. START WITH SINK DRAINS = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062527-6

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLERL</u>	Date: <u>4/2/07</u>	Time: <u>1010</u>
Instrument SN: <u>4337 / PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 602</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Szymanski</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SUBJECTED 100% OF FLOOR. TOOK READINGS ~ 6 FT. RESULTS IN CPM 0/13

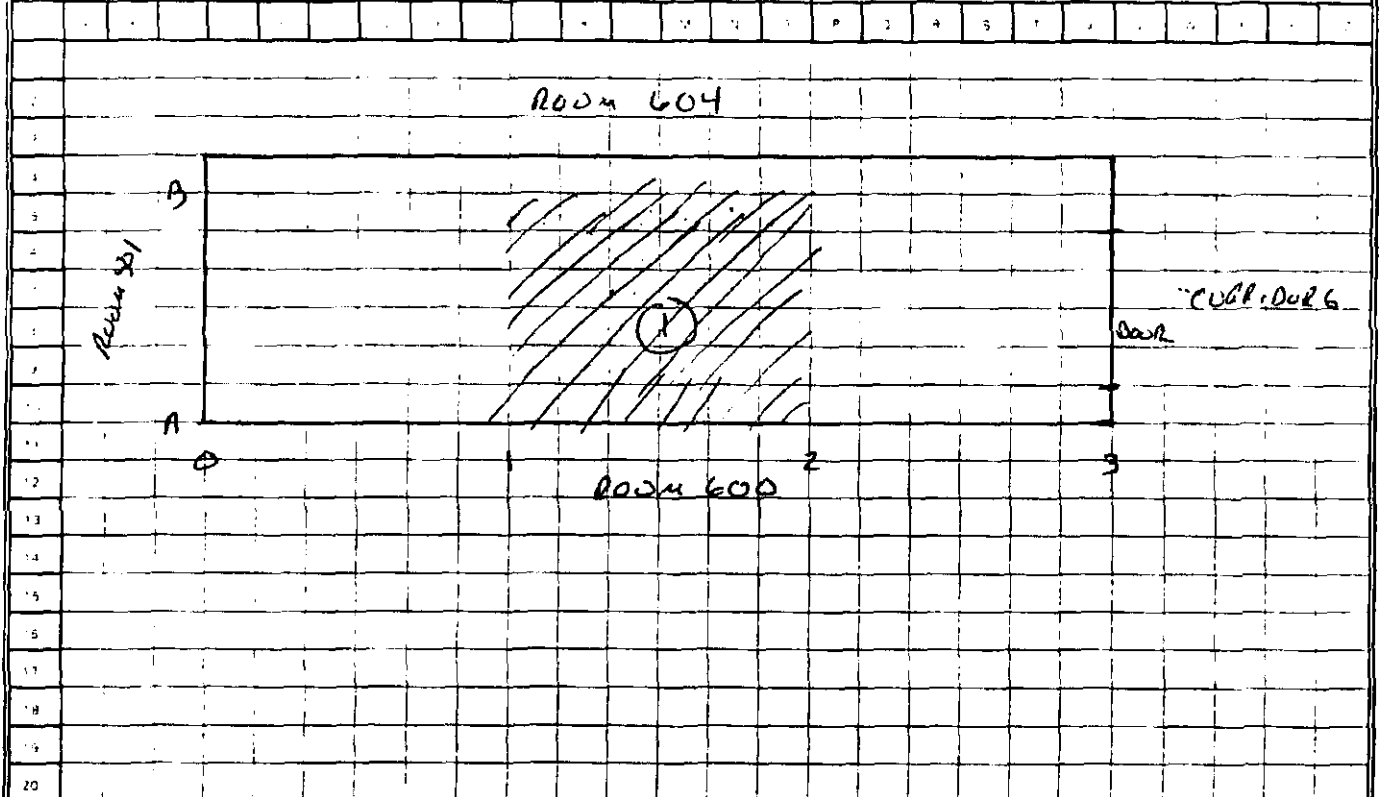
- ① 0/340
- ② 0/360
- ③ 0/360
- ④ 0/360

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062307-7

Page 1 of 1020

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>4/24/07</u>	Time:
Instrument SN <u>43-68 / PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 602</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print) <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes  
 SEARCHED ONE FOOT GRID. HIGHEST READING IN CPM @ B/POSCHE  
 ① 0/80



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062527-8

Page 1 of 1

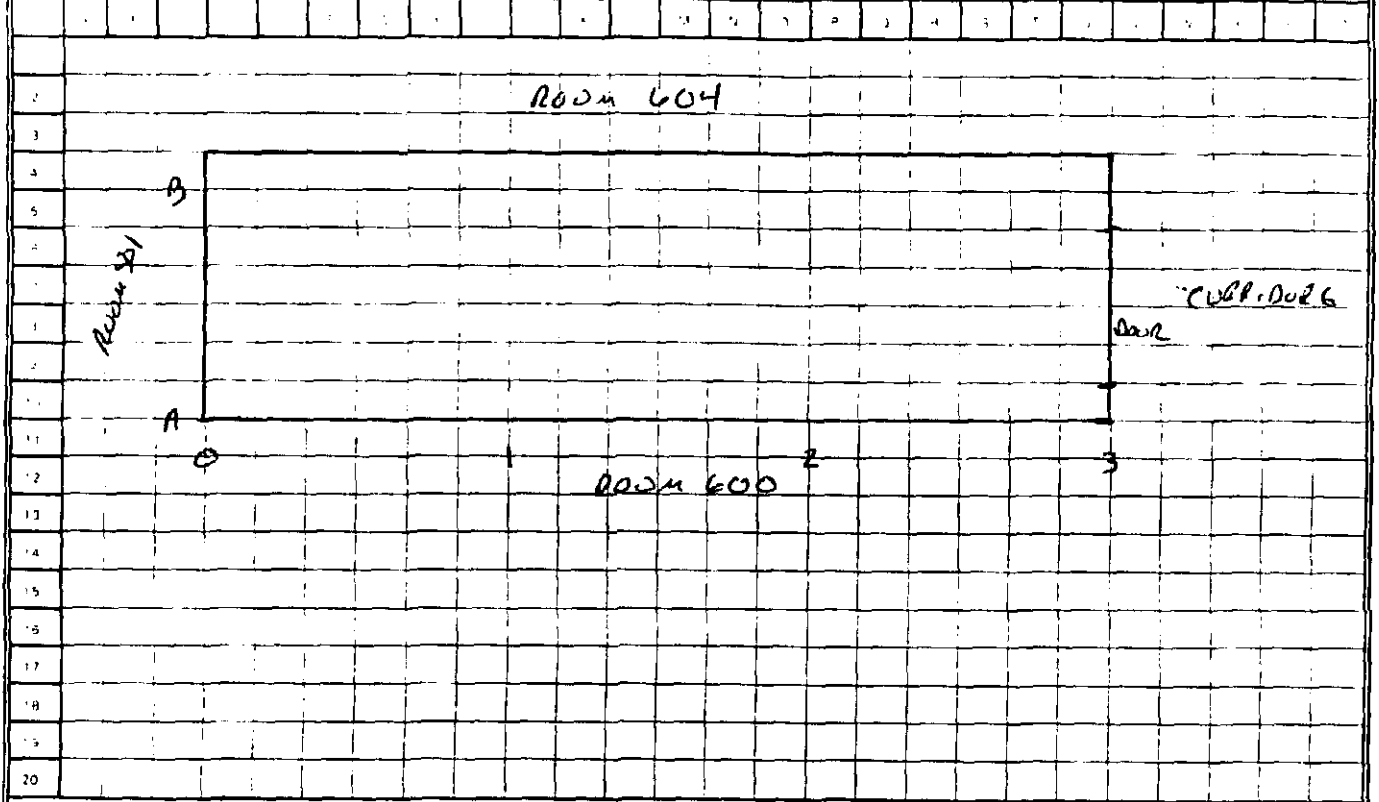
Instrument SN: <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLERK</u>	Date: <u>6/27/07</u>	Time: <u>1030</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																								
Instrument SN: <u>43-681 PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 602</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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<p>Notes: SURVEYED 2 WALL GRIDS. HIGHEST READINGS IN CPM @ 1B / 10000</p> <p>① 0/80</p> <p>② 0/80</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																												

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062327-10

Page 1 of 1

Instrument SN: <u>BICRON B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLRL</u>	Date: <u>4/24/07</u>	Time: <u>1055</u>
Instrument SN: <u>W/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 602</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Syclo</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>14'</u>	
		<input type="checkbox"/> meters		<input type="checkbox"/> inches
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters



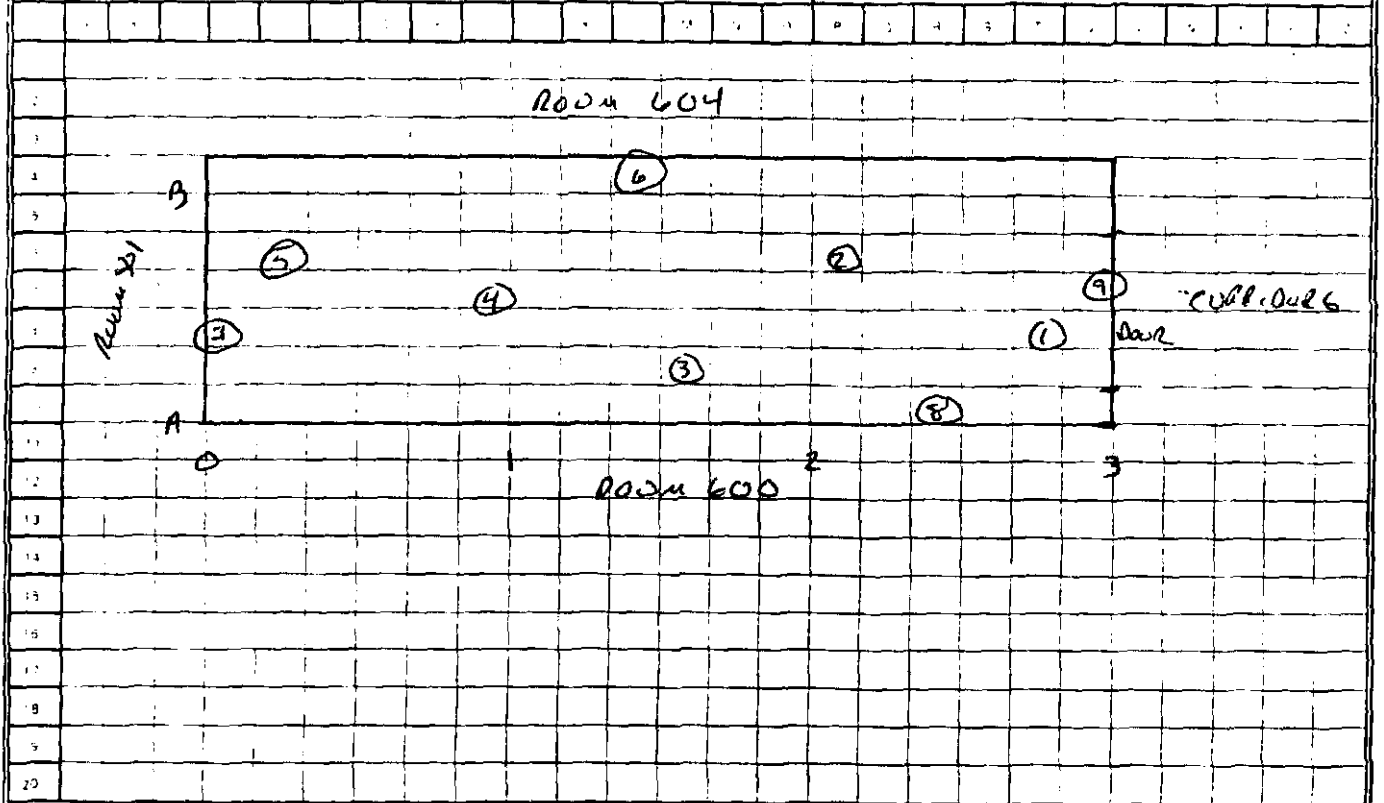
Notes: BKGD = 15  $\mu$ Rm/h. WORKED ROOM WITH MOTOR WAIST HIGH. NO READINGS ABOVE BKGD.

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062527-9

Page 1 of 5

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>10/2/07</u>	Time: <u>1050</u>
Instrument SN <u>43-681 PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 602</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print) <u>JEFFREY W. SUGLID</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> PIN OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>141</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: TOOK 2 MINUTE STATIC COUNTS. 10 SECTS IN CPMD/B/100CM<sup>2</sup>. TOOK 5 MINUTES FOR LSC IN SAME LOCATIONS.

062507-9  
2 of 5

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

### Room 602

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.5, 2+4.5	0/214
2 A+4.5, 2+0.5	1/197
3 A+1.5, 1+3.5	2/209
4 A+3.0, 0+5.5	0/211
5 A+4.5, 0+1.5	0/207
6 B+1.0, 1+2.5, 6.0	1/202
7 A+2.5, 0+0.0, 4.0	1/206
8 A+0.0, 2+2.5, 4.0	0/199
9 A+3.5, 3+0.0, 2.0	1/203

062507-9  
3085

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

High Energy: 14C

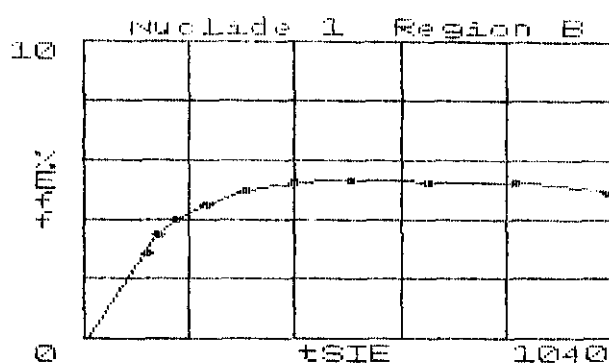
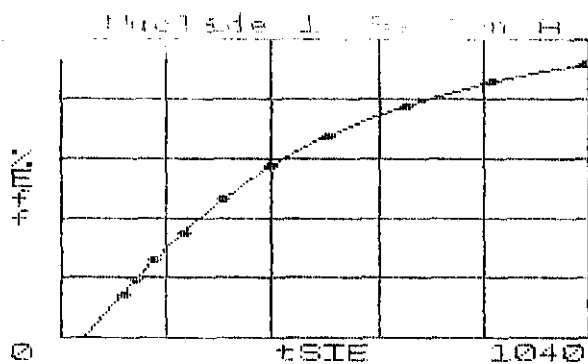
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	9.85
Region B:	12.0 - 156		0	0.0	15.25
Region C:	0.0 - 0.0		0	0.0	0.00

*Room 603*

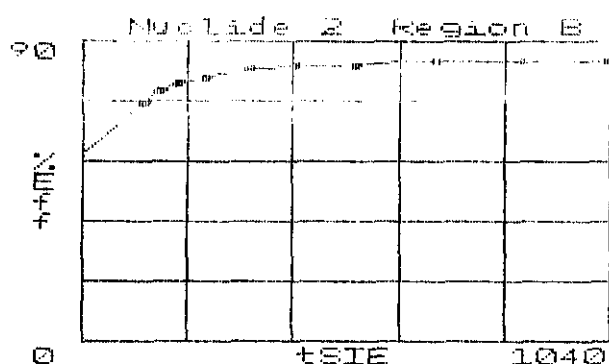
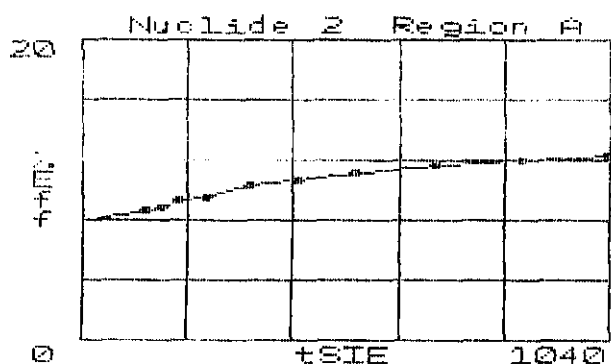
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54

26 Jun 2007 18:32 TRI-CARB - 1.09  
Protocol #:29 SURVEY

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.60	152.93	75.21	122.58	71.51

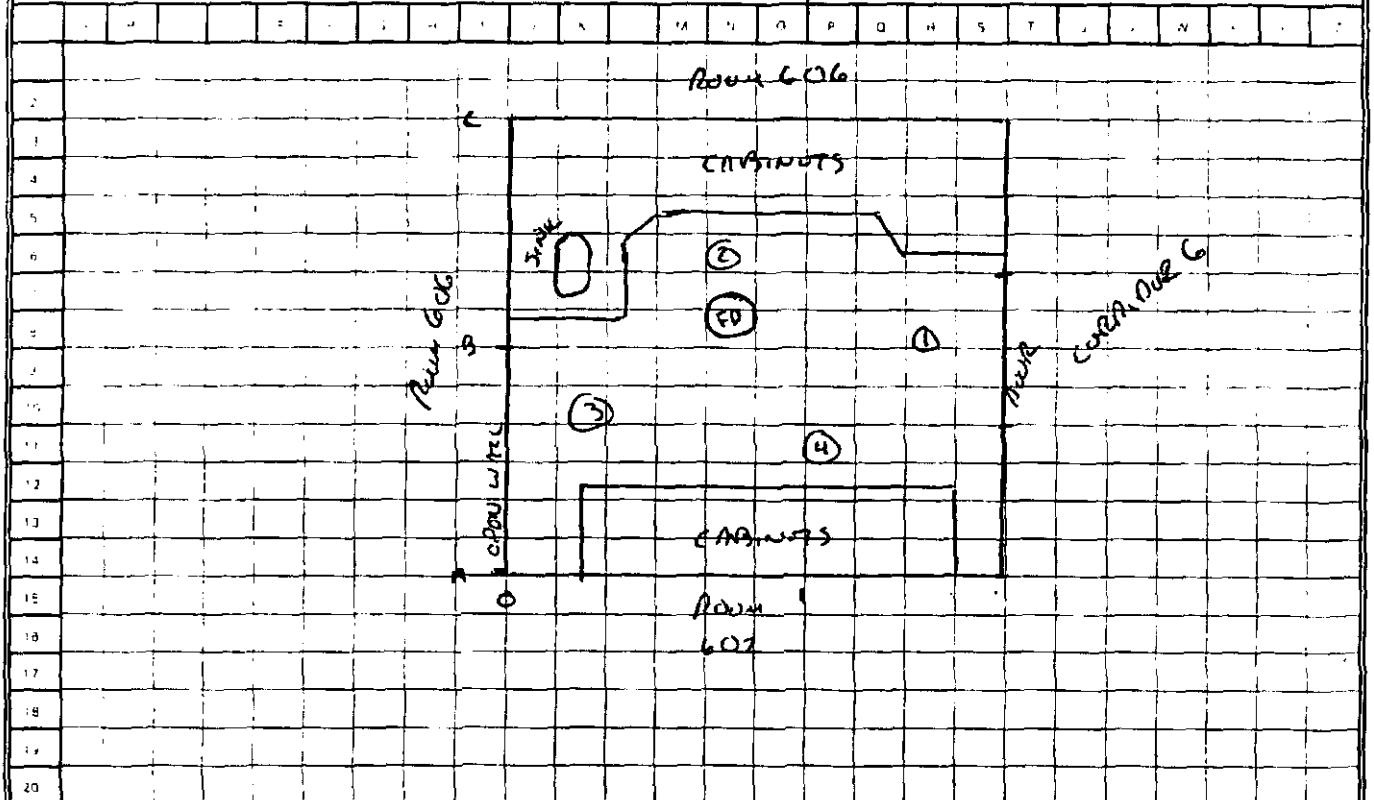
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	9.85	15.25			76.225	701.57	B
2	10.00	0.00	0.00	0.00	0.00	0.000	709.28	
3	10.00	1.59	0.00	2.90	0.00	0.000	720.00	
4	10.00	3.78	0.00	6.95	0.00	0.000	705.19	
5	10.00	1.02	0.00	1.88	0.00	0.000	702.42	
6	10.00	2.46	0.00	4.50	0.00	0.000	710.34	
7	10.00	2.71	0.00	4.97	0.00	0.000	704.78	
8	10.00	0.88	0.00	1.60	0.00	0.000	717.80	
9	10.00	1.83	0.00	3.33	0.00	0.000	719.22	
10	10.00	0.00	0.00	0.00	0.00	0.000	718.24	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062527-11

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLRC</u>	Date: <u>9-2-07</u>	Time: <u>1100</u>
Instrument SN: <u>43-37/PR 177476</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 604</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED 100% OF FLOOR. TOOK READINGS ~ 6 FT. RESULTS IN  
CPM a/B

- ① 0 / 340
- ② 0 / 360
- ③ 0 / 360
- ④ 0 / 360

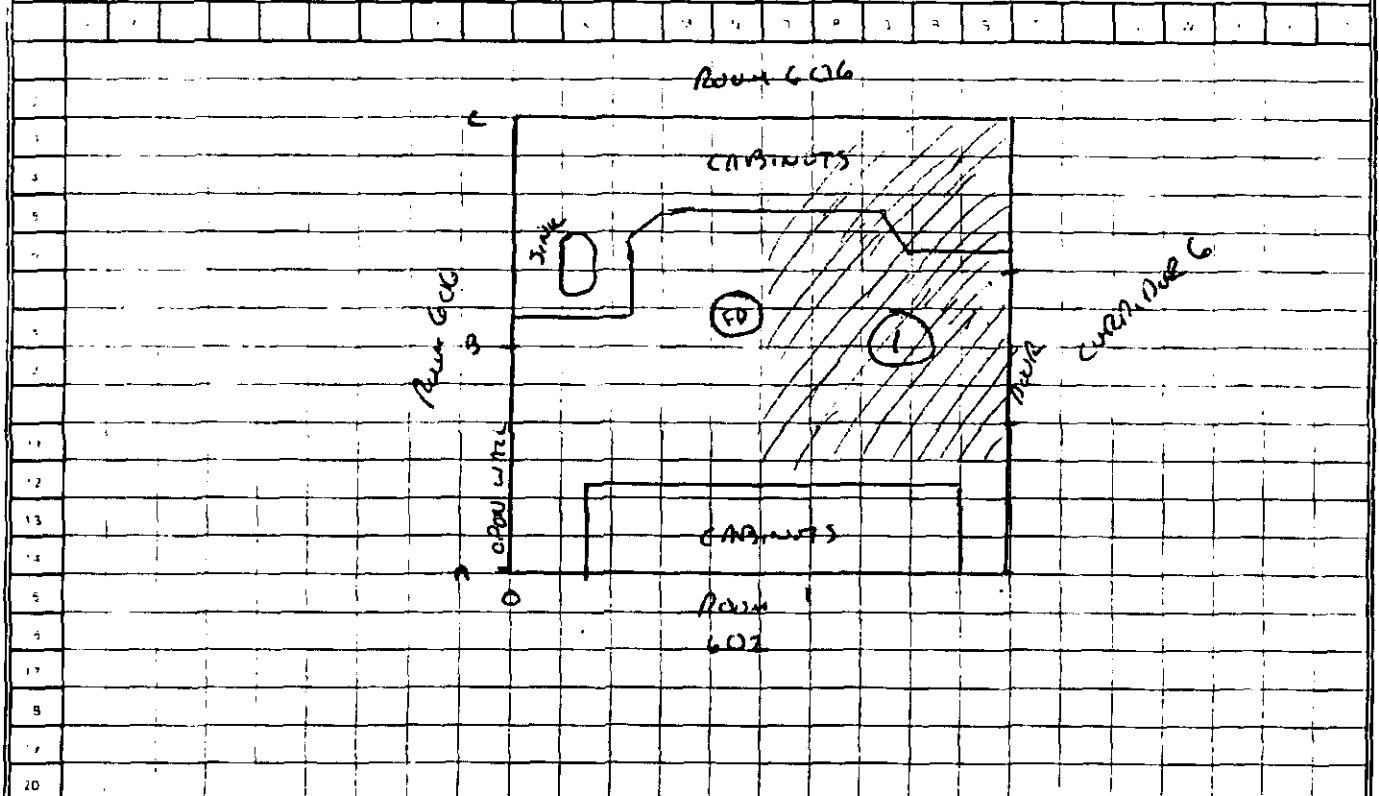


**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-12

Page 1 of 1

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>11/2/07</u>	Time: <u>1110</u>
Instrument SN <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 604</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>161</u>	
			<input type="checkbox"/> meters	<input type="checkbox"/> inches
			<input checked="" type="checkbox"/> feet	<input type="checkbox"/> centimeters



Notes  
 SEARCHED ONE FEWER GR.D. AND SOME COUNTER TOP. HIGHEST READING IN CPM 0/80

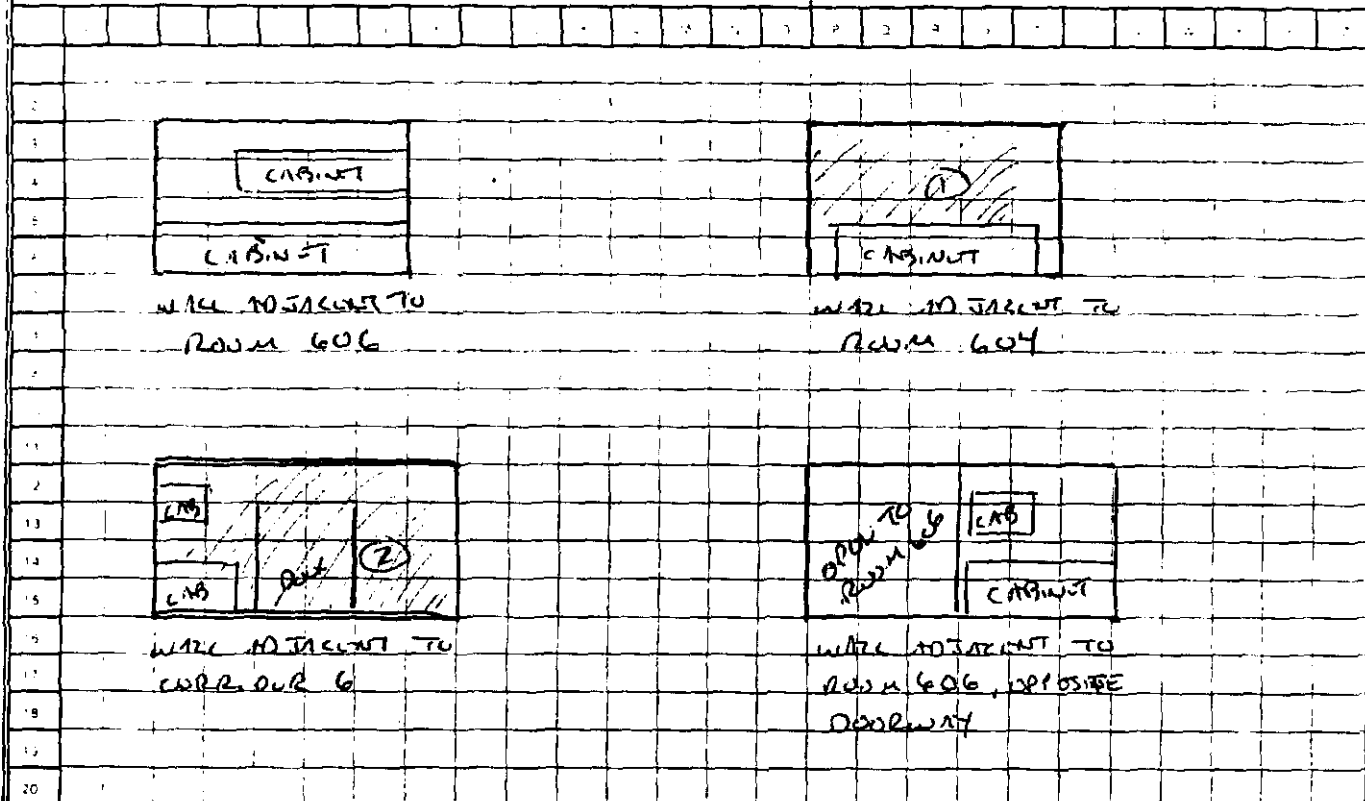
① 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-13

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLOR</u>	Date: <u>4/7/07</u>	Time: <u>1120</u>
Instrument SN: <u>43-68 / PR177476</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 601</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>J. DEAN W. SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u>	
		<input type="checkbox"/> meters	<input type="checkbox"/> inches	
		<input checked="" type="checkbox"/> feet	<input type="checkbox"/> centimeters	



Notes: SCANNED 2 WALL CABS. HIGHEST READINGS IN ROOM 601/0606

① 0/60

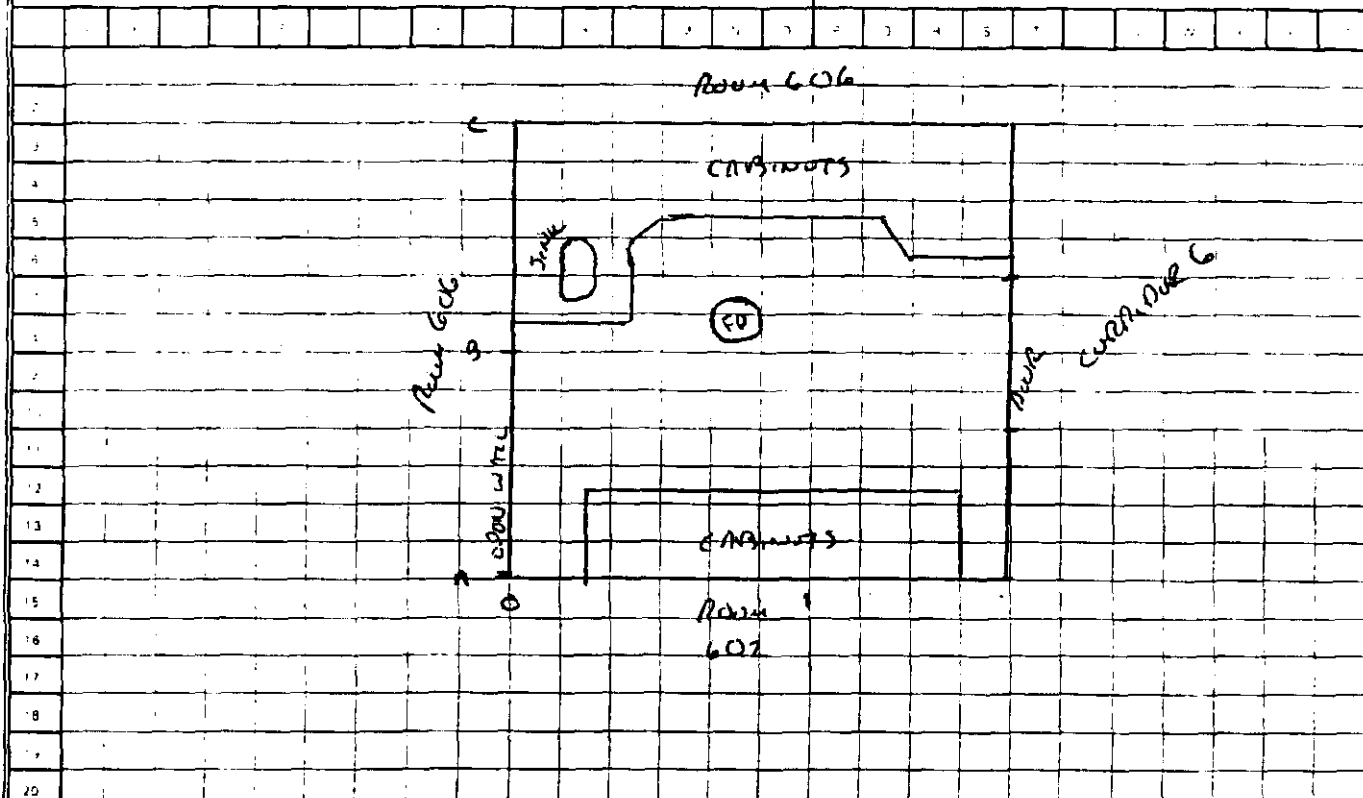
② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-13

Page 1 of 1

Instrument SN: <u>BICLOW/B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLORC</u>	Date: <u>4/1/07</u>	Time: <u>1155</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 604</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
Battery OK <input checked="" type="checkbox"/>	AIV OK <input checked="" type="checkbox"/>	Source Check OK <input checked="" type="checkbox"/>	Grid Dimensions: <u>10'</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



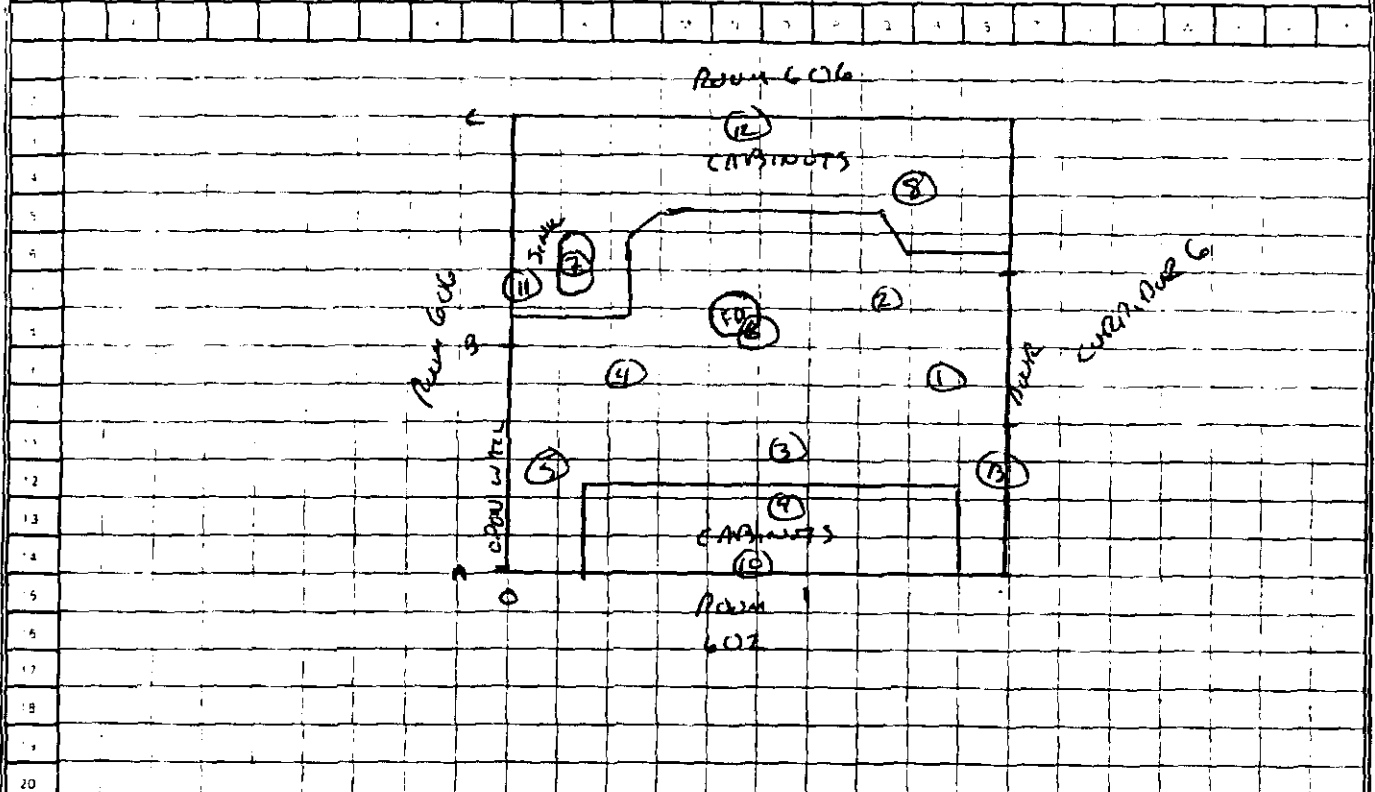
Notes  
 BKGD = 10  $\mu$ Rom/h. WATERED ROOM WITH METER WAIST HIGH,  
 NO READINGS ABOVE BKGD. CONTACT WITH SINK  
 DRAIN = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062257-M

Page 1 of 5

Instrument SN <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORC</u>	Date: <u>4/12/07</u>	Time: <u>11:50</u>
Instrument SN <u>43-681 PR 190453</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 604</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W. SULLIVAN</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



NOTES: PERFORMED 2 MINUTE STATIC COUNTS. RESULTS IN CPM @ 15/100 CM<sup>2</sup>.  
 TOOK SAMPLES FOR LSC IN SAME LOCATIONS.

062527-14  
20F 5

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

#### Room 604

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+5.5, 1+2.5	1/209
2 B+1.5, 1+1.5	1/211
3 A+2.5, 0+5.5	0/204
4 A+5.5, 0+2.5	0/212
5 A+3.0, 0+1.0	1/206
6 B+1.0, 0+4.5	2/200
7 B+4.0, 0+1.5, 2.0	1/207
8 B+4.0, 1+2.0, 2.5	1/202
9 A+1.5, 0+5.5, 2.5	1/210
10 A+0.0, 0+5.0, 4.0	0/198
11 B+1.5, 0+0.0, 4.0	1/203
12 C+0.0, 0+4.5, 4.0	0/197
13 A+2.5, 1+4.0, 2.0	1/209

062507-14

3055

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00  
 Data Mode: Dual DPM

Nuclides: 3H-14C

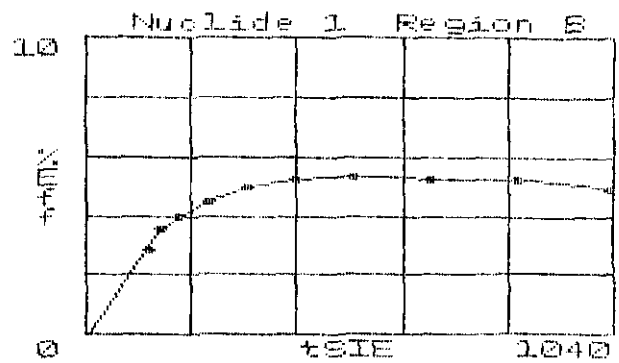
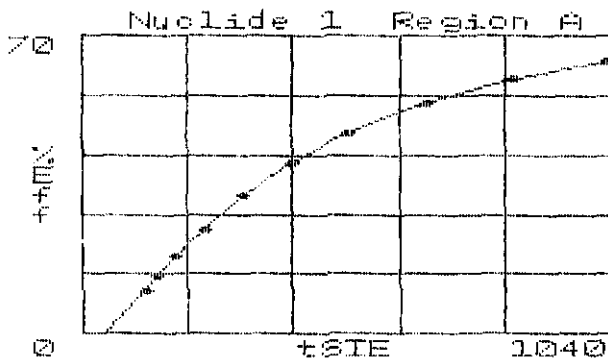
Quench Sets  
 Low Energy: 3H  
 High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	25%	BKG
Region A:	0.0 - 12.0		0	0.0	11.25
Region B:	12.0 - 156		0	0.0	12.35
Region C:	0.0 - 0.0		0	0.0	0.00

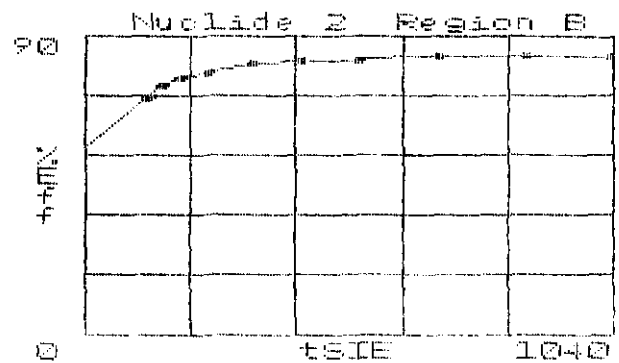
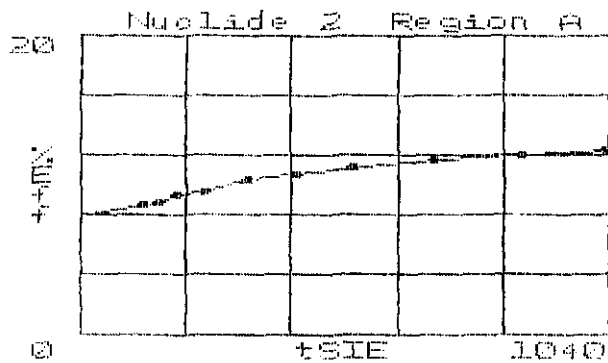
Room 604

Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

062507-14  
SUFS

26 Jun 2007 20:21

TRI-CARB - 1.09

Page #2

Protocol #:32

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	11.25	12.35			75.381	716.08	B
2	10.00	1.52	0.58	2.64	0.52	0.000	712.22	
3	10.00	0.00	0.33	0.00	0.40	0.000	702.93	
4	10.00	0.00	0.42	0.00	0.50	0.000	708.61	
5	10.00	0.00	0.48	0.00	0.57	0.000	711.22	
6	10.00	0.26	0.35	0.39	0.38	0.000	713.90	
7	10.00	1.03	1.07	1.60	1.17	14.865	721.24	
8	10.00	1.05	0.00	1.90	0.00	0.000	723.32	
9	10.00	0.00	0.00	0.00	0.00	0.000	709.23	
10	10.00	0.25	0.85	0.25	0.99	0.000	729.90	
11	10.00	5.06	0.64	9.08	0.19	0.000	715.95	
12	10.00	3.56	0.84	6.31	0.60	0.000	709.97	
13	10.00	0.31	0.86	0.35	1.00	0.000	719.63	
14	10.00	0.25	0.00	0.46	0.00	0.000	724.20	



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-19

Page 1 of 5

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELL</u>	Date: <u>4/2/07</u>	Time: <u>1310</u>
Instrument SN: <u>43-68/PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 606</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. James</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> GIN OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		

*Room 608*

*Room 606*

Notes

062507-19  
345

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

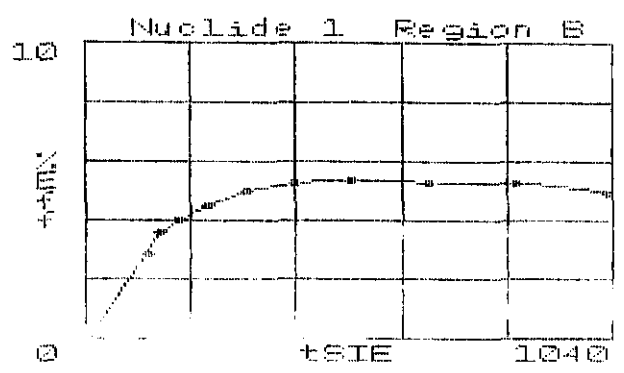
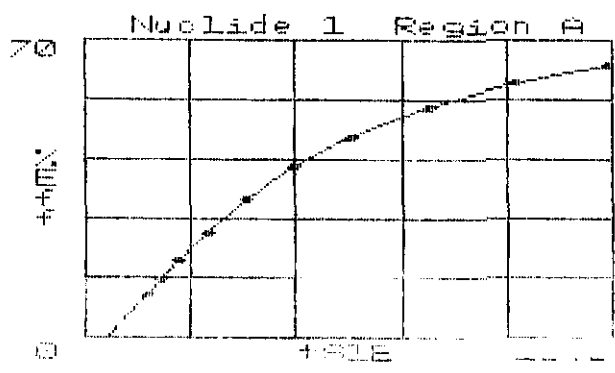
Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00  
 Data Mode: Dual DPM Nuclides: 3H-14C Quench Sets  
 Background Subtract: 1st Vial Low Energy: 3H High Energy: 14C

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	11.04
Region B:	12.0 - 156		0	0.0	11.86
Region C:	0.0 - 0.0		0	0.0	0.00

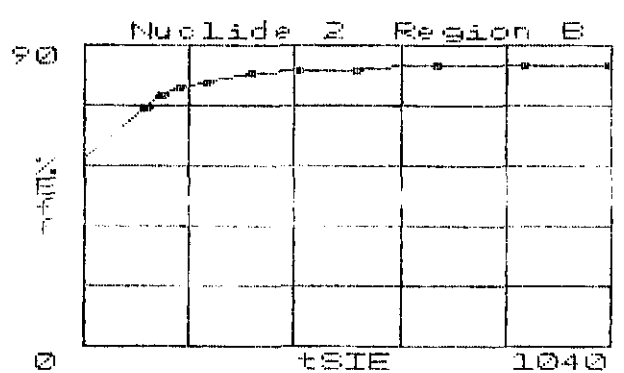
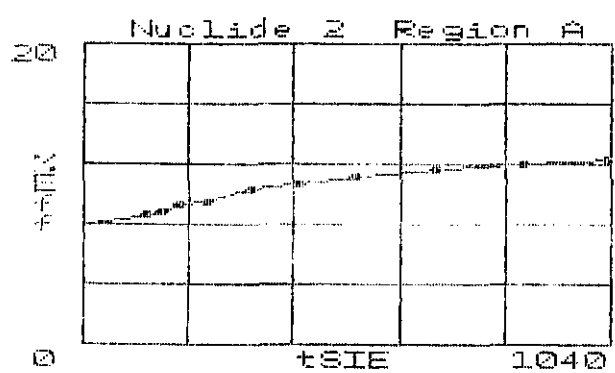
*Room 606*

Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

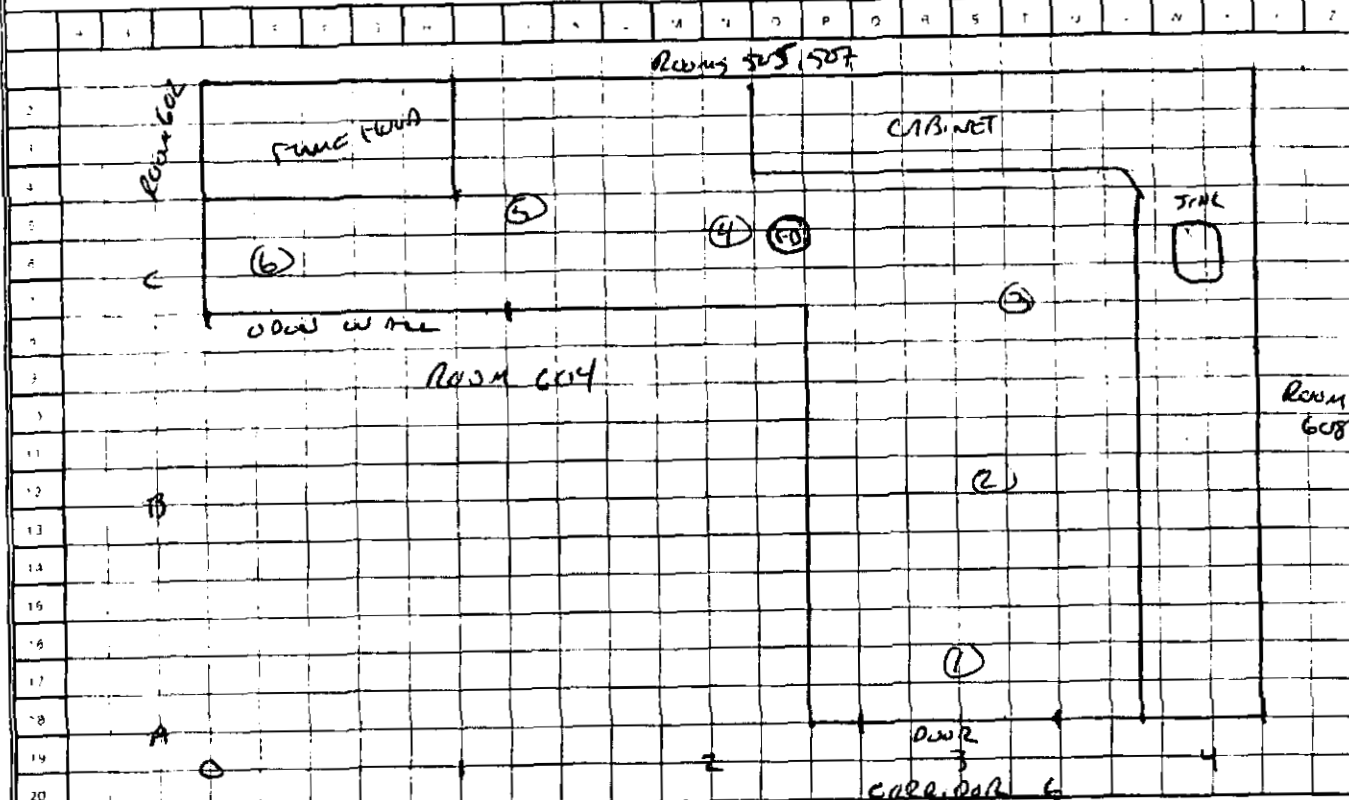
S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.04	11.86			64.144	714.00	B
2	10.00	0.00	0.77	0.00	0.92	0.000	721.65	
3	10.00	0.00	1.03	0.00	1.24	299.81	726.29	
4	10.00	0.00	1.15	0.00	1.38	397.72	708.00	
5	10.00	0.00	0.50	0.00	0.60	0.000	698.21	
6	10.00	0.00	0.00	0.00	0.00	0.000	707.45	
7	10.00	0.00	0.01	0.00	0.01	0.000	710.28	
8	10.00	0.50	0.00	0.91	0.00	0.000	711.18	
9	10.00	1.50	0.80	2.55	0.79	94.172	711.79	
10	10.00	1.18	0.02	2.17	0.00	266.16	703.49	
11	10.00	0.75	0.00	1.37	0.00	0.000	723.97	
12	10.00	0.00	3.93	0.00	4.72	206.46	708.11	
13	10.00	0.67	0.96	0.99	1.08	165.49	714.91	
14	10.00	1.06	0.00	1.94	0.00	0.000	715.84	
15	10.00	1.79	1.51	2.88	1.61	64.672	716.56	
16	10.00	0.00	0.47	0.00	0.56	1104.2	731.09	
17	10.00	0.00	2.12	0.00	2.55	0.000	726.63	
18	10.00	0.00	2.95	0.00	3.54	257.07	708.70	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-16

Page 1 of 1

Instrument SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CELL 2L</u>	Date: <u>6/2/07</u>	Time: <u>1205</u>
Instrument SN: <u>43-37/PR177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>ROOM 606</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SWANNED 100% OF FLOOR, TOOK READINGS ~ 6 FT. RESULTS IN CPM α/β

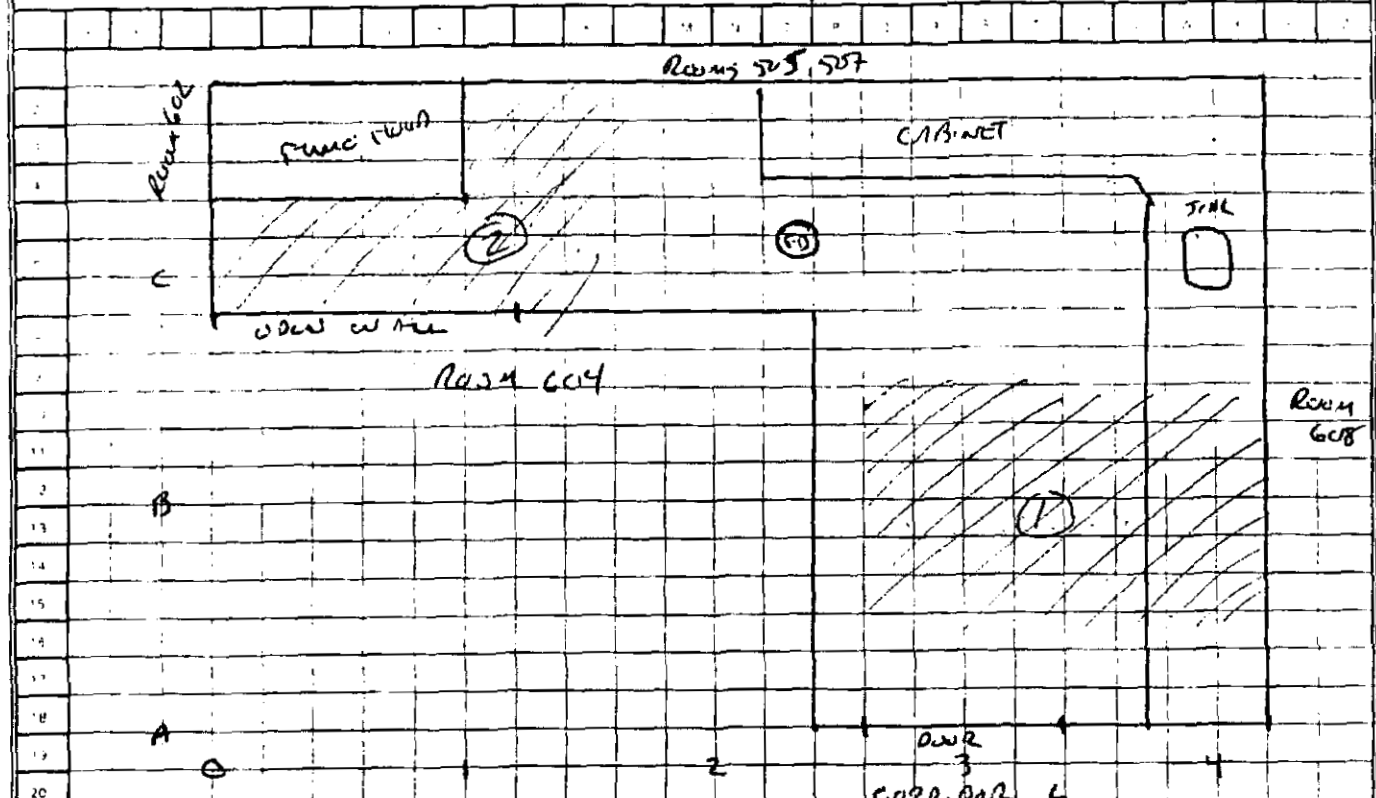
- ① 0/360
- ② 0/380
- ③ 0/380
- ④ 0/360
- ⑤ 0/380
- ⑥ 0/380

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-17

Page 1 of 1

Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CCCR</u>	Date: <u>9/27/07</u>	Time: <u>12:15</u>
Instrument SN: <u>43-68/PR-190583</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 606</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Meter OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



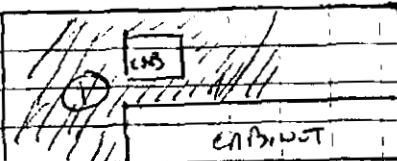
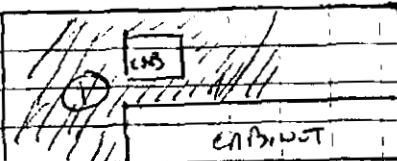
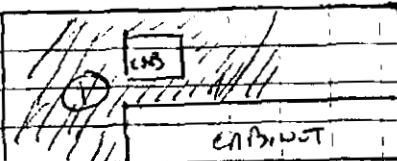
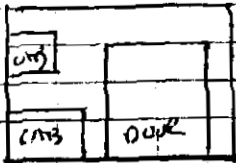
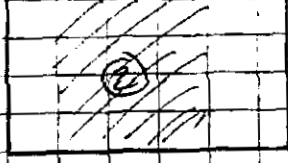

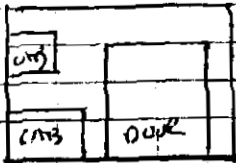
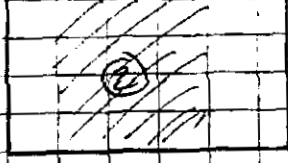

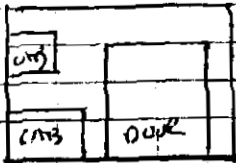
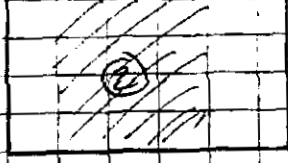

NOTE: SKIPPED 2 FLOOR GRIDS AND SOME COUNTER TOP. HIGHEST READINGS IN CPM A/B/1000RZ

① 0/80  
 ② 0/80

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062507-18

Page 1 of 1

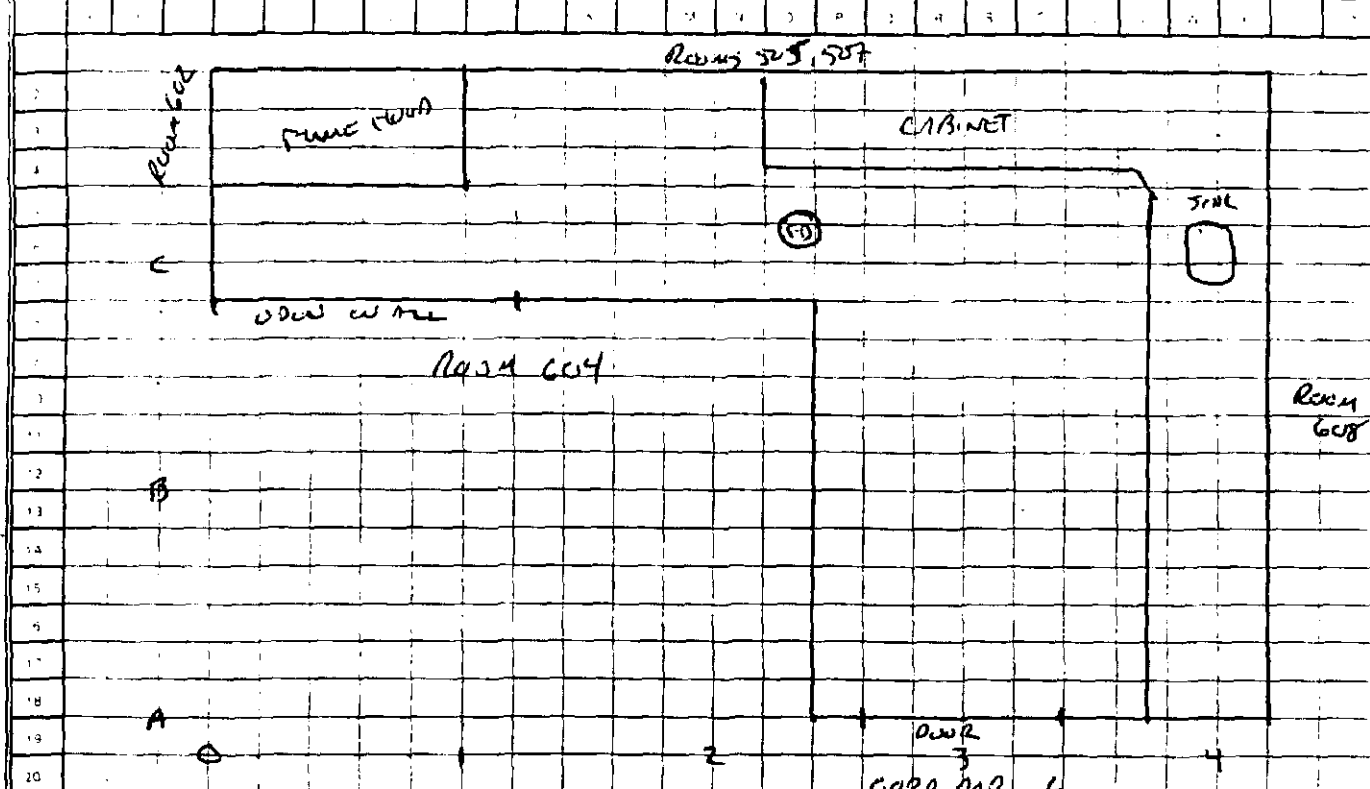
Instrument SN <u>2227 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>ALCOR</u>	Date <u>12/07</u>	Time <u>1230</u>								
Instrument SN <u>43-687 PR140483</u>	Calibration Due <u>10/13/07</u>	Location: <u>Room 606</u>										
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>										
Survey Performed By (Print)		Survey Performed By (Signature) <u>MJL</u>										
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%; height: 40px; vertical-align: middle;">Fume Hood</td> <td style="width:25%; height: 40px; vertical-align: middle;">  </td> <td style="width:25%; height: 40px; vertical-align: middle;">CABINET</td> <td style="width:25%; height: 40px; vertical-align: middle;">CABINET</td> </tr> <tr> <td colspan="2" style="text-align:center;">WALL ADJACENT TO ROOMS 505, 507</td> <td colspan="2" style="text-align:center;">WALL ADJACENT TO ROOM 608</td> </tr> </table>					Fume Hood		CABINET	CABINET	WALL ADJACENT TO ROOMS 505, 507		WALL ADJACENT TO ROOM 608	
Fume Hood		CABINET	CABINET									
WALL ADJACENT TO ROOMS 505, 507		WALL ADJACENT TO ROOM 608										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%; height: 40px; vertical-align: middle;">  </td> <td style="width:33%; height: 40px; vertical-align: middle;">  </td> <td style="width:33%; height: 40px; vertical-align: middle;">  </td> </tr> <tr> <td style="text-align:center;">WALL ADJACENT TO CORR. DR. 6</td> <td style="text-align:center;">WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6</td> <td style="text-align:center;">WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6</td> </tr> </table>								WALL ADJACENT TO CORR. DR. 6	WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6	WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6		
												
WALL ADJACENT TO CORR. DR. 6	WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6	WALL ADJACENT TO ROOM 604, PARALLEL TO CORR. DR. 6										
<p>Notes: SKETCHED 2 WALL GR. DS. HIGHEST READINGS IN CORR. DR. / ROOM</p> <p>① 0/80</p> <p>② 0/80</p>												

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062507-20

Page 1 of 1

Instrument SN: <u>BICLOW 132966</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CCCL</u>	Date: <u>6/2/07</u>	Time: <u>1315</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 606</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Simon</u>		Survey Performed By (Signature): <u>[Signature]</u>		
Battery OK <input checked="" type="checkbox"/>	Source Check OK <input checked="" type="checkbox"/>	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		



Notes: BKGD: 15 mRm/h. WORKED ROOM WITH MOTOR AT WAIST HGT.  
NO READINGS ABOVE BKGD. CONTACT WITH SINK DRAIN  
= BKGD.



INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number 062207-16

Page 1 of 1

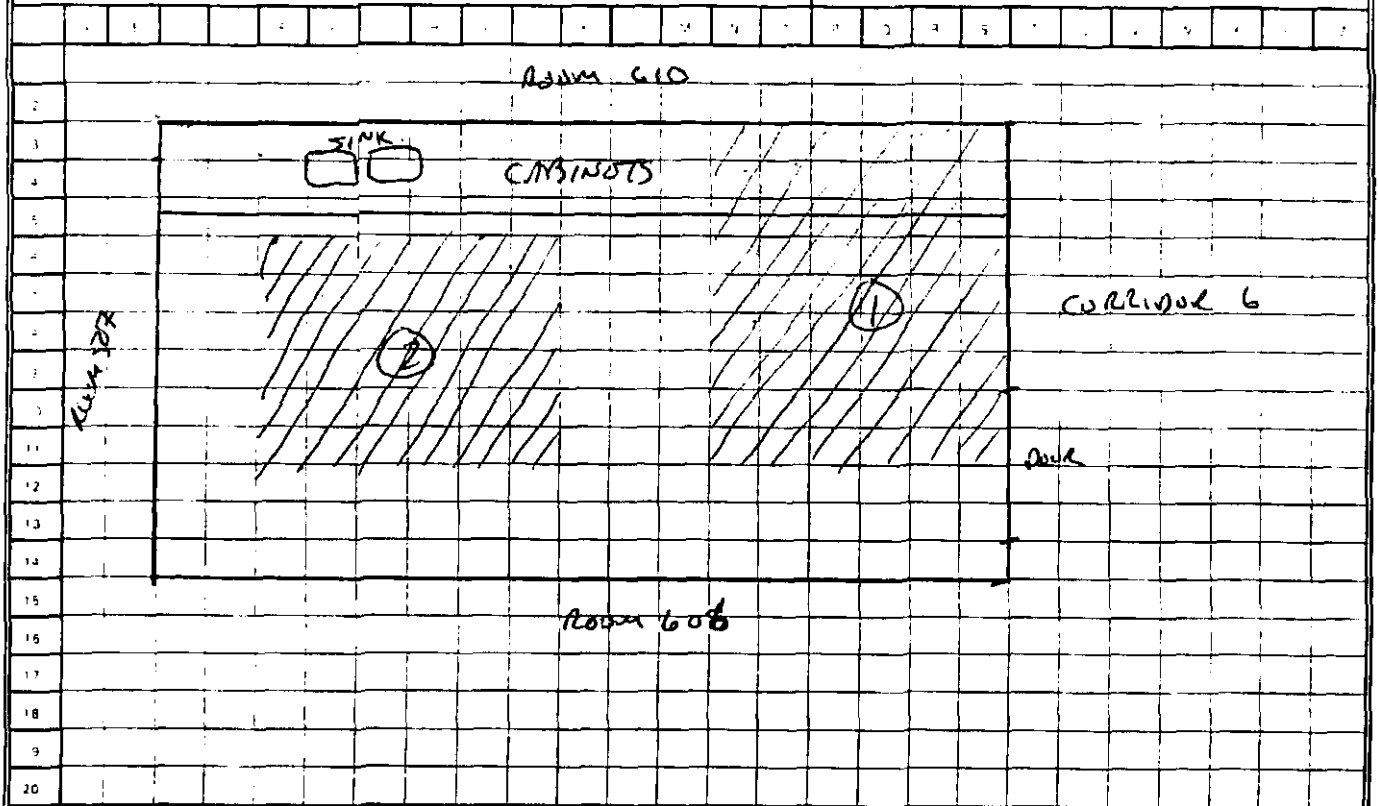
Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLERL</u>	Date: <u>6/22/07</u>	Time: <u>1230</u>
Instrument SN: <u>43-37 / PR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 608</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
Battery OK	ΔHV OK	ΔSource Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	
<p style="text-align: center;"><u>Room 610</u></p>				
<p>Notes: <u>SCANNED 100% OF FLOOR. TOOK READINGS ~ 6 FT. RESULTS IN 0.13 CPA</u></p> <p>① 0 / 360          ② 0 / 380          ③ 0 / 360          ④ 0 / 400          ⑤ 0 / 400          ⑥ 0 / 360</p>				

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-17

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLCRL</u>	Date: <u>6/22/07</u>	Time: <u>1245</u>
Instrument SN: <u>43-68 / PR 190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 608</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W. Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
Battery OK	EHV OK	Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: SCANNED 2 FLOOR GRID HIGHEST READINGS IN CPMD 13/100 C-2  
INCLUDED SOME COUNTER TOP  
 ① 0/80  
 ② 0/80

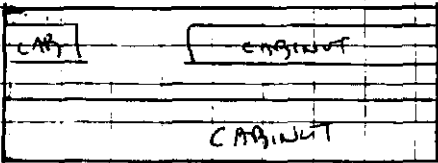
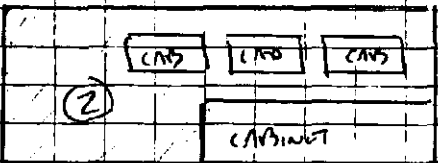
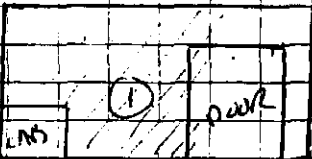

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-F8

Page 1 of 1

Instrument SN <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/22/07</u>	Time: <u>1255</u>
Instrument SN <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 608</u>		
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print) <u>JERRY W JAMES</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> 24V OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u>	
			<input type="checkbox"/> meters	<input type="checkbox"/> inches
			<input checked="" type="checkbox"/> feet	<input type="checkbox"/> centimeters

 <p style="text-align: center;">WALL ADJACENT TO ROOM 604</p>	 <p style="text-align: center;">WALL ADJACENT TO ROOM 606</p>
 <p style="text-align: center;">WALL ADJACENT TO CORRIDOR 6</p>	 <p style="text-align: center;">WALL ADJACENT TO ROOM 507</p>

Notes: SEARCHED 2 WALL CLIPS. HIGHEST READINGS IN CPA & IB / INSCR

① 0/60

② 0/80

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

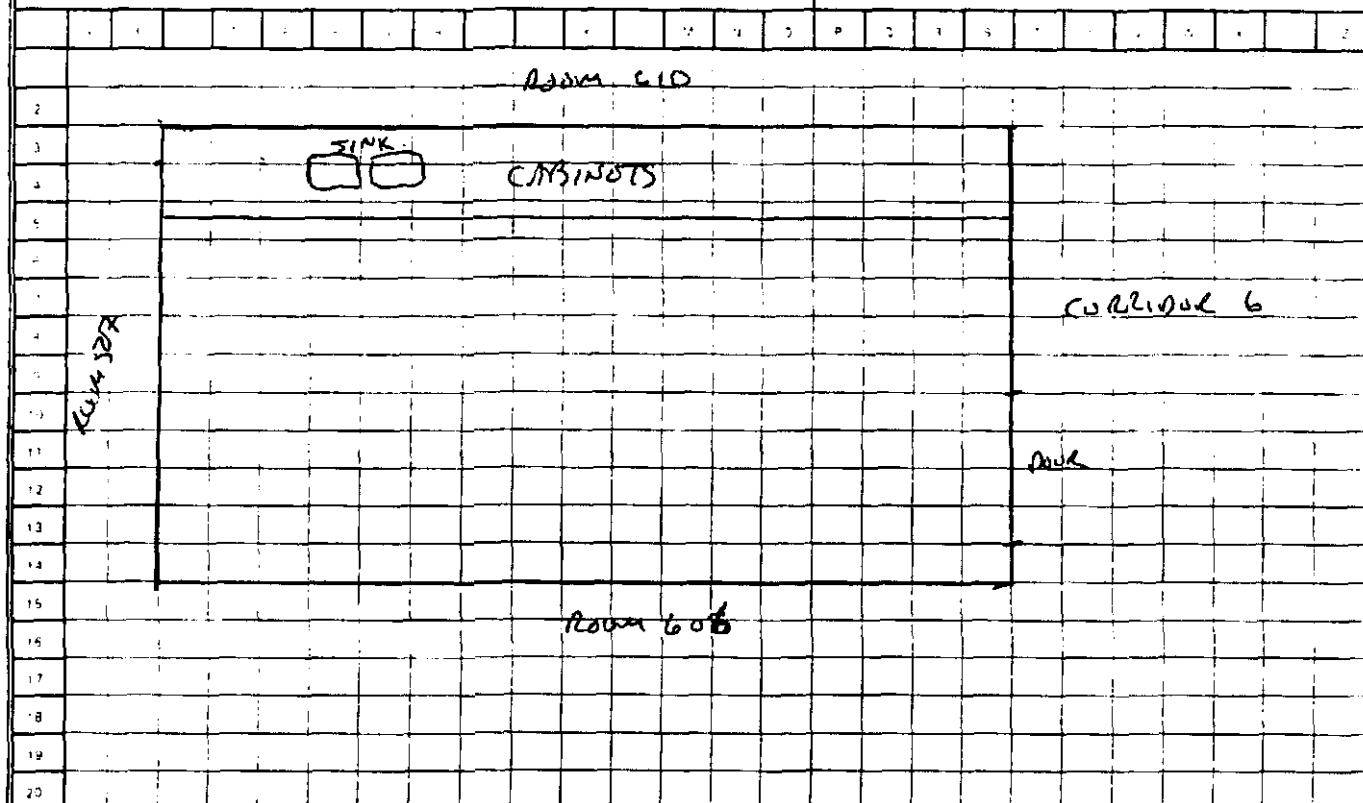
Survey Number 062207-20

Page 1 of 1

Instrument SN: <u>Bickon / B2960</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLXEL</u>	Date: <u>6/22/07</u>	Time: <u>1335</u>
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>Room 608</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		

Survey Performed By (Print): S. F. F. W. J. J. Survey Performed By (Signature): [Signature]

Battery OK <input checked="" type="checkbox"/>	HV OK <input checked="" type="checkbox"/>	Source Check OK <input checked="" type="checkbox"/>	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters
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Notes: BKGD = 15 uR/h WALKED ROOM WITH METOR WAIST HIGH. NO  
REWORKS ABOVE BKGD. CONTACT WITH SINK DRAIN = BKGD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062207-19

Page 1 of 5

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/22/07</u>	Time: <u>1330</u>
Instrument SN: <u>43-68 / PR190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 608</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F55</u>		
Survey Performed By (Print): <u>Jeffrey W Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>141</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

*Handwritten notes on grid:*  
 Room 610  
 SINK (7) (6)  
 CABINETS  
 Corridor 6  
 Room 606  
 Room 608  
 A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z  
 (1) through (11) circled

Notes: TOOK 2 MINUTE STATIC COUNTS. RESULTS IN CPM @ 13/100CM<sup>2</sup>. TOOK LSC SWEEPERS IN SAME LOCATION

062207-19  
2 of 5

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

#### Room 608

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.5, 2+2.5	2/203
2 A+2.5, 1+0.5	1/206
3 A+5.5, 0+2.5	0/211
4 B+1.5, 1+4.0	1/207
5 B+5.5, 2+2.5, 3.0	1/204
6 B+4.5, 0+3.5, 2.5	1/210
7 B+4.5, 0+4.5, 2.5	0/211
8 C+0.0, 1+3.5, 4.0	1/203
9 A+4.5, 0+0.0, 6.0	1/197
10 A+0.0, 1+3.0, 4.0	1/202
11 B+0.0, 2+5.0, 2.0	1/209

062207-19  
3018

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

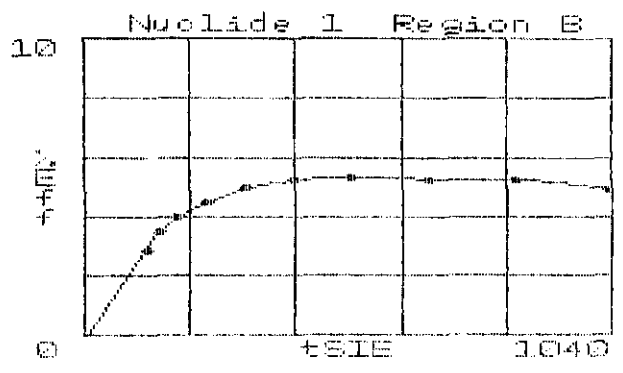
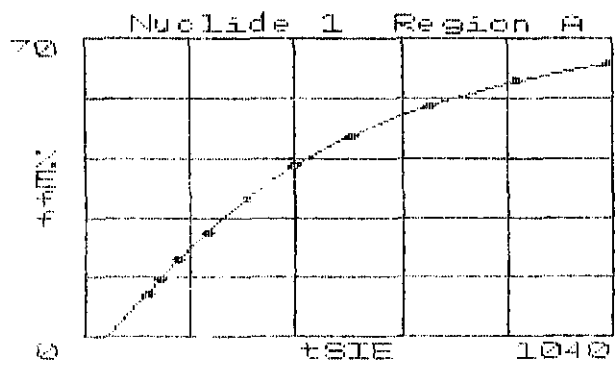
25 Jun 2007 21:43 TRI-CARB - 1.09  
Protocol #:32 SURVEY

Time: 10.00  
Data Mode: Dual DPM Nuclides: 3H-14C Quench Sets  
Background Subtract: 1st Vial Low Energy: 3H High Energy: 14C

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.61
Region B:	12.0 - 156		0	0.0	13.69
Region C:	0.0 - 0.0		0	0.0	0.00

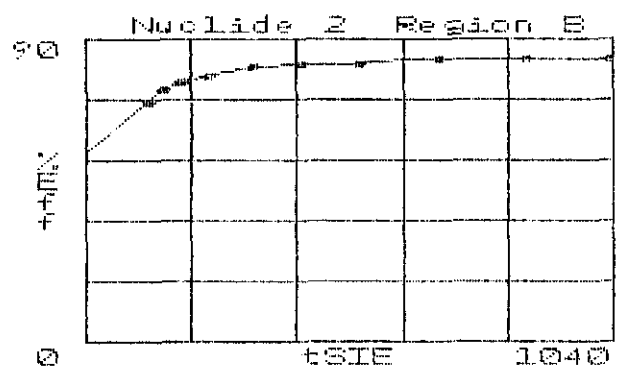
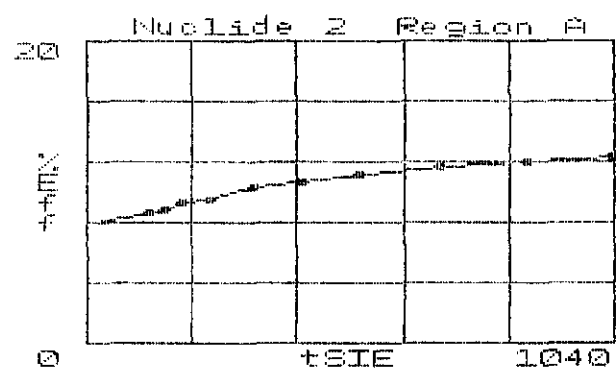
Room 608

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55



25 Jun 2007 21:43 TRI CARB 1.09  
Protocol #:32 SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	10.61	13.69			76.819	711.13	B
2	10.00	0.38	0.00	0.69	0.00	0.000	723.94	
3	10.00	0.00	0.00	0.00	0.00	0.000	715.67	
4	10.00	0.00	0.00	0.00	0.00	0.000	709.75	
5	10.00	2.00	0.00	3.63	0.00	0.000	725.21	
6	10.00	0.95	0.00	1.75	0.00	0.000	704.16	
7	10.00	1.40	0.00	2.57	0.00	0.000	711.76	
8	10.00	0.35	0.00	0.64	0.00	0.000	702.88	
9	10.00	0.18	0.00	0.33	0.00	0.000	711.92	
10	10.00	1.10	0.00	2.01	0.00	0.000	711.10	
11	10.00	2.12	1.18	3.59	1.17	84.652	713.61	
12	10.00	0.88	0.00	1.62	0.00	0.000	708.32	

## SYSTEM NORMALIZED

C14 IPA DATA PROCESSED - 25-Jun-2007 23:53

C14 Eff (0-156 keV) = 96.36 %

C14 CHI SQUARE IPA DATA PROCESSED - 26-Jun-2007 00:03

C14 Chi Square = 19.64

H3 IPA DATA PROCESSED - 26-Jun-2007 00:05

H3 Eff (0-18.6 keV) = 59.72 %

H3 CHI SQUARE IPA DATA PROCESSED - 26-Jun-2007 00:15

H3 Chi Square = 31.11

BKG IPA DATA PROCESSED - 26-Jun-2007 01:16

Bkg (0-18.6 keV) = 13.27 cpm

Bkg (0-156 keV) = 20.10 cpm

C14 E<sup>2</sup>/B (1-156 keV) = 555.61H3 E<sup>2</sup>/B (1-18.6 keV) = 270.53

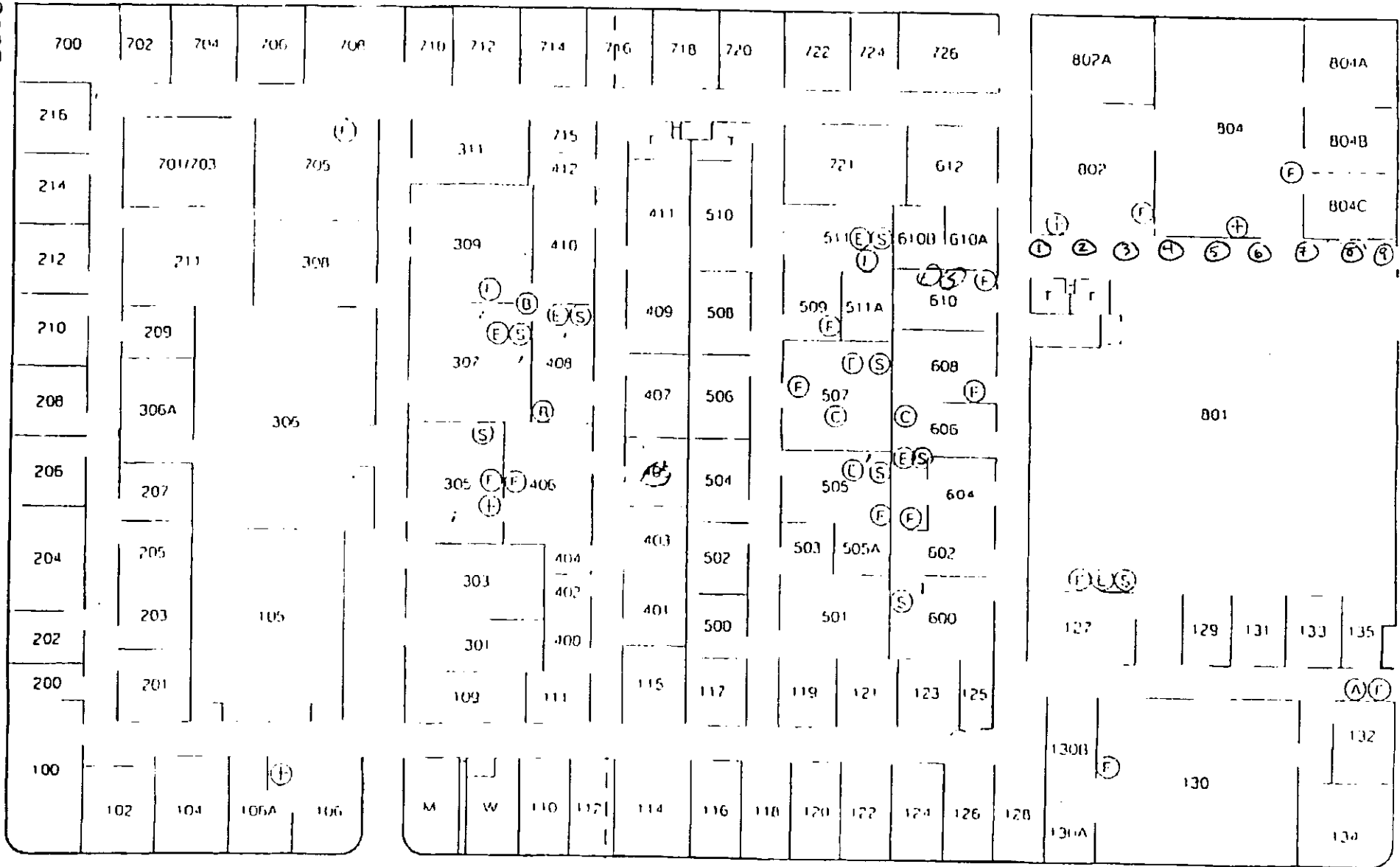
**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-8

Page 1 of 2

Instrument SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>GLRL</u>	Date: <u>6/24/08</u>	Time: <u>1300</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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<p><b>Notes</b> SCANNED PASSAGEWAY FROM CORRIDOR 6 TO EXIT DOOR WHICH WAS THE PATH TAKEN TO MOVE WASTE FROM THE LABS TO THE WASTE STORAGE SHED. TOOK READINGS ~ 6 FT. RESULTS IN CPMD/B FLOOR IS CONCRETE</p> <table style="width:100%;"> <tr> <td>① 0/500</td> <td>⑤ 0/540</td> <td>⑨ 0/540</td> </tr> <tr> <td>② 0/540</td> <td>⑥ 0/580</td> <td></td> </tr> <tr> <td>③ 0/540</td> <td>⑦ 0/540</td> <td></td> </tr> <tr> <td>④ 0/500</td> <td>⑧ 0/540</td> <td></td> </tr> </table>					① 0/500	⑤ 0/540	⑨ 0/540	② 0/540	⑥ 0/580		③ 0/540	⑦ 0/540		④ 0/500	⑧ 0/540																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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062607-8  
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**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-9

Page 1 of 5

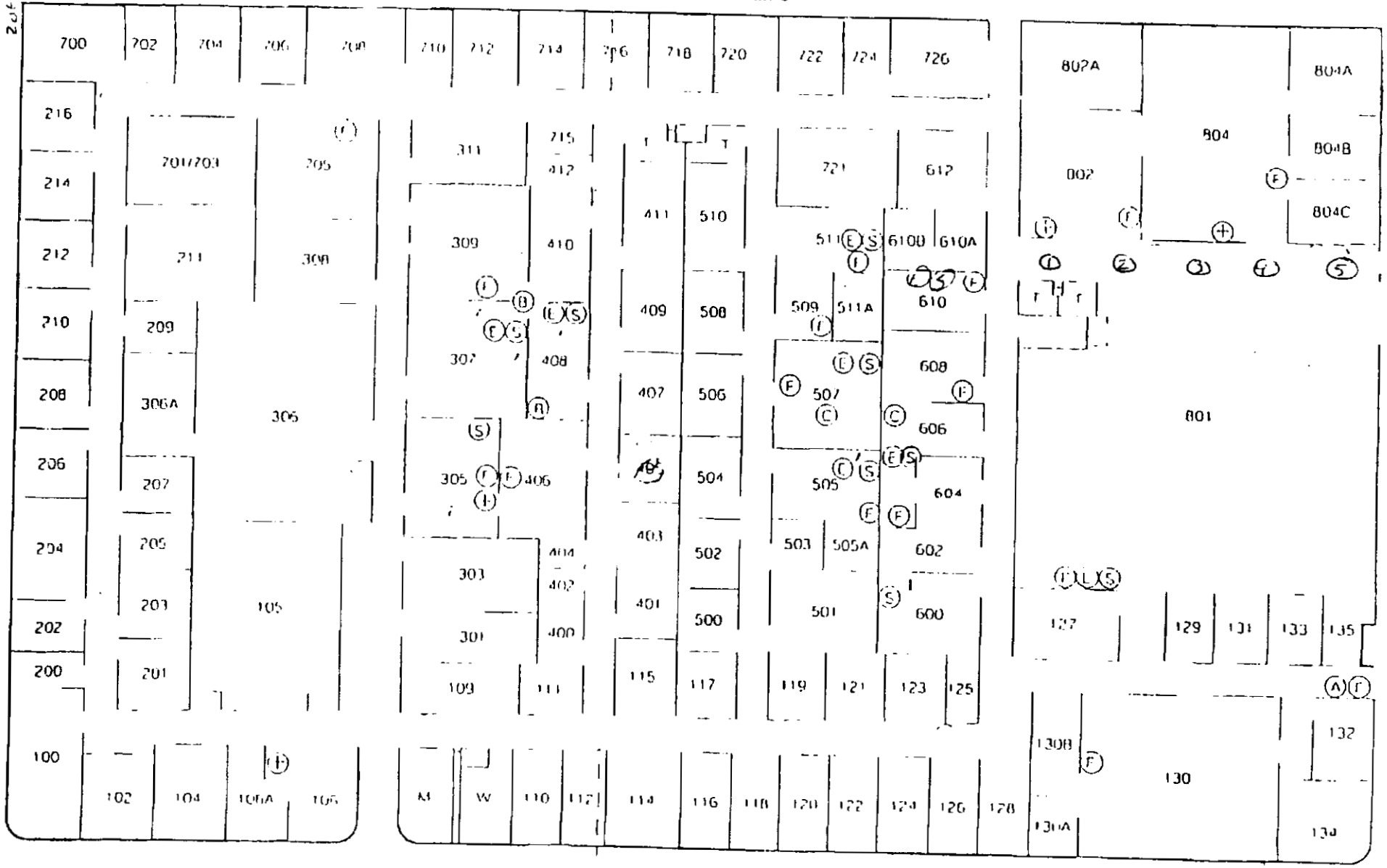
Instrument SN: <u>2224/116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>6/26/07</u>	Time: <u>1315</u>
Instrument SN: <u>43-68/PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 801</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Sumner</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: _____ <input type="checkbox"/> meters <input type="checkbox"/> inches <input type="checkbox"/> feet <input type="checkbox"/> centimeters	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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Notes  
 TOOK 2 MINUTE STATIC COUNTS ON FLOOR. RESULTS IN  
 CPM @ 10/100 CM<sup>2</sup>. TOOK SMOORS FOR USE IN SAME LOCATIONS

- ① 3/214
- ② 2/219
- ③ 3/207
- ④ 4/219
- ⑤ 3/209

06-2607-9  
2 of 5



06267-9  
3085

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

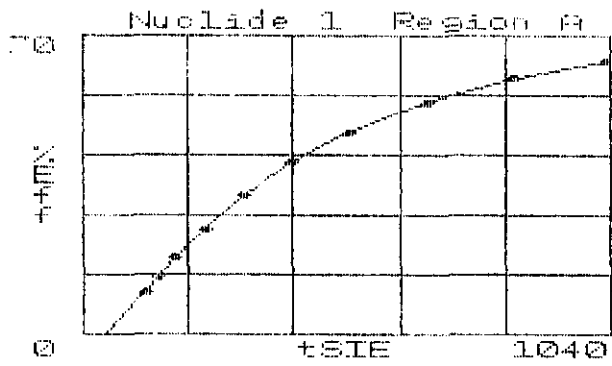
High Energy: 14C

Background Subtract: 1st Vial

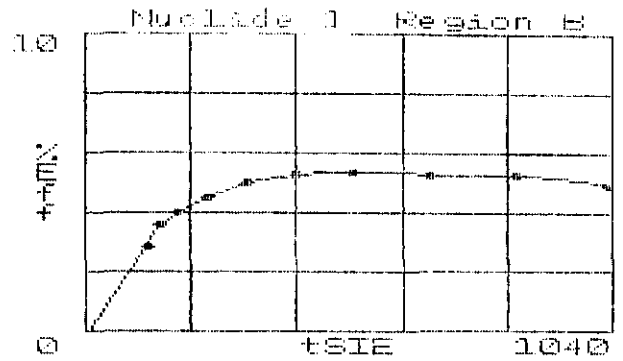
	LL	UL	LCR	25%	BKG
Region A:	0.0 - 12.0		0	0.0	11.45
Region B:	12.0 - 156		0	0.0	11.45
Region C:	0.0 - 0.0		0	0.0	0.00

*Run 801*

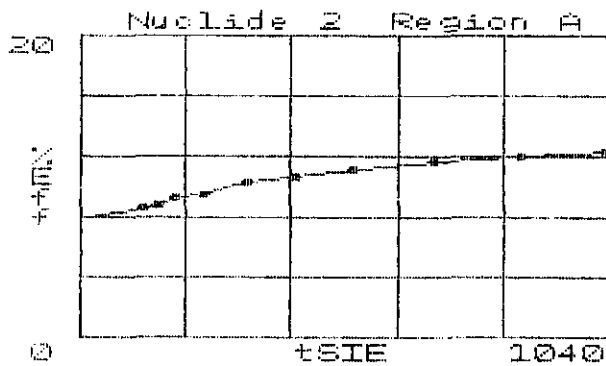
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



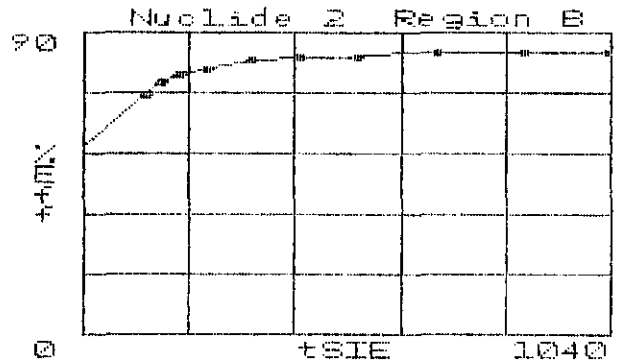
tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10



tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.28	526.12	5.37
416.09	5.24	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31



tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

062607-9

27 Jun 2007 04:47

TRI-CARB - 1.09

50FS

Page #2

Protocol #:27

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	11.45	11.45			80.485	736.30	B
2	10.00	0.00	0.13	0.00	0.16	0.000	734.02	
3	10.00	0.87	0.63	1.40	0.66	0.000	749.77	
4	10.00	0.52	2.08	0.42	2.44	0.000	744.36	
5	10.00	0.80	1.00	1.20	1.11	0.000	727.77	
6	10.00	0.66	1.14	0.91	1.29	0.000	749.03	

SYSTEM NORMALIZED

C14 IPA DATA PROCESSED - 27-Jun-2007 05:45  
C14 Eff (0-156 keV) = 96.54 %



**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062607-10

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CELL</u>	Date: <u>6/24/08</u>	Time: <u>1350</u>																				
Instrument SN: <u>43-371 PR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>Room 801A</u>																						
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>																						
Survey Performed By (Print): <u>JEFFREY W SURCOU</u>		Survey Performed By (Signature): <u>[Signature]</u>																						
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u>																					
		<input type="checkbox"/> meters		<input type="checkbox"/> inches																				
		<input checked="" type="checkbox"/> feet		<input type="checkbox"/> centimeters																				
<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td> </tr> </table>					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20					
<p><b>Notes:</b> <u>SCANNED 100% OF FLOOR. HIGHS WERE READINGS ~ 6 FT. RESULTS</u>  <u>IN CPM @ 1B</u>  <u>(1) 0/300</u>  <u>(2) 0/320</u>  <u>(3) 0/300</u>  <u>(4) 0/300</u></p>																								

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062607-11

Page 1 of 1400

Instrument SN <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELL</u>	Date: <u>6/24/07</u>	Time: <u>1400</u>
Instrument SN <u>4368 / 112190483</u>	Calibration Due <u>10/13/07</u>	Location: <u>Room 801A</u>		
Instrument SN <u>N/A</u>	Calibration Due <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print) <u>JEFFREY W SURCOU</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

The diagram shows a rectangular area drawn on a grid. The area is roughly 10 units wide and 10 units high. A shaded region with diagonal lines is located in the upper right portion of the rectangle. A circled '1' is drawn in the center of this shaded region. The word 'Door' is written near the bottom right corner of the rectangle. The letters 'A', 'B', and 'C' are written at the bottom, right, and top edges of the rectangle respectively.

**Notes** SCANNED ONE FOOT GRID. HIGHEST READING IN CPM @ B / 100CM  
① 0/60

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM

Survey Number 062607-12

Page 1 of 1

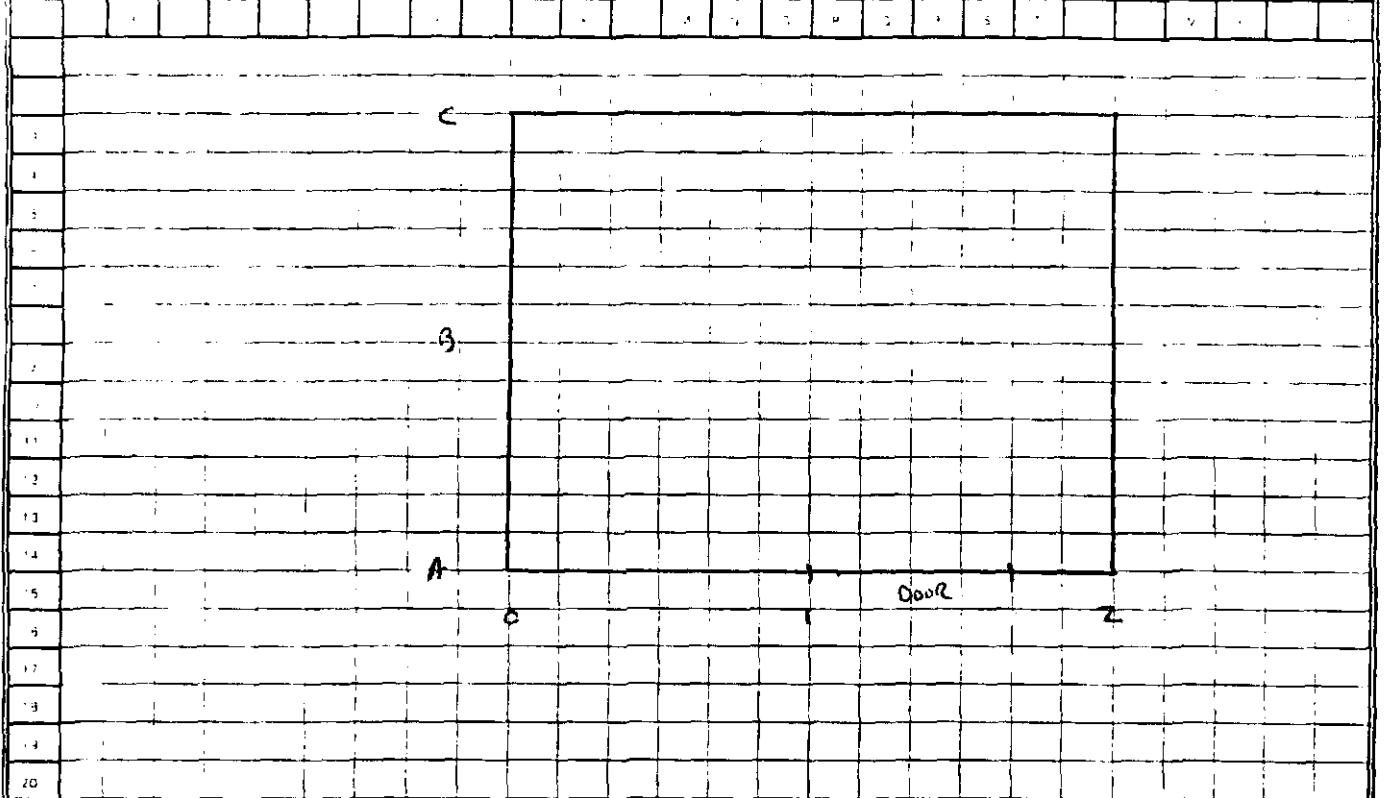
Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>4/26/07</u>	Time: <u>1410</u>
Instrument SN: <u>43-687 PR 150483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 801A</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W. Surin</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>2 x 2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
<p>Notes: <u>SCANNED ONE WALL GRID. HIGHEST READING IN CPA/B/100 CLR</u>  <u>(1) 0/60</u></p>				

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062607-14

Page 1 of 1

Instrument SN <u>BICRON 1B2960</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CELL</u>	Date <u>06/24/07</u>	Time <u>1435</u>
Instrument SN <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>ROOM 801A</u>		
Instrument SN <u>N/A</u>	Calibration Due <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W SUMMERS</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



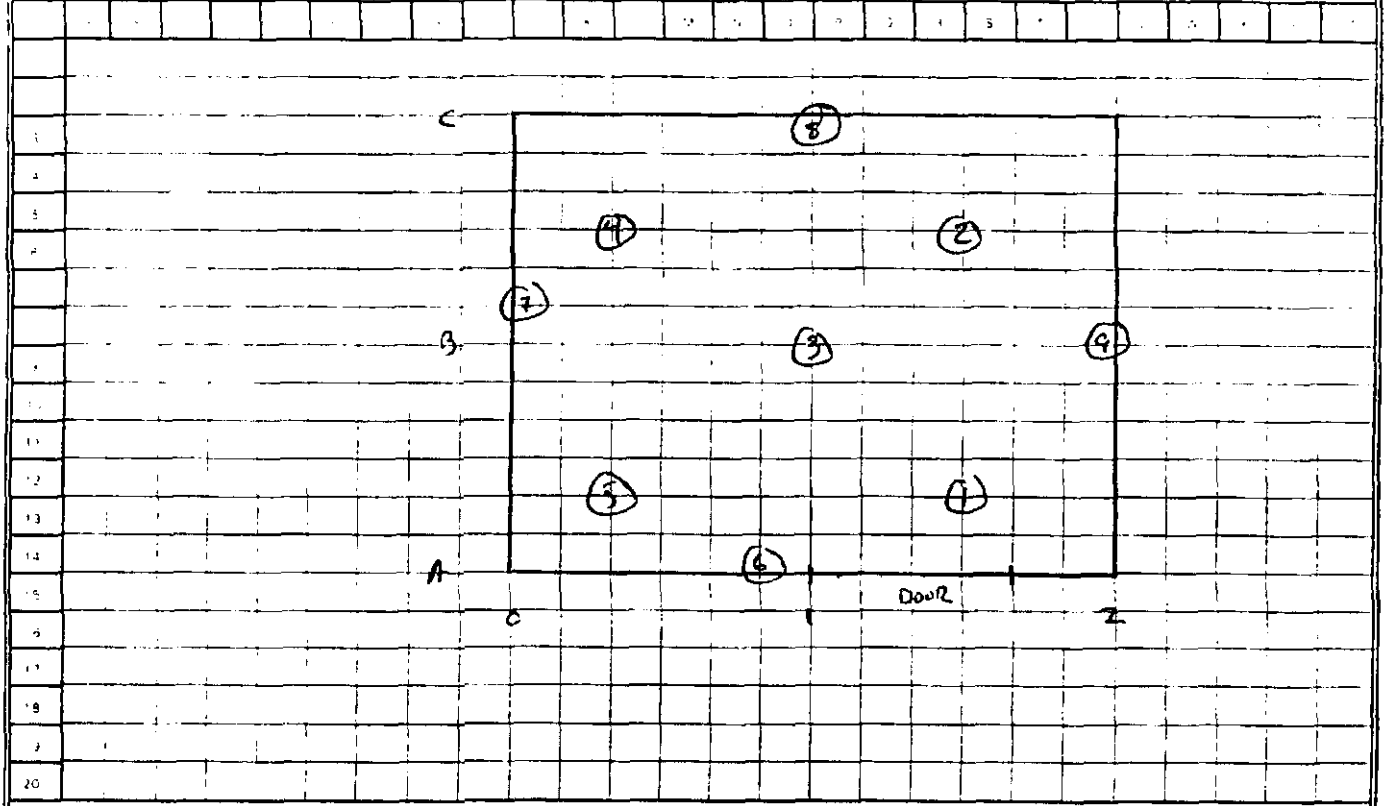
Notes  
BACKD = 10m down (w/ker) room with meter waist high.  
NO READINGS ABOVE BACKD

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.  
RADIOLOGICAL SURVEY FORM**

Survey Number 062607-13

Page 1 of 5

Instrument SN <u>2224/116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CELL</u>	Date <u>6/24/07</u>	Time: <u>1430</u>
Instrument SN <u>4368/12140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 801A</u>		
Instrument SN <u>0/A</u>	Calibration Due: <u>W/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print) <u>JERRY W. SUMCO</u>		Survey Performed By (Signature) <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	



Notes: TOOK 2 MINUTE STATIC COUNTS. RESULTS IN CPA @ 100 CPM. TOOK SAMPLES FOR LSC IN SAME LOCATIONS.

00-2007-13  
2005

### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

### Room 801A

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.0, 1+3.0	1/172
2 B+3.0, 1+3.0	1/178
3 B+3.0, 0+2.0	2/179
4 A+2.0, 0+2.0	0/181
5 B+0.0, 1+0.0	0/174
6 A+0.0, 0+5.0, 4.0	1/183
7 B+1.0, 0+0.0, 4.0	2/180
8 C+0.0, 1+0.0, 4.0	0/174
9 B+0.0, 2+0.0, 4.0	1/174

06 26 07 13  
3065

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

0626 07-13  
4167

27 Jun 2007 06:06  
Protocol #:18

TRI-CARB - 1.09  
SURVEY

Page #1  
User : KIM

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

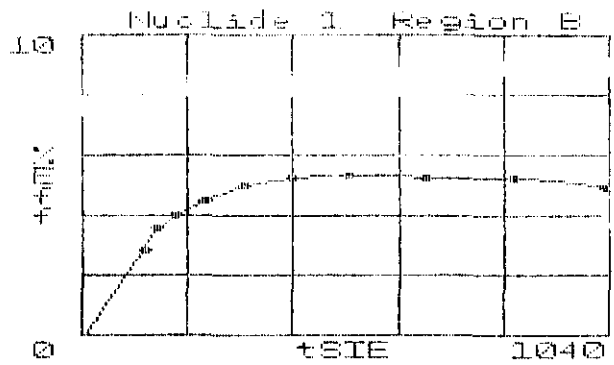
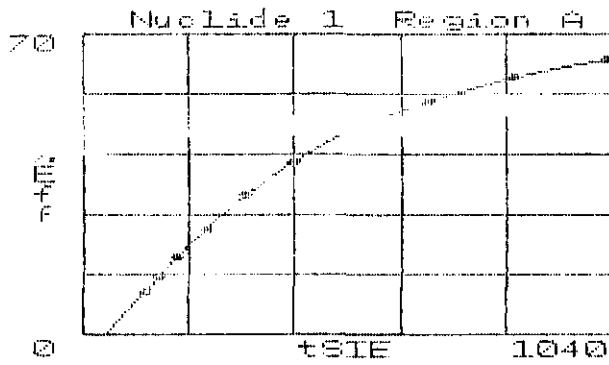
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.59
Region B:	12.0 - 156		0	0.0	11.21
Region C:	0.0 - 0.0		0	0.0	0.00

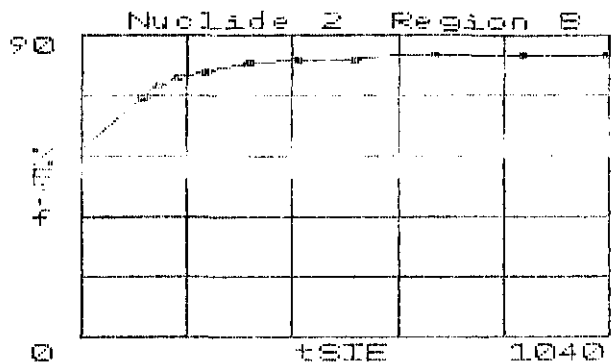
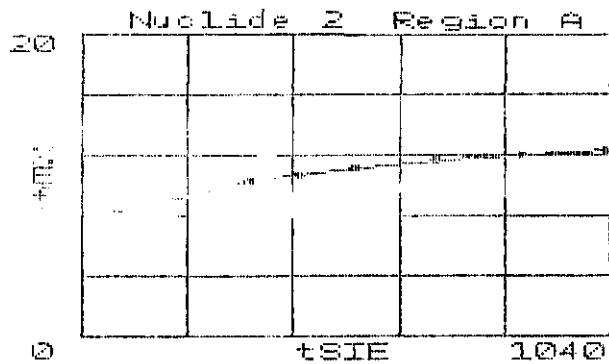
Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count

Room 801A



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.28	526.12	5.37
416.09	5.24	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55



27 Jun 2007 06:06

TRI-CARB - 1.09

Page #2

Protocol #:18

SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.59	11.21			72.665	734.77	B
2	10.00	0.00	1.43	0.00	1.72	68.012	734.04	
3	10.00	0.32	2.98	0.00	3.55	83.436	725.49	
4	10.00	0.00	1.20	0.00	1.44	2472.5	712.14	
5	10.00	0.00	0.00	0.00	0.00	0.000	718.37	
6	10.00	0.00	1.13	0.00	1.36	181.23	730.01	
7	10.00	1.19	1.11	1.88	1.21	0.000	720.80	
8	10.00	0.50	1.40	0.55	1.63	93.010	722.29	
9	10.00	0.00	2.65	0.00	3.19	85.097	719.70	
10	10.00	0.17	0.73	0.12	0.86	49.273	718.05	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-15

Page 1 of 1

Instrument/SN: <u>2224/116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/26/07</u>	Time: <u>1500</u>
Instrument/SN: <u>43-681 PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>ROOM 801B</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SUMNER</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1x1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

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Notes: SCANNED 100% OF FLOOR. HIGHEST READINGS IN CPN & 1B/100HR

① 2/21/5 0180  
 ② 4/27/5 0180  
 ③ 2/27/5 0180

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-16

Page 1 of 1

Instrument SN: <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLORL</u>	Date: <u>6/24/07</u>	Time: <u>1510</u>
Instrument SN: <u>43-68 / PR140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>Room 8013</u>		
Instrument SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jeffrey W Sullivan</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters		
. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 M N O P Q R S T U V W X Y Z				
Notes: <u>Scanned one wall grid. Highest reading in CM 213/1000R</u>  <u>① 0.1445 0180</u>				

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-18

Page 1 of 1

Instrument SN: <u>BICROW 1B2962</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>GLCRL</u>	Date: <u>4/24/08</u>	Time: <u>1535</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-17

Page 1 of 5

Instrument SN: <u>2224 / 116235</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>10/24/07</u>	Time: <u>1530</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Notes: <u>TOOK 2 MINUTE STATIC COUNTS. RESULTS IN CPM @ 15 INCHES. TOOK 5 MEAS FOR LSC IN SAME LOCATIONS</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

**Static Count and Smear Locations**

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

**Room 801B**

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+2.0, 1+0.0	2/198
2 B+3.0, 1+0.0	1/204
3 A+3.0, 0+2.0	2/212
4 A+2.0, 0+2.0	1/201
5 B+0.0, 0+4.0	1/209
6 B+0.0, 1+2.0, 4.0	0/196
7 C+0.0, 0+4.0, 4.0	1/178
8 B+0.0, 0+0.0, 4.0	0/181
9 A+0.0, 0+4.0, 4.0	1/176

062607-17  
3065

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

Low Energy: 3H

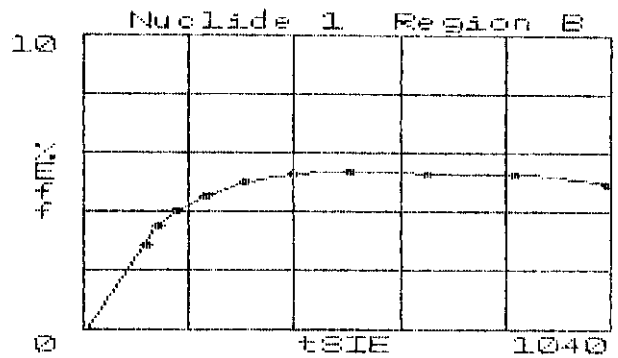
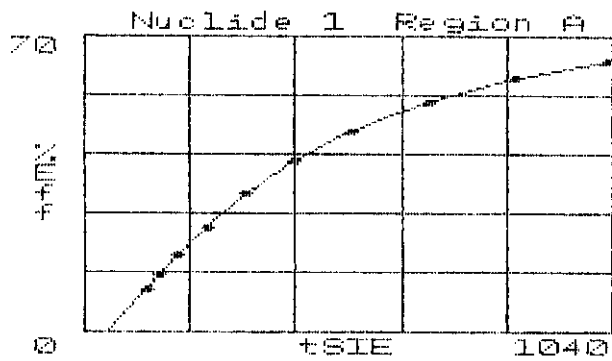
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.79
Region B:	12.0 - 156		0	0.0	13.28
Region C:	0.0 - 0.0		0	0.0	0.00

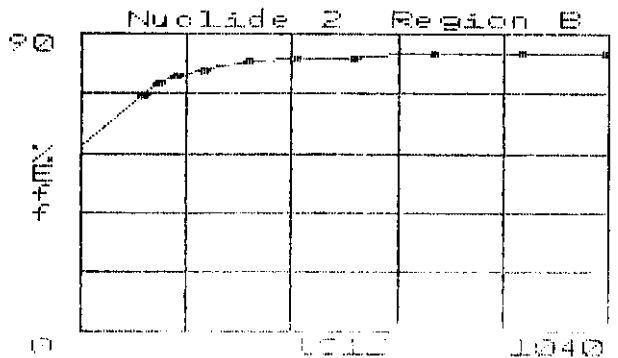
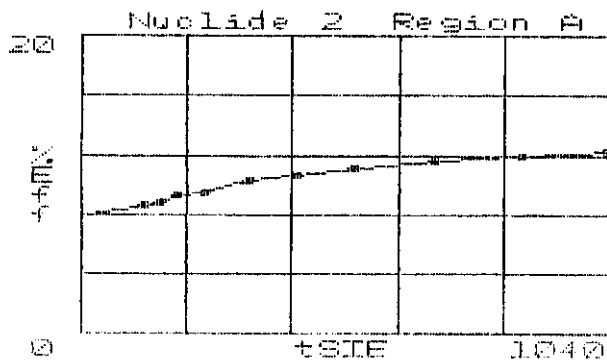
Room 801 B

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55



27 Jun 2007 07:56 IRI-CARB - 1.09  
Protocol #:26 SURVEY


239.94 9.55 188.56 9.32 239.94 79.05 188.56 77.31  
152.93 8.76 122.58 8.59 152.93 75.21 122.58 71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tsIE	FLAG
1	10.00	10.79	13.28			72.255	723.03	B
2	10.00	0.00	0.00	0.00	0.00	0.000	708.10	
3	10.00	0.00	0.00	0.00	0.00	0.000	703.07	
4	10.00	0.00	0.10	0.00	0.12	0.000	698.86	
5	10.00	0.39	0.00	0.71	0.00	0.000	713.26	
6	10.00	0.30	0.33	0.47	0.37	79.715	698.89	
7	10.00	0.00	0.00	0.00	0.00	0.000	709.57	
8	10.00	0.00	0.00	0.00	0.00	0.000	709.65	
9	10.00	1.42	0.00	2.59	0.00	73.429	713.44	
10	10.00	0.00	0.00	0.00	0.00	0.000	709.85	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-2

Page 1 of 1

Instrument SN: <u>2224 / 170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>ALORL</u>	Date: <u>6/12/08</u>	Time: <u>1000</u>
Instrument SN: <u>43-37 / PR 177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>WASTE STORAGE BUILDING</u>		
Instrument SN: <u>w/lt</u>	Calibration Due: <u>2/11</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JERRY W JONES</u>		Survey Performed By (Signature): 		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

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Notes: SURVEYED 100% OF FLOOR, SCANS ARE READINGS TAKEN EVERY 3 FEET  
IN CPM 0/13

(1) 0/500	(6) 0/500
(2) 0/460	(7) 0/460
(3) 0/500	(8) 0/440
(4) 0/500	(9) 0/500
(5) 0/460	(10) 0/500

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number UG2107-3

Page 1 of 1

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLERL</u>	Date: <u>6/2/07</u>	Time: <u>1030</u>
Instrument SN: <u>4368 / PRCFCH83</u>	Calibration Due: <u>10/13/07</u>	Location: <u>WASTE STORAGE BUILDING</u>		
Instrument SN: <u>5, 14</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>Jerry W. Jones</u>		Survey Performed By (Signature): <u>[Signature]</u>		
<input checked="" type="checkbox"/> Battery OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters	

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Notes: SCANNED ~ 50% OF FLOOR, HIGHEST READING PER GRID IN  
CPM ~ 13 / 100 CM<sup>2</sup>

① 0/200

② 0/200

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-5

Page 1 of 1

Instrument/SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>GLDRL</u>	Date: <u>6/24/07</u>	Time: <u>1145</u>																						
Instrument/SN: <u>43-68 / 912190483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>WASTE STORAGE BUILDING</u>																								
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>F53</u>																								
Survey Performed By (Print): <u>JEFFREY W SUMER</u>		Survey Performed By (Signature): <u>[Signature]</u>																								
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>2x2</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																								
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Notes: SCANNED IN SOLE OF WALLS. HIGHEST READING IN CEN 2/3 / 100CM<sup>2</sup>

- ① 0/200
- ② 0/200
- ③ 0/220
- ④ 0/200
- ⑤ 0/150
- ⑥ 4/200

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-1

Page 1 of 1

Instrument/SN: <u>Bicron / B296W</u>	Calibration Due: <u>10/10/07</u>	Site Name: <u>CLERL</u>	Date: <u>10/24/07</u>	Time: <u>0930</u>																						
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>WASTE STORAGE BUILDING</u>																								
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>																								
Survey Performed By (Print): <u>Jerry W. Jones</u>		Survey Performed By (Signature): <u>[Signature]</u>																								
<input checked="" type="checkbox"/> Battery OK <input checked="" type="checkbox"/> HV OK <input checked="" type="checkbox"/> Source Check OK		Grid Dimensions: <u>1 x 1</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																								
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*Notes* BELO = 15 uRm/h WALKED BLOC WITH METER AT WAIST HEIGHT, NO REMAINS ABOVE BELO

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062107-4

Page 1 of 9

Instrument SN: <u>2224 / 116239</u>	Calibration Due: <u>10/13/07</u>	Site Name: <u>CLLRL</u>	Date: <u>10/14/07</u>	Time: <u>11:30</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Instrument SN: <u>4368 / PR 140483</u>	Calibration Due: <u>10/13/07</u>	Location: <u>WASTE STORAGE BUILDING</u>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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<p>Notes: <u>TOOK 2 MINUTE STATIC READING. ALSO TOOK SWIPES FOR GROSS ALPHA AND LSC IN SAME LOCATION.</u></p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

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### Static Count and Smear Locations

First number indicates letter starting point and number of additional feet along that axis.

Second number indicates number starting point and number of additional feet along that axis.

Third number, if present, indicates height above floor in feet. If no number present, assume 0.

### Waste Storage Building

Survey Location	CPM $\alpha/\beta$ per 100 cm <sup>2</sup> (total for 2 minute count)
1 A+1.0, 1+2.5	2/206
2 A+4.0, 1+2.5	1/217
3 B+2.0, 1+2.5	2/208
4 B+2.0, 1+0.5	1/198
5 A+5.0, 1+0.5	3/216
6 A+2.0, 1+0.5	2/214
7 A+1.0, 0+4.0	3/202
8 A+4.0, 0+4.0	2/212
9 B+2.0, 0+4.0	3/208
10 B+3.0, 0+2.5	3/202
11 B+0.0, 0+2.5	2/216
12 A+2.5, 0+2.5	0/219
13 A+1.0, 0+0.5	3/204
14 A+4.0, 0+0.5	1/212
15 B+2.0, 0+0.5	1/215
16 B+3.0, 0+3.5, 4.0	2/187
17 B+3.0, 1+1.5, 6.0	3/193
18 B+1.0, 1+4.0, 2.0	2/201
19 A+2.0, 1+4.0, 4.0	1/198
20 A+0.0, 1+0.5, 4.0	2/193
21 A+0.0, 0+2.5, 6.0	2/189
22 A+2.0, 0+0.0, 2.0	0/192
23 B+0.5, 0+0.0, 4.0	2/197

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Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.




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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

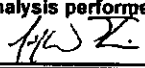
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 21, 2007		Sample Ship Date: N/A		Sample Analysis Date: June 21, 2007		Report Date:	
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum		Instrument Model: 2929 Scaler w/43-10-1 Probe		Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008	
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):		<b>Instrument Efficiency</b>					
		Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)
		2400-98	12700	43478	10	4347	0.34
		<b>Instrument Background</b>					
		Gross Counts		Count Time (min)		Background Count Rate (cpm)	
38		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	1	2	-0.1	-0.4	0.5	1.4	a
2	1	2	-0.1	-0.4	0.5	1.4	a
3	2	2	0.4	1.1	0.7	1.4	a
4	1	2	-0.1	-0.4	0.5	1.4	a
5	0	2	-0.6	-1.9	0.0	1.4	a
6	1	2	-0.1	-0.4	0.5	1.4	a
7	2	2	0.4	1.1	0.7	1.4	a
8	3	2	0.9	2.5	0.9	1.4	a
9	1	2	-0.1	-0.4	0.5	1.4	a
10	0	2	-0.6	-1.9	0.0	1.4	a
11	1	2	-0.1	-0.4	0.5	1.4	a
12	0	2	-0.6	-1.9	0.0	1.4	a
13	1	2	-0.1	-0.4	0.5	1.4	a
14	1	2	-0.1	-0.4	0.5	1.4	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Waste Storage Building.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS


Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 21, 2007		Sample Ship Date: N/A		Sample Analysis Date: June 21, 2007		Report Date:	
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum		Instrument Model: 2929 Scaler w/43-10-1 Probe		Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008	
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):		<b>Instrument Efficiency</b>					
		Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)
		2400-98	12700	43478	10	4347	0.34
		<b>Instrument Background</b>					
		Gross Counts		Count Time (min)		Background Count Rate (cpm)	
38		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	0	2	-0.6	-1.9	0.0	1.4	a
16	2	2	0.4	1.1	0.7	1.4	a
17	2	2	0.4	1.1	0.7	1.4	a
18	1	2	-0.1	-0.4	0.5	1.4	a
19	0	2	-0.6	-1.9	0.0	1.4	a
20	1	2	-0.1	-0.4	0.5	1.4	a
21	2	2	0.4	1.1	0.7	1.4	a
22	0	2	-0.6	-1.9	0.0	1.4	a
23	1	2	-0.1	-0.4	0.5	1.4	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Waste Storage Building					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 21, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 21, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52818	10	5210	0.26	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3100		60		52			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	104	2	0.3	1.3	5.1	6.5	a
2	111	2	3.8	14.7	5.3	6.5	a
3	113	2	4.8	18.6	5.3	6.5	a
4	102	2	-0.7	-2.6	5.1	6.5	a
5	99	2	-2.2	-8.3	5.0	6.5	a
6	110	2	3.3	12.8	5.2	6.5	a
7	105	2	0.8	3.2	5.1	6.5	a
8	103	2	-0.2	-0.6	5.1	6.5	a
9	110	2	3.3	12.8	5.2	6.5	a
10	97	2	-3.2	-12.2	4.9	6.5	a
11	104	2	0.3	1.3	5.1	6.5	a
12	108	2	2.3	9.0	5.2	6.5	a
13	111	2	3.8	14.7	5.3	6.5	a
14	109	2	2.8	10.9	5.2	6.5	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Waste Storage Building					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

062107-4  
7089

INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 21, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 21, 2007	Report Date:				
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126128/132238	Calibration Due: April 2, 2008				
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52618	10	5210	0.26	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3100		60		52			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	111	2	3.8	14.7	5.3	6.5	a
16	102	2	-0.7	-2.6	5.1	6.5	a
17	104	2	0.3	1.3	5.1	6.5	a
18	113	2	4.8	18.6	5.3	6.5	a
19	106	2	1.3	5.1	5.1	6.5	a
20	104	2	0.3	1.3	5.1	6.5	a
21	103	2	-0.2	-0.6	5.1	6.5	a
22	93	2	-5.2	-19.8	4.8	6.5	a
23	106	2	1.3	5.1	5.1	6.5	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Waste Storage Building.					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): <i>HWZ</i>			License No.: MDE License No: MD-31-281-01	

Time: 10.00  
Data Mode: Dual DPM

Nuclides: 3H-14C

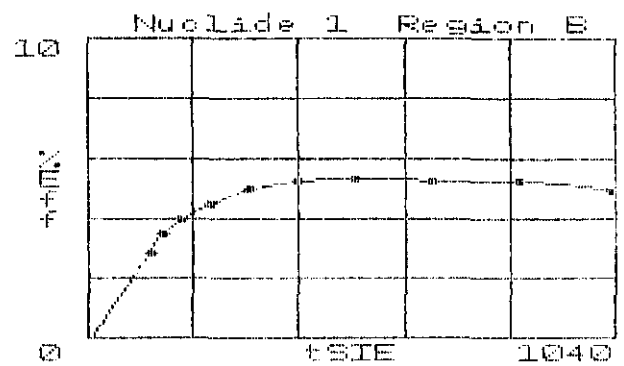
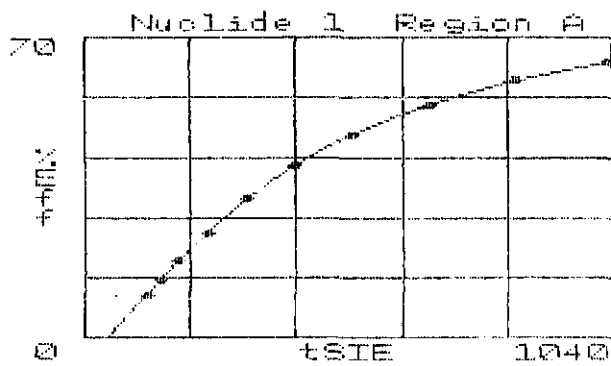
Quench Sets  
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	14.02
Region B:	12.0 - 156		0	0.0	13.18
Region C:	0.0 - 0.0		0	0.0	0.00

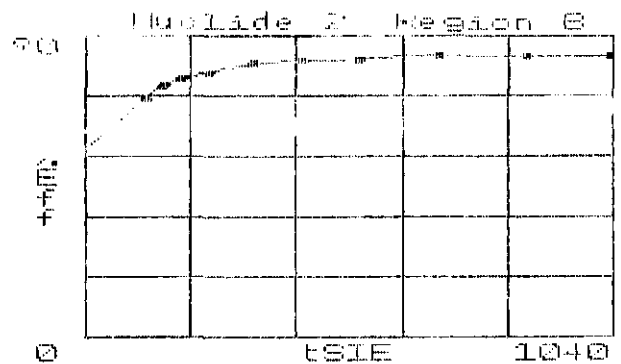
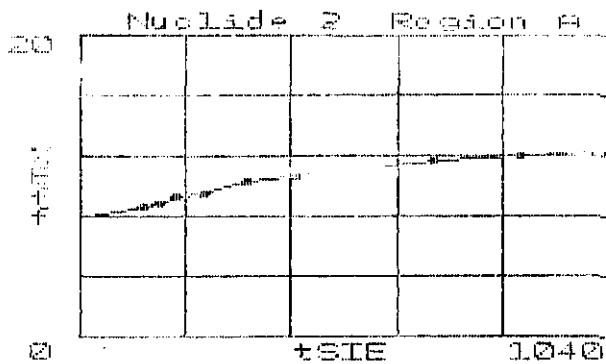
SHED

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	11.99
697.16	11.62	538.87	11.12
426.87	10.69	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

062107-4  
9059

21 Jun 2007 21:07  
Protocol #:28

TRI-CARB - 1.09  
SURVEY

Page #2  
User : KIM

239.94	9.55	188.56	9.31	239.94	79.05	188.56	77.31
152.93	8.75	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	14.02	13.18			58.789	711.52	B
2	10.00	0.00	1.54	0.00	1.85	0.000	714.05	
3	10.00	0.00	1.10	0.00	1.32	0.000	727.30	
4	10.00	0.00	0.27	0.00	0.33	0.000	715.66	
5	10.00	0.00	0.30	0.00	0.36	0.000	703.19	
6	10.00	0.00	0.21	0.00	0.25	0.000	697.51	
7	10.00	0.00	0.00	0.00	0.00	0.000	717.62	
8	10.00	0.00	0.00	0.00	0.00	0.000	699.78	
9	10.00	0.00	0.00	0.00	0.00	0.000	703.74	
10	10.00	0.00	0.89	0.00	1.07	0.000	699.42	
11	10.00	0.00	0.00	0.00	0.00	0.000	688.50	
12	10.00	0.00	0.00	0.00	0.00	0.000	661.98	
13	10.00	0.00	0.00	0.00	0.00	0.000	689.06	
14	10.00	0.00	0.50	0.00	0.60	0.000	688.92	
15	10.00	0.00	0.00	0.00	0.00	0.000	707.19	
16	10.00	0.00	0.00	0.00	0.00	0.000	700.18	
17	10.00	0.00	0.00	0.00	0.00	0.000	712.56	
18	10.00	0.00	0.00	0.00	0.00	0.000	695.85	
19	10.00	0.00	0.00	0.00	0.00	0.000	704.87	
20	10.00	0.00	0.00	0.00	0.00	0.000	694.96	
21	10.00	0.00	0.00	0.00	0.00	0.000	678.12	
22	10.00	0.00	0.00	0.00	0.00	0.000	708.18	
23	10.00	0.00	0.53	0.00	0.64	0.000	716.26	
24	10.00	0.00	0.00	0.00	0.00	0.000	703.62	

SYSTEM NORMALIZED

C14 IPA DATA PROCESSED - 22-Jun-2007 01:31  
C14 Eff (0-156 keV) = 96.14 %  
C14 CHI SQUARE IPA DATA PROCESSED - 22-Jun-2007 01:41  
C14 Chi Square = 21.23  
H3 IPA DATA PROCESSED - 22-Jun-2007 01:43  
H3 Eff (0-18.6 keV) = 60.01 %  
H3 CHI SQUARE IPA DATA PROCESSED - 22-Jun-2007 01:53  
H3 Chi Square = 14.38  
BKG IPA DATA PROCESSED - 22-Jun-2007 02:54  
Bkg (0-18.6 keV) = 14.72 cpm  
Bkg (0-156 keV) = 22.23 cpm  
C14 E<sup>2</sup>/B (1-156 keV) = 522.97  
H3 E<sup>2</sup>/B (1-18.6 keV) = 243.74

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Form No: 062607-7

Page 1 of 3

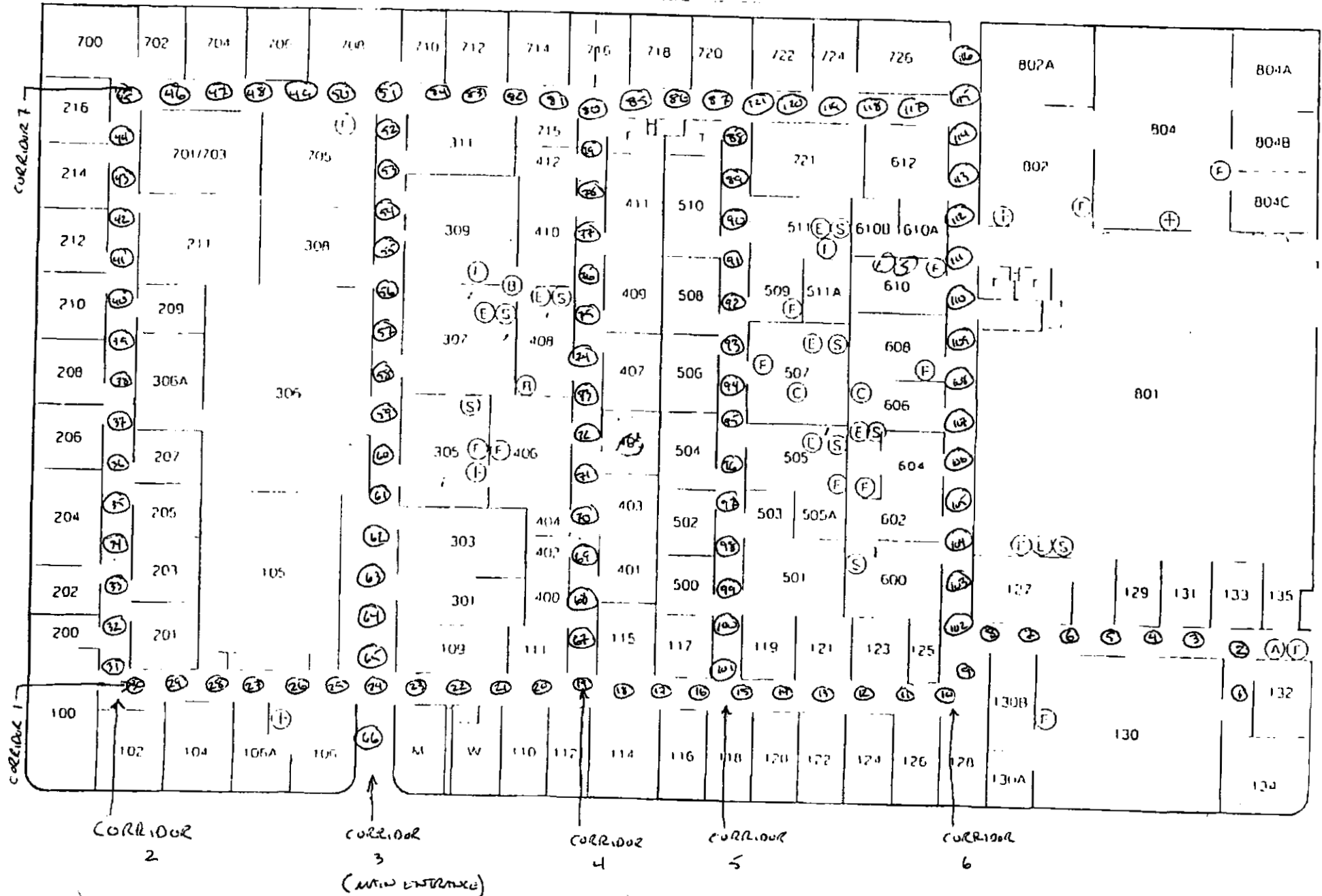
Instrument SN: 2224/170347	Calibration Due: 6/7/08	Site Name: CALREL	Date: 6/26/07	Time: 1245
Instrument SN: 43-37/PR177476	Calibration Due: 6/7/08	Location: CORRIDORS		
Instrument SN: None	Calibration Due: N/A	Purpose: FSS		
Survey Performed By (Print): Jeffrey W. Sumner		Survey Performed By (Signature): <i>[Signature]</i>		

<input checked="" type="checkbox"/> Fluency OK	<input checked="" type="checkbox"/> HV OK	<input checked="" type="checkbox"/> Source Check OK	Grid Dimensions:
			<input type="checkbox"/> meters <span style="margin-left: 100px;"><input type="checkbox"/> inches</span>
			<input type="checkbox"/> feet <span style="margin-left: 100px;"><input type="checkbox"/> centimeters</span>

		I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1)	0/360	21) 0/360	41) 0/350	61) 0/360	81) 0/350	101) 0/360	121) 0/360	141) 0/360	161) 0/360	181) 0/360	201) 0/360	221) 0/360	241) 0/360	261) 0/360	281) 0/360	301) 0/360	321) 0/360	341) 0/360	361) 0/360
2)	0/340	22) 0/350	42) 0/350	62) 0/350	82) 0/350	102) 0/360	122) 0/360	142) 0/360	162) 0/360	182) 0/360	202) 0/360	222) 0/360	242) 0/360	262) 0/360	282) 0/360	302) 0/360	322) 0/360	342) 0/360	362) 0/360
3)	0/360	23) 0/350	43) 0/400	63) 0/360	83) 0/360	103) 0/360	123) 0/360	143) 0/360	163) 0/360	183) 0/360	203) 0/360	223) 0/360	243) 0/360	263) 0/360	283) 0/360	303) 0/360	323) 0/360	343) 0/360	363) 0/360
4)	0/350	24) 0/350	44) 0/360	64) 0/360	84) 0/360	104) 0/360	124) 0/360	144) 0/360	164) 0/360	184) 0/360	204) 0/360	224) 0/360	244) 0/360	264) 0/360	284) 0/360	304) 0/360	324) 0/360	344) 0/360	364) 0/360
5)	0/360	25) 0/360	45) 0/350	65) 0/350	85) 0/360	105) 0/360	125) 0/360	145) 0/360	165) 0/360	185) 0/360	205) 0/360	225) 0/360	245) 0/360	265) 0/360	285) 0/360	305) 0/360	325) 0/360	345) 0/360	365) 0/360
6)	0/340	26) 0/340	46) 0/360	66) 0/360	86) 0/360	106) 0/360	126) 0/360	146) 0/360	166) 0/360	186) 0/360	206) 0/360	226) 0/360	246) 0/360	266) 0/360	286) 0/360	306) 0/360	326) 0/360	346) 0/360	366) 0/360
7)	0/400	27) 0/340	47) 0/360	67) 0/360	87) 0/360	107) 0/360	127) 0/360	147) 0/360	167) 0/360	187) 0/360	207) 0/360	227) 0/360	247) 0/360	267) 0/360	287) 0/360	307) 0/360	327) 0/360	347) 0/360	367) 0/360
8)	0/360	28) 0/360	48) 0/360	68) 0/360	88) 0/360	108) 0/360	128) 0/360	148) 0/360	168) 0/360	188) 0/360	208) 0/360	228) 0/360	248) 0/360	268) 0/360	288) 0/360	308) 0/360	328) 0/360	348) 0/360	368) 0/360
9)	0/350	29) 0/350	49) 0/360	69) 0/360	89) 0/360	109) 0/360	129) 0/360	149) 0/360	169) 0/360	189) 0/360	209) 0/360	229) 0/360	249) 0/360	269) 0/360	289) 0/360	309) 0/360	329) 0/360	349) 0/360	369) 0/360
10)	0/340	30) 0/360	50) 0/360	70) 0/360	90) 0/360	110) 0/360	130) 0/360	150) 0/360	170) 0/360	190) 0/360	210) 0/360	230) 0/360	250) 0/360	270) 0/360	290) 0/360	310) 0/360	330) 0/360	350) 0/360	370) 0/360
11)	0/360	31) 0/360	51) 0/360	71) 0/360	91) 0/360	111) 0/360	131) 0/360	151) 0/360	171) 0/360	191) 0/360	211) 0/360	231) 0/360	251) 0/360	271) 0/360	291) 0/360	311) 0/360	331) 0/360	351) 0/360	371) 0/360
12)	0/360	32) 0/360	52) 0/360	72) 0/360	92) 0/360	112) 0/360	132) 0/360	152) 0/360	172) 0/360	192) 0/360	212) 0/360	232) 0/360	252) 0/360	272) 0/360	292) 0/360	312) 0/360	332) 0/360	352) 0/360	372) 0/360
13)	0/360	33) 0/360	53) 0/360	73) 0/360	93) 0/360	113) 0/360	133) 0/360	153) 0/360	173) 0/360	193) 0/360	213) 0/360	233) 0/360	253) 0/360	273) 0/360	293) 0/360	313) 0/360	333) 0/360	353) 0/360	373) 0/360
14)	0/350	34) 0/360	54) 0/360	74) 0/360	94) 0/360	114) 0/360	134) 0/360	154) 0/360	174) 0/360	194) 0/360	214) 0/360	234) 0/360	254) 0/360	274) 0/360	294) 0/360	314) 0/360	334) 0/360	354) 0/360	374) 0/360
15)	0/360	35) 0/360	55) 0/360	75) 0/360	95) 0/360	115) 0/360	135) 0/360	155) 0/360	175) 0/360	195) 0/360	215) 0/360	235) 0/360	255) 0/360	275) 0/360	295) 0/360	315) 0/360	335) 0/360	355) 0/360	375) 0/360
16)	0/360	36) 0/360	56) 0/360	76) 0/360	96) 0/360	116) 0/360	136) 0/360	156) 0/360	176) 0/360	196) 0/360	216) 0/360	236) 0/360	256) 0/360	276) 0/360	296) 0/360	316) 0/360	336) 0/360	356) 0/360	376) 0/360
17)	0/360	37) 0/360	57) 0/360	77) 0/360	97) 0/360	117) 0/360	137) 0/360	157) 0/360	177) 0/360	197) 0/360	217) 0/360	237) 0/360	257) 0/360	277) 0/360	297) 0/360	317) 0/360	337) 0/360	357) 0/360	377) 0/360
18)	0/360	38) 0/360	58) 0/360	78) 0/360	98) 0/360	118) 0/360	138) 0/360	158) 0/360	178) 0/360	198) 0/360	218) 0/360	238) 0/360	258) 0/360	278) 0/360	298) 0/360	318) 0/360	338) 0/360	358) 0/360	378) 0/360
19)	0/360	39) 0/360	59) 0/360	79) 0/360	99) 0/360	119) 0/360	139) 0/360	159) 0/360	179) 0/360	199) 0/360	219) 0/360	239) 0/360	259) 0/360	279) 0/360	299) 0/360	319) 0/360	339) 0/360	359) 0/360	379) 0/360
20)	0/360	40) 0/360	60) 0/360	80) 0/360	100) 0/360	120) 0/360	140) 0/360	160) 0/360	180) 0/360	200) 0/360	220) 0/360	240) 0/360	260) 0/360	280) 0/360	300) 0/360	320) 0/360	340) 0/360	360) 0/360	380) 0/360

SEARCHED CORRIDORS, WALKED CENTER LINE, TOOK READINGS ~ 6 FT (RESULT) IN CPU 2/15. TOOK SAMPLES FOR LSC ON EVERY MULTIPLE OF 5. TOOK LSC SAMPLES AT LOCATIONS 5), 10), 15), 20) ETC 8/17/07 14:30

062607-7  
2 OF 5





062607-7  
3045

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

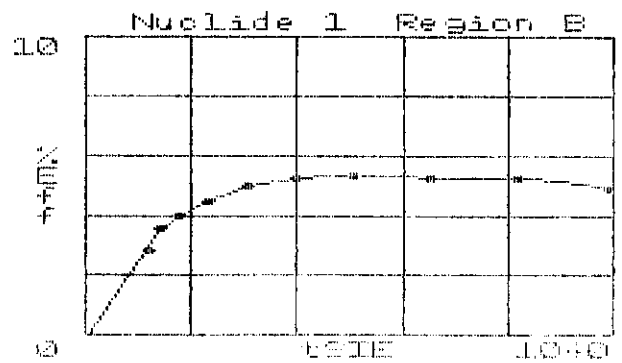
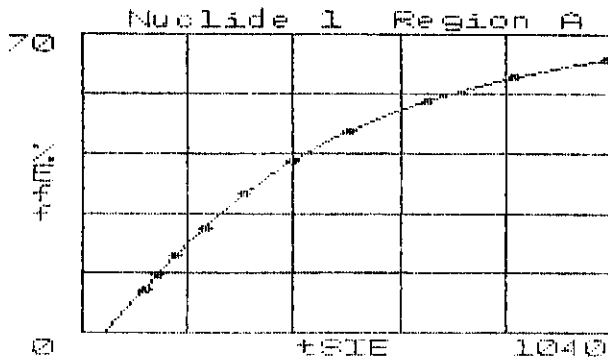
Low Energy: 3H  
High Energy: 14C

Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.56
Region B:	12.0 - 156		0	0.0	11.64
Region C:	0.0 - 0.0		0	0.0	0.00

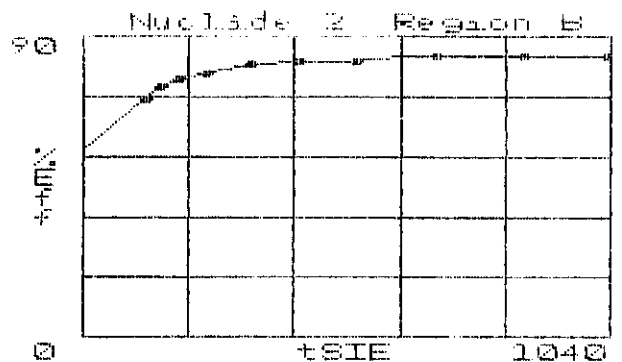
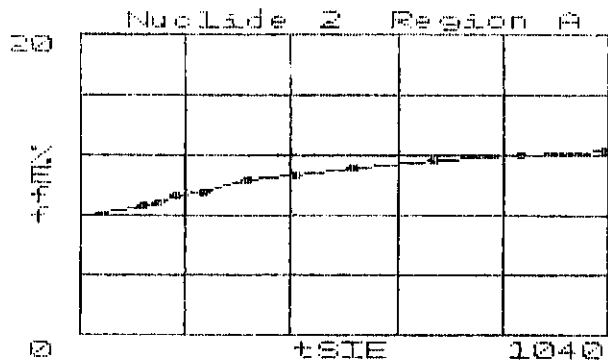
**CURRIDS**

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.99
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

28 Jun 2007 10:56 TRI-CARB - 1.09  
Protocol #:28 SURVEY

239.94 9.55 188.56 9.32 239.94 79.05 188.56 77.31  
152.93 8.76 122.58 8.60 152.93 75.21 122.58 71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.56	11.64			71.605	728.65	B
2	10.00	0.00	0.00	0.00	0.00	0.000	715.82	
3	10.00	0.37	0.23	0.60	0.24	0.000	729.88	
4	10.00	0.50	0.00	0.91	0.00	567.37	719.19	
5	10.00	0.28	0.12	0.47	0.11	32.100	729.82	
6	10.00	0.00	1.25	0.00	1.50	62.194	726.44	
7	10.00	0.61	1.54	0.71	1.78	82.588	729.24	
8	10.00	0.00	0.66	0.00	0.79	723.05	726.07	
9	10.00	0.70	0.00	1.28	0.00	0.000	721.71	
10	10.00	0.52	1.68	0.51	1.97	155.35	720.21	
11	10.00	0.67	0.00	1.22	0.00	0.000	727.71	
12	10.00	0.00	0.00	0.00	0.00	0.000	729.79	
13	10.00	1.05	1.65	1.49	1.87	53.103	718.83	
14	10.00	1.38	1.32	2.17	1.43	92.861	719.22	
15	10.00	0.00	0.00	0.00	0.00	0.000	735.05	
16	10.00	0.68	0.00	1.23	0.00	223.44	729.92	
17	10.00	0.00	1.96	0.00	2.35	112.26	724.30	
18	10.00	0.00	0.15	0.00	0.18	0.000	736.39	
19	10.00	1.13	1.57	1.67	1.76	104.35	715.84	
20	10.00	0.39	0.00	0.70	0.00	0.000	734.74	
21	10.00	0.00	1.22	0.00	1.47	94.963	732.97	
22	10.00	0.00	0.26	0.00	0.32	0.000	723.29	
23	10.00	1.89	2.51	2.79	2.80	88.415	732.92	
24	10.00	0.00	0.60	0.00	0.72	0.000	737.92	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-2

Page 1 of 1

Instrument/SN: <u>2224/170347</u>	Calibration Due: <u>6/7/08</u>	Site Name: <u>CLCRL</u>	Date: <u>6/24/07</u>	Time: <u>0930</u>
Instrument/SN: <u>43-37( P2177476</u>	Calibration Due: <u>6/7/08</u>	Location: <u>CORRIDOR 2</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FLOOR MONITOR BAREGROUND</u>		

Survey Performed By (Print): Jeffrey W Suran      Survey Performed By (Signature): [Signature]

Battery OK       HV OK       Source Check OK

Grid Dimensions: 5x5  
 meters       inches  
 feet       centimeters

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮										
4																										
5																										
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7																										
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12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										

Notes: TOOK SLAB READINGS ONLY 6 FEET DOWN CENTERLINE OF HALLWAY. RESULTS ARE CPM @ 18

① 0/400	⑦ 0/480	⑬ 0/420
② 0/420	⑧ 0/460	⑭ 0/440
③ 0/440	⑨ 0/460	⑮ 0/400
④ 0/520	⑩ 0/440	
⑤ 0/420	⑪ 0/400	
⑥ 0/440	⑫ 0/460	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062007-1

Page 1 of 8

Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Site Name: <u>GLORR</u>	Date: <u>6/24/07</u>	Time: <u>0815</u>																						
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>CORRIDOR 2</u> <u>HALLWAY ONE</u>																								
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>BACKGROUND LSC SURVEYS</u>																								
Survey Performed By (Print): <u>Jeffrey W. Seward</u>		Survey Performed By (Signature): <u>[Signature]</u>																								
<input type="checkbox"/> Battery OK <input type="checkbox"/> HV OK <input type="checkbox"/> Source Check OK		Grid Dimensions: <u>5x5</u> <input type="checkbox"/> meters <input type="checkbox"/> inches <input checked="" type="checkbox"/> feet <input type="checkbox"/> centimeters																								
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1																										
2																										
3		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮										
4																										
5																										
6																										
7																										
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11																										
12																										
13																										
14																										
15																										
16																										
17																										
18																										
19																										
20																										

Notes

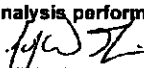
① OUTSIDE ROOM 100	⑩ OUTSIDE ROOM 201
② OUTSIDE ROOM 202	⑪ OUTSIDE ROOM 210
③ OUTSIDE ROOM 201	⑫ OUTSIDE ROOM 212
④ OUTSIDE ROOM 203	⑬ OUTSIDE ROOM 211
⑤ OUTSIDE ROOM 204	⑭ OUTSIDE ROOM 214
⑥ OUTSIDE ROOM 205	⑮ OUTSIDE ROOM 216
⑦ OUTSIDE ROOM 207	
⑧ OUTSIDE ROOM 206	
⑨ OUTSIDE ROOM 208	

ALL SURVEYS TAKEN CENTERLINE OF DOOR, 2 1/2 FEET OUT, ALSO TOOK SURVEYS FOR CROSS AIB IN SAME LOCATIONS

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RSP-019 (Rev. 003) - Attachment 4

CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	43161	10	4316	0.34	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	1	2	-0.1	-0.3	0.5	1.3	a
2	1	2	-0.1	-0.3	0.5	1.3	a
3	0	2	-0.6	-1.8	0.0	1.3	a
4	2	2	0.4	1.2	0.7	1.3	a
5	1	2	-0.1	-0.3	0.5	1.3	a
6	0	2	-0.6	-1.8	0.0	1.3	a
7	1	2	-0.1	-0.3	0.5	1.3	a
8	1	2	-0.1	-0.3	0.5	1.3	a
9	2	2	0.4	1.2	0.7	1.3	a
10	0	2	-0.6	-1.8	0.0	1.3	a
11	3	2	0.9	2.6	0.9	1.3	a
12	0	2	-0.6	-1.8	0.0	1.3	a
13	1	2	-0.1	-0.3	0.5	1.3	a
14	1	2	-0.1	-0.3	0.5	1.3	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Background smears taken in corridor 2					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT		Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01		

062007-1  
 3058

### CERTIFICATE OF ANALYSIS - SMEARS

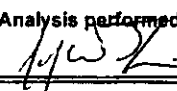
Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007			Report Date:		
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum		Instrument Model: 2929 Scaler w/43-10-1 Probe		Instrument Serial No.: 126128/132238		Calibration Due: April 2, 2008	
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):		<b>Instrument Efficiency</b>					
		Source Identifier/SN	Source Activity - 47 (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)
		2400-98	12700	43161	10	4316	0.34
		<b>Instrument Background</b>					
		Gross Counts		Count Time (min)		Background Count Rate (cpm)	
36		60		1			
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	1	2	-0.1	-0.3	0.5	1.3	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe)		Notes: Background smears taken in corridor 2					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01	

062007-1  
4058

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CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52406	10	5187	0.26	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3197		60		53			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	113	2	3.2	12.4	5.3	6.6	a
2	111	2	2.2	8.5	5.3	6.6	a
3	119	2	6.2	24.0	5.5	6.6	a
4	104	2	-1.3	-4.9	5.1	6.6	a
5	99	2	-3.8	-14.6	5.0	6.6	a
6	103	2	-1.8	-6.9	5.1	6.6	a
7	107	2	0.2	0.8	5.2	6.6	a
8	104	2	-1.3	-4.9	5.1	6.6	a
9	102	2	-2.3	-8.8	5.1	6.6	a
10	107	2	0.2	0.8	5.2	6.6	a
11	115	2	4.2	16.3	5.4	6.6	a
12	112	2	2.7	10.5	5.3	6.6	a
13	119	2	6.2	24.0	5.5	6.6	a
14	96	2	-5.3	-20.4	4.9	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Background smears taken in corridor 2					
<b>Analysis performed by (print):</b> Jeffrey W. Sumlin, RRPT			<b>Analysis performed by (signature):</b> 			<b>License No.:</b> MDE License No: MD-31-281-01	

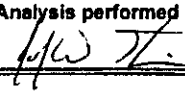


062007-1  
508

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CERTIFICATE OF ANALYSIS - SMEARS

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 18, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 19, 2007			Report Date:		
DATA ACQUISITION							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238		Calibration Due: April 2, 2008			
Analysis Method: <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  Analysis Type: <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	Instrument Efficiency						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2399-98	20000	52406	10	5187	0.26	
	Instrument Background						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
3197		60		53			
RESULTS							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
15	114	2	3.7	14.3	5.3	6.6	a
Codes: (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		Notes: Background smears taken in corridor 2					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT		Analysis performed by (signature): 			License No.: MDE License No: MD-31-281-01		

09007-1  
6008

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

BK605 Flow  
 Coll. Out 2

062007-1  
 7 of 8

20 Jun 2007 14:45  
 Protocol #:18

TRI-CARB - 1.09  
 SURVEY

Page #1  
 User : KIM

Time: 10.00  
 Data Mode: Dual DPM

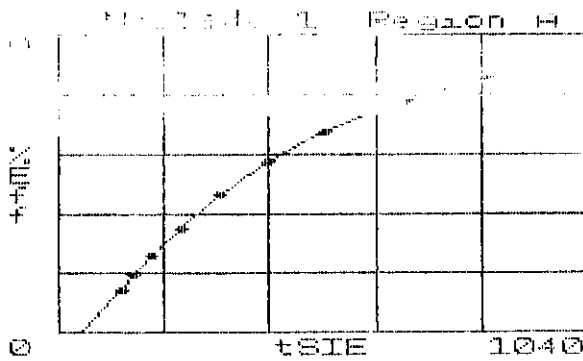
Nuclides: 3H-14C

Quench Sets  
 Low Energy: 3H  
 High Energy: 14C

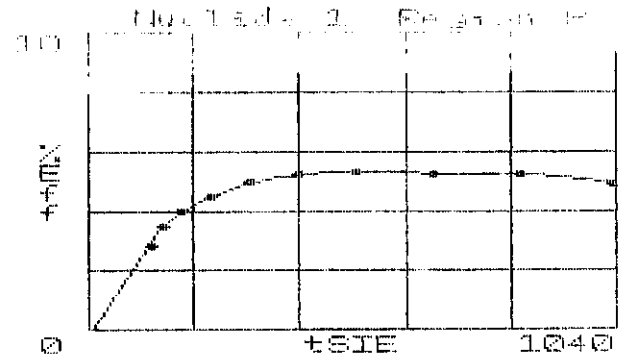
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	15.16
Region B:	12.0 - 156		0	0.0	14.74
Region C:	0.0 - 0.0		0	0.0	0.00

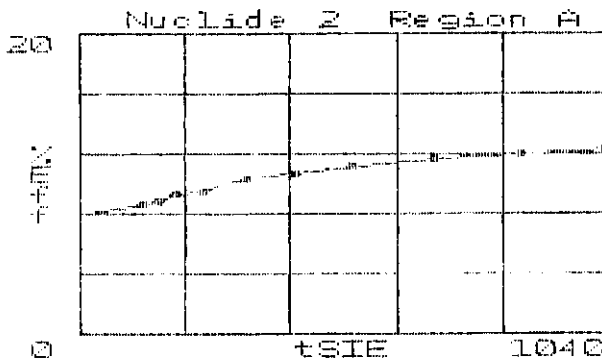
Quench Indicator: tSIE/AEC  
 Ext Std Terminator: Count



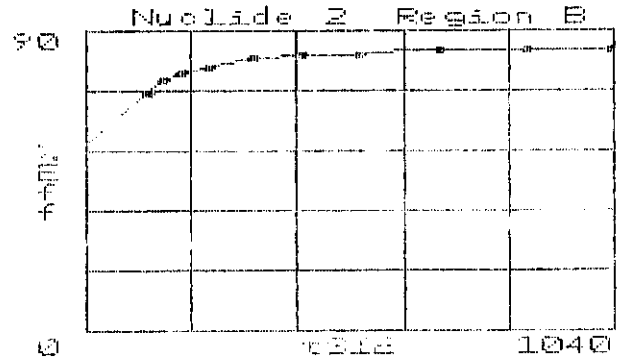
tSIE	%EffA	tSIE	%EffA
1034.8	63.94	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.43	320.19	32.62
242.00	24.69	184.16	18.16
149.13	13.67	121.67	10.10



tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	11.99
697.16	11.62	538.87	11.12
426.87	10.69	329.70	10.31



tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.54

20 Jun 2007 14:45

TRI-CARB - 1.09

BK903 FROM  
CURRIOR 2

062007-1  
8 of 8

Protocol #:18

SURVEY

Page #2

User : KIM

239.94	9.55	188.56	9.31	239.94	79.05	188.56	77.31
152.93	8.75	122.58	8.59	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	15.16	14.74			65.455	733.65	B
2	10.00	0.00	0.00	0.00	0.00	0.000	741.71	
3	10.00	0.00	0.00	0.00	0.00	0.000	739.07	
4	10.00	0.00	1.01	0.00	1.21	1080.2	760.59	
5	10.00	0.00	0.00	0.00	0.00	0.000	762.92	
6	10.00	0.00	0.00	0.00	0.00	0.000	769.40	
7	10.00	0.15	0.00	0.27	0.00	0.000	771.66	
8	10.00	0.89	0.00	1.57	0.00	0.000	777.98	
9	10.00	0.00	0.00	0.00	0.00	0.000	775.96	
10	10.00	0.00	0.00	0.00	0.00	0.000	769.07	
11	10.00	0.00	0.00	0.00	0.00	0.000	776.68	
12	10.00	0.00	0.08	0.00	0.10	0.000	782.08	
13	10.00	0.00	0.00	0.00	0.00	0.000	770.45	
14	10.00	0.00	0.00	0.00	0.00	0.000	770.21	
15	10.00	0.00	0.00	0.00	0.00	0.000	759.23	
16	10.00	0.00	0.00	0.00	0.00	0.000	765.63	

**INTEGRATED ENVIRONMENTAL MANAGEMENT, INC.**  
**RADIOLOGICAL SURVEY FORM**

Survey Number 062607-6

Page 1 of 6

Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Site Name: <u>CLLPL</u>	Date: <u>6/24/07</u>	Time: <u>1045</u>
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Location: <u>SINK AND FUME HOOD DRAINS</u>		
Instrument/SN: <u>N/A</u>	Calibration Due: <u>N/A</u>	Purpose: <u>FSS</u>		
Survey Performed By (Print): <u>JEFFREY W SANCHEZ</u>		Survey Performed By (Signature): <u>[Signature]</u>		

<input type="checkbox"/> Battery OK	<input type="checkbox"/> HV OK	<input type="checkbox"/> Source Check OK	Grid Dimensions: <u>N/A</u>
			<input type="checkbox"/> meters <input type="checkbox"/> inches
			<input type="checkbox"/> feet <input type="checkbox"/> centimeters

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	
1		1)	ROOM 305	SINK											21)	ROOM 511	SINK	RIGHT									
2		2)	ROOM 305	HOOD											22)	ROOM 511	HOOD										
3		3)	ROOM 307	SINK											27)	ROOM 511A	SINK	LEFT									
4		4)	ROOM 307	HOOD NORTH											24)	ROOM 511A	SINK	RIGHT									
5		5)	ROOM 307	HOOD WEST											25)	ROOM 608	SINK	LEFT									
6		6)	ROOM 309	SINK LEFT											26)	ROOM 608	SINK	RIGHT									
7		7)	ROOM 309	SINK RIGHT											27)	ROOM 606	SINK										
8		8)	ROOM 309	HOOD											28)	ROOM 606	HOOD										
9		9)	ROOM 311	SINK											29)	ROOM 604	SINK										
10		10)	ROOM 408	SINK											30)	ROOM 600	SINK	LEFT									
11		11)	ROOM 408	HOOD											31)	ROOM 600	SINK	RIGHT									
12		12)	ROOM 505	SINK LEFT											32)	ROOM 600	HOOD										
13		13)	ROOM 505	SINK RIGHT											33)	ROOM 511	OLD SINK	AREA									
14		14)	ROOM 505	HOOD																							
15		15)	ROOM 505A	SINK																							
16		16)	ROOM 507	SINK LEFT																							
17		17)	ROOM 507	SINK RIGHT																							
18		18)	ROOM 507	HOOD																							
19		19)	ROOM 509	SINK																							
20		20)	ROOM 511	SINK LEFT																							

Notes: TOOK LSC SAMPLES IN ABOVE LOCATIONS, ALSO TOOK SAMPLES FOR GROSS alpha IN ROOM 305 SINK AND HOOD.

0626.7-6  
ZOF6

Smears counted on Ludlum 2929/43-10-1 are in sequential order.

Smears counted on the LSC unit are as follows:

Smear Result 1 is from a clean smear used as a background for the LSC counter.

Smear Results 2 to the end of that run are one number higher than the corresponding location on the survey map.

06-2617-6  
30:6

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**CERTIFICATE OF ANALYSIS - SMEARS**

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 26, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 26, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input checked="" type="checkbox"/> Gross Alpha <input type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	Source Identifier/SN	Source Activity - 4π (dpm)	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Efficiency (cpm/dpm)	
	2400-98	12700	44014	10	4401	0.35	
	<b>Instrument Background</b>						
	Gross Counts		Count Time (min)		Background Count Rate (cpm)		
	37		60		1		
<b>RESULTS</b>							
Smear No.	Gross Counts	Count Time (min)	Net Count Rate (cpm)	Activity (dpm)	+/- (dpm)	MDA (dpm)	Codes
1	0	2	-0.6	-1.8	0.0	1.4	a
2	0	2	-0.6	-1.8	0.0	1.4	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Dried smears before counting. Smears from Room 305					
Analysis performed by (print): Jeffrey W. Sumlin, RRPT			Analysis performed by (signature):			License No.: MDE License No: MD-31-281-01	

06 2007-6  
4 of 6

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RSP-019 (Rev. 003) - Attachment 4

**CERTIFICATE OF ANALYSIS - SMEARS**

Client Name: GLERL		IEM Project No.: 2005006.003					
Sample Collection Date: June 20, 2007	Sample Ship Date: N/A	Sample Analysis Date: June 20, 2007	Report Date:				
<b>DATA ACQUISITION</b>							
Instrument Manufacturer: Ludlum	Instrument Model: 2929 Scaler w/43-10-1 Probe	Instrument Serial No.: 126126/132238	Calibration Due: April 2, 2008				
<b>Analysis Method:</b> <input checked="" type="checkbox"/> IEM RSP (specify): RSP-019 <input type="checkbox"/> Other (specify):  <b>Analysis Type:</b> <input type="checkbox"/> Gross Alpha <input checked="" type="checkbox"/> Gross Beta <input type="checkbox"/> Other (specify):	<b>Instrument Efficiency</b>						
	<b>Source Identifier/SN</b>	<b>Source Activity - 4π (dpm)</b>	<b>Gross Counts</b>	<b>Count Time (min)</b>	<b>Net Count Rate (cpm)</b>	<b>Efficiency (cpm/dpm)</b>	
	2399-98	20000	52627	10	5209	0.26	
	<b>Instrument Background</b>						
	<b>Gross Counts</b>		<b>Count Time (min)</b>		<b>Background Count Rate (cpm)</b>		
3203		60		53			
<b>RESULTS</b>							
<b>Smear No.</b>	<b>Gross Counts</b>	<b>Count Time (min)</b>	<b>Net Count Rate (cpm)</b>	<b>Activity (dpm)</b>	<b>+/- (dpm)</b>	<b>MDA (dpm)</b>	<b>Codes</b>
1	106	2	-0.4	-1.5	5.1	6.6	a
2	103	2	-1.9	-7.2	5.1	6.6	a
<b>Codes:</b> (a) - No correction for self-absorption (b) - Visible damage to sample (c) - Sample returned to client (d) - Other (describe): (e) - Other (describe):		<b>Notes:</b> Dried smears before counting. Smears from Room 305					
<b>Analysis performed by (print):</b> Jeffrey W. Sumlin, RRPT			<b>Analysis performed by (signature):</b>			<b>License No.:</b> MDE License No: MD-31-281-01	



Time: 10.00

Data Mode: Dual DPM

Nuclides: 3H-14C

Quench Sets

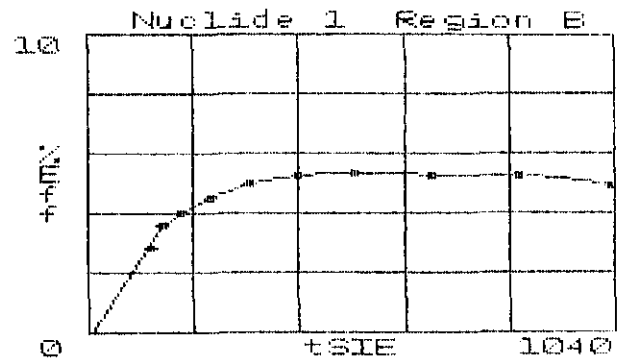
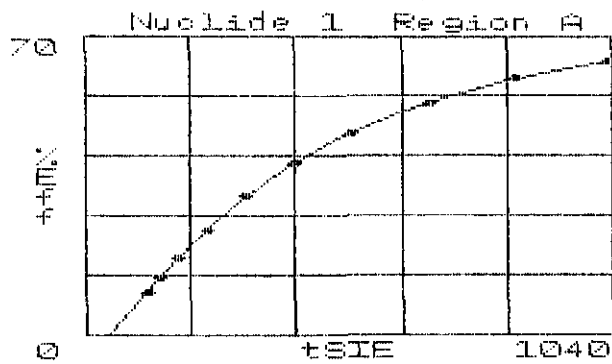
Low Energy: 3H

High Energy: 14C

Background Subtract: 1st Vial

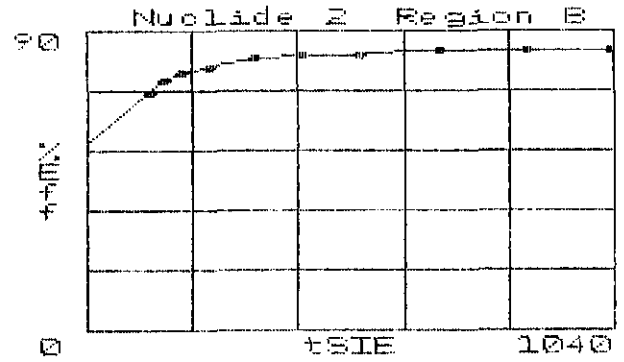
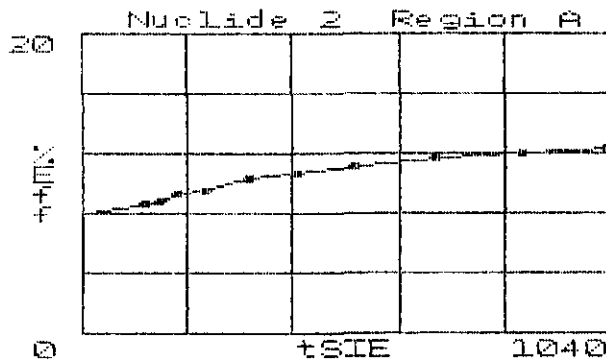
	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 12.0		0	0.0	10.01
Region B:	12.0 - 156		0	0.0	12.59
Region C:	0.0 - 0.0		0	0.0	0.00

Quench Indicator: tSIE/AEC  
Ext Std Terminator: Count



tSIE	%EffA	tSIE	%EffA
1034.8	63.95	850.73	59.86
680.77	54.36	526.12	47.53
416.09	40.44	320.19	32.62
242.00	24.70	184.16	18.16
149.13	13.67	121.67	10.10

tSIE	%EffB	tSIE	%EffB
1034.8	4.95	850.73	5.27
680.77	5.27	526.12	5.37
416.09	5.23	320.19	4.98
242.00	4.49	184.16	4.02
149.13	3.54	121.67	2.85



tSIE	%EffA	tSIE	%EffA
1035.1	12.29	869.29	12.00
697.16	11.63	538.87	11.13
426.87	10.70	329.70	10.31

tSIE	%EffB	tSIE	%EffB
1035.1	83.64	869.29	84.06
697.16	84.32	538.87	82.87
426.87	82.43	329.70	81.55

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SURVEY

User : KIM

239.94	9.55	188.56	9.32	239.94	79.05	188.56	77.31
152.93	8.76	122.58	8.60	152.93	75.21	122.58	71.52

S#	TIME	CPMA	CPMB	DPM1	DPM2	SIS	tSIE	FLAG
1	10.00	10.01	12.59			82.537	737.25	B
2	10.00	1.34	0.00	2.49	0.00	0.000	682.26	
3	10.00	0.00	1.13	0.00	1.37	0.000	642.14	
4	10.00	1.14	2.56	1.46	2.95	0.000	690.63	
5	10.00	0.00	1.14	0.00	1.38	0.000	658.50	
6	10.00	0.00	0.00	0.00	0.00	0.000	679.18	
7	10.00	0.54	0.46	0.88	0.49	0.000	702.14	
8	10.00	2.09	0.00	3.69	0.00	0.000	770.41	
9	10.00	2.99	2.51	5.19	2.67	0.000	624.25	
10	10.00	0.07	0.00	0.13	0.00	0.000	744.59	
11	10.00	2.65	1.55	4.45	1.56	32.864	716.25	
12	10.00	2.98	1.71	5.05	1.72	42.637	699.16	
13	10.00	1.22	1.78	1.78	2.00	55.640	711.40	
14	10.00	1.29	3.61	1.46	4.19	52.397	710.12	
15	10.00	0.00	0.56	0.00	0.67	0.000	691.68	
16	10.00	0.02	0.38	0.00	0.45	0.000	719.39	
17	10.00	1.22	2.58	1.58	2.97	0.000	703.62	
18	10.00	0.25	0.00	0.46	0.00	0.000	697.12	
19	10.00	0.00	0.09	0.00	0.11	0.000	662.43	
20	10.00	0.00	0.00	0.00	0.00	0.000	633.21	
21	10.00	0.83	0.00	1.50	0.00	0.000	728.69	
22	10.00	1.30	0.40	2.22	0.34	0.000	751.00	
23	10.00	0.14	0.76	0.07	0.90	0.000	717.39	
24	10.00	1.73	0.00	3.18	0.00	0.000	700.37	
25	10.00	1.94	0.00	3.54	0.00	0.000	716.79	
26	10.00	2.31	0.00	4.19	0.00	0.000	728.13	
27	10.00	0.00	2.60	0.00	3.13	0.000	703.48	
28	10.00	0.09	1.86	0.00	2.23	54.490	708.28	
29	10.00	0.16	0.54	0.15	0.63	71.193	755.65	
30	10.00	0.43	0.00	0.79	0.00	0.000	700.67	
31	10.00	0.00	0.00	0.00	0.00	0.000	711.01	
32	10.00	2.01	1.59	3.31	1.68	55.328	697.63	
33	10.00	0.00	0.00	0.00	0.00	0.000	657.34	
34	10.00	2.35	0.00	4.34	0.00	0.000	697.29	

This report was prepared under the direction of  
BMT Entech

by

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