Celgene Corporation
86 Morris Avenue
Summit, New Jersey 07901
Tel 908-673-9000
Fax 908-673-9001

NMSB2

January 17, 2006

U.S. Nuclear Regulatory Commission
Region 1
Attn: Licensing Assistance Team
475 Allendale Road
King of Prussia, PA 19406

03030074

Re: Removal of Warren, NJ site from License No: 29-28056-01

To Whom It May Concern:

Celgene Corporation (License No: 29-28056-01) respectfully requests an amendment to our license. This amendment would remove our facility at 7 Powder Horn Drive, Warren NJ, 07059 from our license and consider the site acceptable for unrestricted use.

Attached, please find the radiological decommissioning report for the Warren, NJ facility in support of our request. This report clearly demonstrates the site meets the criteria for unrestricted release as defined in 10 CFR 20.1402.

Celgene Corporation also respectfully requests the Nuclear Regulatory Commission (NRC) expedite the review of our request. This site has not been utilized by Celgene Corporation since October of 2005 and will not be available to sub-lease until the NRC acts upon our amendment request.

Thank you for your prompt consideration of our request. Should you have questions or concerns, do not hesitate to contact Mr. Michael Conroy, RSO at 908-673-9506.

Sincerely,

David Stirling
Chief Scientific Officer,
Executive Vice-President
Research & Development

138255

Enclosure

MATERIALS-002

PHILOTECHNICS

Laboratory Radiological Decommissioning Report

Prepared for:

The Celgene Corporation
86 Morris Avenue
Summit, NJ 07901

In reference to:

7 Powder Horn Drive
Warren, NJ 07059

030300174

U.S. Nuclear Regulatory Commission
Radioactive Materials License #29-28056-01

Survey Dates: December 5 - 7, 2005
Report Date: December 30, 2005

Prepared by:
Philotechnics, Ltd.
1740 Massachusetts Avenue
Boxborough, MA 01719

DECOMMISSIONING REPORT CONTENTS

Section 1.0 – Executive Summary

A radiological survey was completed utilizing the requirements from Nuclear Regulatory Commission and recommendations from MARSSIM (Multi Agency Radiation Survey and Site Investigation Manual) in order to provide pertinent information for the decommissioning and ultimate unrestricted release of specified areas. A review of all data collection and analysis supports our professional opinion that these areas meet criteria for unrestricted release according to NRC 10 CFR 20.1402 "Radiological Criteria for Unrestricted Use" based upon the following:

- ***All final scanning measurements were indistinguishable from background (below the Scanning Survey Minimum Detectable Concentration (MDC)).***
- ***All final static measurements were below the DCGL for C-14.***
- ***All final wipe surveys were indistinguishable from background (below the MDC of the Scintillation Counter).***
- ***The total effective dose equivalent (TEDE) from any potential radioactive materials in the specified areas is calculated to be 0.0237 mrem/year based upon instrumentation MDCs and static surveys.***

Section 2.0 – Project Scope, Findings and Summary

Prior to removal from the license, the Nuclear Regulatory Commission requires that an appropriate decommissioning survey and report be submitted for their review. This document provides the licensee with appropriate information to request removal of the specified areas through an amendment request with NRC.

In accordance with our proposal agreement with the Celgene Corporation, Philotechnics, Ltd. performed a radiological decommissioning of the specified areas. The survey and report provides pertinent information for radiological decommissioning of specified research laboratories and affiliated areas at the Celgene Corporation. The Final Status Survey and analytical data follow the guidance of MARSSIM (NUREG-1575) and NUREG-1507. The facility is a commercial/light industrial building used for pharmaceutical research.

The Celgene Corporation occupies two facilities: one located at 86 Morris Avenue in Summit, New Jersey and the other at 7 Powder Horn Drive in Warren, New Jersey. This decommissioning project pertains to specific areas of Celgene's Warren, New Jersey facility that the Celgene Corporation wishes to have removed from their radioactive materials license. Appendix A shows floor diagrams for the facility indicating the areas that have been decommissioned.

The following summarizes the independent conclusions representing Philotechnics's best professional judgment based on information and data available to us during the course of this assignment. Factual information regarding operations, conditions, and test data provided by the client, owner, or their representative has been assumed correct and complete based upon careful and diligent review of the safety program and past inspection records. Additionally, the conclusions presented are based on the conditions that existed at the time of the assessment. Note that on-site observation of the above referenced facilities consisted of readily visible, accessible areas only.

Table 1: Assessment Review

Assessment Component	Acceptable	Unacceptable	Section
License Review & Historical Use	X		4.0
Radiation Surveys			5.0
A) Static Measurements – Hand-held instruments	X		
B) Static Measurements – Scintillation Counter	X		
C) Scanning Measurements – Hand-held instruments	X		

Conclusions and Recommendations

Based upon the results of our survey, it is our professional opinion that these spaces are free of any radioactive contamination and/or radioactive material sources and may be removed as restricted areas from Celgene's Radioactive Materials License in accordance with NRC 10 CFR 20.1402 "Radiological Criteria for Unrestricted Use". During the survey, Philotechnics verified that all labels, signs, or other similar markings indicating the presence of radioactive materials had been removed or obliterated. Additionally, no concerns requiring further investigation exist at this time.

Project Team

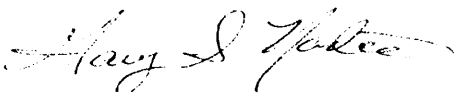
The project team consisted of the following individuals:

Researched by:	Patrick McDermott, Gary S. Nadeau, and Matt Norton
Surveyed by:	Gary S. Nadeau, Frank Brown, David Lewis, Tim Pratt, Rob Saunders
Written by:	Gary S. Nadeau

Project Manager and Contact: Gary S. Nadeau

Closing

We appreciate the opportunity to provide this radiological decommissioning and trust that the enclosed information is adequate for decision-making needs. Should you have any questions, please do not hesitate to call the undersigned.



Gary S. Nadeau, CNMT
Sr. Health Physicist
Philotechnics, Ltd.

December 29, 2005

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Section 3.0 – Assessment, Methodology and Report Limitations

The Laboratory Decommissioning process evaluates a property's environmental status for release of affected areas to allow unrestricted use by current or future tenants. The assessment involves the review of operations as they pertain to radioactive materials (RAM) use in order to identify potential radioactive contamination.

Assessment activities related to the laboratory decommissioning for the facility included the following tasks:

- A visual survey of both current and past RAM use areas in order to identify potential contamination and/or presence of radioactive materials
- Interviews with client personnel regarding current and historical use of RAM at the facility
- Review of existing documentation, as provided, regarding prior inspections, investigations, events or conditions at the facility related to RAM use
- Direct surveys of all laboratory areas with the use of portable hand-held radiation detection equipment to identify the presence of radioactive materials
- Indirect surveys to test for removable contamination with the use of a scintillation counter and wipes taken throughout the specified areas
- Preparation of a report documenting our findings, recommendations and professional opinions regarding observed or suspected radiological concerns

Facility Point of Contact

At the facility, Matt Norton and Gary S. Nadeau met with Michael Conroy, who is the Radiation Safety Officer for Celgene. Mr. Conroy was able to provide specific information regarding radioactive materials use at the facility based upon his historical knowledge of the facility and implemented practices at the Celgene Corporation.

Report Limitations

This report has been prepared solely for the use and benefit of Celgene in compliance with the requirements and recommendations by MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual, NUREG-1575). Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the field of environmental science. This warranty is in lieu of all other warranties either expressed or implied. Philotechnics is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration presented in this report.

It must be noted that no investigation, or survey, can absolutely rule out the existence of radioactive materials. This assessment has been based upon prior history, observable conditions, direct surveys and indirect surveys. There are limitations based upon this approach where contaminants can escape detection using these methods. Minimum detectable concentrations have been specified for the instrumentation used to qualify the detection limits.

The work performed in conjunction with this assessment and the data developed are intended as a description of available information at the dates and location given. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated. In addition, this report is not intended as a regulatory agency compliance/safety audit or for the purpose of ensuring that all applicable permits and/or operating procedures are current and/or appropriate.

Section 4.0 License Review and Historical Use

Radioactive Materials (RAM) License

This decommissioning request for unrestricted release affects specific laboratory areas currently at Celgene's Warren, New Jersey site's radioactive materials license (#29-28056-01). The laboratories are located at Celgene's 7 Powder Horn Drive facility. Radioactive material usage has ceased at the Warren, NJ site and radioisotopes are no longer being ordered to this site. All radioactive materials were removed from the Warren, NJ site by an authorized vendor. Specific areas being decommissioned are detailed in the Restricted Area Summary (Table 3).

The Celgene Corporation first received their license in 1988. The license was authorized to use H-3, C-14, P-32, P-33, S-35, and Cl-36.

Prior to the cessation of licensed activities at the Warren site, the Celgene Corporation was authorized to possess the following isotopes:

Table 2: RAM License Possession Limits

Nuclide	Form	License Possession Limit
Hydrogen-3 (H-3)	Any	Not to exceed 100 millicuries (mCi)
Carbon-14 (C-14)	Any	Not to exceed 100 millicuries (mCi)
Phosphorus-32 (P-32)	Any	Not to exceed 100 millicuries (mCi)
Sulfur-35 (S-35)	Any	Not to exceed 100 millicuries (mCi)
Phosphorus-33 (P-33)	Any	Not to exceed 100 millicuries (mCi)

Authorized Use
To be used for labeling and as tracers in chemical and biological (in-vitro) studies.

Restricted Area Summary

In order to exit the lease of the subject property, The Celgene Corporation requires the unconditional release of the 7 Powder Horn Drive facility. The areas being requested for release are specified in the table below and are identified on the diagrams in Appendix A.

Table 3: Restricted Area Summary - 7 Powder Horn Drive

Restricted Area	Isotope usage
Room 13 – Dark Room	^{3}H
Room 14 - Laboratory	^{3}H, ^{32}P, ^{35}S
Room 15 - Laboratory	^{3}H, ^{32}P, ^{35}S
Room 18A – Count Room	^{3}H, ^{14}C, ^{32}P, ^{33}P, ^{35}S
Room 20 – Cold Room	^{3}H, ^{14}C
Underdeveloped Area	^{3}H

Restricted Area	Isotope usage
Room 105 - Laboratory	^{3}H, ^{14}C, ^{32}P, ^{35}S
Room 106 – Cell Labeling	^{3}H
Room 113 – Hot Lab	^{3}H, ^{14}C, ^{32}P, ^{33}P, ^{35}S
Waste Storage - Cage	^{3}H, ^{14}C, ^{32}P, ^{33}P, ^{35}S
Chemical Storage – 36C	^{3}H, ^{14}C, ^{32}P, ^{33}P, ^{35}S
Hallway	^{3}H, ^{14}C, ^{32}P, ^{33}P, ^{35}S

Historical Use

The Celgene Corporation is a typical biotech research company that uses small quantities of radioactive materials (RAM) for purposes of tracers in chemical and biological studies.

Operations utilizing radioactive materials have been conducted since 1988. The facility is leased by Celgene Corporation and consists of approximately 38,500 sq. ft. of space. This space is divided between administrative areas (offices, cafeteria, restrooms, etc.) and operational space (labs, mechanical rooms, shipping/receiving areas and storage areas).

Operations involving licensed materials at the Warren site ceased in October of 2005 and were transferred to the Corporation's Summit, NJ facility.

H-3 and P-32 have historically been the isotopes primarily used at the 7 Powder Horn Drive facility since they occupied the site in 1988. Based on the historical site assessment, H-3 and C-14 are the isotopes of concern for this report. The survey model was developed and implemented to detect the isotopes used in each specific area, realizing that any potential contamination due to the short lived isotopes would have decayed by the time of the decommissioning survey.

Philotechnics conducted extensive reviews of facility records as well as interviewing key personnel on November 29, 2005. The records review included: radioactive materials licenses, license applications, amendment requests, radiological surveys, radionuclide receipt and distribution records, incident reports and waste manifest reviews.

A detailed historical overview of the areas within the facility where licensed material was used or stored was prepared after the records review and personnel interviews.

Individuals interviewed included:

Mr. Michael Conroy, Current RSO
Mr. Faribourz Payvandi, RSO from 1999-2003
Mr. Peter Schafer, Lead Scientist from 1999 to present
Mr. David Stirling, Chief Scientific Officer and original authorized user in 1988

Isotope Use History

Hydrogen-3: Hydrogen-3 (H-3) has been the workhorse of the Celgene Corporation isotopes. It has seen consistent use throughout the life of the Warren Site. **H-3 must be considered as a potential contaminant.**

Carbon-14: Carbon-14 (C-14) has been used only sporadically. It was apparently used in the late 1980's, then not again until 2000. **C-14 must be considered as a potential contaminant.**

Phosphorous-32: Phosphorous-32 (P-32) had been used and was second only to H-3 in how frequently it was used. The last order of P-32 was received on site in September of 2003. **Therefore, due to the short half-life of P-32, this isotope need not be considered a contaminant.**

Sulphur-35: Sulphur-35 (S-35) saw extensive use during the 1990's, but not since. There is no evidence of any S-35 orders since prior to 2000. This information was confirmed via interviews with current research staff. **Due to the short half-life of S-35 and the most recent order would have been no later than 1999, this isotope need not be considered a contaminant.**

Chlorine-36: There is no evidence that Chlorine-36 (Cl-36) was ever utilized on site. The original license (1988) authorized Celgene to have Cl-36 with a possession limit of 100 millicuries. In 1990, the NRC informed Celgene that they would be required to set aside monies for decommissioning to keep the 100 millicuries of Cl-36 on the license. Celgene removed Cl-36 from the license. An interview with Mr. David Stirling confirmed the isotope was never utilized on site. **Cl-36 need not be considered a contaminant.**

Phosphorous-33: Phosphorous-33 (P-33) was added to the license in the 1990's. Work with this isotope was sporadic at best. Like S-35, there is no evidence of any P-33 orders since prior to 2000. This information was confirmed via interviews with current research staff. **Due to the short half-life of P-33 and the fact that the most recent order would have been no later than 1999, this isotope need not be considered a contaminant.**

Area Use History

This information in this section relied heavily upon record reviews (surveys of areas, notes of spills, correspondence with the regulators) to identify known and potential areas of use. These notes were then cross checked with facility personnel to ultimately classify areas as impacted or non-impacted.

The entirety of the administrative areas, that is the conference rooms, cafeteria, showers, and all of the office spaces are non-impacted.

The majority of the laboratory and operational spaces are also considered non-impacted. Autoclave rooms, mechanical rooms, storage spaces, chemistry laboratories, QA/QC labs, etc. were not authorized for the use of licensed materials. Additionally, records review and interviews confirm that licensed materials were not utilized in these areas.

Section 5.0 – Radiation Surveys

Description of Radiation Surveys

During the period of December 5 - 7, 2005, Philotechnics, Ltd. completed a comprehensive wipe and meter survey in all accessible areas, which included benches, floors, cabinets, sinks, hoods, traps and laboratory exhausts in the areas identified in Table 3. Survey maps depicting these laboratories are included as Appendix C.

The following instrumentation was used to quantify radiation levels:

- Bicron Electra 1B, S/N: 5056
  BP19DD (beta probe)
  Serial # 213 (Calibrated on 5/13/05)
- Bicron Selectra 1A, S/N: 213
  BP19DD (beta probe)
  Serial # K110 (Calibrated on 6/20/05)
- Bicron Selectra 1A, S/N:
  BP19DD (beta probe)
  Serial # 478 (Calibrated on 8/18/04)
- Ludlum Model 2221, S/N: 134537
  43-37 (beta probe),
  Serial #148548 (Calibrated on 6/15/05)
- Innovision 451P Ion Chamber, S/N: 6289 (Calibrated on 12/10/04)
- Packard Scintillation Counter (Operational Test 12/27/05)

The instrument calibrations were completed using NIST traceable sources and the Certificates of Calibration are included as Appendix B.

Minimum Detectable Concentration (MDC) Calculations

Philotechnics analytical sheets are included as Appendix D, which show calculations for Static MDC for the Scintillation Counter, Static MDC for Instruments, and Scanning MDC for Instruments. These calculations follow the guidance in MARSSIM NUREG-1575 and NUREG-1507. This information is used to verify the effectiveness of the instrumentation used in units of dpm/100 cm^2.

Area Classifications

Based on the results of the historical site assessment, facility areas were classified as impacted areas or non-impacted areas. Non-impacted areas are areas with no potential residual radioactivity from licensed activities. These include non-laboratory areas inside the building. Impacted areas are those areas that may have some level of potential residual radioactivity from licensed activities.

Impacted areas are typically divided into Class 1, 2, or 3 areas. Class 1 areas have the greatest potential for contamination and therefore receive the highest degree of survey effort for the final

status survey, followed by Class 2 and then by Class 3. The table below lists the recommended maximum survey unit sizes based on floor area. It should be noted that these limits are recommended and are not absolute.

Class 1 Areas – Areas with the highest potential for contamination, and meet the following criteria: (1) impacted; (2) potential for delivering a dose above the release criterion; (3) potential for small areas of elevated activity; and (4) insufficient evidence to support classification as Class 2 or Class 3.

Class 2 Areas – Areas that meet the following criterion: (1) impacted; (2) low potential for delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

Class 3 Areas – Areas that meet the following criterion: (1) impacted; (2) little or no potential for delivering a dose above the release criterion; and (3) little or no potential for small areas of elevated activity.

Non-impacted Areas: Indoor areas other than those identified as restricted areas by the RAM license, and surfaces above two meters in height in the areas specified below.

Impacted Class 2 Areas: Dark Room (13), Laboratory (14), Laboratory (15), Count Room (18A), Cold Room (20), Laboratory (105), Cell Labeling (106), and Hot Lab (113), Waste Storage Cage and Chemical Storage (36C), including all surfaces less than two meters in height.

Impacted Class 3 Areas: Hallway and Underdeveloped Area.

Table 5: Recommended Maximum Survey Unit Size Limits

Type of Survey Unit	**Class 1**	**Class 2**	**Class 3**
Structures	Up to 100 m^2	100 m^2 to 1,000 m^2	No limit

Table 6: Laboratory Classification

Area Designation	Classification
7 Powder Horn Drive	
Room 13 – Dark Room	Class 2
Room 14 - Laboratory	Class 2
Room 15 - Laboratory	Class 2
Room 18A – Count Room	Class 2
Room 20 – Cold Room	Class 2
Room 105 - Laboratory	Class 2
Room 106 – Cell Labeling	Class 2
Room 113 – Hot Lab	Class 2
Waste Storage - Cage	Class 2
Chemical Storage – 36C	Class 2
Hallway & Underdeveloped Area	Class 3

Survey Methodology

Our methodology for this Final Status Survey was broken down into two approaches based upon the two different classifications. In the Class 2 areas, walls and floors and were considered, however the result is a large area divided by a small number of samples. The spacing between these samples becomes too wide for these small areas. Therefore, the number of sample locations were increased and spread evenly throughout the laboratory. In most cases an excess of samples were taken as a conservative measure.

The MARSSIM guidance recommends simple random measurement patterns for Class 3 survey units to ensure that the measurements are independent and support the assumptions of the statistical tests. For this survey, measurement locations were selected by a simple random measurement pattern. Additional measurements were made on a judgmental basis in order to sample in areas where potential contamination may exist.

Surface Scans

The following table compares MARSSIM recommendations and actual area coverage for the scan survey completed at Celgene.

Table 7: Scan Survey Coverage Comparison

Classification	Percentage of Surface Area Requiring Scan Coverage (MARSSIM)	Celgene Surface Area Scan Coverage
1	100%	N/A
2	10 – 100% (Judgmental)	90 – 100%
3	Judgmental	80 – 100%

Class 2 survey areas received a 90 – 100% scan survey of all accessible areas and the Class 3 survey areas received an 80 - 100% scan survey of all accessible areas. These scan survey percentages were chosen in order to provide a more comprehensive survey of the affected areas and a higher confidence that there was no contamination present. In the event of any elevated activity noted from the survey, the location would have been marked and additional measurements would have been taken to quantify the activity. ***All final scan surveys were indistinguishable from background measurements and therefore additional follow up was not required.***

Fixed or Static Measurements

Static measurements were completed at locations specified in the survey design. No additional areas were identified during the final scanning survey that would warrant specific static measurements. The probe was held as close to the surface as practicable to determine a count rate in counts per minute. The data calculations from this survey are included as Appendix F. Appendix E provides a summary of statistical data for static measurements and smear measurements. ***All final static measurements were below the established DCGL for C-14.***

Data Analysis

The following table summarizes MARSSIM guidance for conclusions based upon data provided by the Final Status Survey.

Table 8: Guidance for Survey Conclusions

Survey Result	Conclusion
All measurements less than $DCGL_w$	Survey unit meets release criterion
Average greater than $DCGL_w$	Survey unit does not meet release criterion
Any measurement greater than $DCGL_w$ and the average less then $DCGL_w$	Conduct Sign test and elevated measurement comparison

The guidance in MARSSIM allows you to establish your $DCGL_w$ such that you will meet the release criterion that you have established.

Table 9: Established $DGGL_w$'s for Survey

Isotope	$DCGL_w$'s (DPM/100 cm^2)	Removable $DCGL_w$'s (DPM/100 cm^2)*
H-3	5.00×10^4	200
C-14	1.46×10^4	200

The limiting $DCGL_w$ for beta emitters is C-14 at 1.46×10^4 dpm/100 cm^2. P-32, P-33, and S-35 were not considered due to decay and the last date of receipt. $DCGL_w$'s were established based upon the potential existence of contamination.

All wipe samples taken at the facility were counted on a Beckman Scintillation Counter for one minute. A data sheet, included as Appendix G, details the CPM results, the DPM conversions and indicates if the result is below the MDC or the maximum DPM calculated. The channels for the Packard LSC counter were set up so that H-3 would be detected in Channel A and C-14 in Channel B. As detailed on the calculation sheets, ***all final wipe surveys were indistinguishable from background (below the Minimum Detectable Concentration (MDC) of the instrumentation).***

Section 6.0 –Decontamination / Decommissioning Review

Decontamination

Full decontamination is the physical or chemical process of reducing and preventing the spread or potential exposure of contamination. Decontamination options include the use of commercially available materials that will effectively remove radioactive materials from surface areas so that the contamination can be collected and properly disposed. No decontamination was performed on this project.

All final wipe surveys were indistinguishable from background (below the MDC of the Scintillation Counter).

Dose Calculations

To support the unrestricted release of the specified laboratories, dose calculations were completed using DandD code Version2.1. The data sheets are included in Appendix G and doses were calculated using the MDC limits of the instrumentation to give a maximum potential dose resulting from any radioactive material that may not have been detected by the survey. Isotopes of P-32, P-33, S-35 and Cl-36 were not considered as contributors to the dose calculation due to decay and historical usage at the facility. Using the MDC values and static measurements, the maximum Total Effective Dose Equivalent (TEDE) is calculated to be 0.0237 mrem/year. It is important to recognize that this dose calculation assumes this level of contamination uniformly exists in all areas affected by the decommissioning and that this calculation is very conservative. ***The total effective dose equivalent (TEDE) from any potential radioactive materials in the specified areas is calculated to be 0.0237 mrem/year.***

Decommissioning Review

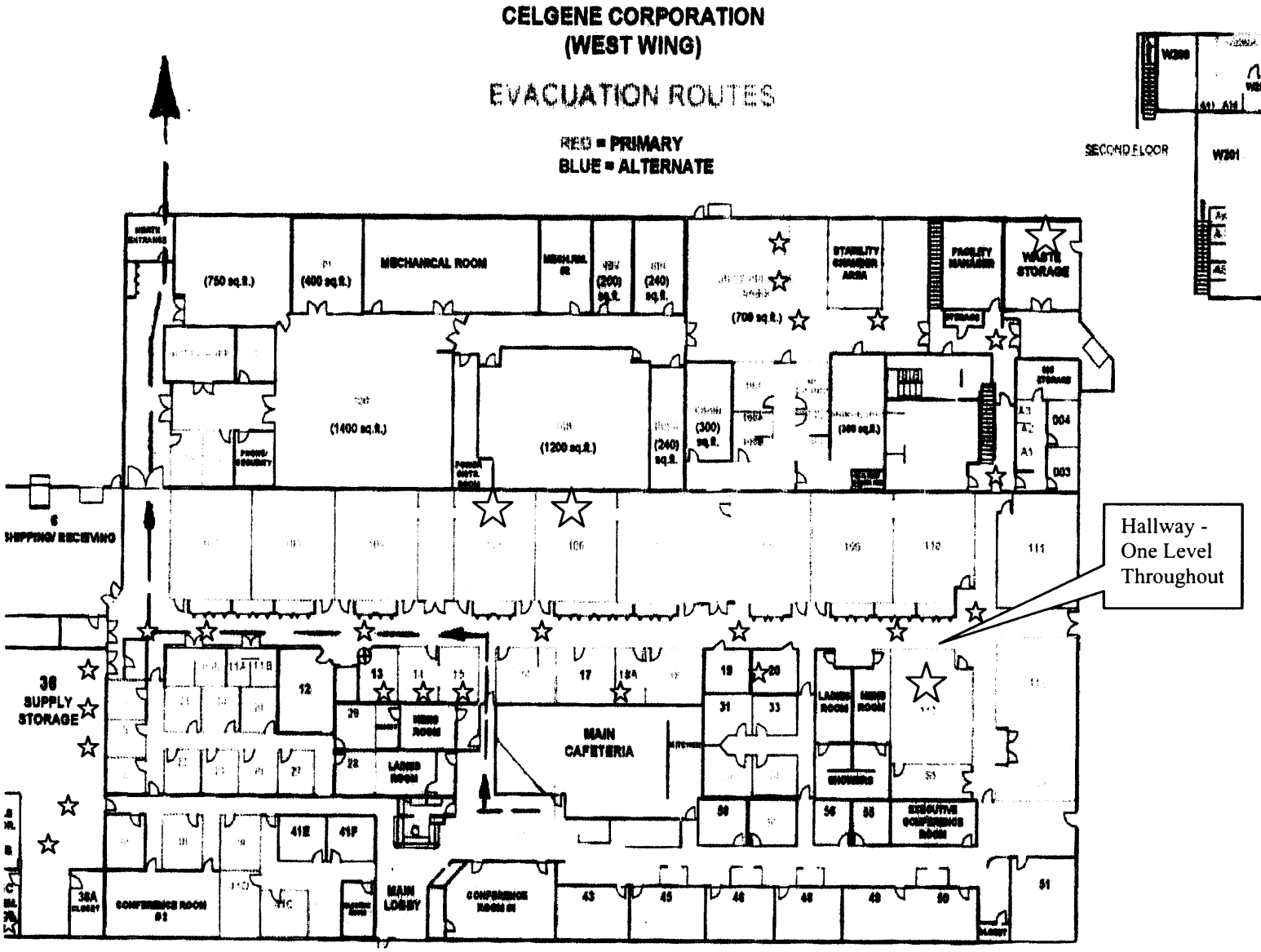
Philotechnics has reviewed all of the applicable data pertaining to the history of radioactive materials use as well as the area and wipe surveys completed at the Celgene Corporation located at 7 Powder Horn Drive. It is our professional opinion that these spaces are free of any radioactive materials and/or radioactive contamination, would qualify for unrestricted release, and may be removed from the Celgene Corporation's radioactive materials license in accordance with NRC 10 CFR 20.1402 "Radiological Criteria for Unrestricted Use"

APPENDIX A

The Celgene Corporation Site Diagrams
Decommissioning Areas

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix A



The Celgene Corporation – Facility Map
7 Powder Horn Drive
Warren, NJ

☆ = Areas being decommissioned

APPENDIX B

Certificates of Calibration

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Duratek

CALIBRATION CERTIFICATE

Page 1 of 1

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: Selectra1A	Serial Number: 213
Contact Name: Tim Pratt		Probe: IBP19DD	Serial Number: K110
Contract Purchase Order Number: PO-0000258	Work Order Number: 2005-02885	Calibration Method: Electronic and Source	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range (Auto Ranging)	Calibration Standard Value (cpm)	Instrument Response (cpm)		Comments	
		Before Calibration	After Calibration		
0-1K	200	198	198	Pulser: 120935	Cal Due: 04/26/06
0-1K	500	504	504	DVM: 6565015	Cal Due: 10/19/05
0-1K	800	800	800	D-814: 2551	Cal Due: 10/04/05
1K-10K	2,000	2,004	2,004	Humidity: 958670	Cal Due: 03/22/06
1K-10K	5,000	5,000	5,000	Temp: 21.8 °C	Pressure: 745mmHg
1K-10K	8,000	8,030	8,030	Humidity: 61%	
10K-100K	20,000	20,100	20,100		
10K-100K	50,000	50,000	50,000	Audio: SAT	Backlight: SAT
10K-100K	80,000	80,300	80,300	Batt. Check: SAT	Overange: SAT
100K-1M	200,000	201,000	201,000		
100K-1M	500,000	500,000	500,000		
100K-1M	800,000	803,000	803,000	Calibrated in accordance with OEM Technical Manual and Industry applicable standards	
All readings within ±10% of Standard Value					

METER CALIBRATION TESTS				COMMENTS
Test 1 – Software Version	8	Test 5,6,7 Dac Tests	SAT	See detector calibration sheet for detector specific information. Instrument left in "Supervisor Mode" with parameters unlocked per customer request.
Test 2 – Keypad Test	SAT	Test 8 – Calibrate HV	SAT	
Test 3 – Display Test	SAT	Test 9 – HV Error Check	SAT	
Test 4 – Option Switches	SAT			

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By: _____ Reviewed By: _____ Date: 6/20/05

Calibration Date: 6/20/2005 Calibration Due: 6/20/2006

Appendix B

Duratek

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		DETECTOR INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: 1BP19DD	Serial Number: K110
Contact Name: Tim Pratt		Calibration Method: Electronic and Source	
Contract Purchase Order Number: PO-0000258	Work Order Number: 2005-02885		

DETECTOR PARAMETER SETUPS

Parameter	As Found	As Left	Parameter	As Found	As Left	Comments
0	3.6	4.7	A	On	On	D-814: 2551 Cal Due: 10/04/05
1	Off	Off	b	Off	Off	Humidity: 958670 Cal Due: 03/22/06
3	920V	920V	c	Auto	Auto	
4	3.00uA	3.00uA	E	int	int	
5	3uS	3uS	F	566	566	Temp: 21.8 °C Humidity: 61%
6	1.50V	1.50V	G	bp19	bp19	Pressure: 745mmHg
7	60s	60s	H	100	110	** Parameters are loaded into the Selectra instrument automatically when smart detector is connected. **
8	unit CPM	unit CPM				

INSTRUMENT INFORMATION

Model	Serial Number	Calibration Due Date
Selectra 1A	213	06/20/2006

USED FOR EFFICIENCY DETERMINATION AND HV PLATEAUING

EFFICIENCY DETERMINATION FOR C^{14} #010002 at 259,740 DPM Certification Date: 12/14/99
EFFICIENCY DETERMINATION FOR Tc^{99} #119718 at 20,520 DPM Certification Date: 10/14/97

Background (CPM)	Gross Source Counts (CPM)	Net Source Counts (CPM)	Efficiency in %(Determined on contact)
503	20,300	19,797	7.6% for C^{14}
503	4109	3606	17.6% for Tc^{99}

Gross source counts taken from an average of three one minute counts from the Heel, Middle, and Toe of Detector

Comments

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By: _____ Reviewed By: _____ Date: _____

Calibration Date: 6/20/2005 Calibration Due: 6/20/2006

Appendix B

Duratek

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		DETECTOR INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: BP19DD	Serial Number: 213
Contact Name: Tim Pratt		Calibration Method: Electronic and Source	
Contract Purchase Order Number: PO-0000258	Work Order Number: 2005-02803		

DETECTOR PARAMETER SETUPS

Parameter	As Found	As Left	Parameter	As Found	As Left	Comments	
0	3.7	3.8	8	unit CPM	unit CPM	Pulser: 120935	Cal Due: 04/26/06
1	Off	Off	A	On	On	DVM: 6565015	Cal Due: 10/19/05
3	1000V	1000V	b	Off	Off	D-814: 2551	Cal Due: 10/04/05
4	3.00uA	3.00uA	c	Auto	Auto	Humidity: 958670	Cal Due: 03/22/06
5	3uS	3uS	E	int	int	Temp: 21.7 °C	Pressure: 741mmHg
6	1.5V	1.5V	F	566	566	Humidity: 63%	
7	60s	60s	n	Off m	Off m	**Detector specific parameters must be entered into instrument manually in the SUPERVISOR mode**	

INSTRUMENT INFORMATION

Model	Serial Number	Calibration Due Date
Electra 1A	5056	05/13/2006

USED FOR EFFICIENCY DETERMINATION AND HV PLATEAUING

EFFICIENCY DETERMINATION FOR C^{14} #010002 at 259,740 DPM Certification Date: 12/14/99
EFFICIENCY DETERMINATION FOR Tc^{99} #119718 at 20,520 DPM Certification Date: 10/14/97

Background (CPM)	Gross Source Counts (CPM)	Net Source Counts (CPM)	Efficiency in % (Determined on contact)
442	15,300	14,858	5.7% for C^{14}
442	3,867	3,425	16.7% for Tc^{99}

Gross source counts taken from an average of three one minute counts from the Heel, Middle, and Toe of Detector

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument).

Instrument Calibrated By:	Reviewed By:	Date: 5-13-05
Calibration Date: 05/13/2005	Calibration Due: 05/13/2006	

Appendix B

Duratek

CALIBRATION CERTIFICATE

Page 1 of 1

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: Electra1B	Serial Number: 5056
Contact Name: Dave Culp		Probe: BP19DD	Serial Number: 213
Contract Purchase Order Number: PO-0000258	Work Order Number: 2005-02803	Calibration Method: Electronic and Source	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range (Auto Ranging)	Calibration Standard Value (cpm)	Instrument Response (cpm) Before Calibration	Instrument Response (cpm) After Calibration	Comments
0-1K	200	198	198	Pulser: 120935 Cal Due: 04/26/06
0-1K	500	498	498	DVM: 6565015 Cal Due: 10/19/05
0-1K	800	800	800	D-814: 2551 Cal Due: 10/04/05
1K-10K	2,000	2,004	2,004	Humidity: 958670 Cal Due: 03/22/06
1K-10K	5,000	4,992	4,992	Temp: 21.7 °C Pressure: 741mmHg
1K-10K	8,000	7,998	7,998	Humidity: 63%
10K-100K	20,000	20,100	20,100	
10K-100K	50,000	49,800	49,800	Audio: SAT Backlight: SAT
10K-100K	80,000	80,000	80,000	Batt. Check: SAT Overange: SAT
100K-1M	200,000	201,000	201,000	
100K-1M	500,000	497,000	497,000	
100K-1M	800,000	800,000	800,000	Calibrated in accordance with OEM Technical Manual and Industry applicable standards
All readings within ±10% of Standard Values				

METER CALIBRATION TESTS				COMMENTS
Test 1 – Software Version	15	Test 5,6,7 Dac Tests	SAT	See detector calibration sheet for detector specific information. Calibration performed with dead time off. Instrument left in "Supervisor Mode" with parameters unlocked per customer request.
Test 2 – Keypad Test	SAT	Test 8 – Calibrate HV	SAT	
Test 3 – Display Test	SAT	Test 9 – HV Error Check	SAT	
Test 4 – Option Switches	SAT			

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By: _____ Reviewed By: _____ Date: 5-15-05

Calibration Date: 5/13/2005 Calibration Due: 5/13/2006

Appendix B

Duratek

CALIBRATION CERTIFICATE

Page 1 of 1

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		INSTRUMENT INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: Electra1B	Serial Number: 4809
Contact Name: Tim Pratt		Probe: BP19DD	Serial Number: 347
Contract Purchase Order Number: PO-0000298	Work Order Number: 2005-03158	Calibration Method: Electronic and Source	

INSTRUMENT CALIBRATION INFORMATION

Instrument Range (Auto Ranging)	Calibration Standard Value (cpm)	Instrument Response (cpm) Before Calibration	Instrument Response (cpm) After Calibration	Comments
0-1K	200	198	198	Pulser: 100272 Cal Due: 09/15/06
0-1K	500	498	498	DVM: TW12663 Cal Due: 03/30/06
0-1K	800	798	798	D-812: 2816 Cal Due: 04/19/06
1K-10K	2,000	2,004	2,004	Humidity: 958670 Cal Due: 03/22/06
1K-10K	5,000	5,010	5,010	Temp: 21.6 °C Pressure: 737mmHg
1K-10K	8,000	7,996	7,996	Humidity: 61%
10K-100K	20,000	20,000	20,000	
10K-100K	50,000	50,100	50,100	Audio: SAT Backlight: SAT
10K-100K	80,000	80,300	80,300	Batt. Check: SAT Overange: SAT
100K-1M	200,000	203,000	203,000	
100K-1M	500,000	518,000	518,000	
100K-1M	800,000	844,000	844,000	Calibrated in accordance with OEM Technical Manual and Industry applicable standards
All readings within -10% of Standard Values				

METER CALIBRATION TESTS				COMMENTS
Test 1 – Software Version	15	Test 5,6,7 Dac Tests	SAT	See detector calibration sheet for detector specific information. Calibration performed with dead time off. Instrument left in "Supervisor Mode" with parameters unlocked per customer request.
Test 2 – Keypad Test	SAT	Test 8 – Calibrate HV	SAT	
Test 3 – Display Test	SAT	Test 9 – HV Error Check	SAT	
Test 4 – Option Switches	SAT			

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By: M. Pauli	Reviewed By:	Date: 9-27-05
Calibration Date: 09/26/05		Calibration Due: 09/26/06

Appendix B

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION		DETECTOR INFORMATION	
Customer Name: Philotechnics Ltd.		Manufacturer: NE Technology	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: BP19DD	Serial Number: 347
Contact Name: Tim Pratt		Calibration Method: Electronic and Source	
Contract Purchase Order Number: PO-0000298	Work Order Number: 2005-03158		

DETECTOR PARAMETER SETUPS

Parameter	As Found	As Left	Parameter	As Found	As Left	Comments	
0	3.9	4.5	8	unit CPM	unit CPM	Pulser: 100272	Cal Due: 09/15/06
1	Off	Off	A	Off	Off	DVM: TW12663	Cal Due: 03/30/06
3	920V	920V	b	Off	Off	D-812: 2816	Cal Due: 04/19/06
4	3.00uA	3.00uA	c	Auto	Auto	Humidity: 958670	Cal Due: 03/22/06
5	4uS	4uS	E	int	int	Temp: 21.6 °C	Pressure: 737mmHg
6	1.55V	1.55V	F	566	566	Humidity: 61%	
7	30s	60s	n	Off m	Off m	**Detector specific parameters must be entered into instrument manually in the SUPERVISOR mode**	

INSTRUMENT INFORMATION

Model	Serial Number	Calibration Due Date
Electra 1B	4809	09/26/2006

USED FOR EFFICIENCY DETERMINATION AND HV PLATEAUING

EFFICIENCY DETERMINATION FOR C^{14} #010002 at 259,740 DPM Certification Date: 12/14/99
EFFICIENCY DETERMINATION FOR Tc^{99} #099608 at 21,312 DPM Certification Date: 8/8/96

Background (CPM)	Gross Source Counts (CPM)	Net Source Counts (CPM)	Efficiency in % (Determined on contact)
345	15,767	15,422	5.9% for C^{14}
345	4,068	3,723	17.5% for Tc^{99}

Gross source counts taken from an average of three one minute counts from the Heel, Middle, and Toe of Detector

STATEMENT OF CERTIFICATION

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By: M. Pauli Reviewed By: [signature] Date: 9-22-05

Calibration Date: 09/26/05 Calibration Due: 09/26/06

Appendix B

Duratek

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			DETECTOR INFORMATION	
Customer Name: Philotechnics, Ltd.			Manufacturer: Ludlum	
Address: 118 Mitchell Road Oak Ridge, TN 37830			Detector Model: 43-37B	
Contact Name: Tim Pratt			Serial Number: 148548	
Customer Purchase Order Number: P-0000258	Work Order Number: 2005-02885		Evaluation Method: Source	
DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION				
Source Nuclide: Tc^{99}	Serial Number: 119718	Activity: 20,520 dpm	Certification Date: 10/14/97	

Parameter	As Found	As Left	Precision Test	CPM
Count 1 (Left Center)	5657	5657	Count 1 (Heel)	5681
Count 2 (Right Center)	5645	5645	Count 2 (Center)	5657
Count 3 (Left Heel)	5681	5681	Count 3 (Toe)	5669
Count 4 (Right Heel)	5799	5799	Average	5669
Count 5 (Left Toe)	5669	5669	Tolerance	±10%
Count 6 (Right Toe)	5809	5809	Pass/Fail	Pass
Average	5710	5710		
Background (CPM)	1197.4	1197.4		
Net Counts	4512.6	4512.6		
Efficiency	22%	22%		

Low Sample Activity: Source #: N/A	High Sample Activity: Source #: N/A	Dead Time (DT): N/A	Calibration Constant (CC): N/A

SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2221	134537	06/15/05	1197.4	1850V	4 mV=40

Detector Setup Report	YES	NO √	Barcode Report	YES	NO √	Voltage Plateau	YES √ NO

COMMENTS

Calibrated in accordance with IN-WI-237 Rev 0

10 minute background performed — Efficiency performed on contact with 5ft. cable

STATEMENT OF CERTIFICATION

We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).

Detector Certified By:	Reviewed By:	Date: 6-15-05
Certification Date: 6/15/2005		Certification Due: 6/15/2006

Appendix B

Duratek

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

CUSTOMER INFORMATION			DETECTOR INFORMATION	
Customer Name: Philotechnics, Ltd.			Manufacturer: Ludlum	
Address: 118 Mitchell Road Oak Ridge, TN 37830			Detector Model: 43-37B	
Contact Name: Tim Pratt			Serial Number: 148548	
Customer Purchase Order Number: P-0000258	Work Order Number: 2005-02885		Evaluation Method: Source	

DETECTOR EFFICIENCY/RESPONSE/PRECISION INFORMATION				
Source Nuclide: C^{14}	Serial Number: 010002	Activity: 259,740 dpm	Certification Date: 10/14/97	
Parameter	As Found	As Left	Precision Test	CPM
Count 1 (Left Center)	33823	33823	Count 1 (Heel)	34045
Count 2 (Right Center)	33912	33912	Count 2 (Center)	33823
Count 3 (Left Heel)	34045	34045	Count 3 (Toe)	35310
Count 4 (Right Heel)	33788	33788	Average	34392
Count 5 (Left Toe)	35310	35310	Tolerance	±10%
Count 6 (Right Toe)	33671	33671	Pass/Fail	Pass
Average	34091.5	34091.5		
Background (CPM)	1197.4	1197.4		
Net Counts	32894.1	32894.1		
Efficiency	12.7%	12.7%		

Low Sample Activity: Source #: N/A	High Sample Activity: Source #: N/A	Dead Time (DT): N/A	Calibration Constant (CC): N/A

SCALER INFORMATION			DETECTOR INFORMATION		
Model	Serial Number	Due Date	Background (cpm)	Operating Voltage	Threshold
2221	134537	06/15/05	1197.4	1850V	4 mV=40

Detector Setup Report YES NO √	Barcode Report YES NO √	Voltage Plateau YES √ NO

COMMENTS

Calibrated in accordance with IN-WI-237 Rev 0

10 minute background performed

Efficiency performed on contact with 5Ft. cable

STATEMENT OF CERTIFICATION

We Certify that the detector listed above was evaluated for proper operation prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this detector).

Detector Certified By:	Reviewed By:	Date: 6-15-05
Certification Date: 6/15/2005		Certification Due: 6/15/2006

Appendix B

Duratek

CALIBRATION CERTIFICATE

Duratek Instrument Services
628 Gallaher Road
Kingston, TN 37763
Phone: (865) 376-8337
Fax: (865) 376-8331

This Certificate will be accompanied by Calibration Charts or Readings where applicable

Customer Information		Instrument Information	
Customer Name: Philotechnics Ltd.		Manufacturer: Victoreen	
Address: 118 Mitchell Road Oak Ridge, TN 37830		Model: 451P-DE-SI	Serial Number: 0000006289
Contact Name: Pam Thomas		Probe: N/A	Serial Number: N/A
Contract Purchase Order Number: PO-0000101	Work Order Number: 2004-02393	Calibration Method: Source	

Instrument Calibration Information

Instrument Range	Calibration Value	Tolerance (V10%)	Instrument Response		Comments	
			Before Calibration	After Calibration		
µR/hr					DVM: 6565015	Cal Due: 10/19/05
AutoRanging	500	(450-550)	490	490	D-812: 2816	Cal Due: 04/15/04
mR/hr					Timer: 02010806	Cal Due: 03/04/05
AutoRanging	5	(4.5-5.5)	4.2	5.0	DTH-1A: 100799	Cal Due: 11/11/05
AutoRanging	50	(45-55)	48	48		
AutoRanging	500	(450-550)	490	490	Geotropism: SAT	Zero: SAT
R/hr					Batteries: SAT	Precision Test: SAT
AutoRanging	5	(4.5-5.5)	5.0	5.0	Overrange: SAT	
Integrate						
Integrate	2.0mR	1.80 – 2.20 mR	1.98	1.98	Temp: 23.3°C	Pressure: 730mmHg
	Exposed to 120mr/hr field for 1 minute = 2.0mR				Humidity: 63%	
CALIBRATION FACTORS						
Factor #		Value	As Found	As Left	Cs137 #019701	Cert Date: 07/16/04
1		500uR/hr	100	100	Cs137 #019702	Cert Date: 04/08/04
2		5mR/hr	105	116	Cs137 #049711	Cert Date: 04/09/04
3		50mR/hr	100	100		
4		500mR/hr	98	98	Calibrated in accordance with original equipment technical manual.	
5		5R/hr	93	93		
6		Integrated Dose	100/104	100/104		
Blink Alarm			4.5R/hr	4.5R/hr		

Statement of Certification

We Certify that the instrument listed above was calibrated and inspected prior to shipment and that it met all the Manufacturers published operating specifications. We further certify that our Calibration Measurements are traceable to the National Institute of Standards and Technology. (We are not responsible for damage incurred during shipment or use of this instrument)

Instrument Calibrated By:	Reviewed By:	Date: 12-10-04
Calibration Date: 12/10/2004		Calibration Due: 12/10/2005

Appendix B

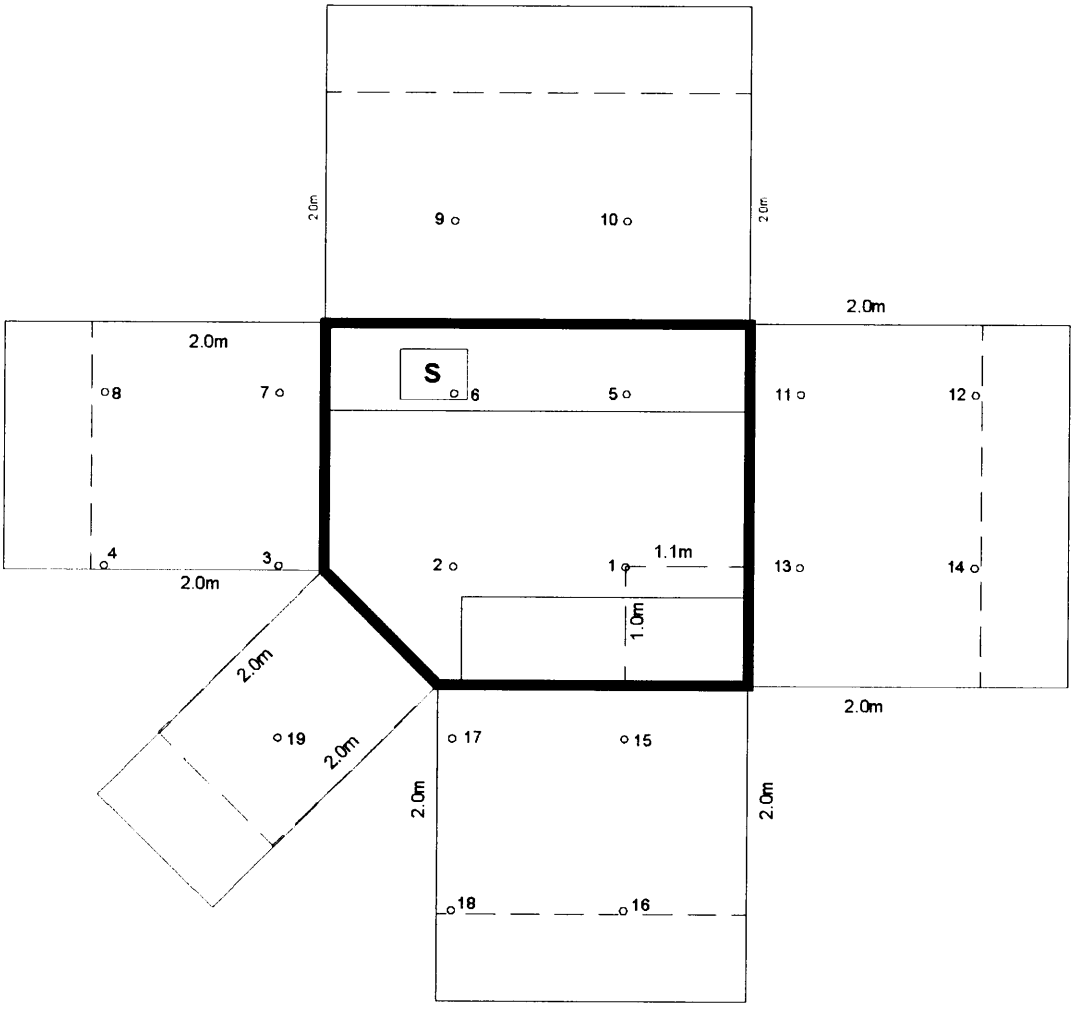
APPENDIX C

Laboratory Survey Maps

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix C

Room 13
Celgene - Darkroom (37.11 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
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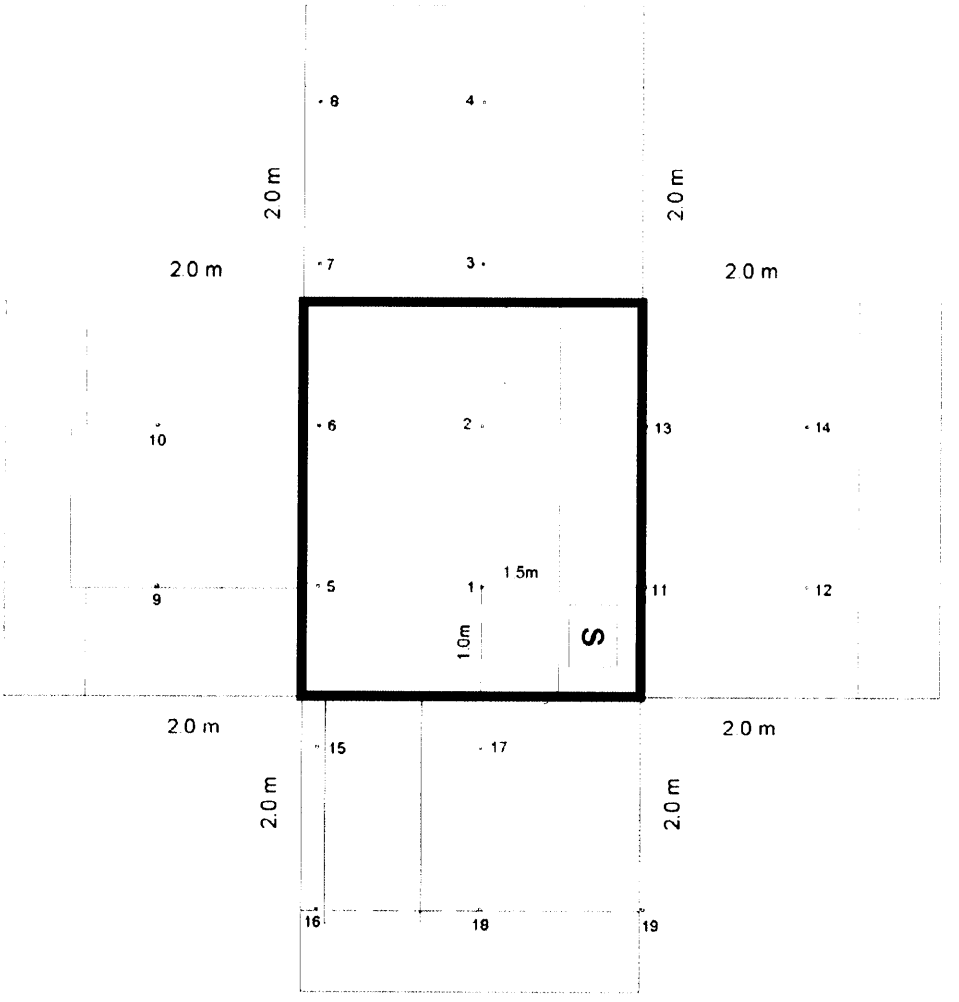
Email: gsnadeau@philotechnics.com

Appendix C

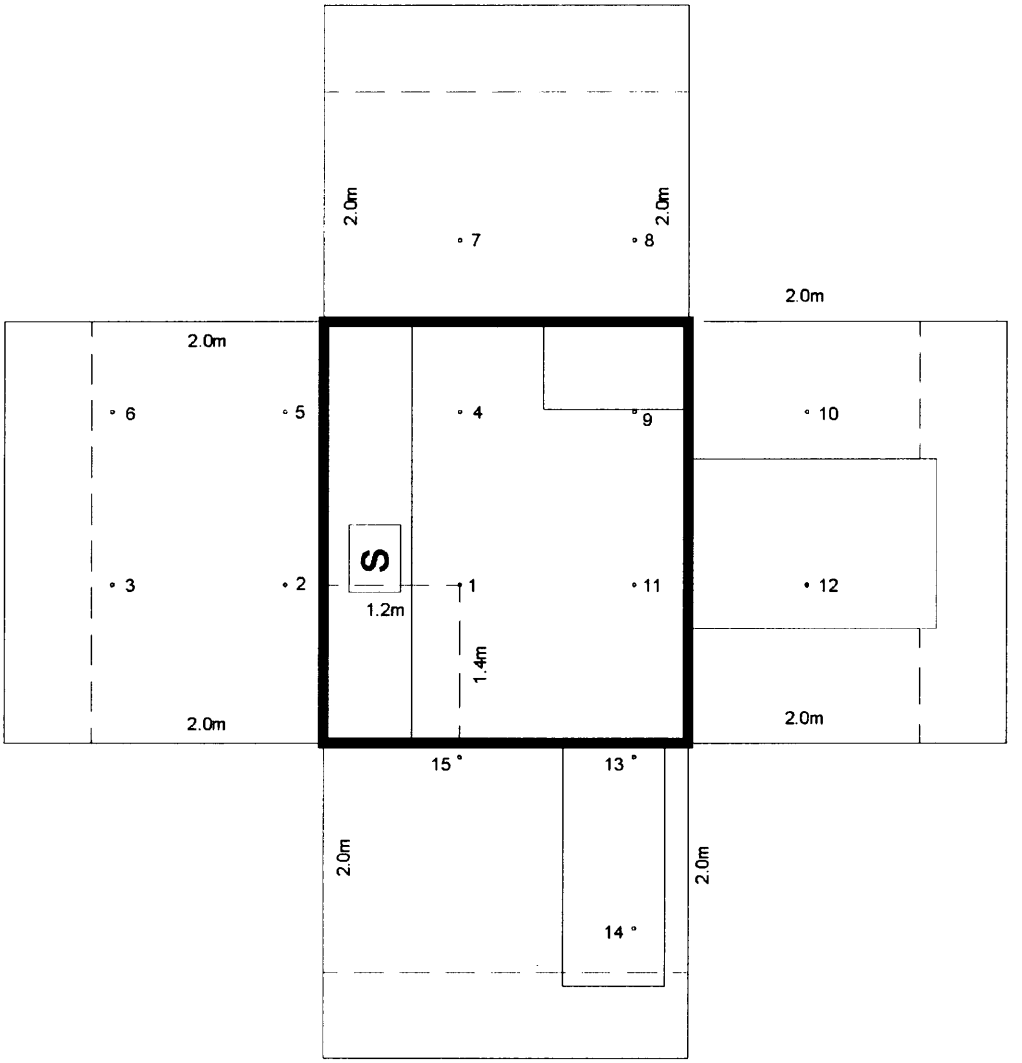
Celgene - Room 14 (35.57 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Celgene - Room 15 (35.82 sq. meters)

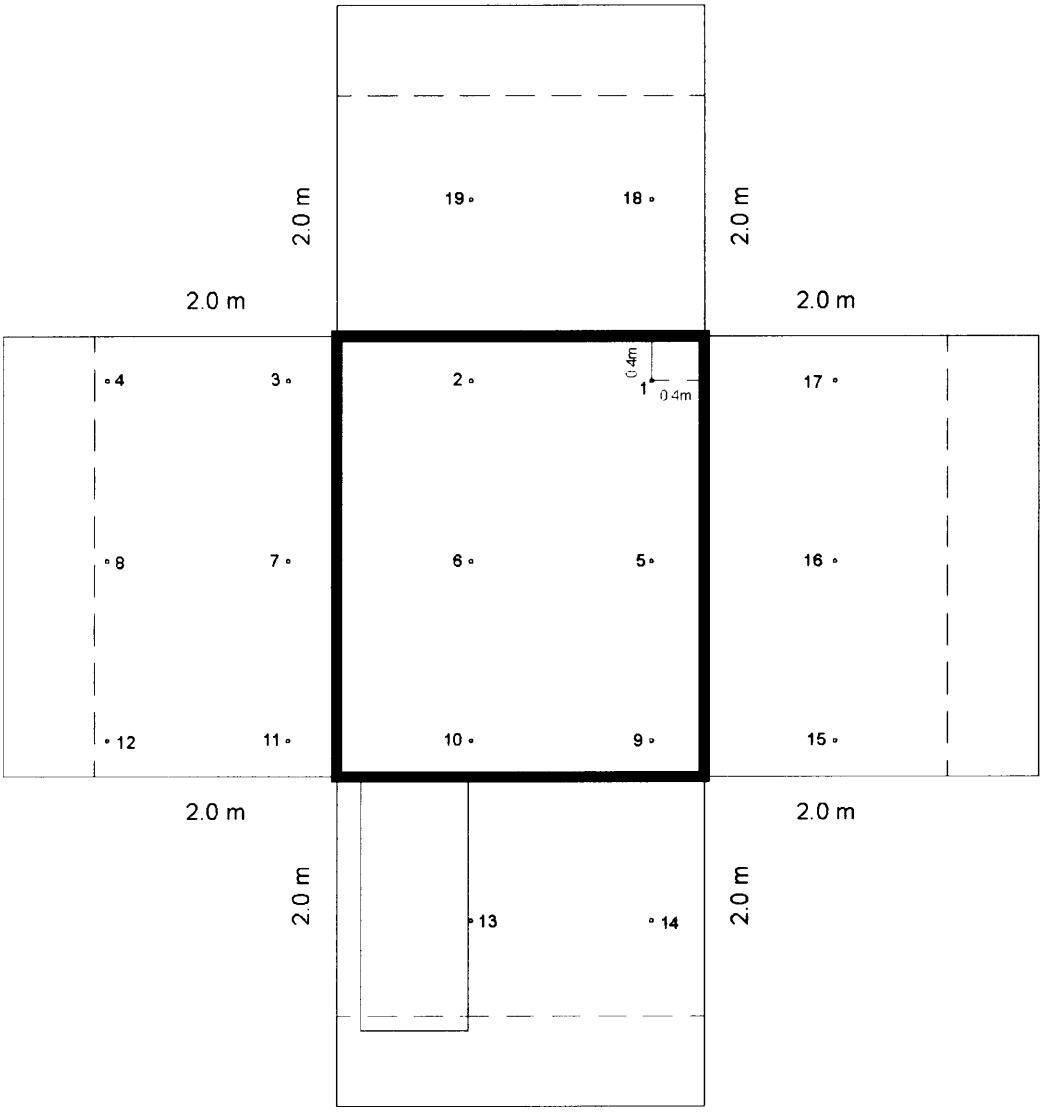


***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Celgene - Room 18A (37.92 sq. meters)

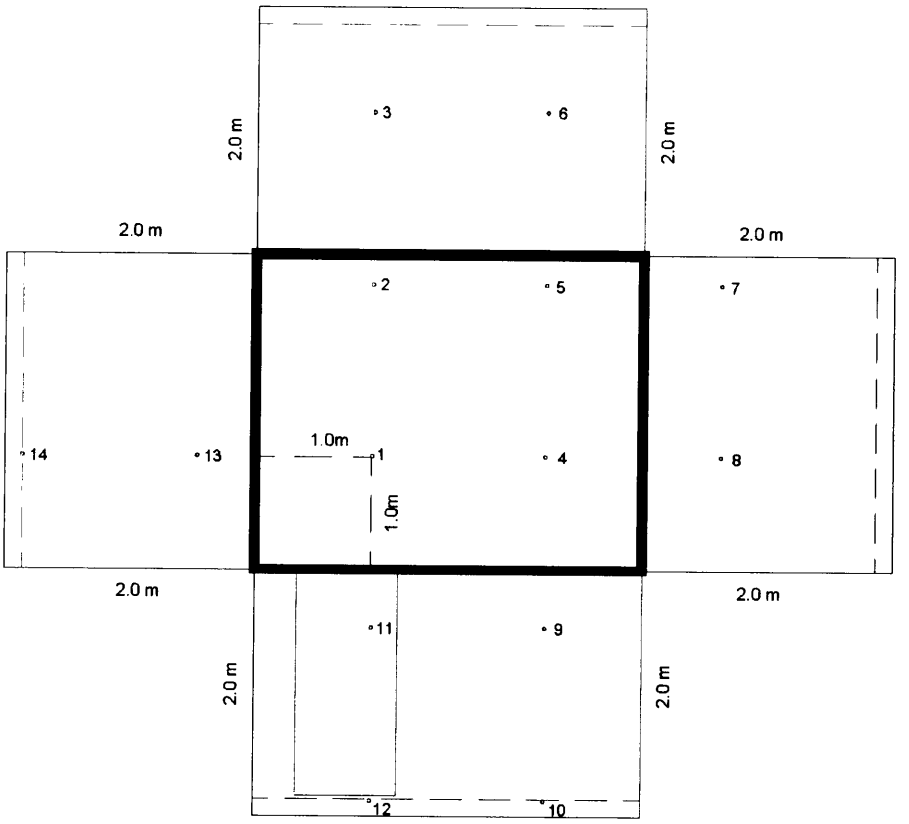


***Wipe results <200DPM/100cm^2 unless otherwise noted**

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix C

Celgene - Room 20 (33.48 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
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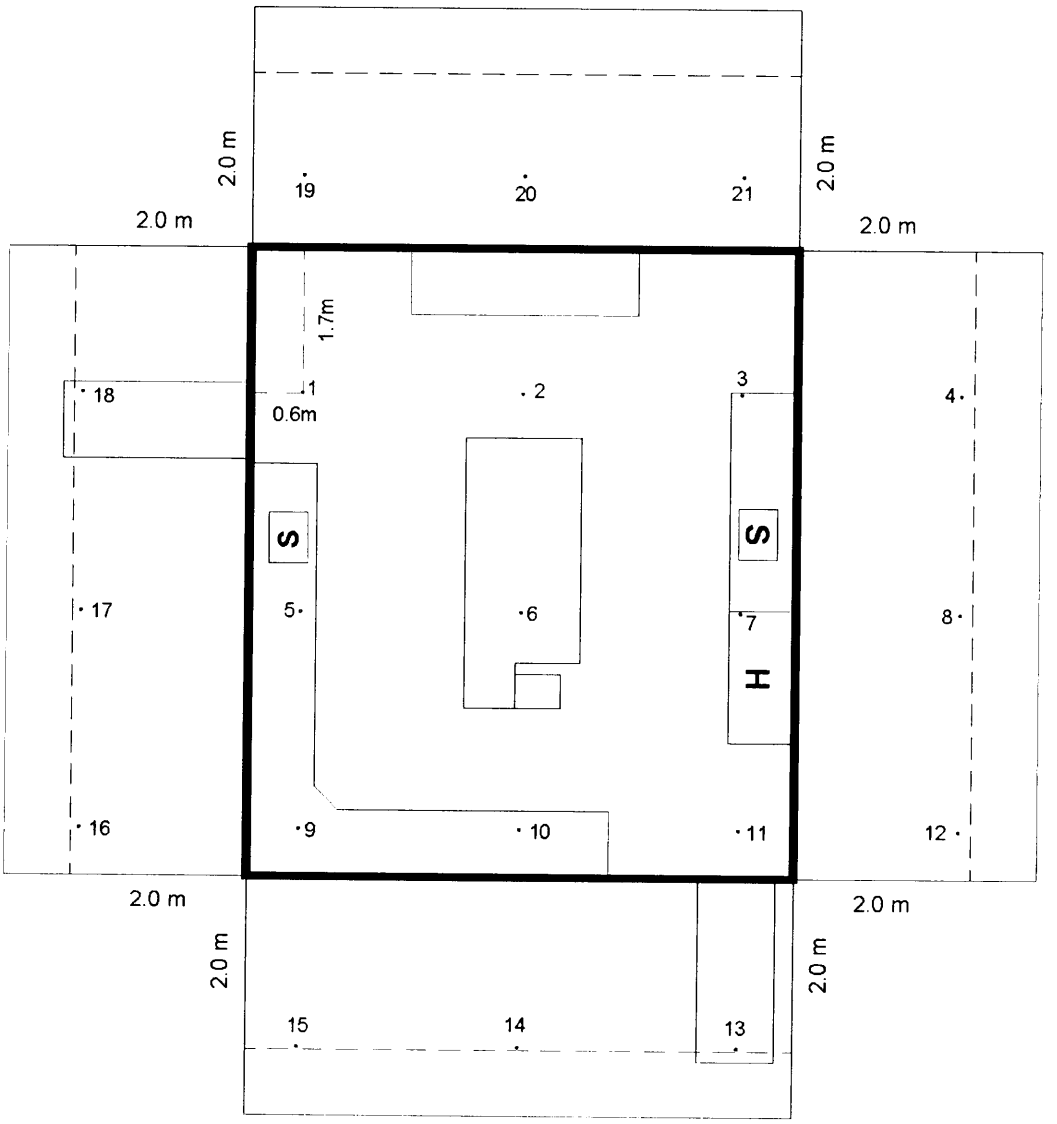
Email: gsnadeau@philotechnics.com

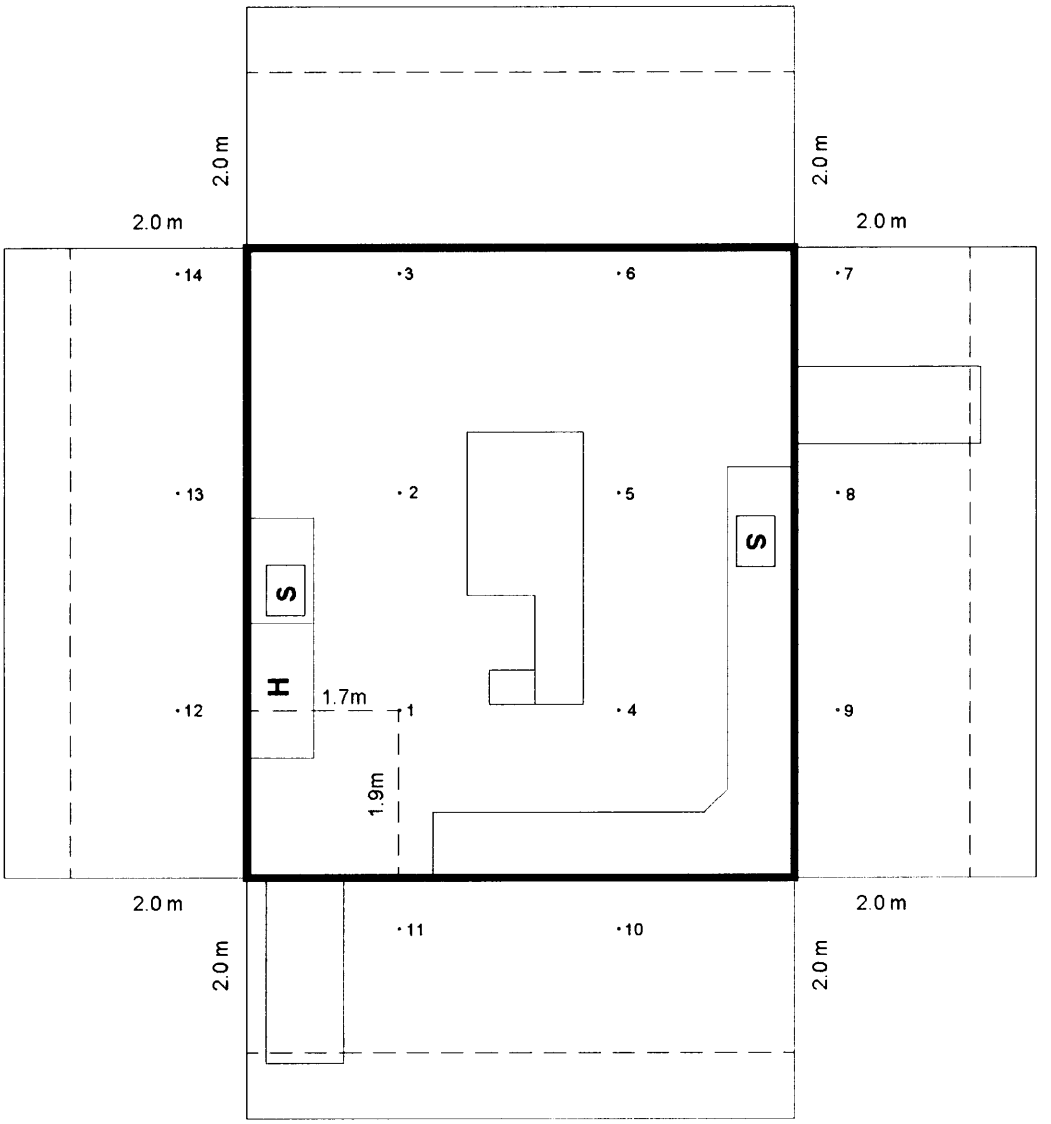
Celgene - Room 105 (98.57 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

Celgene - Room 106 (98.67 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

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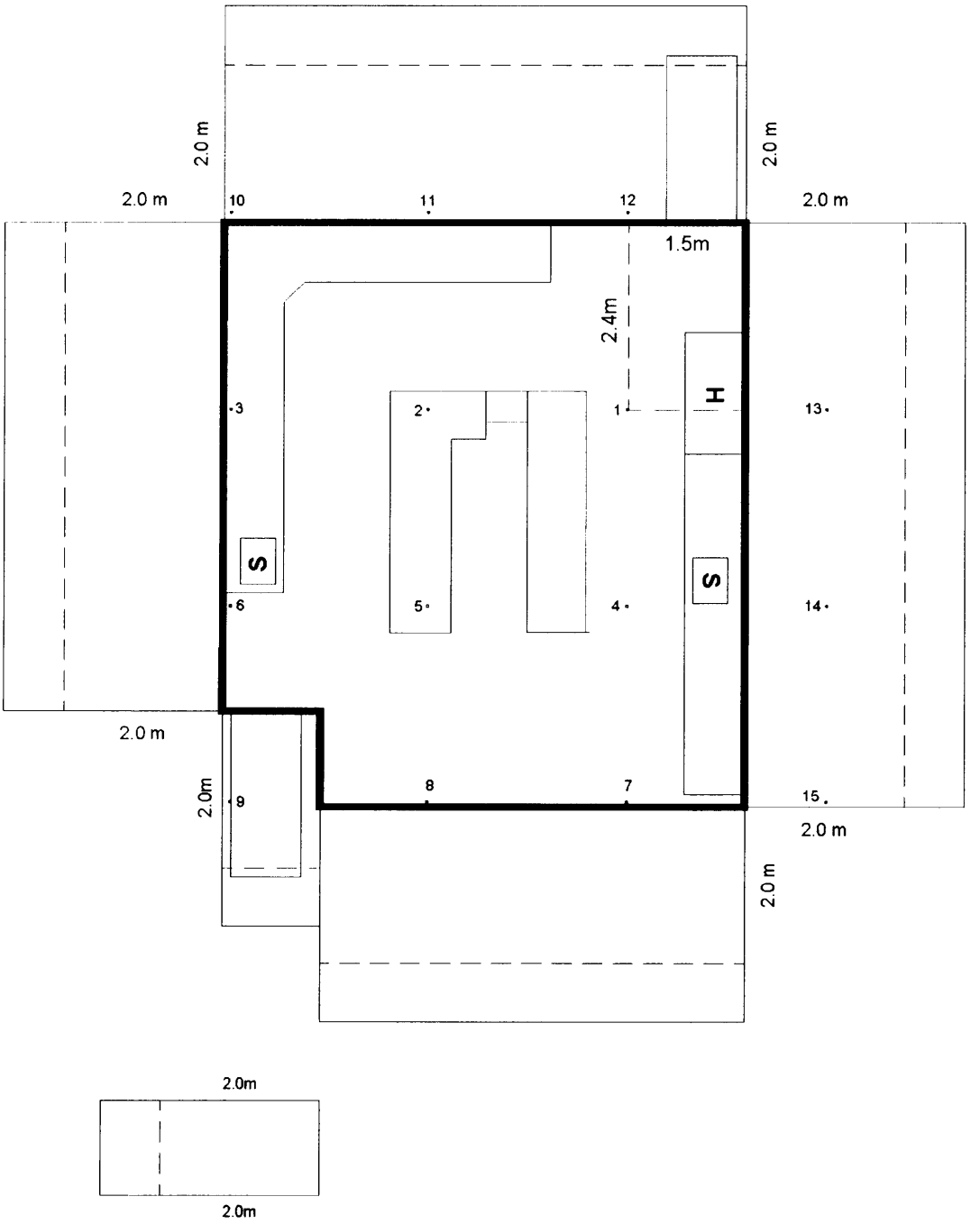
Email: gsnadeau@philotechnics.com

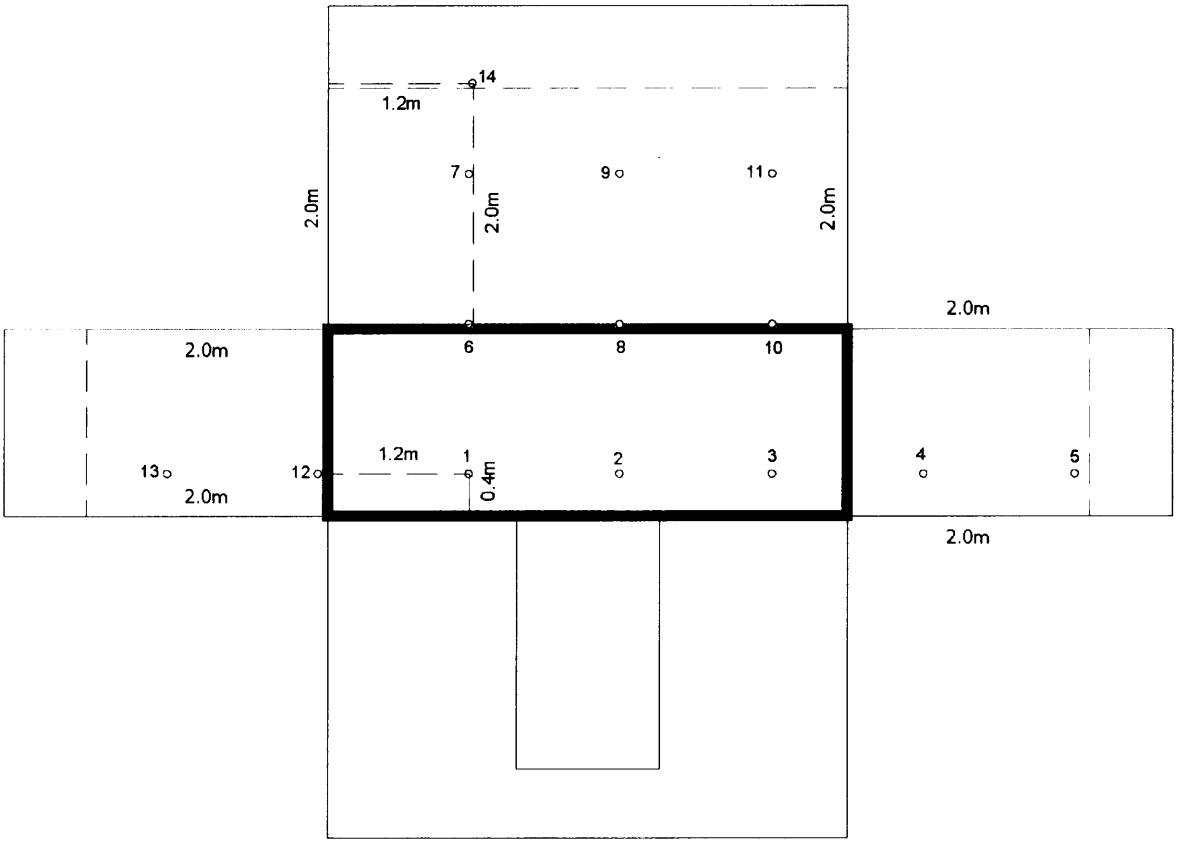
Celgene - Room 113 (103.18 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

Celgene - Waste Storage Cage (21.55 sq. meters)

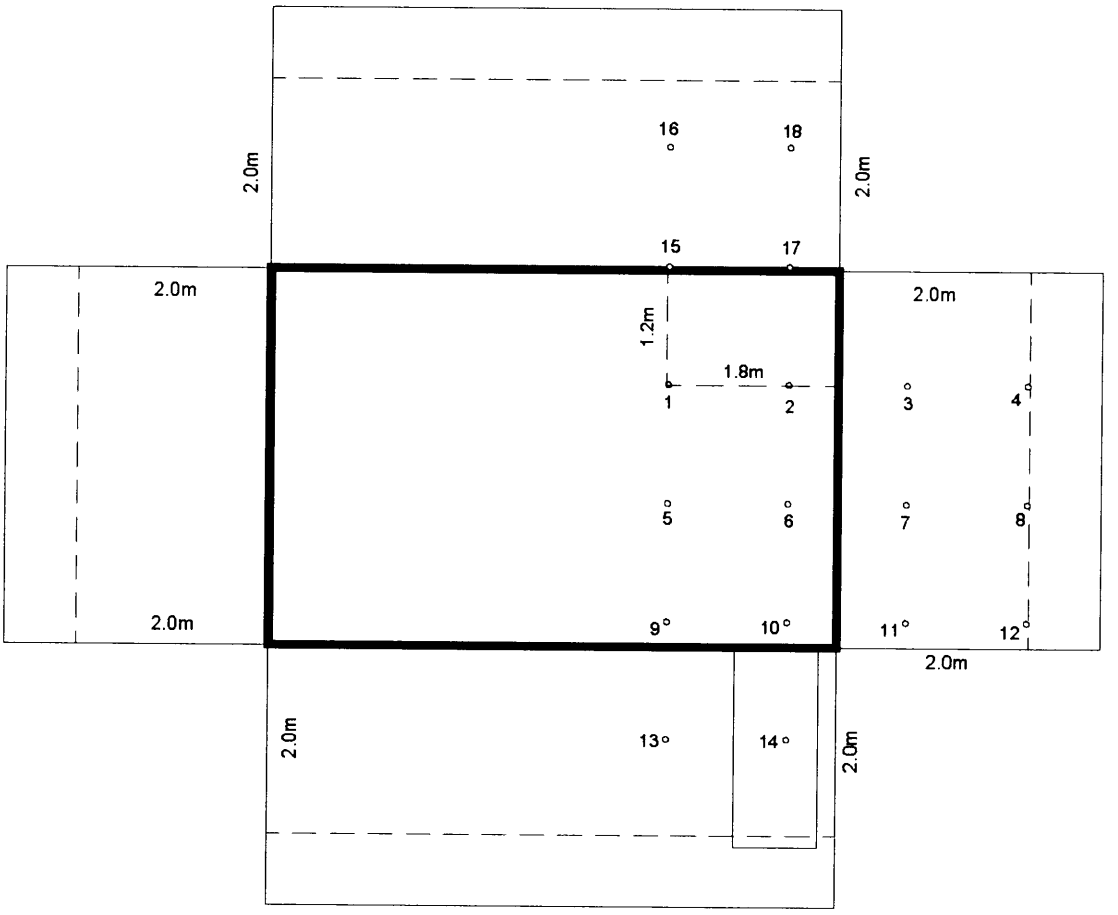


***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Celgene - Chemical Storage (63.30 sq. meters)

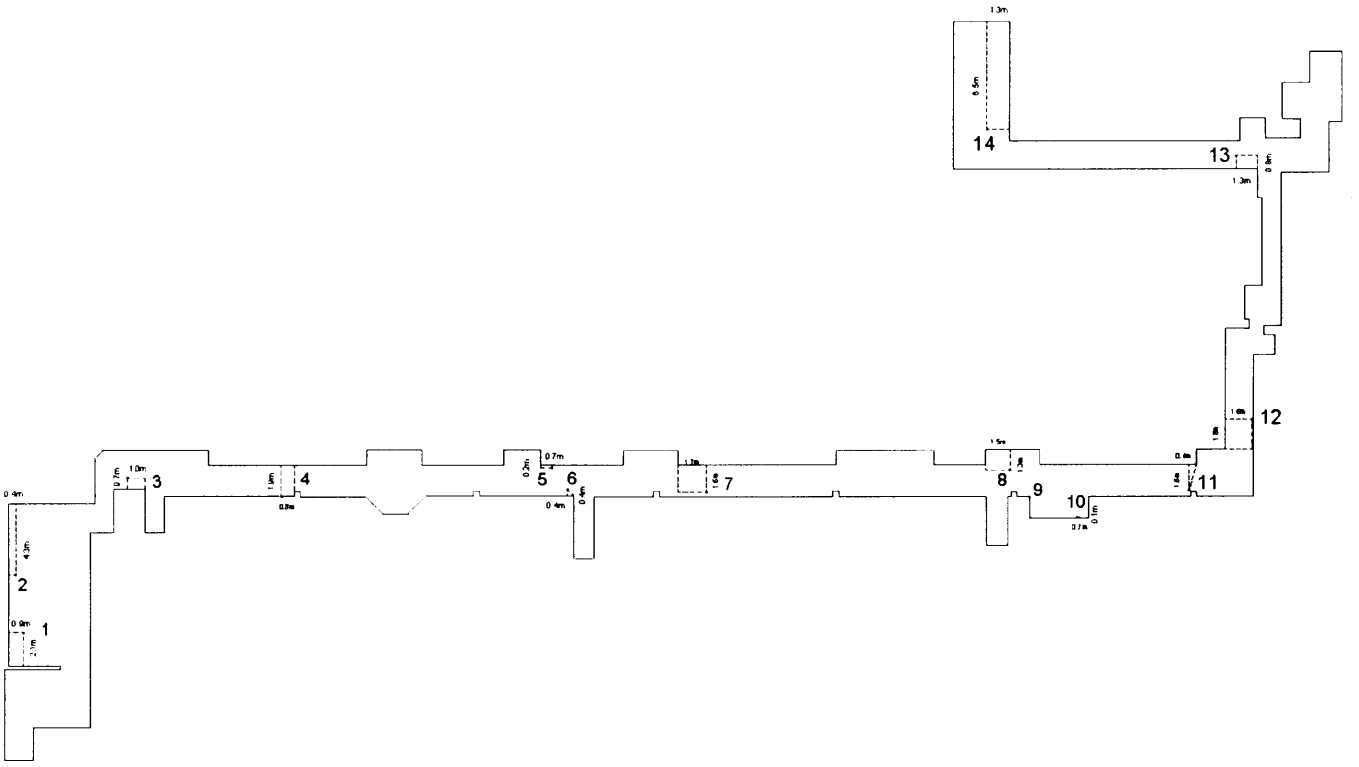


***Wipe results <200DPM/100cm^2 unless otherwise noted**

Appendix C

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Celgene - Hallway (354.19 sq. meters)



***Wipe results <200DPM/100cm^2 unless otherwise noted**

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

APPENDIX D

MARSSIM Analytical Calculations

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix D

Philotechnics
Analytical Worksheet

Minimum Detectable Concentration (MDC) Static Count Calculations for Liquid Scintillation Counter
(95% confidence level via MARSSIM method)

$$MDC\,(dpm/100cm^2) = \frac{3 + 3.29\sqrt{(R_b)(T_{s+b})(1 + T_{s+b}/T_b)}}{(Eff.)(T_{s+b})} \qquad \text{(Eq. 1)}$$

Where:

Eff. = LSC total efficiency: Counter cpm/NIST Standard dpm
R_b = LSC background rate (cpm)
T_{s+b} = Sample count time (minutes)
T_b = Background count time (minutes)

Static Count MDC Calculations						
Isotope	Eff.	R_b	T_{s+b}	T_b	MDC (Static)	
H-3	65.00%	20.10	1	1	36.71	dpm/100 cm^2
C-14	90.00%	25.50	1	1	29.44	dpm/100 cm^2

Minimum Detectable Concentration (MDC) Static Count Calculations for Hand-Held Monitors
(95% confidence level via MARSSIM method)

$$MDC\,(dpm/100cm^2) = \frac{3 + 3.29\sqrt{(R_b)(T_{s+b})(1 - T_{s+b}/T_b)}}{(Eff.)(T_{s+b})(probeareacm^2/100cm^2)} \qquad \text{(Eq. 2)}$$

Where:

Eff. = Probe efficiency (2π geometry)
R_b = Average background rate (cpm)
T_{s+b} = Sample count time (minutes)
T_b = Background count time (minutes)
P = Probe area (cm2)

Static Count MDC Calculations							
Isotope	Eff.	R_b	T_{s+b}	T_b	P	MDC (Static)	
Probe: BP19DD							
C-14	5.7%	433 6667	1	1	100	1752.50	dpm/100 cm^2

Ref. MARSSIM NUREG-1575
NUREG-1507

MDA Worksheet
Page 1 of 3

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1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix D

Philotechnics
Analytical Worksheet

Scan Minimum Detectable Concentration (MDC) Calculations

(Scan MDA per MARSSIM/NUREG-1575, NUREG-1507 methodology)

$$Scan\,MDC = \frac{MDCR}{\sqrt{p}\,(\varepsilon_i)(\varepsilon_s)\left(\frac{A}{100cm^2}\right)} \qquad \text{(Eq. 3)}$$

Where:

p = surveyor efficiency, per MARSSIM (0.5)
ε_i = instrument efficiency (2π geometry)
ε_s = surface efficiency, 1 for gammas and high energy betas (1 Mev Emax (e.g. P-32, Cl-36, Sr/Y-90, etc.), 0.5 for low energy betas (e.g. C-14, P-33, S-35, Tc-99, Ca-45, etc.)
A = probe active area (cm^2)

And,

$$MDCR = S_i\,(60\,\text{sec}/\text{min})/i\,\text{sec} \qquad \text{(Eq. 4)}$$

Where:

MDCR = Minimum detectable count rate (cpm)
S_i = source counts in time interval, i.

Floor Sheet Vinyl

And,

$$S_i = d'\sqrt{B_i} \qquad \text{(Eq. 5)}$$

Where:

d' = 1.38 for 95% true positive scan detection rate, per. MARRISM, Table 6.5
B_i = Background counts in interval, i

And,

$$B_i = (P_b)(i)(1\,\text{min}/60\,\text{sec}) \qquad \text{(Eq. 6)}$$

Where:

P_b = probe background count rate (cpm)
i = observation interval

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1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix D

Philotechnics
Analytical Worksheet

Scan Minimum Detectable Concentration (MDC) Calculations

(Scan MDA per MARSSIM/NUREG-1575, NUREG-1507 methodology)

Specific Scan MDC calculation results:

	BP19DD			43-37			
	Benches	Floor		Floor			
P_b =	434	459		1137			cpm
i =	1	1		1			sec
B_i =	7.23	7.64		18.95			counts
d' =	1.38	1.38		1.38			
S_i =	3.71	3.81		6.01			counts
MDCR =	222.60	228.89		360.44			cpm

Scan MDC Calculations						
Isotope	ε_i	ε_s	A	MDC (Scan)		
Probe: BP19DD						
C-14	5.70%	0.50	100	11046	dpm/100 cm^2	Benches
Probe: BP19DD						
C-14	6%	0.50	100	11358	dpm/100 cm^2	Floor
Probe: 43-37						
C-14	12.7%	0.50	100	5098	dpm/100 cm^2	Floor

Ref MARSSIM NUREG-1575
NUREG-1507

MDA Worksheet
Page 3 of 3

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

APPENDIX E

Statistical Documentation
for
Statics and Wipes

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Celgene Beta Static Statistics - Net DPM	
Mean	-64.5
Standard Error	67.3
Median	-34.5
Mode	-1175.4
Standard Deviation	922.3
Sample Variance	850577.0
Kurtosis	0.3
Skewness	0.4
Range	5592.9
Minimum	-2101.7
Maximum	3491.2
Sum	-12124.3
Count	188.0
Largest(1)	3491.2
Smallest(1)	-2101.7
Confidence Level(95.0%)	132.7

Celgene H-3 Wipe Statistics - Net DPM	
Mean	-44.5
Standard Error	0.4
Median	-47.7
Mode	-47.7
Standard Deviation	7.0
Sample Variance	49.3
Kurtosis	6.4
Skewness	2.6
Range	36.9
Minimum	-47.7
Maximum	-10.8
Sum	-11267.7
Count	253.0
Largest(1)	-10.8
Smallest(1)	-47.7
Confidence Level(95.0%)	0.9

Celgene C-14 Wipe Statistics - Net DPM	
Mean	-29.0
Standard Error	0.0
Median	-29.0
Mode	-29.0
Standard Deviation	0.2
Sample Variance	0.1
Kurtosis	124.1
Skewness	10.9
Range	3.0
Minimum	-29.0
Maximum	-26.0
Sum	-7331.0
Count	253.0
Largest(1)	-26.0
Smallest(1)	-29.0
Confidence Level(95.0%)	0.0

APPENDIX F

Static Measurement Data Sheets
&
DPM Calculations

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix F

		Beta			
Room	Location	Gross CPM	DPM/100cm2	Result	Dose Rate
Chemical Storage	1	511	930	<MDC	BKG
Chemical Storage	2	521	1105	<MDC	BKG
Chemical Storage	3	452	-105	<MDC	BKG
Chemical Storage	4	525	1175	<MDC	BKG
Chemical Storage	5	499	719	<MDC	BKG
Chemical Storage	6	499	719	<MDC	BKG
Chemical Storage	7	657	3491	<MDC	BKG
Chemical Storage	8	540	1439	<MDC	BKG
Chemical Storage	9	540	1439	<MDC	BKG
Chemical Storage	10	536	1368	<MDC	BKG
Chemical Storage	11	457	-18	<MDC	BKG
Chemical Storage	12	467	158	<MDC	BKG
Chemical Storage	13	458	0	<MDC	BKG
Chemical Storage	14	425	-579	<MDC	BKG
Chemical Storage	15	433	-439	<MDC	BKG
Chemical Storage	16	445	-228	<MDC	BKG
Chemical Storage	17	438	-351	<MDC	BKG
Chemical Storage	18	407	-895	<MDC	BKG
Dark Room	1	591	712	<MDC	BKG
Dark Room	2	640	1542	<MDC	BKG
Dark Room	3	559	169	<MDC	BKG
Dark Room	4	568	322	<MDC	BKG
Dark Room	5	569	339	<MDC	BKG
Dark Room	6	536	-220	<MDC	BKG
Dark Room	7	548	-17	<MDC	BKG
Dark Room	8	567	305	<MDC	BKG
Dark Room	9	573	356	<MDC	BKG
Dark Room	10	557	136	<MDC	BKG
Dark Room	11	632	1407	<MDC	BKG
Dark Room	12	554	85	<MDC	BKG
Dark Room	13	586	627	<MDC	BKG
Dark Room	14	604	932	<MDC	BKG
Dark Room	15	582	559	<MDC	BKG
Dark Room	16	551	34	<MDC	BKG
Dark Room	17	547	-34	<MDC	BKG
Dark Room	18	511	-644	<MDC	BKG
Dark Room	19	519	-508	<MDC	BKG
Lab Room 14	1	577	678	<MDC	BKG
Lab Room 14	2	592	932	<MDC	BKG
Lab Room 14	3	498	-661	<MDC	BKG
Lab Room 14	4	540	51	<MDC	BKG
Lab Room 14	5	515	-373	<MDC	BKG
Lab Room 14	6	636	1678	<MDC	BKG
Lab Room 14	7	545	136	<MDC	BKG
Lab Room 14	8	555	305	<MDC	BKG
Lab Room 14	9	536	-17	<MDC	BKG
Lab Room 14	10	534	-51	<MDC	BKG
Lab Room 14	11	549	203	<MDC	BKG
Lab Room 14	12	570	559	<MDC	BKG
Lab Room 14	13	500	-627	<MDC	BKG

Appendix F

		Beta			
Room	Location	Gross CPM	DPM/100cm2	Result	Dose Rate
Lab Room 14	14	631	1593	<MDC	BKG
Lab Room 14	15	505	-542	<MDC	BKG
Lab Room 14	16	553	271	<MDC	BKG
Lab Room 14	17	542	85	<MDC	BKG
Lab Room 14	18	522	-254	<MDC	BKG
Lab Room 14	19	613	1288	<MDC	BKG
Lab Room 15	1	613	1203	<MDC	BKG
Lab Room 15	2	580	644	<MDC	BKG
Lab Room 15	3	548	102	<MDC	BKG
Lab Room 15	4	633	1542	<MDC	BKG
Lab Room 15	5	510	-542	<MDC	BKG
Lab Room 15	6	517	-424	<MDC	BKG
Lab Room 15	7	518	-407	<MDC	BKG
Lab Room 15	8	575	559	<MDC	BKG
Lab Room 15	9	557	254	<MDC	BKG
Lab Room 15	10	514	-475	<MDC	BKG
Lab Room 15	11	610	1153	<MDC	BKG
Lab Room 15	12	529	-220	<MDC	BKG
Lab Room 15	13	522	-339	<MDC	BKG
Lab Room 15	14	605	1068	<MDC	BKG
Lab Room 15	15	513	-492	<MDC	BKG
Lab Room 105	1	636	644	<MDC	BKG
Lab Room 105	2	474	-2102	<MDC	BKG
Lab Room 105	3	593	-85	<MDC	BKG
Lab Room 105	4	542	-949	<MDC	BKG
Lab Room 105	5	638	678	<MDC	BKG
Lab Room 105	6	603	85	<MDC	BKG
Lab Room 105	7	570	-475	<MDC	BKG
Lab Room 105	8	649	864	<MDC	BKG
Lab Room 105	9	607	153	<MDC	BKG
Lab Room 105	10	609	186	<MDC	BKG
Lab Room 105	11	529	-1169	<MDC	BKG
Lab Room 105	12	631	559	<MDC	BKG
Lab Room 105	13	534	-1085	<MDC	BKG
Lab Room 105	14	540	-983	<MDC	BKG
Lab Room 105	15	550	-814	<MDC	BKG
Lab Room 105	16	604	102	<MDC	BKG
Lab Room 105	17	652	915	<MDC	BKG
Lab Room 105	18	685	1475	<MDC	BKG
Lab Room 105	19	609	186	<MDC	BKG
Lab Room 105	20	615	288	<MDC	BKG
Lab Room 105	21	547	-864	<MDC	BKG
Lab Room 106	1	586	644	<MDC	BKG
Lab Room 106	2	648	1695	<MDC	BKG
Lab Room 106	3	675	2153	<MDC	BKG
Lab Room 106	4	550	34	<MDC	BKG
Lab Room 106	5	533	-254	<MDC	BKG
Lab Room 106	6	519	-492	<MDC	BKG
Lab Room 106	7	541	-119	<MDC	BKG
Lab Room 106	8	542	-102	<MDC	BKG

Appendix F

		Beta			
Room	Location	Gross CPM	DPM/100cm2	Result	Dose Rate
Lab Room 106	9	523	-424	<MDC	BKG
Lab Room 106	10	534	-237	<MDC	BKG
Lab Room 106	11	566	305	<MDC	BKG
Lab Room 106	12	635	1475	<MDC	BKG
Lab Room 106	13	665	1983	<MDC	BKG
Lab Room 106	14	625	1305	<MDC	BKG
Lab Room 18A	1	567	1474	<MDC	BKG
Lab Room 18A	2	464	-333	<MDC	BKG
Lab Room 18A	3	487	70	<MDC	BKG
Lab Room 18A	4	504	368	<MDC	BKG
Lab Room 18A	5	462	-368	<MDC	BKG
Lab Room 18A	6	506	404	<MDC	BKG
Lab Room 18A	7	387	-1684	<MDC	BKG
Lab Room 18A	8	422	-1070	<MDC	BKG
Lab Room 18A	9	436	-825	<MDC	BKG
Lab Room 18A	10	389	-1649	<MDC	BKG
Lab Room 18A	11	462	-368	<MDC	BKG
Lab Room 18A	12	426	-1000	<MDC	BKG
Lab Room 18A	13	477	-105	<MDC	BKG
Lab Room 18A	14	419	-1123	<MDC	BKG
Lab Room 18A	15	484	18	<MDC	BKG
Lab Room 18A	16	401	-1439	<MDC	BKG
Lab Room 18A	17	436	-825	<MDC	BKG
Lab Room 18A	18	467	-281	<MDC	BKG
Lab Room 18A	19	405	-1368	<MDC	BKG
Lab Room 20	1	431	-772	<MDC	BKG
Lab Room 20	2	441	-596	<MDC	BKG
Lab Room 20	3	425	-877	<MDC	BKG
Lab Room 20	4	420	-965	<MDC	BKG
Lab Room 20	5	425	-877	<MDC	BKG
Lab Room 20	6	400	-1316	<MDC	BKG
Lab Room 20	7	398	-1351	<MDC	BKG
Lab Room 20	8	377	-1719	<MDC	BKG
Lab Room 20	9	401	-1298	<MDC	BKG
Lab Room 20	10	402	-1281	<MDC	BKG
Lab Room 20	11	395	-1404	<MDC	BKG
Lab Room 20	12	383	-1614	<MDC	BKG
Lab Room 20	13	402	-1281	<MDC	BKG
Lab Room 20	14	392	-1456	<MDC	BKG
Lab Room 113	1	484	211	<MDC	BKG
Lab Room 113	2	401	-1246	<MDC	BKG
Lab Room 113	3	436	-632	<MDC	BKG
Lab Room 113	4	467	-88	<MDC	BKG
Lab Room 113	5	405	-1175	<MDC	BKG
Lab Room 113	6	405	-1175	<MDC	BKG
Lab Room 113	7	405	-1175	<MDC	BKG
Lab Room 113	8	405	-1175	<MDC	BKG
Lab Room 113	9	405	-1175	<MDC	BKG
Lab Room 113	10	405	-1175	<MDC	BKG
Lab Room 113	11	405	-1175	<MDC	BKG

Appendix F

		Beta			
Room	Location	Gross CPM	DPM/100cm2	Result	Dose Rate
Lab Room 113	12	405	-1175	<MDC	BKG
Lab Room 113	13	405	-1175	<MDC	BKG
Lab Room 113	14	405	-1175	<MDC	BKG
Lab Room 113	15	405	-1175	<MDC	BKG
Waste Room Cage	1	619	661	<MDC	BKG
Waste Room Cage	2	597	268	<MDC	BKG
Waste Room Cage	3	589	153	<MDC	BKG
Waste Room Cage	4	582	34	<MDC	BKG
Waste Room Cage	5	500	-1356	<MDC	BKG
Waste Room Cage	6	490	-1525	<MDC	BKG
Waste Room Cage	7	495	-1441	<MDC	BKG
Waste Room Cage	8	608	475	<MDC	BKG
Waste Room Cage	9	544	-610	<MDC	BKG
Waste Room Cage	10	558	-373	<MDC	BKG
Waste Room Cage	11	509	-1203	<MDC	BKG
Waste Room Cage	12	519	-1034	<MDC	BKG
Waste Room Cage	13	530	-847	<MDC	BKG
Waste Room Cage	14	507	-1237	<MDC	BKG
Hallway	1	479	1018	<MDC	BKG
Hallway	2	446	439	<MDC	BKG
Hallway	3	429	140	<MDC	BKG
Hallway	4	419	-35	<MDC	BKG
Hallway	5	422	18	<MDC	BKG
Hallway	6	459	667	<MDC	BKG
Hallway	7	505	1474	<MDC	BKG
Hallway	8	436	263	<MDC	BKG
Hallway	9	411	-175	<MDC	BKG
Hallway	10	443	386	<MDC	BKG
Hallway	11	408	-228	<MDC	BKG
Hallway	12	534	1982	<MDC	BKG
Hallway	13	407	-246	<MDC	BKG
Hallway	14	425	70	<MDC	BKG
Exhaust Vent	Rm 14	467	456	<MDC	BKG
Exhaust Vent	Rm 14	480	684	<MDC	BKG
Exhaust Vent	Rm 105	452	193	<MDC	BKG
Exhaust Vent	Rm106	433	-140	<MDC	BKG
Exhaust Vent	Rm 113	426	-263	<MDC	BKG
Exhaust Vent	Dark Room	458	298	<MDC	BKG

APPENDIX G

Wipe Survey Data Sheets
&
DPM Calculations

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

Appendix G

		Beta - ^{3}H			Beta - ^{14}C		
Room	Location	Gross CPM	DPM/100cm^2	Result	Gross CPM	DPM/100cm^2	Result
Chemical Storage	1	0	-48	<MDC	0	-32	<MDC
Chemical Storage	2	0	-48	<MDC	0	-32	<MDC
Chemical Storage	3	0	-48	<MDC	0	-32	<MDC
Chemical Storage	4	0	-48	<MDC	0	-32	<MDC
Chemical Storage	5	0	-48	<MDC	0	-32	<MDC
Chemical Storage	6	11	-31	<MDC	0	-32	<MDC
Chemical Storage	7	17	-22	<MDC	0	-32	<MDC
Chemical Storage	8	0	-48	<MDC	0	-32	<MDC
Chemical Storage	9	13	-28	<MDC	0	-32	<MDC
Chemical Storage	10	0	-48	<MDC	0	-32	<MDC
Chemical Storage	11	9	-35	<MDC	0	-32	<MDC
Chemical Storage	12	2	-45	<MDC	0	-32	<MDC
Chemical Storage	13	15	-25	<MDC	0	-32	<MDC
Chemical Storage	14	0	-48	<MDC	0	-32	<MDC
Chemical Storage	15	0	-48	<MDC	0	-32	<MDC
Chemical Storage	16	17	-22	<MDC	0	-32	<MDC
Chemical Storage	17	0	-48	<MDC	1	-31	<MDC
Chemical Storage	18	6	-38	<MDC	0	-32	<MDC
Dark Room	1	0	-48	<MDC	0	-32	<MDC
Dark Room	2	0	-48	<MDC	0	-32	<MDC
Dark Room	3	0	-48	<MDC	0	-32	<MDC
Dark Room	4	0	-48	<MDC	0	-32	<MDC
Dark Room	5	0	-48	<MDC	0	-32	<MDC
Dark Room	6	0	-48	<MDC	0	-32	<MDC
Dark Room	7	0	-48	<MDC	0	-32	<MDC
Dark Room	8	0	-48	<MDC	0	-32	<MDC
Dark Room	9	0	-48	<MDC	0	-32	<MDC
Dark Room	10	2	-45	<MDC	0	-32	<MDC
Dark Room	11	0	-48	<MDC	0	-32	<MDC
Dark Room	12	0	-48	<MDC	0	-32	<MDC
Dark Room	13	9	-34	<MDC	0	-32	<MDC
Dark Room	14	2	-45	<MDC	0	-32	<MDC
Dark Room	15	0	-48	<MDC	0	-32	<MDC
Dark Room	16	9	-35	<MDC	0	-32	<MDC
Dark Room	17	0	-48	<MDC	0	-32	<MDC
Dark Room	18	0	-48	<MDC	0	-32	<MDC
Dark Room	19	0	-48	<MDC	0	-32	<MDC
Lab Room 14	1	0	-48	<MDC	0	-32	<MDC
Lab Room 14	2	9	-34	<MDC	0	-32	<MDC
Lab Room 14	3	0	-48	<MDC	0	-32	<MDC
Lab Room 14	4	0	-48	<MDC	0	-32	<MDC
Lab Room 14	5	0	-48	<MDC	0	-32	<MDC
Lab Room 14	6	0	-48	<MDC	0	-32	<MDC
Lab Room 14	7	2	-45	<MDC	0	-32	<MDC
Lab Room 14	8	0	-48	<MDC	0	-32	<MDC
Lab Room 14	9	9	-34	<MDC	0	-32	<MDC
Lab Room 14	10	0	-48	<MDC	0	-32	<MDC
Lab Room 14	11	9	-34	<MDC	0	-32	<MDC
Lab Room 14	12	0	-48	<MDC	0	-32	<MDC
Lab Room 14	13	0	-48	<MDC	0	-32	<MDC
Lab Room 14	14	0	-48	<MDC	0	-32	<MDC
Lab Room 14	15	2	-45	<MDC	0	-32	<MDC
Lab Room 14	16	0	-48	<MDC	0	-32	<MDC
Lab Room 14	17	0	-48	<MDC	0	-32	<MDC
Lab Room 14	18	0	-48	<MDC	0	-32	<MDC
Lab Room 14	19	4	-42	<MDC	0	-32	<MDC

Appendix G

		Beta - ^{3}H		Beta - ^{14}C			
Room	Location	Gross CPM	DPM/100cm^2	Result	Gross CPM	DPM/100cm^2	Result
Lab Room 15	1	0	-48	<MDC	0	-32	<MDC
Lab Room 15	2	0	-48	<MDC	0	-32	<MDC
Lab Room 15	3	0	-48	<MDC	0	-32	<MDC
Lab Room 15	4	0	-48	<MDC	0	-32	<MDC
Lab Room 15	5	0	-48	<MDC	0	-32	<MDC
Lab Room 15	6	0	-48	<MDC	0	-32	<MDC
Lab Room 15	7	0	-48	<MDC	0	-32	<MDC
Lab Room 15	8	0	-48	<MDC	0	-32	<MDC
Lab Room 15	9	0	-48	<MDC	0	-32	<MDC
Lab Room 15	10	0	-48	<MDC	0	-32	<MDC
Lab Room 15	11	2	-45	<MDC	0	-32	<MDC
Lab Room 15	12	0	-48	<MDC	0	-32	<MDC
Lab Room 15	13	0	-48	<MDC	0	-32	<MDC
Lab Room 15	14	0	-48	<MDC	0	-32	<MDC
Lab Room 15	15	0	-48	<MDC	0	-32	<MDC
Lab Room 105	1	0	-48	<MDC	0	-32	<MDC
Lab Room 105	2	2	-45	<MDC	0	-32	<MDC
Lab Room 105	3	0	-48	<MDC	0	-32	<MDC
Lab Room 105	4	0	-48	<MDC	0	-32	<MDC
Lab Room 105	5	15	-25	<MDC	0	-32	<MDC
Lab Room 105	6	0	-48	<MDC	0	-32	<MDC
Lab Room 105	7	0	-48	<MDC	0	-32	<MDC
Lab Room 105	8	0	-48	<MDC	0	-32	<MDC
Lab Room 105	9	0	-48	<MDC	0	-32	<MDC
Lab Room 105	10	4	-42	<MDC	0	-32	<MDC
Lab Room 105	11	2	-45	<MDC	0	-32	<MDC
Lab Room 105	12	0	-48	<MDC	0	-32	<MDC
Lab Room 105	13	0	-48	<MDC	0	-32	<MDC
Lab Room 105	14	0	-48	<MDC	0	-32	<MDC
Lab Room 105	15	2	-45	<MDC	2	-30	<MDC
Lab Room 105	16	0	-48	<MDC	0	-32	<MDC
Lab Room 105	17	0	-48	<MDC	0	-32	<MDC
Lab Room 105	18	4	-42	<MDC	0	-32	<MDC
Lab Room 105	19	0	-48	<MDC	0	-32	<MDC
Lab Room 105	20	0	-48	<MDC	0	-32	<MDC
Lab Room 105	21	0	-48	<MDC	0	-32	<MDC
Lab Room 106	1	4	-42	<MDC	0	-32	<MDC
Lab Room 106	2	9	-34	<MDC	0	-32	<MDC
Lab Room 106	3	0	-48	<MDC	0	-32	<MDC
Lab Room 106	4	0	-48	<MDC	0	-32	<MDC
Lab Room 106	5	0	-48	<MDC	0	-32	<MDC
Lab Room 106	6	0	-48	<MDC	0	-32	<MDC
Lab Room 106	7	0	-48	<MDC	0	-32	<MDC
Lab Room 106	8	0	-48	<MDC	0	-32	<MDC
Lab Room 106	9	0	-48	<MDC	0	-32	<MDC
Lab Room 106	10	0	-48	<MDC	0	-32	<MDC
Lab Room 106	11	0	-48	<MDC	0	-32	<MDC
Lab Room 106	12	0	-48	<MDC	0	-32	<MDC
Lab Room 106	13	0	-48	<MDC	0	-32	<MDC
Lab Room 106	14	0	-48	<MDC	0	-32	<MDC

Appendix G

		Beta - ^{3}H			Beta - ^{14}C		
Room	Location	Gross CPM	DPM/100cm^2	Result	Gross CPM	DPM/100cm^2	Result
Lab Room 18A	1	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	2	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	3	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	4	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	5	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	6	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	7	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	8	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	9	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	10	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	11	6	-38	<MDC	0	-32	<MDC
Lab Room 18A	12	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	13	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	14	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	15	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	16	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	17	0	-48	<MDC	0	-32	<MDC
Lab Room 18A	18	2	-45	<MDC	0	-32	<MDC
Lab Room 18A	19	0	-48	<MDC	0	-32	<MDC
Lab Room 20	1	0	-48	<MDC	0	-32	<MDC
Lab Room 20	2	2	-45	<MDC	0	-32	<MDC
Lab Room 20	3	0	-48	<MDC	0	-32	<MDC
Lab Room 20	4	4	-42	<MDC	0	-32	<MDC
Lab Room 20	5	0	-48	<MDC	0	-32	<MDC
Lab Room 20	6	0	-48	<MDC	0	-32	<MDC
Lab Room 20	7	0	-48	<MDC	0	-32	<MDC
Lab Room 20	8	0	-48	<MDC	0	-32	<MDC
Lab Room 20	9	4	-42	<MDC	0	-32	<MDC
Lab Room 20	10	0	-48	<MDC	0	-32	<MDC
Lab Room 20	11	0	-48	<MDC	0	-32	<MDC
Lab Room 20	12	0	-48	<MDC	0	-32	<MDC
Lab Room 20	13	0	-48	<MDC	0	-32	<MDC
Lab Room 20	14	20	-17	<MDC	0	-32	<MDC
Lab Room 113	1	0	-48	<MDC	0	-32	<MDC
Lab Room 113	2	2	-45	<MDC	0	-32	<MDC
Lab Room 113	3	0	-48	<MDC	0	-32	<MDC
Lab Room 113	4	11	-31	<MDC	0	-32	<MDC
Lab Room 113	5	0	-48	<MDC	0	-32	<MDC
Lab Room 113	6	2	-45	<MDC	0	-32	<MDC
Lab Room 113	7	15	-25	<MDC	0	-32	<MDC
Lab Room 113	8	0	-48	<MDC	0	-32	<MDC
Lab Room 113	9	0	-48	<MDC	0	-32	<MDC
Lab Room 113	10	11	-31	<MDC	0	-32	<MDC
Lab Room 113	11	7	-37	<MDC	0	-32	<MDC
Lab Room 113	12	6	-38	<MDC	0	-32	<MDC
Lab Room 113	13	0	-48	<MDC	0	-32	<MDC
Lab Room 113	14	0	-48	<MDC	0	-32	<MDC
Lab Room 113	15	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	1	11	-31	<MDC	0	-32	<MDC
Waste Room Cage	2	20	-17	<MDC	0	-32	<MDC
Waste Room Cage	3	24	-11	<MDC	0	-32	<MDC
Waste Room Cage	4	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	5	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	6	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	7	11	-31	<MDC	0	-32	<MDC
Waste Room Cage	8	9	-34	<MDC	0	-32	<MDC
Waste Room Cage	9	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	10	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	11	2	-45	<MDC	0	-32	<MDC
Waste Room Cage	12	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	13	0	-48	<MDC	0	-32	<MDC
Waste Room Cage	14	0	-48	<MDC	0	-32	<MDC

Appendix G

		Beta - ^{3}H			Beta - ^{14}C		
Room	Location	Gross CPM	DPM/100cm^2	Result	Gross CPM	DPM/100cm^2	Result
Hallway	1	0	-48	<MDC	0	-32	<MDC
Hallway	2	0	-48	<MDC	0	-32	<MDC
Hallway	3	4	-42	<MDC	0	-32	<MDC
Hallway	4	9	-34	<MDC	0	-32	<MDC
Hallway	5	0	-48	<MDC	0	-32	<MDC
Hallway	6	0	-48	<MDC	0	-32	<MDC
Hallway	7	0	-48	<MDC	0	-32	<MDC
Hallway	8	0	-48	<MDC	0	-32	<MDC
Hallway	9	0	-48	<MDC	0	-32	<MDC
Hallway	10	2	-45	<MDC	0	-32	<MDC
Hallway	11	0	-48	<MDC	0	-32	<MDC
Hallway	12	9	-34	<MDC	0	-32	<MDC
Hallway	13	0	-48	<MDC	0	-32	<MDC
Hallway	14	3	-43	<MDC	3	-29	<MDC
Systems							
Exhaust Vent	Rm 14	0	-48	<MDC	0	-32	<MDC
Exhaust Vent	Rm 14	0	-48	<MDC	0	-32	<MDC
Exhaust Vent	Rm 105	0	-48	<MDC	0	-32	<MDC
Exhaust Vent	Rm106	0	-48	<MDC	0	-32	<MDC
Exhaust Vent	Rm 113	0	-48	<MDC	0	-32	<MDC
Exhaust Vent	Dark Room	16	-23	<MDC	0	-32	<MDC
Rm 113	Under Sink	0	-48	<MDC	0	-32	<MDC
Rm 113	Under Sink	0	-48	<MDC	0	-32	<MDC
Rm 113	In Fume Hood	0	-48	<MDC	0	-32	<MDC
Rm 113	In Fume Hood	2	-45	<MDC	0	-32	<MDC
Rm 113	Counter	0	-48	<MDC	0	-32	<MDC
Rm 113	Counter	9	-34	<MDC	0	-32	<MDC
Rm 113	Counter	0	-48	<MDC	0	-32	<MDC
Rm 113	Counter	0	-48	<MDC	0	-32	<MDC
Rm 113	Counter	0	-48	<MDC	0	-32	<MDC
Rm 113	Counter	15	-25	<MDC	0	-32	<MDC
Rm 113	Counter	0	-48	<MDC	0	-32	<MDC
Rm 14	Trap	21	-15	<MDC	0	-32	<MDC
Rm 15	Trap	0	-48	<MDC	0	-32	<MDC
Rm 105	Trap	0	-48	<MDC	0	-32	<MDC
Rm 105	Trap	0	-48	<MDC	0	-32	<MDC
Rm 106	Trap	0	-48	<MDC	0	-32	<MDC
Rm 106	Trap	0	-48	<MDC	0	-32	<MDC
Dark Room	Trap	0	-48	<MDC	0	-32	<MDC
Rm 113	Trap	4	-42	<MDC	0	-32	<MDC
Rm 113	Trap	0	-48	<MDC	0	-32	<MDC
Rm 14	Light Switch	0	-48	<MDC	0	-32	<MDC
Rm 15	Light Switch	0	-48	<MDC	0	-32	<MDC
Rm 105	Light Switch	0	-48	<MDC	0	-32	<MDC
Rm 106	Light Switch	6	-38	<MDC	0	-32	<MDC
Rm 18A	Light Switch	0	-48	<MDC	0	-32	<MDC
Rm 113	Light Switch	0	-48	<MDC	0	-32	<MDC
Hallway	Light Switch	0	-48	<MDC	0	-32	<MDC
Hallway	Light Switch	0	-48	<MDC	0	-32	<MDC
Hallway	Light Switch	0	-48	<MDC	0	-32	<MDC
Hallway	Light Switch	0	-48	<MDC	0	-32	<MDC
Dark Room	Light Switch	0	-48	<MDC	0	-32	<MDC

Appendix G

		Beta - ^{3}H			Beta - ^{14}C		
Room	Location	Gross CPM	DPM/100cm^2	Result	Gross CPM	DPM/100cm^2	Result
Hallway	Telephone	0	-48	<MDC	0	-32	<MDC
Hallway	Telephone	0	-48	<MDC	0	-32	<MDC
Hallway	Telephone	0	-48	<MDC	0	-32	<MDC
Hallway	Telephone	0	-48	<MDC	0	-32	<MDC
Rm 14	Sink Drain	20	-17	<MDC	0	-32	<MDC
Rm 15	Sink Drain	2	-45	<MDC	0	-32	<MDC
Rm 105	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 105	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 105	Fume Drain	6	-38	<MDC	0	-32	<MDC
Rm 105	Floor Drain	0	-48	<MDC	0	-32	<MDC
Rm 106	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 106	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 106	Fume Drain	0	-48	<MDC	0	-32	<MDC
Rm 113	Sink Drain	12	-29	<MDC	0	-32	<MDC
Rm 113	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 113	Fume Drain	0	-48	<MDC	0	-32	<MDC
Rm 106	Floor Drain	0	-48	<MDC	0	-32	<MDC
Rm 113	Floor Drain	0	-48	<MDC	0	-32	<MDC
Dark Room	Sink Drain	0	-48	<MDC	0	-32	<MDC
Rm 105	In Fume Hood	0	-48	<MDC	0	-32	<MDC
Rm 105	In Fume Hood	2	-45	<MDC	0	-32	<MDC
Rm 105	Under Sink	0	-48	<MDC	0	-32	<MDC
Rm 105	Counter	0	-48	<MDC	0	-32	<MDC
Rm 105	Under Sink	0	-48	<MDC	0	-32	<MDC
Rm 105	Under Sink	4	-42	<MDC	0	-32	<MDC
Underdeveloped Area	Behind Shelf	0	-48	<MDC	0	-32	<MDC
Underdeveloped Area	Floor	11	-31	<MDC	0	-32	<MDC
Underdeveloped Area	Under Shelf	0	-48	<MDC	0	-32	<MDC
Underdeveloped Area	Shelf	0	-48	<MDC	0	-32	<MDC
Rm 106	In Fume Hood	4	-42	<MDC	0	-32	<MDC
Rm 106	Counter	0	-48	<MDC	0	-32	<MDC
Rm 106	Counter	0	-48	<MDC	0	-32	<MDC
Rm 106	Under Sink	0	-48	<MDC	0	-32	<MDC
Rm 106	Under Sink	0	-48	<MDC	0	-32	<MDC

APPENDIX H

DandD Dose Code Calculations

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

DandD Building Occupancy Scenario

DandD Version: 2.1.0
Run Date/Time: 12/29/2005 3:56:36 PM
Site Name: The Celgene Corporation
Description: Decommissioning of 7 Powder Horn Drive
FileName:C:\Documents and Settings\Sr. HP\My Documents\Celgene Decommissioning.mcd

Options:

Implicit progeny doses NOT included with explicit parent doses
Nuclide concentrations are distributed among all progeny
Number of simulations: 100
Seed for Random Generation: 8718721
Averages used for behavioral type parameters

External Pathway is ON
Inhalation Pathway is ON
Secondary Ingestion Pathway is ON

Initial Activities:

Nuclide	Area of Contamination (m^2)	Distribution
3H	UNLIMITED	CONSTANT(dpm 100 cm**2)
Justification for concentration: Instrument MDC		Value 3.67E+01
14C	UNLIMITED	CONSTANT(dpm 100 cm**2)
Justification for concentration: Maximum Static Value for Static Surveys		Value 3.49E+03

Site Specific Parameters:

General Parameters:

None

Correlation Coefficients:

None

Philotechnics, Ltd.
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Email: gsnadeau@philotechnics.com

Summary Results:

90.00% of the 100 calculated TEDE values are < 2.37E-02 mrem/year .
The 95 % Confidence Interval for the 0.9 quantile value of TEDE is 2.21E-02 to 2.59E-02 mrem/year

Philotechnics, Ltd.
1740 Massachusetts Avenue, Boxborough, MA, 01719
Phone: 978-266-0377 • Fax: 978-263-0696
Email: gsnadeau@philotechnics.com

This is to acknowledge the receipt of your letter/application dated

1/17/2006, and to inform you that the initial processing which includes an administrative review has been performed.

☑ AMEND. 29-28056-01
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 138255.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader