

January 25, 2011

Katherine Streit
U.S. NRC Region III
2443 Warrenville Road
Suite 210
Lisle, Illinois 60532-4352

RE: Sigma-Aldrich (Sigma) Fort Mims Site, Documents relating to NRC's Request for Additional Information, USNRC License # 24-16273-01

Dear Ms Streit,

Accompanying this cover letter is a CD, which I've labeled, dated and signed. This CD contains a single PDF-formatted file (Sigma response to NRC RAIs 2011-02-25.doc). The contents of the CD represent Sigma's response to NRC's request for additional information.

Please let me know if you have any questions or concerns.

Best regards,



Thomas K Spencer
Radiation Safety Officer

RECEIVED MAR 02 2011

25 February 2011

Katherine Streit
U.S. NRC Region III
2443 Warrenville Road
Suite 210
Lisle, Illinois 60532-4352

RE: Sigma-Aldrich (Sigma) Fort Mims Site Decommissioning, Request for Additional Information, USNRC License # 24-16273-01

Dear Ms. Streit,

On 14 Jan 2011 the NRC and Sigma held a conference call, documented in your Telephone Conversation Record, dated 16 Jan 2011. In that conference, you listed some areas in which additional information is needed to complete your technical review. In a subsequent teleconference with Sigma and the NRC on 09 Feb 2011, you requested a summary of the GeoCheck Report used to determine depth to the water table. The following provides Sigma's responses to those requests.

(1a) Provide written justification for "Industrial Worker" scenario as the compliance-based scenario to comply with 10 CFR 20.1402. Justification may include written statements or description of discussions with local land planners, including dates; meetings with local stakeholders; trending analysis of the land use for the region; zoning permit descriptions; and peak exposure time.

Sigma response.

The Industrial Worker scenario is justified through analysis of 1) The City of Maryland Heights Land Use Map, 2) Official Zoning Map, and 3) email correspondence on 10 Aug 2010 with David Bookless, a planner with the city of Maryland Heights. These are documented in Attachments 1, 2 and 3, respectively.

The Land Use Map (Attachment 1), published 25 Jan 2011, shows the current land use of the Fort Mims property and surrounding area as Industrial/Commercial. The nearest residential use is nearly one mile away.

The current Zoning Map (Attachment 2), amended 04 Nov 2010, shows that the Fort Mims property is near the center a large area zoned as PD-M (Planned Development-Manufacturing) or M-1 (Office, Commercial and Light Manufacturing). The nearest residential zone is nearly one mile away.

In an email communication (Attachment 3) with David Bookless, a planner for the City of Maryland Heights, Mr. Bookless indicates that it is unlikely that the Fort Mims property would be re-zoned, because it is part of a larger Planned District (Lakeside Crossing).

Based on the findings that current and future use/zoning is predominately industrial/commercial, the Industrial Worker scenario is appropriate for use in dose modeling analysis.

(1b) Provide identification of land uses that are less likely but plausible to bound the risk of the release for unrestricted use. Less likely but plausible land uses may include, but are not limited to, onsite residential use or excavation of soil for use in an off-site scenario.

Sigma response.

Philotechnics, Ltd., under contract with Sigma, prepared a report titled “Additional RESRAD Modeling and Uncertainty Analyses”, dated 25 Jan 2011. This report is included as Attachment 4.

A “**Suburban Resident**” model was analyzed. Site-specific parameters were set to the same values as those used for the industrial worker model, which is the primary model used to demonstrate compliance with release criteria.

Using the Suburban Resident model, the instantaneous dose at time $t=0$ is 397 mrem/year (the time the radioactivity was first measured), which in this case was May 2009, nearly two years ago. This dose decreases to 46 mrem/year after the first year, and 0.5 mrem/year after three years. The decrease is due to migration and associated dilution of radioactivity in soil.

As in the original RESRAD model, the maximum concentration of ^{14}C and the maximum concentration of ^3H were assumed to be present throughout the entire contaminated zone, which is a very conservative assumption. For these reasons, the bounding dose of 397 mrem/year is demonstrably conservative.

A “**Resident Farmer**” scenario, in which excavated dirt is transported and ultimately utilized in farming, was analyzed by RESRAD. In this scenario, because the soils would be dug up, transported, and spread, the average concentrations of ^{14}C and ^3H were used. Area and thickness of the contaminated zone, as well as all other site soil parameters, are the same as in the original RESRAD model. The instantaneous dose at time $t=0$ is 114 mrem/year. After the first year, the dose decreases to 0.002 mrem/year.

(1c) Once less likely but plausible scenarios have been identified, provide a quantitative analysis of or a qualitative argument discounting the need to analyze all scenarios generated from the reasonable foreseeable land uses. Time to peak dose may be used to discount onsite scenarios depending on the detail of justification used to demonstrate "Industrial Worker" as the onsite scenario provided in response to item 1 (a).

Sigma Response.

As noted in the previous responses, a change in zoning at the Fort Mims location is very unlikely because of its siting within a much larger industrial/commercial area. Therefore, a

Resident Farmer scenario at the Fort Mims property is exceedingly unlikely, and can be discounted in the dose analysis.

The off-site Resident Farmer scenario discussed in section 1b is plausible, but unlikely. The scenario shows an instantaneous dose of 114 mrem/year at t=0, and 0.002 mrem/year after the first year. The dose drops off very rapidly during the first year. Even if the dirt was moved to a farming location, it is very unlikely that farming activities would progress rapidly enough to result in an exposure above 10 mrem/year. It is therefore reasonable to discount this scenario in the dose analysis.

The Suburban Resident modeling results in calculated doses of 397, 46 and 0.5 mrem/year after t=0, 1 and 3 years, respectively. At present time, we are nearly two years from t=0. This, taken with the extremely low probability of a Suburban Resident scenario in the next year, supports discounting the Suburban Resident scenario in the dose analysis.

(2) Provide uncertainty analysis for site-specific parameters, including the distribution coefficient and hydraulic conductivity, to demonstrate that uncertainty in the model geological parameters will not result in a significant increase in exposure. If significant increase in exposure is found in the uncertainty ranges of these parameters, further justification may be required for site-specific information.

Sigma Response.

Uncertainty analyses are also provided in the Philotechnics report (Attachment 4). The report documents additional uncertainty analyses on hydraulic conductivity (Ksat) and distribution coefficient (Kd). A total of FIVE analyses were run:

- Ksat of the Unsaturated Zone
- Kd for carbon in the Unsaturated Zone
- Kd for carbon in the Saturated Zone
- Kd for hydrogen in the Unsaturated Zone
- Kd for hydrogen in the Saturated Zone

None of the models indicated any appreciable difference in dose.

(3) Provide a scaled map demonstrating the total area of the site and the total area sampled as compared to the site-specific model contaminated area of 12,000 m²

Sigma Response

This information is provided in the Philotechnics report, Summary of Soil Sampling and Analysis (Attachment 5)

(4) Since the dose assessment is associated with a request for release of the site for unrestricted use, provide the results of soil sample results in the form of a final status survey as described in your approved "Fort Mims Facility Soil Sampling and Analysis Plan," dated October 20, 2008.

Sigma Response

This information is provided in the Philotechnics report, Summary of Soil Sampling and Analysis (Attachment 5)

(5) Provide chemical analysis results, if any, from soil samples collected.

Sigma Response

TestAmerica performed soil chemical testing, under contract with Sigma. The report is attached (Attachment 6). For the sampling point, we chose location #61 in survey unit FMF-29. The 14C soil concentration at location #61 at depths of 0.2, 1.0 and 2 meters was 483, 128 and 398 pCi/g, respectively. The sample for chemical analysis was a composite from surface to 6 ft (1.8 m). We believe that the depth and magnitude of 14C concentration, including its close proximity to the septic tank, was optimal for detecting chemical contamination, if any existed, on the survey site.

The sample was screened for 36 organic volatile compounds. Except for acetone, none were detected. Acetone was detected at an estimated concentration of 8.5 ug/kg, which was below the laboratory's reporting limit of 24 ug/kg.

(6) Provide a summary of the GeoCheck report used to determine depth to the water table.

Sigma Response

Cheryl Stipsits, EHS Director for Sigma-Aldrich Saint Louis, prepared a summary letter to NRC dated 15 Feb 2011. The letter, provided as Attachment 7, summarizes the water well data within a one-mile radius of the Fort Mims Site.

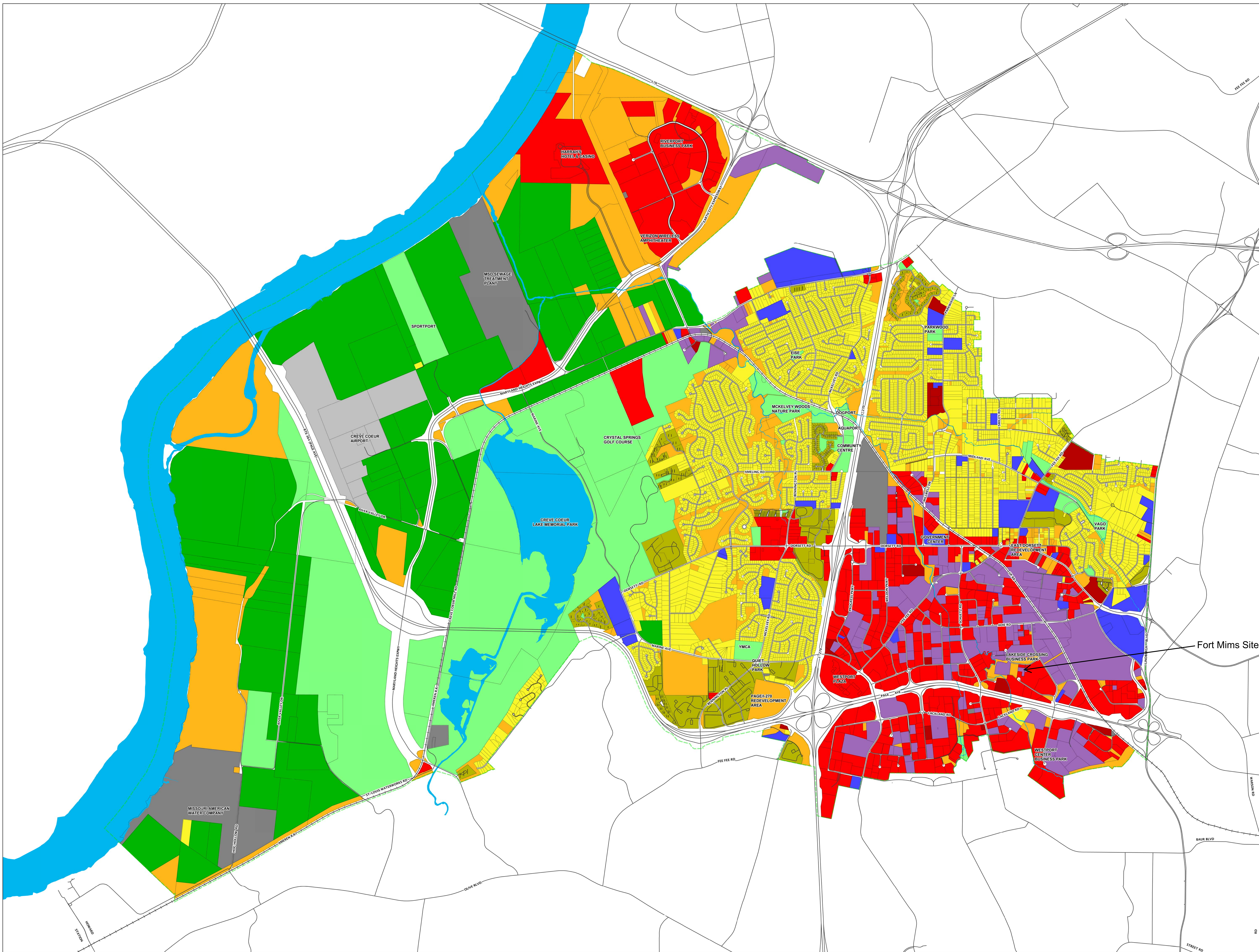
Please contact me if you have any questions or concerns regarding Sigma's responses to your request for additional information.

Sincerely,



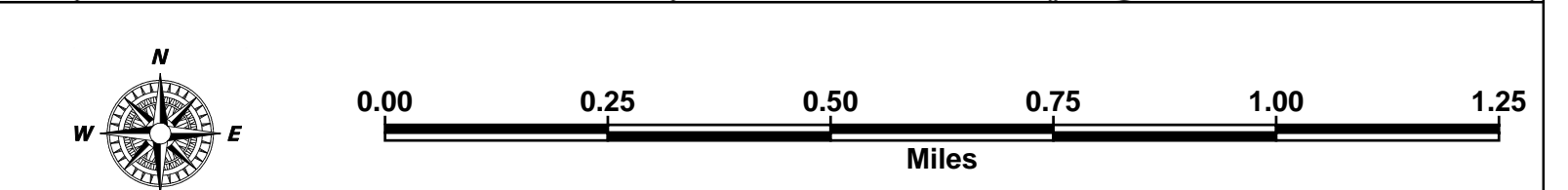
Thomas K Spencer
Radiation Safety Officer

ATTACHMENT 1 – Maryland Heights Land Use Map



LAND USE
CITY OF MARYLAND HEIGHTS

- | | | | |
|---|--|---|---|
| ■ AGRICULTURAL | ■ INDUSTRIAL | ■ RESIDENTIAL (MFD) | ■ UTILITY |
| ■ BUSINESS | ■ INSTITUTIONAL | ■ RESIDENTIAL (SFD) | ■ VACANT LAND |
| ■ COMMERCIAL | ■ RECREATIONAL | ■ TRANSPORTATION | |

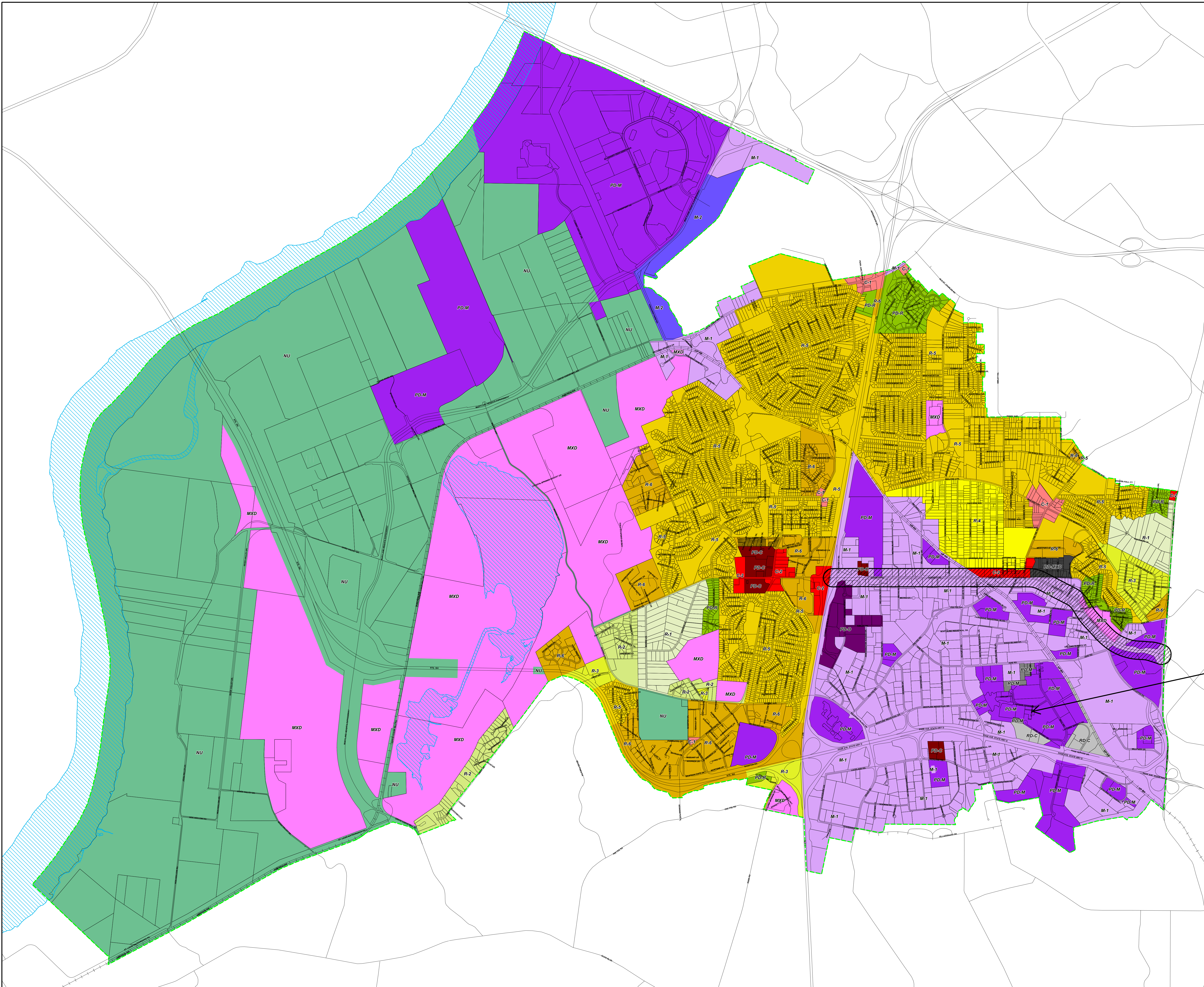


The information contained on this document has been compiled from multiple sources. The City of Maryland Heights does not make any warranties to its representation or accuracy. Published by the City of Maryland Heights Geographic Information Services 01/25/2011

ATTACHMENT 1 – Maryland Heights Zoning Map

OFFICIAL ZONING MAP FOR THE CITY OF MARYLAND HEIGHTS, MISSOURI

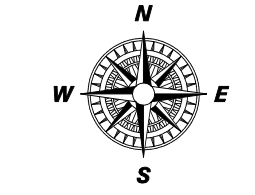
- NU
- R-1
- R-2
- R-3
- R-4
- R-5
- R-6
- C-1
- C-2
- M-1
- M-2
- PD-R
- PD-CR
- PD-C
- MXD
- PD-O
- PD-M
- RD-C
- RD-M
- RD-MXD
- OD-C



Fort Mims Site

Map amended by ordinance number: 2010-3453
 Map amended by ordinance number: 2003-3291
 Map amended by ordinance number: 2005-3292
 Map amended by ordinance number: 2003-3242
 Map amended by ordinance number: 2005-3166
 Map amended by ordinance number: 2003-3174
 Map amended by ordinance number: 2005-3104
 Map amended by ordinance number: 2005-3038
 Map amended by ordinance number: 2005-3029
 Map amended by ordinance number: 2007-2947
 Map amended by ordinance number: 2001-2913
 Map amended by ordinance number: 2007-2883
 Map amended by ordinance number: 2005-2801
 Map amended by ordinance number: 2005-2796
 Map amended by ordinance number: 2005-2751
 Map amended by ordinance number: 2005-2677
 Map amended by ordinance number: 2005-2622
 Map amended by ordinance number: 2004-2528
 Map amended by ordinance number: 2004-2458
 Map amended by ordinance number: 2004-2440
 Map adopted by ordinance number: 2004-2429

Amended by the City Council on: 06/02/2009
 Amended by the City Council on: 06/02/2009
 Amended by the City Council on: 05/07/2009
 Amended by the City Council on: 03/04/2008
 Amended by the City Council on: 03/04/2008
 Amended by the City Council on: 06/05/2008
 Amended by the City Council on: 02/01/2008
 Amended by the City Council on: 01/17/2008
 Amended by the City Council on: 07/19/2007
 Amended by the City Council on: 02/02/2007
 Amended by the City Council on: 03/01/2007
 Amended by the City Council on: 11/03/2006
 Amended by the City Council on: 10/19/2006
 Amended by the City Council on: 06/01/2006
 Amended by the City Council on: 11/03/2005
 Amended by the City Council on: 08/12/2005
 Amended by the City Council on: 09/16/2004
 Amended by the City Council on: 03/16/2004
 Amended by the City Council on: 02/05/2004
 Adopted by the City Council on: 01/15/2004



ATTACHMENT 3 - Email Communication with David
Bookless


Attachment 3 - Email Communication with David Bookless

Bill Ritter/stl/sial
02/11/2011 11:00 AM

To Thomas Spencer/stl/sial@sial, Bob Ringering/stl/sial@sial
cc
bcc
Subject Fw: Zoning Info

David Bookless is who I talked with. His contact info is in the file at bottom if you need to contact him.
----- Forwarded by Bill Ritter/stl/sial on 02/11/2011 10:59 AM -----

Bill Ritter/stl/sial
08/11/2010 08:42 AM

To "David Bookless" <dbookless@marylandheights.com>
cc
Subject RE: Zoning Info 

David,

Thanks a lot. This helps. I realize no one can predict the future with absolute certainty but at least we know there are no definite changes pending.

Bill

SIGMA-ALDRICH

Bill Ritter / Vice President, Global Manufacturing & Capital

3050 Spruce Street / Saint Louis, MO, 63103 / USA
P: (314) 301-2098 /
sigma-aldrich.com

"David Bookless" <dbookless@marylandheights.com>



"David Bookless"
<dbookless@marylandheights.com>
08/10/2010 05:12 PM

To "Bill Ritter" <Bill.Ritter@sial.com>
cc
Subject RE: Zoning Info

Bill,

The property is within a Planned District (Lakeside Crossing) with a site-specific ordinance governing the properties therein. While it is possible the property could be rezoned, it is unlikely as it is part of the larger district. That is not to say the district ordinance could not be amended to accommodate some change if deemed appropriate by the Planning Commission and City Council. If you have any further questions, please let me know.

David

From: Bill Ritter [mailto:Bill.Ritter@sial.com]
Sent: Tuesday, August 10, 2010 3:48 PM
To: David Bookless
Subject: Zoning Info

Hi David,

We have a property in Maryland Heights where we once conducted light manufacturing work. That work has ceased and we are decommissioning the site. We need to decide what to do with the site, e.g., renovate for new ops, sell, etc. I realize it is zoned commercial now but can you give us your best estimate as to whether it will remain so in the future (as opposed to re-zoning to residential or other)? The address is:

11542 Fort Mims Dr.
Maryland Heights, MO

Thanks for any insight you can give.

Bill

SIGMA-ALDRICH[®]

Bill Ritter / Vice President, Global Manufacturing & Capital

3050 Spruce Street / Saint Louis, MO, 63103 / USA

P: (314) 301-2098 /

sigma-aldrich.com

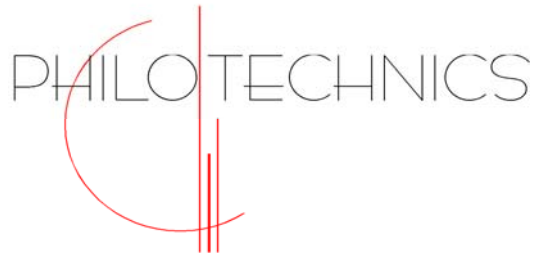
This message and any files transmitted with it are the property of Sigma-Aldrich Corporation, are confidential, and are intended solely for the use of the person or entity to whom this e-mail is addressed. If you are not one of the named recipient(s) or otherwise have reason to believe that you have received this message in error, please contact the sender and delete this message immediately from your computer. Any other use, retention, dissemination, forwarding, printing,



or copying of this e-mail is strictly prohibited. David B Bookless.vcf

ATTACHMENT 4 - Additional RESRAD Modeling and
Uncertainty Analyses

Attachment 4



Fort Mims Facility
Decontamination and Decommissioning Project

Additional RESRAD Modeling and Uncertainty analyses

Sigma Aldrich Company
11542 Fort Mims Drive
Maryland Heights, Missouri

January 25, 2011

Prepared by:

**Philotechnics, Ltd.
201 Renovare Boulevard
Oak Ridge, TN 37830**

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Appendix B: RESRAD Report for Resident Farmer Occupancy Scenario

Appendix C: Uncertainty Analysis K_{sat} of the Unsaturated Zone

Appendix D: Uncertainty Analysis K_d for carbon in the Unsaturated Zone

Appendix E: Uncertainty Analysis K_d for carbon in the Saturated Zone

Appendix F: Uncertainty Analysis K_d for hydrogen in the Unsaturated Zone

Appendix G: Uncertainty Analysis K_d for hydrogen in the Saturated Zone

1.0 Executive Summary

Philotechnics developed a RESRAD model to demonstrate the residual radioactivity in soils from licensed activities would not be likely to cause an average member of the critical group to receive a dose, from all sources, in excess of 25 mrem per year. An “industrial worker” occupancy scenario was used, consistent with current and expected land use of the site and surrounding properties. That model and report were sent to U.S. Nuclear Regulatory Commission, Region III (NRC), in December 2010.

During their review, NRC staff requested additional RESRAD modeling of plausible but unlikely occupancy scenarios. One suggested model was “suburban resident”; that model was run using the appropriate template in RESRAD with site specific parameters and maximum site radionuclide concentrations as used in the original submittal. The other model requested involved removing the soil from the fort Mims site and transferring it to farmland for use as topsoil; that was run using the “resident farmer” template, site specific parameters, and average soil concentrations at the Fort Mims site.

NRC Staff also requested additional uncertainty analyses to demonstrate the effect of soil characteristics—hydraulic conductivity (K_{sat}) and distribution coefficient (K_d)—on the migration of radioactivity to the groundwater and subsequent contribution to radiation exposure due to ingestion of contaminated drinking water.

The suburban resident scenario will bound the dose at the absolute maximum, though highly unlikely. The bounding dose using this model is 397 mrem/year at time $T=0$ (the time the radioactivity was first measured), which in this case was May 2009, nearly two years ago. RESRAD calculates the dose at a time $T=1$ as 46 mrem/year with decreasing dose in subsequent years.

Uncertainty analyses indicate changes in K_{sat} or K_d would have little to no effect on the dose to a resident now or in the future.

2.0 Suburban Resident Scenario

RESRAD Suburban Resident template was used. Site-specific parameters were set to the same values as were used for the industrial worker model which is the primary model used to demonstrate compliance with release criteria.

Using the suburban resident model, the instantaneous dose at time $T=0$ is 397 mrem/year (the time the radioactivity was first measured), which in this case was May 2009, nearly two years ago; this decreases to 46 mrem/year after the first year and 0.5 mrem/year after three years. The decrease is due to migration and associated dilution of radioactivity in soil.

As in the original RESRAD model, the maximum concentration of ^{14}C and the maximum concentration of ^3H were assumed to be present throughout the entire contaminated zone, which is a very conservative assumption.

For these reasons, the bounding dose of 397 mrem is demonstrably conservative.

The suburban resident RESRAD report is included as Appendix A to this report.

3.0 The Resident Farmer Scenario

At the request of NRC staff, we analyzed the potential dose after removal of the soils from the Fort Mims site for use as topsoil or fill over farmland. The "resident farmer" template was used. Because the soils will be dug up, transported, and spread; the average concentrations of ^{14}C and ^3H were used. Area and thickness of the contaminated zone, as well as all other site soil parameters, are the same as in the original RESRAD model. The instantaneous dose at time $T=0$ is 114 mrem/year. After the first year, the dose decreases to 0.002 mrem/year.

The resident farmer RESRAD report is included as Appendix B to this report.

4.0 Uncertainty Analyses

NRC staff requested additional uncertainty analyses on hydraulic conductivity (K_{sat}) and distribution coefficient (K_d). A total of FIVE analyses were run:

- K_{sat} of the Unsaturated Zone (Appendix C)
- K_d for carbon in the Unsaturated Zone (Appendix D)
- K_d for carbon in the Saturated Zone (Appendix E)
- K_d for hydrogen in the Unsaturated Zone (Appendix F)
- K_d for hydrogen in the Saturated Zone (Appendix G)

None of the models indicated any appreciable difference in dose.

Uncertainty analyses results are included as appendices to this report.

Appendix A

RESRAD Report Suburban Resident

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

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Time = 3.000E+00	11
Time = 1.000E+01	12
Time = 3.000E+01	13
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Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	C-14 (Source: FGR 12)	1.345E-05	1.345E-05	DCF1(1)
A-1	H-3 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(2)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	C-14(p) (Class: ORGANIC)	2.090E-06	2.090E-06	DCF2(1)
B-1	C-14(g) (Class: CO2)	2.350E-08	2.350E-08	C14GInhDCF
B-1	H-3	6.400E-08	6.400E-08	DCF2(2)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	C-14	2.090E-06	2.090E-06	DCF3(1)
D-1	H-3	6.400E-08	6.400E-08	DCF3(2)
D-34	Food transfer factors:			
D-34	C-14, plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(1,1)
D-34	C-14, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(1,2)
D-34	C-14, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(1,3)
D-34	H-3, plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(2,1)
D-34	H-3, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(2,2)
D-34	H-3, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(2,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(1,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(1,2)
D-5	H-3, fish	1.000E+00	1.000E+00	BIOFAC(2,1)
D-5	H-3, crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(2,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.200E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T (2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T (3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T (4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T (5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T (6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T (7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T (8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T (9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): C-14	1.290E+03	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): H-3	4.250E+01	0.000E+00	---	S1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1 (1)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1 (2)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.300E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.200E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	3.730E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Summary : RESRAD Default Parameters Suburban Resident Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.400E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.200E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.730E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.040E+01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.124E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.104E-01	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Summary : RESRAD Default Parameters Suburban Resident Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	not used	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	1.000E-01	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)

Summary : RESRAD Default Parameters Suburban Resident Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS

Summary : RESRAD Default Parameters Suburban Resident Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	1	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Contaminated Zone Dimensions	Initial Soil Concentrations, pCi/g	
Area: 12000.00 square meters	C-14	1.290E+03
Thickness: 3.00 meters	H-3	4.250E+01
Cover Depth: 0.00 meters		

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	3.967E+02	4.628E+01	5.388E-01	2.345E-05	4.986E-13	1.205E-26	0.000E+00	0.000E+00
M(t):	1.587E+01	1.851E+00	2.155E-02	9.382E-07	1.994E-14	4.821E-28	0.000E+00	0.000E+00

Maximum TDOSE(t): 3.967E+02 mrem/yr at t = 0.000E+00 years

Summary : RESRAD Default Parameters Suburban Resident Scenario

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Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	1.022E-02	0.0000	3.832E-01	0.0010	0.000E+00	0.0000	3.961E+02	0.9984	0.000E+00	0.0000	0.000E+00	0.0000	7.381E-02	0.0002
H-3	0.000E+00	0.0000	9.584E-03	0.0000	0.000E+00	0.0000	1.397E-01	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	7.446E-05	0.0000
Total	1.022E-02	0.0000	3.928E-01	0.0010	0.000E+00	0.0000	3.962E+02	0.9988	0.000E+00	0.0000	0.000E+00	0.0000	7.388E-02	0.0002

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.966E+02	0.9996
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.494E-01	0.0004
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.967E+02	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	1.095E-03	0.0000	4.104E-02	0.0009	0.000E+00	0.0000	4.617E+01	0.9975	0.000E+00	0.0000	0.000E+00	0.0000	7.904E-03	0.0002
H-3	0.000E+00	0.0000	3.984E-03	0.0001	0.000E+00	0.0000	5.980E-02	0.0013	0.000E+00	0.0000	0.000E+00	0.0000	3.095E-05	0.0000
Total	1.095E-03	0.0000	4.502E-02	0.0010	0.000E+00	0.0000	4.623E+01	0.9988	0.000E+00	0.0000	0.000E+00	0.0000	7.935E-03	0.0002

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.622E+01	0.9986
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.382E-02	0.0014
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.628E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	1.250E-05	0.0000	4.686E-04	0.0009	0.000E+00	0.0000	5.272E-01	0.9785	0.000E+00	0.0000	0.000E+00	0.0000	9.024E-05	0.0002
H-3	0.000E+00	0.0000	6.880E-04	0.0013	0.000E+00	0.0000	1.033E-02	0.0192	0.000E+00	0.0000	0.000E+00	0.0000	5.345E-06	0.0000
Total	1.250E-05	0.0000	1.157E-03	0.0021	0.000E+00	0.0000	5.375E-01	0.9977	0.000E+00	0.0000	0.000E+00	0.0000	9.558E-05	0.0002

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.278E-01	0.9795
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.102E-02	0.0205
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.388E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	1.897E-12	0.0000	7.112E-11	0.0000	0.000E+00	0.0000	8.004E-08	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	1.370E-11	0.0000
H-3	0.000E+00	0.0000	1.459E-06	0.0622	0.000E+00	0.0000	2.190E-05	0.9339	0.000E+00	0.0000	0.000E+00	0.0000	1.134E-08	0.0005
Total	1.897E-12	0.0000	1.459E-06	0.0622	0.000E+00	0.0000	2.198E-05	0.9373	0.000E+00	0.0000	0.000E+00	0.0000	1.135E-08	0.0005

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.013E-08	0.0034
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.337E-05	0.9966
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.345E-05	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.762E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	3.112E-14	0.0624	0.000E+00	0.0000	4.672E-13	0.9371	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-16	0.0005
Total	0.000E+00	0.0000	3.112E-14	0.0624	0.000E+00	0.0000	4.672E-13	0.9371	0.000E+00	0.0000	0.000E+00	0.0000	2.418E-16	0.0005

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.762E-27	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.986E-13	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.986E-13	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-26	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-26	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-26	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.205E-26	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	3.074E-01	3.583E-02	4.091E-04	6.212E-11	1.368E-30	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	3.514E-03	1.502E-03	2.593E-04	5.500E-07	1.173E-14	2.836E-28	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=								
	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
C-14	8.132E+01	6.978E+02	6.111E+04	4.025E+11	*4.455E+12	*4.455E+12	*4.455E+12	*4.455E+12	
H-3	7.113E+03	1.665E+04	9.642E+04	4.546E+07	2.131E+15	*9.597E+15	*9.597E+15	*9.597E+15	

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
C-14	1.290E+03	0.000E+00	3.074E-01	8.132E+01	3.074E-01	8.132E+01
H-3	4.250E+01	0.000E+00	3.514E-03	7.113E+03	3.514E-03	7.113E+03

Summary : RESRAD Default Parameters Suburban Resident Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_RESIDENT_WORST_CASE.RAD

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	3.966E+02	4.622E+01	5.278E-01	8.013E-08	1.762E-27	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	1.494E-01	6.382E-02	1.102E-02	2.337E-05	4.986E-13	1.205E-26	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	1.290E+03	1.381E+02	1.577E+00	2.394E-07	5.265E-27	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	4.250E+01	1.767E+01	3.051E+00	6.471E-03	1.380E-10	7.907E-38	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

RESRAD.EXE execution time = 3.00 seconds

Appendix B

RESRAD Report Resident Farmer

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Total Dose Components	
Time = 0.000E+00	9
Time = 1.000E+00	10
Time = 3.000E+00	11
Time = 1.000E+01	12
Time = 3.000E+01	13
Time = 1.000E+02	14
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Dose Conversion Factor (and Related) Parameter Summary
 Dose Library: FGR 12 & FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	C-14 (Source: FGR 12)	1.345E-05	1.345E-05	DCF1(1)
A-1	H-3 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(2)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	C-14(p) (Class: ORGANIC)	2.090E-06	2.090E-06	DCF2(1)
B-1	C-14(g) (Class: CO2)	2.350E-08	2.350E-08	C14GIInhDCF
B-1	H-3	6.400E-08	6.400E-08	DCF2(2)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	C-14	2.090E-06	2.090E-06	DCF3(1)
D-1	H-3	6.400E-08	6.400E-08	DCF3(2)
D-34	Food transfer factors:			
D-34	C-14, plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(1,1)
D-34	C-14, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(1,2)
D-34	C-14, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(1,3)
D-34	H-3, plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(2,1)
D-34	H-3, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(2,2)
D-34	H-3, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(2,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(1,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(1,2)
D-5	H-3, fish	1.000E+00	1.000E+00	BIOFAC(2,1)
D-5	H-3, crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(2,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETRG table in Ground Pathway of Detailed Report.

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : RESRAD Default Parameters Resident Farmer Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_FARMER_AVG_CASE.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.200E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T (2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T (3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T (4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T (5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T (6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T (7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T (8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T (9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): C-14	4.470E+01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): H-3	5.100E+00	0.000E+00	---	S1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1 (1)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1 (2)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.200E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.300E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.000E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.200E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	3.730E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	4.400E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.200E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.730E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.040E+01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.124E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	4.000E-02	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.104E-01	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	5.000E-01	-1	---	FPLANT
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	1	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area: 12000.00 square meters
 Thickness: 3.00 meters
 Cover Depth: 0.00 meters

C-14 4.470E+01
 H-3 5.100E+00

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	1.141E+02	1.505E+01	1.811E-01	2.109E-05	4.494E-13	1.228E-25	0.000E+00	0.000E+00
M(t):	4.565E+00	6.020E-01	7.246E-03	8.436E-07	1.798E-14	4.914E-27	0.000E+00	0.000E+00

Maximum TDOSE(t): 1.141E+02 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	3.542E-04	0.0000	1.328E-02	0.0001	0.000E+00	0.0000	6.863E+01	0.6013	3.181E+01	0.2787	1.355E+01	0.1187	2.557E-03	0.0000
H-3	0.000E+00	0.0000	1.150E-03	0.0000	0.000E+00	0.0000	8.382E-02	0.0007	2.375E-02	0.0002	2.108E-02	0.0002	8.935E-06	0.0000
Total	3.542E-04	0.0000	1.443E-02	0.0001	0.000E+00	0.0000	6.871E+01	0.6020	3.183E+01	0.2789	1.357E+01	0.1189	2.566E-03	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.140E+02	0.9989
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.298E-01	0.0011
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.141E+02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	3.793E-05	0.0000	1.422E-03	0.0001	0.000E+00	0.0000	7.999E+00	0.5315	5.070E+00	0.3369	1.922E+00	0.1277	2.739E-04	0.0000
H-3	0.000E+00	0.0000	4.781E-04	0.0000	0.000E+00	0.0000	3.588E-02	0.0024	1.143E-02	0.0008	9.717E-03	0.0006	3.714E-06	0.0000
Total	3.793E-05	0.0000	1.900E-03	0.0001	0.000E+00	0.0000	8.035E+00	0.5339	5.081E+00	0.3376	1.931E+00	0.1283	2.776E-04	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.499E+01	0.9962
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.751E-02	0.0038
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.505E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	4.330E-07	0.0000	1.624E-05	0.0001	0.000E+00	0.0000	9.134E-02	0.5042	5.791E-02	0.3197	2.195E-02	0.1212	3.127E-06	0.0000
H-3	0.000E+00	0.0000	8.255E-05	0.0005	0.000E+00	0.0000	6.196E-03	0.0342	1.973E-03	0.0109	1.678E-03	0.0093	6.414E-07	0.0000
Total	4.330E-07	0.0000	9.879E-05	0.0005	0.000E+00	0.0000	9.753E-02	0.5384	5.988E-02	0.3306	2.362E-02	0.1304	3.768E-06	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.712E-01	0.9452
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.930E-03	0.0548
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.811E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	6.572E-14	0.0000	2.464E-12	0.0000	0.000E+00	0.0000	1.387E-08	0.0007	8.806E-09	0.0004	3.335E-09	0.0002	4.746E-13	0.0000
H-3	0.000E+00	0.0000	1.751E-07	0.0083	0.000E+00	0.0000	1.314E-05	0.6231	4.186E-06	0.1985	3.560E-06	0.1688	1.360E-09	0.0001
Total	6.572E-14	0.0000	1.751E-07	0.0083	0.000E+00	0.0000	1.316E-05	0.6238	4.195E-06	0.1989	3.563E-06	0.1689	1.361E-09	0.0001

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.601E-08	0.0012
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.106E-05	0.9988
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.109E-05	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.053E-28	0.0000	1.947E-28	0.0000	7.363E-29	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	3.734E-15	0.0083	0.000E+00	0.0000	2.803E-13	0.6238	8.937E-14	0.1988	7.597E-14	0.1690	2.901E-17	0.0001
Total	0.000E+00	0.0000	3.734E-15	0.0083	0.000E+00	0.0000	2.803E-13	0.6238	8.937E-14	0.1988	7.597E-14	0.1690	2.901E-17	0.0001

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.737E-28	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.494E-13	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.494E-13	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Resident Farmer Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_FARMER_AVG_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	9.738E-26	0.7927	7.317E-30	0.0001	0.000E+00	0.0000	7.630E-27	0.0621	4.736E-27	0.0386	1.310E-26	0.1066	1.228E-25	1.0000
Total	9.738E-26	0.7927	7.317E-30	0.0001	0.000E+00	0.0000	7.630E-27	0.0621	4.736E-27	0.0386	1.310E-26	0.1066	1.228E-25	1.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Resident Farmer Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_FARMER_AVG_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary : RESRAD Default Parameters Resident Farmer Scenario

File : C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_FARMER_AVG_CASE.RAD

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
C-14	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	2.550E+00	3.354E-01	3.830E-03	5.819E-10	1.284E-29	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	2.545E-02	1.128E-02	1.947E-03	4.130E-06	8.813E-14	2.409E-26	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t=								
	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
C-14	9.803E+00	7.454E+01	6.527E+03	4.296E+10	*4.455E+12	*4.455E+12	*4.455E+12	*4.455E+12	
H-3	9.822E+02	2.217E+03	1.284E+04	6.053E+06	2.837E+14	*9.597E+15	*9.597E+15	*9.597E+15	

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
C-14	4.470E+01	0.000E+00	2.550E+00	9.803E+00	2.550E+00	9.803E+00
H-3	5.100E+00	0.000E+00	2.545E-02	9.822E+02	2.545E-02	9.822E+02

Summary : RESRAD Default Parameters Resident Farmer Scenario

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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	1.140E+02	1.499E+01	1.712E-01	2.601E-08	5.737E-28	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	1.298E-01	5.751E-02	9.930E-03	2.106E-05	4.494E-13	1.228E-25	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
C-14	C-14	1.000E+00	4.470E+01	4.787E+00	5.465E-02	8.295E-09	1.824E-28	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	5.100E+00	2.120E+00	3.661E-01	7.765E-04	1.656E-11	9.488E-39	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

RESRASCALC.EXE execution time = 2.75 seconds

Appendix C

Uncertainty Analysis Hydraulic Conductivity of the Unsaturated Zone

Dose from All Pathways v.s. Hydraulic Conductivity of Unsaturated zone 1

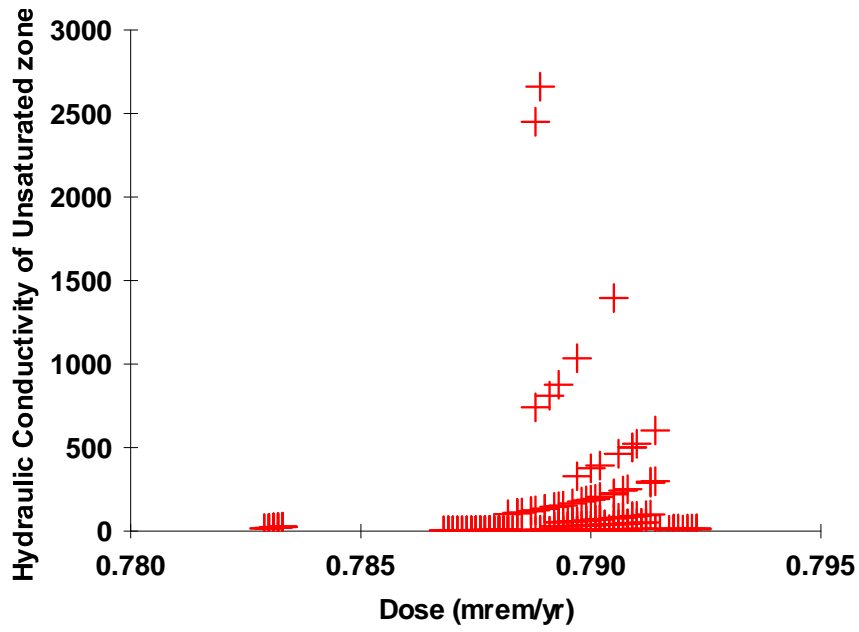


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Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters			
1	HCUZ(1)	BOUNDED LOGNORMAL-N	2.3	2.11	.004	9250

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE(j,t), mrem/yr							
			t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14										
Min	6.23E+02	7.83E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	7.21E+02	7.92E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	6.51E+02	7.89E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	2.54E+01	2.22E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3										
Min	3.09E+01	6.91E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	2.34E-26	0.00E+00	0.00E+00
Max	4.09E+01	1.21E-01	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.17E-01	9.72E-23	0.00E+00	0.00E+00
Avg	3.70E+01	8.66E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	4.00E-03	1.73E-23	0.00E+00	0.00E+00
Std	2.35E+00	1.15E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-02	2.87E-23	0.00E+00	0.00E+00
ΣALL										
Min	6.23E+02	7.83E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.34E-26	0.00E+00	0.00E+00
Max	7.21E+02	7.92E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.17E-01	9.72E-23	0.00E+00	0.00E+00
Avg	6.51E+02	7.89E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	4.00E-03	1.73E-23	0.00E+00	0.00E+00
Std	2.54E+01	2.21E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-02	2.87E-23	0.00E+00	0.00E+00

ΣALL is total dose summed for all nuclides.

Probabilistic Risk Summary

Nuclide (j)	t=	RISK(j, t)							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	6.43E-40	0.00E+00	0.00E+00
Avg		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	2.17E-42	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		1.33E-06	5.52E-07	9.53E-08	2.02E-10	5.13E-06	4.25E-27	0.00E+00	0.00E+00
Avg		1.33E-06	5.52E-07	9.53E-08	2.02E-10	1.75E-07	7.54E-28	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.66E-07	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		5.30E-06	9.77E-07	1.00E-07	2.02E-10	5.13E-06	4.25E-27	0.00E+00	0.00E+00
Avg		5.30E-06	9.77E-07	1.00E-07	2.02E-10	1.75E-07	7.54E-28	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.66E-07	0.00E+00	0.00E+00	0.00E+00

ΣALL is total risk summed for all nuclides.

Probabilistic Dose vs Pathway(i): Ground External

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Inhalation (w/o Radon)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Ind.)

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr						
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr						
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Soil Ingestion

Nuclide (j)	DOSE (i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max	2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg	2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max	2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg	2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Water Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-26	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-01	9.72E-23	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-03	1.73E-23	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-02	2.87E-23	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.34E-26	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.17E-01	9.72E-23	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-03	1.73E-23	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-02	2.87E-23	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Dep.)

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr						
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Cumulative Probability	Dose (t), mrem/yr								
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03	
0.025	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.08E-26	0.00E+00	0.00E+00	
0.050	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.37E-25	0.00E+00	0.00E+00	
0.075	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.09E-25	0.00E+00	0.00E+00	
0.100	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.79E-25	0.00E+00	0.00E+00	
0.125	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.73E-25	0.00E+00	0.00E+00	
0.150	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.48E-25	0.00E+00	0.00E+00	
0.175	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.63E-25	0.00E+00	0.00E+00	
0.200	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.58E-25	0.00E+00	0.00E+00	
0.225	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.80E-25	0.00E+00	0.00E+00	
0.250	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	9.25E-25	0.00E+00	0.00E+00	
0.275	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.06E-24	0.00E+00	0.00E+00	
0.300	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.25E-24	0.00E+00	0.00E+00	
0.325	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.48E-24	0.00E+00	0.00E+00	
0.350	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.68E-24	0.00E+00	0.00E+00	
0.375	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.92E-24	0.00E+00	0.00E+00	
0.400	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.14E-24	0.00E+00	0.00E+00	
0.425	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.52E-24	0.00E+00	0.00E+00	
0.450	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.94E-24	0.00E+00	0.00E+00	
0.475	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.24E-24	0.00E+00	0.00E+00	
0.500	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.82E-24	0.00E+00	0.00E+00	
0.525	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.34E-24	0.00E+00	0.00E+00	
0.550	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.89E-24	0.00E+00	0.00E+00	
0.575	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.70E-24	0.00E+00	0.00E+00	
0.600	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.46E-24	0.00E+00	0.00E+00	
0.625	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.56E-24	0.00E+00	0.00E+00	
0.650	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.97E-24	0.00E+00	0.00E+00	
0.675	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.02E-23	0.00E+00	0.00E+00	
0.700	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.21E-23	0.00E+00	0.00E+00	
0.725	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.43E-23	0.00E+00	0.00E+00	
0.750	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.73E-23	0.00E+00	0.00E+00	
0.775	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.07E-23	0.00E+00	0.00E+00	
0.800	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.41E-23	0.00E+00	0.00E+00	
0.825	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.09E-23	0.00E+00	0.00E+00	
0.850	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.80E-23	0.00E+00	0.00E+00	
0.875	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.00E-23	0.00E+00	0.00E+00	
0.900	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.26E-23	0.00E+00	0.00E+00	
0.925	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	9.72E-23	0.00E+00	0.00E+00	
0.950	1.89E-01	2.15E-02	5.14E-04	6.11E-07	3.08E-02	9.72E-23	0.00E+00	0.00E+00	
0.975	1.89E-01	2.15E-02	5.14E-04	6.11E-07	7.32E-02	9.72E-23	0.00E+00	0.00E+00	
1.000	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.17E-01	9.72E-23	0.00E+00	0.00E+00	

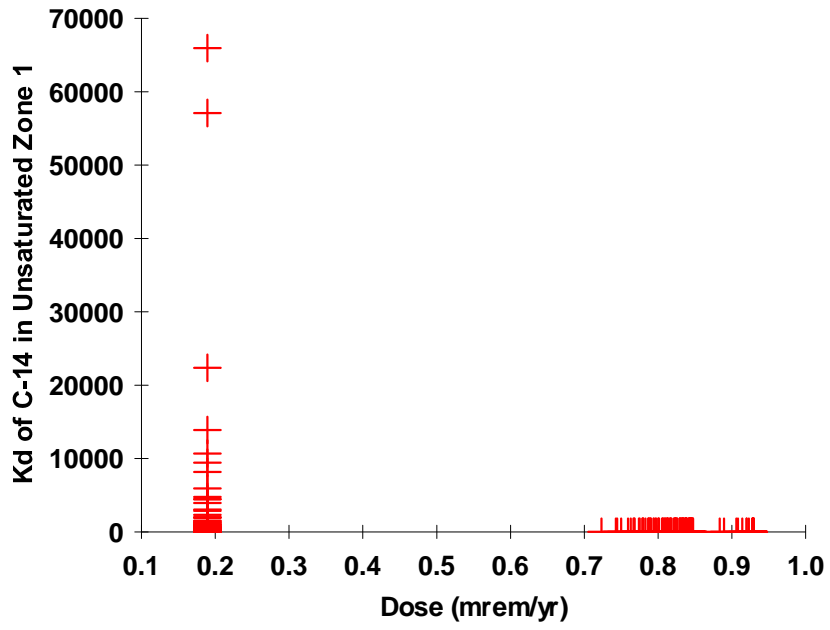
Peak of the mean dose (averaged over observations) at graphical times

Repetition	Time of peak mean dose Years	Peak mean dose mrem/yr
1	6.400E+02	7.828E-01
2	6.400E+02	7.827E-01
3	6.400E+02	7.827E-01

Appendix D

Uncertainty Analysis Distribution Coefficient of Carbon in the Unsaturated Zone

Dose from All Pathways v.s. Kd of C-14 in Unsaturated Zone
1



Part VI: Uncertainty Analysis

RESRAD Uncertainty Analysis Results

Probabilistic Input	2
Total Dose	3
Total Risk	4
Dose vs Pathway: Ground External	5
Dose vs Pathway: Inhalation (w/o Radon)	6
Dose vs Pathway: Radon (Water Ind.)	7
Dose vs Pathway: Plant (Water Ind.)	8
Dose vs Pathway: Meat (Water Ind.)	9
Dose vs Pathway: Milk (Water Ind.)	10
Dose vs Pathway: Soil Ingestion	11
Dose vs Pathway: Water Ingestion	12
Dose vs Pathway: Fish Ingestion	13
Dose vs Pathway: Radon (Water Dep.)	14
Dose vs Pathway: Plant (Water Dep.)	15
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Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters	
1	DCACTU1(1)	LOGNORMAL-N	2.4	3.22

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE (j,t), mrem/yr							
			t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14										
Min	0.00E+00	1.85E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	1.00E+03	8.51E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	8.32E-01	8.44E-01	8.20E-01	7.50E-01
Avg	1.46E+02	4.83E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	2.39E-02	1.55E-01	5.93E-02	1.48E-02
Std	2.37E+02	3.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-01	3.23E-01	2.11E-01	1.04E-01
H-3										
Min	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Max	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Avg	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL										
Min	0.00E+00	1.89E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Max	1.00E+03	9.30E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	8.32E-01	8.44E-01	8.20E-01	7.50E-01
Avg	1.42E+02	4.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	2.39E-02	1.55E-01	5.93E-02	1.48E-02
Std	2.38E+02	3.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-01	3.23E-01	2.11E-01	1.04E-01

ΣALL is total dose summed for all nuclides.

Probabilistic Risk Summary

Nuclide (j)	t=	RISK(j,t)							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.97E-06	4.25E-07	4.85E-09	7.36E-16	1.54E-05	1.56E-05	1.52E-05	1.39E-05
Avg		3.97E-06	4.25E-07	4.85E-09	7.36E-16	4.43E-07	2.87E-06	1.10E-06	2.75E-07
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-06	6.00E-06	3.91E-06	1.92E-06
H-3									
Min		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Max		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Avg		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Max		5.30E-06	9.77E-07	1.00E-07	2.02E-10	1.54E-05	1.56E-05	1.52E-05	1.39E-05
Avg		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.43E-07	2.87E-06	1.10E-06	2.75E-07
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.52E-06	6.00E-06	3.91E-06	1.92E-06

ΣALL is total risk summed for all nuclides.

Probabilistic Dose vs Pathway(i): Ground External

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Inhalation (w/o Radon)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Ind.)

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Soil Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Water Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E-01	8.44E-01	8.20E-01	7.50E-01	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-02	1.55E-01	5.93E-02	1.48E-02	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-01	3.23E-01	2.11E-01	1.04E-01	
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.32E-01	8.44E-01	8.20E-01	7.50E-01	
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-02	1.55E-01	5.93E-02	1.48E-02	
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-01	3.23E-01	2.11E-01	1.04E-01	

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Cumulative Probability	Dose (t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
0.025	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.050	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.075	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.100	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.125	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.150	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.175	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.200	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.225	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.250	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.275	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.300	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.325	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.350	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.375	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.400	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.425	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.450	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.475	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.500	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.525	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.550	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.575	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.600	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.625	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.650	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.675	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.700	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.725	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.750	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.775	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.800	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.825	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.27E-01	0.00E+00	0.00E+00
0.850	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.27E-01	0.00E+00	0.00E+00
0.875	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.28E-01	0.00E+00	0.00E+00
0.900	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.28E-01	2.97E-25	0.00E+00
0.925	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.29E-01	2.75E-05	0.00E+00
0.950	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.30E-01	8.08E-01	0.00E+00
0.975	1.89E-01	2.15E-02	5.14E-04	6.11E-07	7.60E-01	8.35E-01	8.12E-01	1.65E-19
1.000	1.89E-01	2.15E-02	5.14E-04	6.11E-07	8.32E-01	8.44E-01	8.20E-01	7.50E-01

Summary of dose at graphical times, reptition 1

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	8.30E-01	2.40E-02	1.30E-14	1.30E-14	1.30E-14	7.83E-01	8.30E-01
4.00E+01	7.74E-02	9.22E-01	1.44E-01	7.74E-02	7.74E-02	9.11E-01	9.18E-01	9.22E-01
8.00E+01	4.31E-17	8.44E-01	1.34E-01	4.31E-17	8.33E-01	8.40E-01	8.43E-01	8.44E-01
1.00E+02	7.69E-25	8.43E-01	1.58E-01	7.69E-25	8.29E-01	8.32E-01	8.37E-01	8.43E-01
1.20E+02	0.00E+00	8.36E-01	1.74E-01	0.00E+00	8.30E-01	8.32E-01	8.33E-01	8.36E-01
1.60E+02	0.00E+00	8.36E-01	1.98E-01	0.00E+00	8.23E-01	8.29E-01	8.34E-01	8.36E-01
2.00E+02	0.00E+00	8.31E-01	1.16E-01	0.00E+00	8.18E-01	8.22E-01	8.28E-01	8.30E-01
2.40E+02	0.00E+00	8.30E-01	8.19E-02	0.00E+00	7.33E-01	8.15E-01	8.23E-01	8.30E-01
2.80E+02	0.00E+00	8.23E-01	5.71E-02	0.00E+00	1.09E-23	8.10E-01	8.19E-01	8.23E-01
3.00E+02	0.00E+00	8.20E-01	6.43E-02	0.00E+00	1.13E-22	8.09E-01	8.13E-01	8.20E-01
3.20E+02	0.00E+00	8.22E-01	4.86E-02	0.00E+00	0.00E+00	8.06E-01	8.11E-01	8.21E-01
3.60E+02	0.00E+00	8.15E-01	4.03E-02	0.00E+00	0.00E+00	7.62E-01	8.05E-01	8.15E-01
4.00E+02	0.00E+00	8.10E-01	4.01E-02	0.00E+00	0.00E+00	7.58E-01	8.01E-01	8.10E-01
4.40E+02	0.00E+00	8.06E-01	3.45E-02	0.00E+00	0.00E+00	2.46E-01	7.97E-01	8.06E-01
4.80E+02	0.00E+00	8.02E-01	3.62E-02	0.00E+00	0.00E+00	4.23E-01	7.90E-01	8.02E-01
5.20E+02	0.00E+00	7.98E-01	2.43E-02	0.00E+00	0.00E+00	3.12E-14	7.87E-01	7.98E-01
5.60E+02	0.00E+00	7.91E-01	3.51E-02	0.00E+00	0.00E+00	3.46E-01	7.85E-01	7.91E-01
6.00E+02	0.00E+00	7.85E-01	3.12E-02	0.00E+00	0.00E+00	0.00E+00	7.80E-01	7.85E-01
6.40E+02	0.00E+00	7.79E-01	2.33E-02	0.00E+00	0.00E+00	0.00E+00	7.75E-01	7.79E-01
6.80E+02	0.00E+00	7.87E-01	2.33E-02	0.00E+00	0.00E+00	0.00E+00	7.71E-01	7.87E-01
7.20E+02	0.00E+00	7.75E-01	1.54E-02	0.00E+00	0.00E+00	0.00E+00	3.65E-01	7.75E-01
7.60E+02	0.00E+00	7.71E-01	2.30E-02	0.00E+00	0.00E+00	0.00E+00	7.64E-01	7.71E-01
8.00E+02	0.00E+00	7.63E-01	1.52E-02	0.00E+00	0.00E+00	0.00E+00	3.61E-01	7.63E-01
8.40E+02	0.00E+00	7.69E-01	1.53E-02	0.00E+00	0.00E+00	0.00E+00	3.59E-01	7.69E-01
8.80E+02	0.00E+00	7.63E-01	1.52E-02	0.00E+00	0.00E+00	0.00E+00	3.60E-01	7.63E-01
9.20E+02	0.00E+00	7.52E-01	2.25E-02	0.00E+00	0.00E+00	0.00E+00	7.50E-01	7.52E-01
9.60E+02	0.00E+00	7.46E-01	1.49E-02	0.00E+00	0.00E+00	0.00E+00	3.54E-01	7.46E-01
1.00E+03	0.00E+00	7.50E-01	7.50E-03	0.00E+00	0.00E+00	0.00E+00	1.70E-19	7.43E-01

Summary of dose at graphical times, reptition 2

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	8.32E-01	2.36E-02	1.30E-14	1.30E-14	1.30E-14	7.60E-01	8.32E-01
4.00E+01	7.74E-02	9.24E-01	1.44E-01	7.74E-02	7.74E-02	9.11E-01	9.18E-01	9.24E-01
8.00E+01	4.31E-17	8.46E-01	1.31E-01	4.31E-17	8.35E-01	8.42E-01	8.45E-01	8.46E-01
1.00E+02	7.69E-25	8.44E-01	1.49E-01	7.69E-25	8.28E-01	8.31E-01	8.36E-01	8.44E-01
1.20E+02	0.00E+00	8.41E-01	1.72E-01	0.00E+00	8.30E-01	8.33E-01	8.37E-01	8.41E-01
1.60E+02	0.00E+00	8.38E-01	1.98E-01	0.00E+00	8.25E-01	8.33E-01	8.36E-01	8.38E-01
2.00E+02	0.00E+00	8.31E-01	1.23E-01	0.00E+00	8.18E-01	8.21E-01	8.26E-01	8.31E-01
2.40E+02	0.00E+00	8.29E-01	9.02E-02	0.00E+00	8.13E-01	8.18E-01	8.28E-01	8.29E-01
2.80E+02	0.00E+00	8.17E-01	5.68E-02	0.00E+00	2.74E-20	8.10E-01	8.12E-01	8.17E-01
3.00E+02	0.00E+00	8.20E-01	5.68E-02	0.00E+00	2.67E-25	8.09E-01	8.14E-01	8.20E-01
3.20E+02	0.00E+00	8.20E-01	5.66E-02	0.00E+00	0.00E+00	8.06E-01	8.10E-01	8.20E-01
3.60E+02	0.00E+00	8.12E-01	4.02E-02	0.00E+00	0.00E+00	7.61E-01	8.04E-01	8.12E-01
4.00E+02	0.00E+00	8.07E-01	4.80E-02	0.00E+00	0.00E+00	7.98E-01	8.00E-01	8.07E-01
4.40E+02	0.00E+00	7.95E-01	3.97E-02	0.00E+00	0.00E+00	7.54E-01	7.95E-01	7.95E-01
4.80E+02	0.00E+00	8.03E-01	3.18E-02	0.00E+00	0.00E+00	3.51E-18	7.96E-01	8.03E-01
5.20E+02	0.00E+00	7.92E-01	3.15E-02	0.00E+00	0.00E+00	3.82E-12	7.87E-01	7.92E-01
5.60E+02	0.00E+00	7.97E-01	2.36E-02	0.00E+00	0.00E+00	0.00E+00	7.83E-01	7.97E-01
6.00E+02	0.00E+00	7.91E-01	2.35E-02	0.00E+00	0.00E+00	0.00E+00	7.79E-01	7.91E-01
6.40E+02	0.00E+00	7.85E-01	1.61E-02	0.00E+00	0.00E+00	0.00E+00	3.93E-01	7.85E-01
6.80E+02	0.00E+00	7.77E-01	3.09E-02	0.00E+00	0.00E+00	0.00E+00	7.72E-01	7.77E-01
7.20E+02	0.00E+00	7.74E-01	3.08E-02	0.00E+00	0.00E+00	0.00E+00	7.69E-01	7.74E-01
7.60E+02	0.00E+00	7.80E-01	2.32E-02	0.00E+00	0.00E+00	0.00E+00	7.70E-01	7.80E-01
8.00E+02	0.00E+00	7.67E-01	1.53E-02	0.00E+00	0.00E+00	0.00E+00	3.61E-01	7.67E-01
8.40E+02	0.00E+00	7.58E-01	1.52E-02	0.00E+00	0.00E+00	0.00E+00	3.60E-01	7.58E-01
8.80E+02	0.00E+00	7.53E-01	1.51E-02	0.00E+00	0.00E+00	0.00E+00	3.58E-01	7.53E-01
9.20E+02	0.00E+00	7.57E-01	1.50E-02	0.00E+00	0.00E+00	0.00E+00	3.55E-01	7.57E-01
9.60E+02	0.00E+00	7.51E-01	1.50E-02	0.00E+00	0.00E+00	0.00E+00	3.56E-01	7.51E-01
1.00E+03	0.00E+00	7.46E-01	2.23E-02	0.00E+00	0.00E+00	0.00E+00	7.43E-01	7.46E-01

Summary of dose at graphical times, reptition 3

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	8.28E-01	2.41E-02	1.30E-14	1.30E-14	1.30E-14	7.91E-01	8.28E-01
4.00E+01	7.74E-02	9.21E-01	1.39E-01	7.74E-02	7.74E-02	9.11E-01	9.19E-01	9.21E-01
8.00E+01	4.31E-17	8.44E-01	1.34E-01	4.31E-17	8.33E-01	8.39E-01	8.43E-01	8.44E-01
1.00E+02	7.69E-25	8.42E-01	1.58E-01	7.69E-25	8.28E-01	8.29E-01	8.37E-01	8.42E-01
1.20E+02	0.00E+00	8.40E-01	1.66E-01	0.00E+00	8.31E-01	8.33E-01	8.35E-01	8.40E-01
1.60E+02	0.00E+00	8.36E-01	1.98E-01	0.00E+00	8.23E-01	8.30E-01	8.34E-01	8.36E-01
2.00E+02	0.00E+00	8.33E-01	1.23E-01	0.00E+00	8.18E-01	8.24E-01	8.30E-01	8.33E-01
2.40E+02	0.00E+00	8.29E-01	8.15E-02	0.00E+00	6.93E-01	8.20E-01	8.26E-01	8.29E-01
2.80E+02	0.00E+00	8.17E-01	6.50E-02	0.00E+00	5.13E-19	8.10E-01	8.15E-01	8.17E-01
3.00E+02	0.00E+00	8.20E-01	5.67E-02	0.00E+00	2.78E-25	8.07E-01	8.10E-01	8.20E-01
3.20E+02	0.00E+00	8.22E-01	5.66E-02	0.00E+00	0.00E+00	8.06E-01	8.08E-01	8.22E-01
3.60E+02	0.00E+00	8.11E-01	4.02E-02	0.00E+00	0.00E+00	7.61E-01	8.03E-01	8.11E-01
4.00E+02	0.00E+00	8.04E-01	4.00E-02	0.00E+00	0.00E+00	7.58E-01	8.01E-01	8.04E-01
4.40E+02	0.00E+00	8.07E-01	4.55E-02	0.00E+00	0.00E+00	7.82E-01	7.95E-01	8.06E-01
4.80E+02	0.00E+00	7.97E-01	3.17E-02	0.00E+00	0.00E+00	2.86E-11	7.93E-01	7.97E-01
5.20E+02	0.00E+00	7.90E-01	3.15E-02	0.00E+00	0.00E+00	5.34E-11	7.87E-01	7.90E-01
5.60E+02	0.00E+00	7.86E-01	2.35E-02	0.00E+00	0.00E+00	0.00E+00	7.83E-01	7.86E-01
6.00E+02	0.00E+00	7.90E-01	2.35E-02	0.00E+00	0.00E+00	0.00E+00	7.78E-01	7.90E-01
6.40E+02	0.00E+00	7.82E-01	2.34E-02	0.00E+00	0.00E+00	0.00E+00	7.78E-01	7.82E-01
6.80E+02	0.00E+00	7.76E-01	2.32E-02	0.00E+00	0.00E+00	0.00E+00	7.72E-01	7.76E-01
7.20E+02	0.00E+00	7.83E-01	2.32E-02	0.00E+00	0.00E+00	0.00E+00	7.68E-01	7.83E-01
7.60E+02	0.00E+00	7.64E-01	1.53E-02	0.00E+00	0.00E+00	0.00E+00	3.63E-01	7.64E-01
8.00E+02	0.00E+00	7.75E-01	2.30E-02	0.00E+00	0.00E+00	0.00E+00	7.61E-01	7.75E-01
8.40E+02	0.00E+00	7.58E-01	1.51E-02	0.00E+00	0.00E+00	0.00E+00	3.59E-01	7.58E-01
8.80E+02	0.00E+00	7.56E-01	1.51E-02	0.00E+00	0.00E+00	0.00E+00	3.57E-01	7.56E-01
9.20E+02	0.00E+00	7.52E-01	7.52E-03	0.00E+00	0.00E+00	0.00E+00	2.13E-10	7.45E-01
9.60E+02	0.00E+00	7.46E-01	7.46E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-01
1.00E+03	0.00E+00	7.45E-01	1.47E-02	0.00E+00	0.00E+00	0.00E+00	3.44E-01	7.44E-01

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-C_UNSAT-ZONE.RAD

Peak of the mean dose (averaged over observations) at graphical times

Repetition	Time of peak mean dose	Peak mean dose
	Years	mrem/yr
1	1.600E+02	1.980E-01
2	1.600E+02	1.982E-01
3	1.600E+02	1.980E-01

Appendix E

Uncertainty Analysis Distribution Coefficient of Carbon in the Saturated Zone

Dose from All Pathways v.s. Kd of C-14 in Saturated Zone

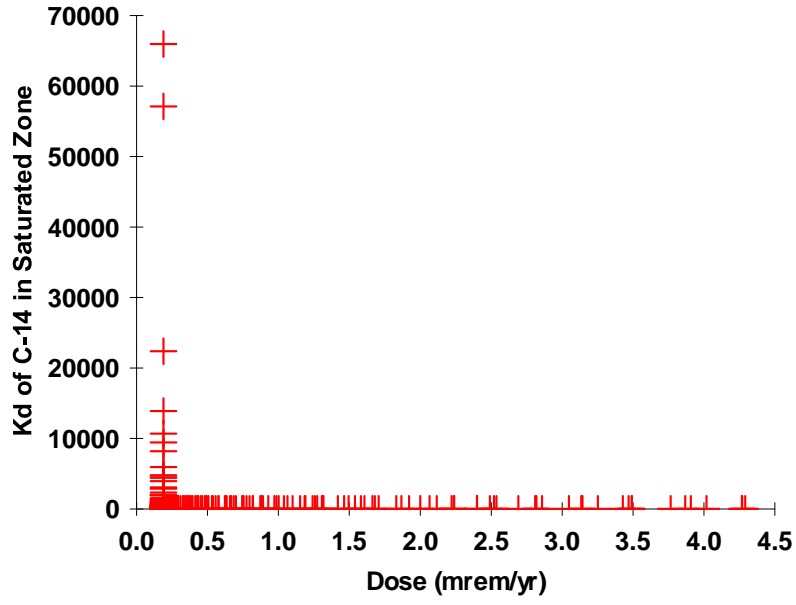


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Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters	
1	DCACTS(1)	LOGNORMAL-N	2.4	3.22

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE (j,t), mrem/yr							
			t=	0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14										
Min	0.00E+00	1.85E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	6.40E+02	4.29E+00	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	2.60E-01
Avg	2.54E+02	6.37E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	2.94E-02
Std	3.13E+02	9.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02
H-3										
Min	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Max	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Avg	3.51E+01	9.55E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL										
Min	0.00E+00	1.89E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
Max	6.40E+02	4.29E+00	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.60E-01
Avg	2.54E+02	6.39E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.94E-02
Std	3.13E+02	9.06E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02

ΣALL is total dose summed for all nuclides.

Probabilistic Risk Summary

Nuclide (j)	t=	RISK(j,t)							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	6.43E-40	0.00E+00	4.83E-06
Avg		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	2.17E-42	0.00E+00	5.45E-07
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-06
H-3									
Min		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Max		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Avg		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	3.37E-29	0.00E+00	0.00E+00
Max		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	3.37E-29	0.00E+00	4.83E-06
Avg		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	3.37E-29	0.00E+00	5.45E-07
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.06E-06

ΣALL is total risk summed for all nuclides.

Probabilistic Dose vs Pathway(i): Ground External

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Inhalation (w/o Radon)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Soil Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Water Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.60E-01
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-02
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	2.60E-01
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.69E-25	0.00E+00	0.00E+00	2.94E-02
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.72E-02

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

le: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-C_SAT-ZONE.RAD

Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative Probability	Dose (t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
0.025	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.050	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.075	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.100	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.125	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.150	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.175	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.200	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.225	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.250	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.275	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.300	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.325	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.350	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.375	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.400	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.425	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.450	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.475	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.500	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	0.00E+00
0.525	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.40E-11
0.550	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	3.72E-04
0.575	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.30E-03
0.600	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.60E-03
0.625	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	4.45E-03
0.650	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	8.13E-03
0.675	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.09E-02
0.700	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.57E-02
0.725	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.12E-02
0.750	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.90E-02
0.775	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	3.62E-02
0.800	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	4.59E-02
0.825	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	5.83E-02
0.850	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	7.70E-02
0.875	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	9.28E-02
0.900	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.15E-01
0.925	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.44E-01
0.950	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	1.81E-01
0.975	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.18E-01
1.000	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.69E-25	0.00E+00	2.60E-01

Summary of dose at graphical times, reptition 1

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14
4.00E+01	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02
8.00E+01	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17
1.00E+02	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25
1.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.40E+02	2.44E-18	4.02E+00	5.15E-01	7.63E-02	1.85E+00	2.85E+00	3.59E+00	4.02E+00
6.80E+02	0.00E+00	1.57E+00	2.01E-01	2.47E-02	7.54E-01	1.12E+00	1.33E+00	1.57E+00
7.20E+02	0.00E+00	1.03E+00	1.37E-01	1.17E-02	5.26E-01	7.65E-01	9.53E-01	1.03E+00
7.60E+02	0.00E+00	7.24E-01	8.90E-02	4.96E-03	3.39E-01	5.18E-01	6.20E-01	7.23E-01
8.00E+02	0.00E+00	5.61E-01	6.95E-02	2.42E-03	2.64E-01	4.15E-01	4.93E-01	5.61E-01
8.40E+02	0.00E+00	4.59E-01	5.78E-02	1.21E-03	2.23E-01	3.36E-01	4.26E-01	4.59E-01
8.80E+02	0.00E+00	3.76E-01	4.45E-02	2.32E-04	1.73E-01	2.60E-01	3.29E-01	3.75E-01
9.20E+02	0.00E+00	3.34E-01	4.06E-02	8.87E-05	1.63E-01	2.42E-01	2.99E-01	3.34E-01
9.60E+02	0.00E+00	2.78E-01	3.40E-02	0.00E+00	1.42E-01	2.16E-01	2.51E-01	2.78E-01
1.00E+03	0.00E+00	2.60E-01	3.13E-02	0.00E+00	1.25E-01	1.91E-01	2.32E-01	2.60E-01

Summary of dose at graphical times, repetition 2

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14
4.00E+01	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02
8.00E+01	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17
1.00E+02	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25
1.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.40E+02	2.03E-18	3.91E+00	5.06E-01	7.61E-02	1.82E+00	2.80E+00	3.48E+00	3.90E+00
6.80E+02	0.00E+00	1.62E+00	2.16E-01	2.48E-02	7.94E-01	1.22E+00	1.50E+00	1.62E+00
7.20E+02	0.00E+00	9.62E-01	1.25E-01	1.04E-02	4.86E-01	7.34E-01	8.45E-01	9.61E-01
7.60E+02	0.00E+00	7.30E-01	9.61E-02	5.57E-03	3.70E-01	5.38E-01	6.90E-01	7.30E-01
8.00E+02	0.00E+00	5.41E-01	6.90E-02	2.56E-03	2.78E-01	4.04E-01	4.97E-01	5.41E-01
8.40E+02	0.00E+00	4.33E-01	5.29E-02	1.31E-03	2.03E-01	3.13E-01	3.83E-01	4.33E-01
8.80E+02	0.00E+00	3.67E-01	4.49E-02	5.46E-04	1.80E-01	2.75E-01	3.26E-01	3.66E-01
9.20E+02	0.00E+00	3.40E-01	4.06E-02	3.47E-05	1.62E-01	2.44E-01	3.02E-01	3.40E-01
9.60E+02	0.00E+00	2.93E-01	3.40E-02	0.00E+00	1.33E-01	2.03E-01	2.59E-01	2.93E-01
1.00E+03	0.00E+00	2.45E-01	2.84E-02	0.00E+00	1.14E-01	1.80E-01	2.19E-01	2.45E-01

Summary of dose at graphical times, repetition 3

Time Years	Dose statistics at graphical times, mrem/yr							
	Minimum	Maximum	Mean	Median	90%	95%	97.5%	99%
0.00E+00	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01	1.89E-01
1.00E+00	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02	2.15E-02
3.00E+00	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04	5.14E-04
1.00E+01	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07	6.11E-07
3.00E+01	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14	1.30E-14
4.00E+01	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02	7.74E-02
8.00E+01	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17	4.31E-17
1.00E+02	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25	7.69E-25
1.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.40E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.80E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.20E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
5.60E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6.40E+02	2.65E-18	3.87E+00	5.06E-01	7.78E-02	1.90E+00	2.81E+00	3.37E+00	3.86E+00
6.80E+02	0.00E+00	1.50E+00	2.04E-01	2.49E-02	7.67E-01	1.15E+00	1.35E+00	1.50E+00
7.20E+02	0.00E+00	9.76E-01	1.24E-01	1.04E-02	4.77E-01	6.91E-01	8.38E-01	9.75E-01
7.60E+02	0.00E+00	6.78E-01	8.79E-02	5.21E-03	3.51E-01	4.89E-01	6.27E-01	6.78E-01
8.00E+02	0.00E+00	5.62E-01	6.88E-02	2.39E-03	2.78E-01	4.00E-01	4.82E-01	5.61E-01
8.40E+02	0.00E+00	4.66E-01	5.74E-02	1.10E-03	2.24E-01	3.49E-01	4.06E-01	4.66E-01
8.80E+02	0.00E+00	3.94E-01	4.84E-02	4.29E-04	1.98E-01	2.81E-01	3.53E-01	3.94E-01
9.20E+02	0.00E+00	3.13E-01	3.73E-02	3.01E-05	1.47E-01	2.24E-01	2.78E-01	3.12E-01
9.60E+02	0.00E+00	2.81E-01	3.41E-02	0.00E+00	1.37E-01	2.05E-01	2.61E-01	2.81E-01
1.00E+03	0.00E+00	2.48E-01	2.86E-02	0.00E+00	1.12E-01	1.83E-01	2.15E-01	2.48E-01

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

le: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-C_SAT-ZONE.RAD

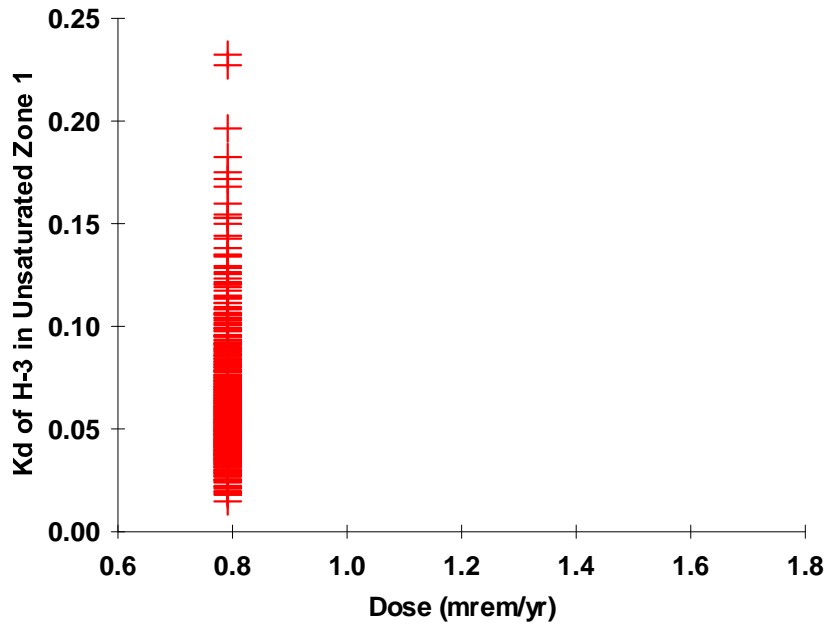
Peak of the mean dose (averaged over observations) at graphical times

Repetition	Time of peak mean dose	Peak mean dose
	Years	mrem/yr
1	6.400E+02	5.148E-01
2	6.400E+02	5.056E-01
3	6.400E+02	5.057E-01

Appendix F

Uncertainty Analysis Distribution Coefficient of Hydrogen in the Unsaturated Zone

Dose from All Pathways v.s. Kd of H-3 in Unsaturated Zone
1



Part VI: Uncertainty Analysis

RESRAD Uncertainty Analysis Results

Probabilistic Input	2
Total Dose	3
Total Risk	4
Dose vs Pathway: Ground External	5
Dose vs Pathway: Inhalation (w/o Radon)	6
Dose vs Pathway: Radon (Water Ind.)	7
Dose vs Pathway: Plant (Water Ind.)	8
Dose vs Pathway: Meat (Water Ind.)	9
Dose vs Pathway: Milk (Water Ind.)	10
Dose vs Pathway: Soil Ingestion	11
Dose vs Pathway: Water Ingestion	12
Dose vs Pathway: Fish Ingestion	13
Dose vs Pathway: Radon (Water Dep.)	14
Dose vs Pathway: Plant (Water Dep.)	15
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Summary of dose at graphical times, reptition 2.....	20
Summary of dose at graphical times, reptition 3.....	21
Peak of the mean dose at graphical times.....	22
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Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	DCACTU1(2)	LOGNORMAL-N	-2.81 .5

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE (j,t), mrem/yr							
			t=	0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14										
Min	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3										
Min	0.00E+00	4.01E-03	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	6.39E-26	0.00E+00	0.00E+00
Max	4.32E+01	1.13E-01	4.01E-03	1.67E-03	2.88E-04	6.11E-07	8.61E-02	1.17E-16	0.00E+00	0.00E+00
Avg	3.32E+01	7.64E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.71E-03	6.46E-19	0.00E+00	0.00E+00
Std	1.19E+01	2.80E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	7.88E-18	0.00E+00	0.00E+00
ΣALL										
Min	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.39E-26	0.00E+00	0.00E+00
Max	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	8.61E-02	1.17E-16	0.00E+00	0.00E+00
Avg	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.71E-03	6.46E-19	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	7.88E-18	0.00E+00	0.00E+00

ΣALL is total dose summed for all nuclides.

Probabilistic Risk Summary

Nuclide (j)	t=	RISK(j,t)							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	6.43E-40	0.00E+00	0.00E+00
Avg		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	2.17E-42	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		1.33E-06	5.52E-07	9.53E-08	2.02E-10	3.77E-06	5.12E-21	0.00E+00	0.00E+00
Avg		1.33E-06	5.52E-07	9.53E-08	2.02E-10	7.49E-08	2.83E-23	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E-07	3.45E-22	0.00E+00	0.00E+00
ΣALL									
Min		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		5.30E-06	9.77E-07	1.00E-07	2.02E-10	3.77E-06	5.12E-21	0.00E+00	0.00E+00
Avg		5.30E-06	9.77E-07	1.00E-07	2.02E-10	7.49E-08	2.83E-23	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23E-07	3.45E-22	0.00E+00	0.00E+00

ΣALL is total risk summed for all nuclides.

Probabilistic Dose vs Pathway(i): Ground External

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Inhalation (w/o Radon)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Soil Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Water Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-26	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-02	1.17E-16	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	6.46E-19	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	7.88E-18	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-26	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.61E-02	1.17E-16	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-03	6.46E-19	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.66E-03	7.88E-18	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-H_UNSAT-ZONE.RAD

Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative Probability	Dose (t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
0.025	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.28E-25	0.00E+00	0.00E+00
0.050	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.84E-25	0.00E+00	0.00E+00
0.075	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.60E-25	0.00E+00	0.00E+00
0.100	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.32E-25	0.00E+00	0.00E+00
0.125	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.26E-25	0.00E+00	0.00E+00
0.150	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.96E-25	0.00E+00	0.00E+00
0.175	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.11E-25	0.00E+00	0.00E+00
0.200	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.12E-25	0.00E+00	0.00E+00
0.225	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.54E-25	0.00E+00	0.00E+00
0.250	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.04E-24	0.00E+00	0.00E+00
0.275	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.20E-24	0.00E+00	0.00E+00
0.300	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.41E-24	0.00E+00	0.00E+00
0.325	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.69E-24	0.00E+00	0.00E+00
0.350	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.01E-24	0.00E+00	0.00E+00
0.375	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.35E-24	0.00E+00	0.00E+00
0.400	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.75E-24	0.00E+00	0.00E+00
0.425	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.28E-24	0.00E+00	0.00E+00
0.450	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.97E-24	0.00E+00	0.00E+00
0.475	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.64E-24	0.00E+00	0.00E+00
0.500	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.65E-24	0.00E+00	0.00E+00
0.525	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.93E-24	0.00E+00	0.00E+00
0.550	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.00E-24	0.00E+00	0.00E+00
0.575	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.01E-23	0.00E+00	0.00E+00
0.600	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.24E-23	0.00E+00	0.00E+00
0.625	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.55E-23	0.00E+00	0.00E+00
0.650	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.02E-23	0.00E+00	0.00E+00
0.675	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.45E-23	0.00E+00	0.00E+00
0.700	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.34E-23	0.00E+00	0.00E+00
0.725	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.53E-23	0.00E+00	0.00E+00
0.750	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.01E-23	0.00E+00	0.00E+00
0.775	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.57E-23	0.00E+00	0.00E+00
0.800	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.18E-22	0.00E+00	0.00E+00
0.825	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.79E-22	0.00E+00	0.00E+00
0.850	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.96E-22	0.00E+00	0.00E+00
0.875	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.05E-22	0.00E+00	0.00E+00
0.900	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.14E-21	0.00E+00	0.00E+00
0.925	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.76E-21	0.00E+00	0.00E+00
0.950	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.17E-20	0.00E+00	0.00E+00
0.975	1.89E-01	2.15E-02	5.14E-04	6.11E-07	3.74E-02	9.80E-20	0.00E+00	0.00E+00
1.000	1.89E-01	2.15E-02	5.14E-04	6.11E-07	8.61E-02	1.17E-16	0.00E+00	0.00E+00

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

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Peak of the mean dose (averaged over observations) at graphical times

Repetition	Time of peak mean dose	Peak mean dose
	Years	mrem/yr
1	6.400E+02	7.904E-01
2	6.400E+02	7.904E-01
3	6.400E+02	7.904E-01

Appendix G

Uncertainty Analysis Distribution Coefficient of Hydrogen in the Saturated Zone

Dose from All Pathways v.s. Kd of H-3 in Saturated Zone

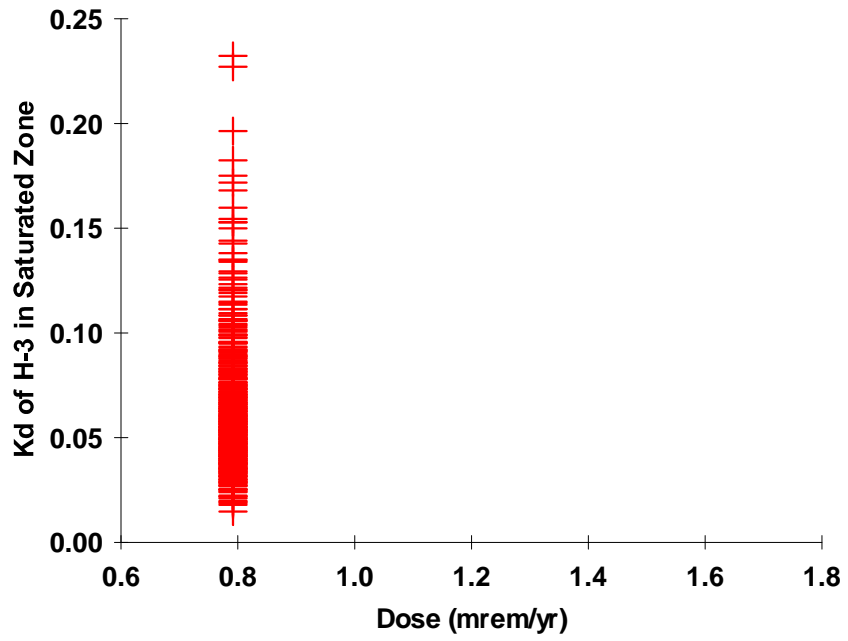


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Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters
1	DCACTS(2)	LOGNORMAL-N	-2.81 .5

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE (j,t), mrem/yr							
			t=	0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02
C-14										
Min	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	6.40E+02	7.90E-01	1.85E-01	1.98E-02	2.26E-04	3.44E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3										
Min	3.51E+01	5.97E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	4.74E-25	0.00E+00	0.00E+00
Max	3.51E+01	1.04E-01	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	3.53E-23	0.00E+00	0.00E+00
Avg	3.51E+01	8.86E-02	4.01E-03	1.67E-03	2.88E-04	6.11E-07	1.30E-14	1.92E-24	0.00E+00	0.00E+00
Std	8.73E-03	8.15E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-24	0.00E+00	0.00E+00
ΣALL										
Min	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	4.74E-25	0.00E+00	0.00E+00
Max	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.53E-23	0.00E+00	0.00E+00
Avg	6.27E+02	7.91E-01	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.92E-24	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-24	0.00E+00	0.00E+00

ΣALL is total dose summed for all nuclides.

Probabilistic Risk Summary

Nuclide (j)	t=	RISK(j,t)							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	6.43E-40	0.00E+00	0.00E+00
Avg		3.97E-06	4.25E-07	4.85E-09	7.36E-16	0.00E+00	2.17E-42	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	1.54E-27	0.00E+00	0.00E+00
Avg		1.33E-06	5.52E-07	9.53E-08	2.02E-10	4.31E-18	8.34E-29	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	0.00E+00	0.00E+00	0.00E+00
Max		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	1.54E-27	0.00E+00	0.00E+00
Avg		5.30E-06	9.77E-07	1.00E-07	2.02E-10	4.31E-18	8.34E-29	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total risk summed for all nuclides.

Probabilistic Dose vs Pathway(i): Ground External

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		3.05E-03	3.27E-04	3.73E-06	5.66E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Inhalation (w/o Radon)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		1.59E-01	1.71E-02	1.95E-04	2.96E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		3.99E-03	1.66E-03	2.86E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Max		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Avg		1.63E-01	1.87E-02	4.81E-04	6.07E-07	1.30E-14	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Ind.)

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Ind.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Soil Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg		2.26E-02	2.42E-03	2.77E-05	4.20E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.28E-05	9.49E-06	1.64E-06	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Max		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Avg		2.27E-02	2.43E-03	2.93E-05	3.48E-09	7.41E-17	0.00E+00	0.00E+00	0.00E+00
Std		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Water Ingestion

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.74E-25	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-23	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E-24	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-24	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.74E-25	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-23	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E-24	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.06E-24	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Radon (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Plant (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Meat (Water Dep.)

Nuclide (j)	DOSE(i,j,t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL								
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Milk (Water Dep.)

Nuclide (j)	t=	DOSE(i,j,t), mrem/yr							
		0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
C-14									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ΣALL									
Min	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Avg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Std	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ΣALL is total pathway dose summed for all nuclides.

Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

le: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-H_SAT-ZONE.RAD

Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative Probability	Dose (t), mrem/yr							
	t= 0.00E+00	1.00E+00	3.00E+00	1.00E+01	3.00E+01	1.00E+02	3.00E+02	1.00E+03
0.025	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.43E-25	0.00E+00	0.00E+00
0.050	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.82E-25	0.00E+00	0.00E+00
0.075	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.23E-25	0.00E+00	0.00E+00
0.100	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.53E-25	0.00E+00	0.00E+00
0.125	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	6.85E-25	0.00E+00	0.00E+00
0.150	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.06E-25	0.00E+00	0.00E+00
0.175	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.35E-25	0.00E+00	0.00E+00
0.200	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.58E-25	0.00E+00	0.00E+00
0.225	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	7.85E-25	0.00E+00	0.00E+00
0.250	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.16E-25	0.00E+00	0.00E+00
0.275	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.40E-25	0.00E+00	0.00E+00
0.300	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.66E-25	0.00E+00	0.00E+00
0.325	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.98E-25	0.00E+00	0.00E+00
0.350	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	9.28E-25	0.00E+00	0.00E+00
0.375	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	9.57E-25	0.00E+00	0.00E+00
0.400	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	9.88E-25	0.00E+00	0.00E+00
0.425	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.02E-24	0.00E+00	0.00E+00
0.450	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.06E-24	0.00E+00	0.00E+00
0.475	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.10E-24	0.00E+00	0.00E+00
0.500	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.14E-24	0.00E+00	0.00E+00
0.525	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.19E-24	0.00E+00	0.00E+00
0.550	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.22E-24	0.00E+00	0.00E+00
0.575	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.28E-24	0.00E+00	0.00E+00
0.600	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.33E-24	0.00E+00	0.00E+00
0.625	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.39E-24	0.00E+00	0.00E+00
0.650	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.47E-24	0.00E+00	0.00E+00
0.675	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.52E-24	0.00E+00	0.00E+00
0.700	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.62E-24	0.00E+00	0.00E+00
0.725	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.72E-24	0.00E+00	0.00E+00
0.750	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.82E-24	0.00E+00	0.00E+00
0.775	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	1.96E-24	0.00E+00	0.00E+00
0.800	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.09E-24	0.00E+00	0.00E+00
0.825	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.27E-24	0.00E+00	0.00E+00
0.850	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.51E-24	0.00E+00	0.00E+00
0.875	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	2.79E-24	0.00E+00	0.00E+00
0.900	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.29E-24	0.00E+00	0.00E+00
0.925	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.93E-24	0.00E+00	0.00E+00
0.950	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	5.27E-24	0.00E+00	0.00E+00
0.975	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	8.14E-24	0.00E+00	0.00E+00
1.000	1.89E-01	2.15E-02	5.14E-04	6.11E-07	1.30E-14	3.53E-23	0.00E+00	0.00E+00

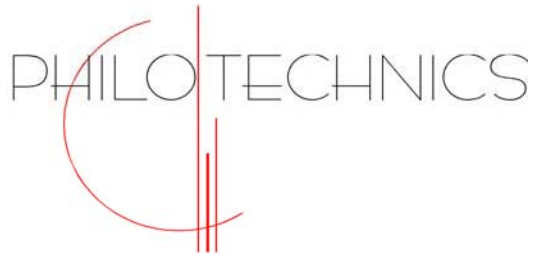
Probabilistic results summary : RESRAD Default Parameters Industrial Worker Sce-

le: C:\RESRAD_FAMILY\RESRAD\6.5\USERFILES\SIGMA_ALDRICH_UNCER_KD-H_SAT-ZONE.RAD

Peak of the mean dose (averaged over observations) at graphical times

Repetition	Time of peak mean dose	Peak mean dose
	Years	mrem/yr
1	6.400E+02	7.904E-01
2	6.400E+02	7.904E-01
3	6.400E+02	7.904E-01

**ATTACHMENT 5 - Summary of Soil Sampling and
Analysis**



Fort Mims Facility
Decontamination and Decommissioning Project

Summary of Soil Sampling and Analysis

Sigma Aldrich Company
11542 Fort Mims Drive
Maryland Heights, Missouri

February 24, 2011

Prepared by:

Philotechnics, Ltd.
201 Renovare Boulevard
Oak Ridge, TN 37830

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Executive Summary 1

Appendix A: Survey Unit 28 Results

Appendix B: Survey Unit 29 Results

Executive Summary

Sigma Aldrich contracted Philotechnics to perform decontamination and decommissioning (D&D) of the Fort Mims facility with the ultimate goal of radioactive material license termination at that location. Previously-submitted reports and the information contained herein describe the decommissioning process, NRC's authorization of release and subsequent decommissioning of the building, and the suitability of the site to be released from licensing and other radiological controls.

Sampling of outdoor soil began in May 2009 after building demolition in accordance with the approved Fort Mims Facility Soil Sampling and Analysis Plan. The number of samples was increased nearly three-fold from the number calculated using MARSSIM guidance because of the difficulty in detecting ^{14}C and ^3H as volumetric contamination in soil renders scanning useless. For that reason, Visual Sampling Plan v 5.0 was used to determine number of samples and spacing.

Soil sampling was conducted in three phases:

- Phase 1 sampling was conducted in May 2009 and covered surface soils within the uppermost 15 cm (6 in) of soils in Survey Units 28 and 29.
- Phase 2 sampling was conducted in November 2009 and covered additional area outside the Survey Units as well as deeper depths.
 - Samples having a Sample ID number ending in 1 were collected at a discrete depth of 1 m beneath the surface.
 - Samples having a Sample ID number ending in 2 were collected at a discrete depth of 2 m beneath the surface.
- Phase 3 samples were collected from the building footprint in May 2010 after the building and slab were removed.
 - Samples having a Sample ID number ending in 0.02 were collected in the uppermost 15 cm of soil.
 - Samples having a Sample ID number ending in 1 were collected at a discrete depth of 1 m beneath the surface.
 - Samples having a Sample ID number ending in 2 were collected at a discrete depth of 2 m beneath the surface.

Results of soil sample analyses indicate the dose to a member of the public after license termination will be far below the release criterion of 25 mrem/year from residual radioactive materials that are distinguishable from background. Specific modeling information has been previously submitted to NRC.

Appendix A

Survey Unit 28



**Sigma Aldrich
Fort Mims Facility D&D
Final Status Survey Package**

Building: <u> FMF </u>	Survey Unit: <u> 028 </u>	Page <u> </u> of <u> </u>
Classification: <input checked="" type="checkbox"/> Class 1 - Impacted <input type="checkbox"/> Class 2 - Impacted <input type="checkbox"/> Class 3 - Impacted		

Applicable Nuclides of Concern:									
Nuclide	<input checked="" type="checkbox"/> ³ H	<input checked="" type="checkbox"/> ¹⁴ C							
Screening Values (pCi/g)	110	12							

Applicable Survey Unit Surfaces:	% of Surface Requiring Scan Surveys			
<input checked="" type="checkbox"/> Soil Surface	<input type="checkbox"/> 20%	<input type="checkbox"/> 50%	<input checked="" type="checkbox"/> 100%	<input type="checkbox"/> N/A

Required Survey Instrumentation	Measurement Type	Static Count Time	Scan Rate	Based on:	Typical Static MDCR
<input checked="" type="checkbox"/> Ludlum 2350-1 w/ SPA-3	Gamma	NA	0.5 Meters/sec.	¹³⁷ Cs	N/A
<input type="checkbox"/> Other: _____ (Specify)					
<input checked="" type="checkbox"/> Soil samples collected will be sent to an off-site laboratory for analysis for all nuclides of concern.					

- | General Survey Instructions: |
|--|
| <ol style="list-style-type: none"> 1. Survey maps have been attached that include the required soil sampling locations. Soil samples shall be collected at each location in accordance with these instructions and the Philotechnics Soil and Surface Sampling Procedure. 2. Perform the required scan surveys at the rate prescribed on the previous page. Document the performance of the scan survey in the comments section of the attached survey data sheets and survey maps. 3. The estimated number of sample locations needed for the statistical evaluation of this survey unit using the Wilcoxon Rank Sum test is 14. However, since scan surveys are ineffective for the primary nuclides of concern, additional samples are integrated into the survey design using the Hahn-Meeker approach from Visual Sample Plan. The required number has been adjusted as needed to insure that a specific sized hot spot is not missed as discussed in the Survey and Analysis Plan. This survey has been designed in accordance with this approach. 4. For Class 1 and Class 2 survey units, the locations are determined by using a random start point and a systematic spacing from this point. Due to this method, the actual number of locations may vary. Collect the samples as presented on the attached survey maps. 5. Soil samples shall be collected at depths of 0-6". Collect enough soil from each depth to make one sample of at least 1000 grams and one sample of at least 500 grams. 7. Sampling tools and equipment shall be cleaned between each sample location in accordance with the Soil Sampling Procedure. |



**Sigma Aldrich
Fort Mims Facility D&D
Final Status Survey Package**

Building: <u> FMF </u>	Survey Unit: <u> 028 </u>	Page <u> </u> of <u> </u>
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Classification: Class 1 - Impacted Class 2 - Impacted Class 3 - Impacted

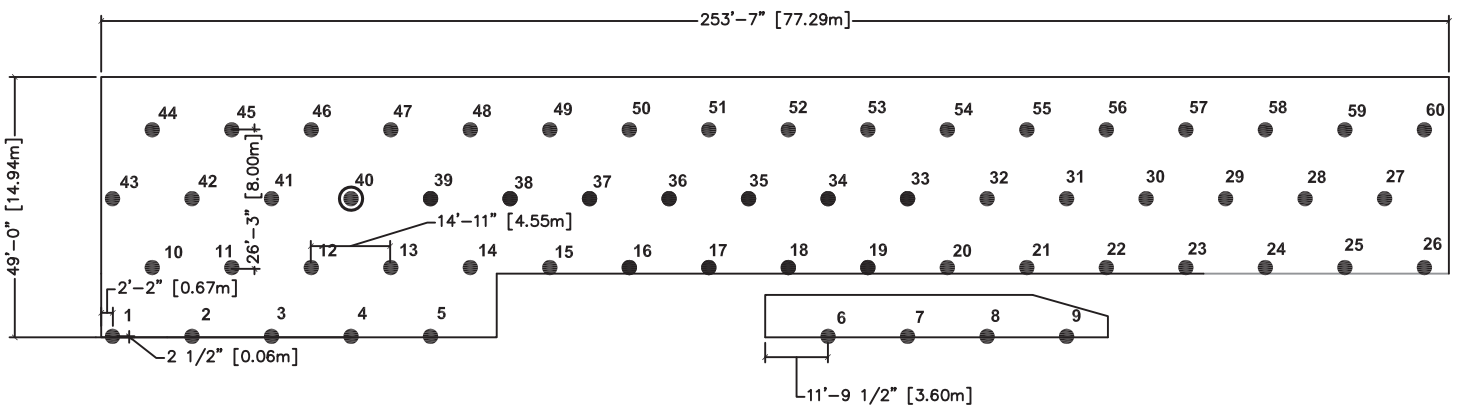
- 8. Samples shall be packaged for transport to the off-site laboratory in accordance with the Soil Sampling Procedure
- 9. A chain of custody form shall be prepared in accordance with the soil sampling procedure.
- 10. Sample result shall be forwarded to the Project Health Physics Manager or designee for review and comparison to the soil screening values and overall site release criterion of 25 mrem/yr TEDE.
- 11. Notify the Project Health Physics manager or designee if any measurement exceeds the applicable investigation level.

Investigation Levels

Survey Unit Classification	Flag Direct Measurement or Sample Result When:
Class 1	>75% of Screening Values
Class 2	>75% of Screening Values

- 12. If any sample result exceeds the investigation levels show above, additional samples may be prescribed by the Project Health Physics Manager as described in the Final Status Survey Plan.
- 13. Copies of any collection logs, chain of custody record, laboratory reports and result evaluation documentation shall be attached and maintained with this survey package.

Special Survey Instructions:



● Random Start Location

● Sample Locations

Typical Spacing – 14' 11" or 4.55 m

SURVEY MAP

BUILDING: ICN

SURVEY UNIT NUMBER: 028

PAGE OF

SURVEY TYPE (CHECK ONE):

Characterization Survey

Final Status Survey

COMMENTS:

SURVEY COMPLETED BY:

DATE COMPLETED:

RADIOLOGICAL CONTROLS SUPERVISOR REVIEW:

DATE:

Sample Results Analysis

Survey Unit **FMF-028**

Sample ID: FMF-028-SOIL-001

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.88	1.79	1.97
C-14	<		1.66

Sample ID: FMF-028-SOIL-002

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	17.9	2.51	
C-14	11.4	1.76	

Sample ID: FMF-028-SOIL-003

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	19.2	2.92	
C-14	35.7	3.08	

Sample ID: FMF-028-SOIL-004

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.81	1.78	
C-14	23.2	2.44	

Sample ID: FMF-028-SOIL-005

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.45	1.25	
C-14	34	2.57	

Sample ID: FMF-028-SOIL-006

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	12.3	2.2	
C-14	35.5	2.81	

Sample ID: FMF-028-SOIL-007

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	18.6	2.61	
C-14	15.3	2	

Sample ID: FMF-028-SOIL-008

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	21	2.64	
C-14	23.8	2.24	

Sample ID: FMF-028-SOIL-009

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	16.9	2.64	
C-14	23.7	2.49	

Sample ID: FMF-028-SOIL-0010

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.7	1.55	
C-14	4.2	1.37	

Sample ID: FMF-028-SOIL-0011

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	13.6	2.34	
C-14	11.2	1.88	

Sample ID: FMF-028-SOIL-0012

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.86	1.52	
C-14	3.97	1.42	

Sample ID: FMF-028-SOIL-0013

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.52	1.73	
C-14	5.14	1.53	

Sample ID: FMF-028-SOIL-0014

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	11.2	2.17	
C-14	10.5	1.85	

Sample ID: FMF-028-SOIL-0015

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	14.9	2.44	
C-14	12.6	1.95	

Sample ID: FMF-028-SOIL-0016

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.39	1.49	
C-14	13.9	1.85	

Sample Results Analysis

Survey Unit **FMF-028**

Sample ID: FMF-028-SOIL-0017

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.72	1.57	
C-14	<		1.99

Sample ID: FMF-028-SOIL-0018

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.25	1.77	
C-14	25.5	2.33	

Sample ID: FMF-028-SOIL-0019

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	15.8	2.6	
C-14	30	2.78	

Sample ID: FMF-028-SOIL-0020

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	21.8	2.96	
C-14	16.9	2.2	

Sample ID: FMF-028-SOIL-0021

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.26	2.01	
C-14	8.08	1.72	

Sample ID: FMF-028-SOIL-0022

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	7.27	1.83	
C-14	26.7	2.58	

Sample ID: FMF-028-SOIL-0023

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.52	1.77	
C-14	8.92	1.93	

Sample ID: FMF-028-SOIL-0024

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.05	1.17	
C-14	<		1.89

Sample ID: FMF-028-SOIL-0025

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.1	1.47	
C-14	<		2.2

Sample ID: FMF-028-SOIL-0026

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.76	1.13	
C-14	<		1.59

Sample ID: FMF-028-SOIL-0027

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.71	1.38	
C-14	<		2.13

Sample ID: FMF-028-SOIL-0028

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.18	1.42	
C-14	<		1.83

Sample ID: FMF-028-SOIL-0029

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.23	1.32	
C-14	<		2.14

Sample ID: FMF-028-SOIL-0030

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.05	1.41	
C-14	5.56	1.66	

Sample ID: FMF-028-SOIL-0031

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.37	1.25	
C-14	15.7	1.92	

Sample ID: FMF-028-SOIL-0032

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.57	1.58	
C-14	29.3	2.74	

Sample Results Analysis

Survey Unit **FMF-028**

Sample ID: FMF-028-SOIL-0033

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.56	1.52	
C-14	31.3	2.72	

Sample ID: FMF-028-SOIL-0034

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.47	1.86	
C-14	8.69	1.9	

Sample ID: FMF-028-SOIL-0035

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.97	1.42	
C-14	2.29	1.17	

Sample ID: FMF-028-SOIL-0036

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.41	1.25	
C-14	1.95	1.16	

Sample ID: FMF-028-SOIL-0037

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.41	1.55	
C-14	6.22	1.67	

Sample ID: FMF-028-SOIL-0038

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	1.65	0.965	
C-14	1.64	1.07	

Sample ID: FMF-028-SOIL-0039

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.24	1.99	
C-14	10.2	1.93	

Sample ID: FMF-028-SOIL-0040

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.31	1.56	
C-14	10.8	1.68	

Sample ID: FMF-028-SOIL-0041

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.11	2.08	
C-14	11	2.04	

Sample ID: FMF-028-SOIL-0042

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	14.2	2.06	
C-14	4.18	1.23	

Sample ID: FMF-028-SOIL-0043

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.95	1.62	
C-14	2.01	1.01	

Sample ID: FMF-028-SOIL-0044

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.7	1.67	
C-14	<		1.36

Sample ID: FMF-028-SOIL-0045

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.92	2.14	
C-14	5.05	1.51	

Sample ID: FMF-028-SOIL-0046

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	11.1	2.37	
C-14	9.36	1.97	

Sample ID: FMF-028-SOIL-0047

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	28.2	3.32	
C-14	42.5	3.59	

Sample ID: FMF-028-SOIL-0048

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	10.2	1.94	
C-14	4.22	1.27	

Sample Results Analysis

Survey Unit FMF-028

Sample ID: FMF-028-SOIL-0049

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	10.7	1.86	
C-14	3.65	1.15	

Sample ID: FMF-028-SOIL-0050

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	7.98	1.72	
C-14	7.92	1.51	

Sample ID: FMF-028-SOIL-0051

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.88	1.57	
C-14	3.79	1.34	

Sample ID: FMF-028-SOIL-0052

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.63	1.74	
C-14	6.55	1.67	

Sample ID: FMF-028-SOIL-0053

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.56	2.04	
C-14	2.62	1.23	

Sample ID: FMF-028-SOIL-0054

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.54	1.54	
C-14	2.62	1.24	

Sample ID: FMF-028-SOIL-0055

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	13.1	2.51	
C-14	4.28	1.55	

Sample ID: FMF-028-SOIL-0056

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	15.9	2.56	
C-14	4.96	1.52	

Sample ID: FMF-028-SOIL-0057

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	15.4	2.18	
C-14	6.72	1.42	

Sample ID: FMF-028-SOIL-0058

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.16	1.72	
C-14	3.62	1.29	

Sample ID: FMF-028-SOIL-0059

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.03	1.65	
C-14	19.5	2.47	

Sample ID: FMF-028-SOIL-0060

Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.44	1.64	
C-14	<		1.85

Matt Norton
Philotechnics
25 Mall Road Suite 301

Burlington, MA 01813

Report of Analysis/Certificate of Conformance

06/12/2009

LIMS #: L38466
Project ID# PH001-3EREGMA-06
Received: 05/08/2009
Delivery Date 06/07/2009
P.O.#: PER RECEIPT
Release #
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-BACKGROUND	L38466-1	
FMF-28-SOIL-001	L38466-2	
FMF-28-SOIL-002	L38466-3	
FMF-28-SOIL-003	L38466-4	
FMF-28-SOIL-004	L38466-5	
FMF-28-SOIL-005	L38466-6	
FMF-28-SOIL-006	L38466-7	
FMF-28-SOIL-007	L38466-8	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-28-SOIL-008	L38466-9	
FMF-28-SOIL-009	L38466-10	
FMF-28-SOIL-010	L38466-11	
FMF-28-SOIL-011	L38466-12	
FMF-28-SOIL-012	L38466-13	
FMF-28-SOIL-013	L38466-14	
FMF-28-SOIL-014	L38466-15	
FMF-28-SOIL-015	L38466-16	
FMF-28-SOIL-016	L38466-17	
FMF-28-SOIL-017	L38466-18	
FMF-28-SOIL-018	L38466-19	
FMF-28-SOIL-019	L38466-20	
FMF-28-SOIL-020	L38466-21	
FMF-28-SOIL-020 DUP	L38466-22	
FMF-28-SOIL-020 MS	L38466-23	
FMF-28-SOIL-021	L38466-24	
FMF-28-SOIL-022	L38466-25	
FMF-28-SOIL-023	L38466-26	
FMF-28-SOIL-024	L38466-27	
FMF-28-SOIL-025	L38466-28	
FMF-28-SOIL-026	L38466-29	
FMF-28-SOIL-027	L38466-30	
FMF-28-SOIL-028	L38466-31	
FMF-28-SOIL-029	L38466-32	
FMF-28-SOIL-030	L38466-33	
FMF-28-SOIL-031	L38466-34	
FMF-28-SOIL-032	L38466-35	
FMF-28-SOIL-033	L38466-36	
FMF-28-SOIL-034	L38466-37	
FMF-28-SOIL-035	L38466-38	
FMF-28-SOIL-036	L38466-39	
FMF-28-SOIL-037	L38466-40	
FMF-28-SOIL-038	L38466-41	
FMF-28-SOIL-039	L38466-42	
FMF-28-SOIL-040	L38466-43	
FMF-28-SOIL-040 DUP	L38466-44	
FMF-28-SOIL-040 MS	L38466-45	
FMF-28-SOIL-041	L38466-46	
FMF-28-SOIL-042	L38466-47	
FMF-28-SOIL-043	L38466-48	
FMF-28-SOIL-044	L38466-49	
FMF-28-SOIL-045	L38466-50	
FMF-28-SOIL-046	L38466-51	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-28-SOIL-047	L38466-52	
FMF-28-SOIL-048	L38466-53	
FMF-28-SOIL-049	L38466-54	
FMF-28-SOIL-050	L38466-55	
FMF-28-SOIL-051	L38466-56	
FMF-28-SOIL-052	L38466-57	
FMF-28-SOIL-053	L38466-58	
FMF-28-SOIL-054	L38466-59	
FMF-28-SOIL-055	L38466-60	
FMF-28-SOIL-056	L38466-61	
FMF-28-SOIL-057	L38466-62	
FMF-28-SOIL-058	L38466-63	
FMF-28-SOIL-059	L38466-64	
FMF-28-SOIL-060	L38466-65	
FMF-28-SOIL-060 DUP	L38466-66	
FMF-28-SOIL-060 MS	L38466-67	
FMF-28-SOIL-060 MSD	L38466-68	
FMF-28-SOIL-020 MSD	L38466-69	
FMF-28-SOIL-040 MSD	L38466-70	

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Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Sample ID: FMF-BACKGROUND	Collect Start: 05/05/2009 14:43	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-1			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.61E+00	pCi/g		2.24	g wet		06/12/09	5	M	U
H-3	2003	<		1.97E+00	pCi/g		2.24	g wet		06/12/09	5	M	U

Sample ID: FMF-28-SOIL-001	Collect Start: 05/05/2009 15:35	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-2			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.66E+00	pCi/g		2.75	g wet		06/10/09	5	M	U
H-3	2003	8.88E+00	1.79E+00		pCi/g		2.75	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-002	Collect Start: 05/05/2009 15:42	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-3			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.14E+01	1.76E+00		pCi/g		2.62	g wet		06/10/09	5	M	+
H-3	2003	1.79E+01	2.51E+00		pCi/g		2.62	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-003	Collect Start: 05/05/2009 15:44	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-4		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.57E+01	3.08E+00		pCi/g		2.1	g wet		06/10/09	5	M	+
H-3	2003	1.92E+01	2.92E+00		pCi/g		2.1	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-004	Collect Start: 05/05/2009 15:49	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-5		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.32E+01	2.44E+00		pCi/g		2.33	g wet		06/10/09	5	M	+
H-3	2003	6.81E+00	1.78E+00		pCi/g		2.33	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-005	Collect Start: 05/05/2009 15:51	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-6		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.40E+01	2.57E+00		pCi/g		2.77	g wet		06/10/09	5	M	+
H-3	2003	3.45E+00	1.25E+00		pCi/g		2.77	g wet		06/11/09	5	M	+

Flag Values

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- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
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- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-006	Collect Start: 05/05/2009 15:54	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-7			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.55E+01	2.81E+00		pCi/g		2.45	g wet		06/10/09	5	M	+
H-3	2003	1.23E+01	2.20E+00		pCi/g		2.45	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-007	Collect Start: 05/05/2009 15:56	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-8			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.53E+01	2.00E+00		pCi/g		2.51	g wet		06/10/09	5	M	+
H-3	2003	1.86E+01	2.61E+00		pCi/g		2.51	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-008	Collect Start: 05/05/2009 15:57	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-9			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.38E+01	2.24E+00		pCi/g		2.72	g wet		06/10/09	5	M	+
H-3	2003	2.10E+01	2.64E+00		pCi/g		2.72	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-009	Collect Start: 05/05/2009 16:01	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.37E+01	2.49E+00		pCi/g		2.28	g wet		06/10/09	5	M	+
H-3	2003	1.69E+01	2.64E+00		pCi/g		2.28	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-010	Collect Start: 05/05/2009 16:13	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.20E+00	1.37E+00		pCi/g		2.6	g wet		06/10/09	5	M	+
H-3	2003	5.70E+00	1.55E+00		pCi/g		2.6	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-011	Collect Start: 05/05/2009 16:18	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.12E+01	1.88E+00		pCi/g		2.37	g wet		06/10/09	5	M	+
H-3	2003	1.36E+01	2.34E+00		pCi/g		2.37	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Matt Norton

Sample ID: FMF-28-SOIL-012	Collect Start: 05/05/2009 16:21	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-13			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.97E+00	1.42E+00		pCi/g		2.44	g wet		06/10/09	5	M	+
H-3	2003	4.86E+00	1.52E+00		pCi/g		2.44	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-013	Collect Start: 05/05/2009 16:28	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-14			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.14E+00	1.53E+00		pCi/g		2.37	g wet		06/10/09	5	M	+
H-3	2003	6.52E+00	1.73E+00		pCi/g		2.37	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-014	Collect Start: 05/05/2009 16:32	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-15			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.05E+01	1.85E+00		pCi/g		2.35	g wet		06/10/09	5	M	+
H-3	2003	1.12E+01	2.17E+00		pCi/g		2.35	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Matt Norton

Sample ID: FMF-28-SOIL-015	Collect Start: 05/05/2009 16:45	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-16			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.26E+01	1.95E+00		pCi/g		2.37	g wet		06/10/09	5	M	+
H-3	2003	1.49E+01	2.44E+00		pCi/g		2.37	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-016	Collect Start: 05/05/2009 16:49	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-17			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.39E+01	1.85E+00		pCi/g		2.68	g wet		06/10/09	5	M	+
H-3	2003	5.39E+00	1.49E+00		pCi/g		2.68	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-017	Collect Start: 05/05/2009 16:53	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-18			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.99E+00	pCi/g		2.29	g wet		06/10/09	5	M	U
H-3	2003	4.72E+00	1.57E+00		pCi/g		2.29	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-018	Collect Start: 05/05/2009 16:58	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-19		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.55E+01	2.33E+00		pCi/g		2.68	g wet		06/10/09	5	M	+
H-3	2003	8.25E+00	1.77E+00		pCi/g		2.68	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-019	Collect Start: 05/05/2009 17:02	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-20		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.00E+01	2.78E+00		pCi/g		2.22	g wet		06/10/09	5	M	+
H-3	2003	1.58E+01	2.60E+00		pCi/g		2.22	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-020	Collect Start: 05/05/2009 17:09	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-21		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.69E+01	2.20E+00		pCi/g		2.28	g wet		06/10/09	5	M	+
H-3	2003	2.18E+01	2.96E+00		pCi/g		2.28	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-020 DUP	Collect Start: 05/05/2009 17:09	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-22		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.10E+01	2.28E+00		pCi/g		2.44	g wet		06/10/09	5	M	+
H-3	2003	1.86E+01	2.65E+00		pCi/g		2.44	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-020 MS	Collect Start: 05/05/2009 17:09	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-23		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.37E+02	8.24E+00		pCi/g		2.31	g wet		06/10/09	5	M	+
H-3	2003	1.05E+02	6.21E+00		pCi/g		2.31	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-021	Collect Start: 05/06/2009 07:15	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-24		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	8.08E+00	1.72E+00		pCi/g		2.34	g wet		06/10/09	5	M	+
H-3	2003	9.26E+00	2.01E+00		pCi/g		2.34	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-022	Collect Start: 05/06/2009 07:18	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-25		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	2.67E+01	2.58E+00		pCi/g		2.32	g wet		06/10/09	5	M	+
H-3	2003	7.27E+00	1.83E+00		pCi/g		2.32	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-023	Collect Start: 05/06/2009 07:21	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-26		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	8.92E+00	1.93E+00		pCi/g		2.08	g wet		06/10/09	5	M	+
H-3	2003	5.52E+00	1.77E+00		pCi/g		2.08	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-024	Collect Start: 05/06/2009 07:24	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-27		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		1.89E+00	pCi/g		2.42	g wet		06/10/09	5	M	U
H-3	2003	2.05E+00	1.17E+00		pCi/g		2.42	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-025	Collect Start: 05/06/2009 07:27	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-28		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		2.20E+00	pCi/g		2.07	g wet		06/10/09	5	M	U
H-3	2003	3.10E+00	1.47E+00		pCi/g		2.07	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-026	Collect Start: 05/06/2009 07:29	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-29		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		1.59E+00	pCi/g		2.87	g wet		06/10/09	5	M	U
H-3	2003	2.76E+00	1.13E+00		pCi/g		2.87	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-027	Collect Start: 05/06/2009 07:33	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-30		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		2.13E+00	pCi/g		2.14	g wet		06/10/09	5	M	U
H-3	2003	2.71E+00	1.38E+00		pCi/g		2.14	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-028	Collect Start: 05/06/2009 07:37	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-31		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		1.83E+00	pCi/g		2.5	g wet		06/10/09	5	M	U
H-3	2003	4.18E+00	1.42E+00		pCi/g		2.5	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-029	Collect Start: 05/06/2009 07:39	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-32		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	<		2.14E+00	pCi/g		2.13	g wet		06/10/09	5	M	U
H-3	2003	2.23E+00	1.32E+00		pCi/g		2.13	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-030	Collect Start: 05/06/2009 07:43	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-33		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	5.56E+00	1.66E+00		pCi/g		2.19	g wet		06/10/09	5	M	+
H-3	2003	3.05E+00	1.41E+00		pCi/g		2.19	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-031	Collect Start: 05/06/2009 07:46	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-34		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.57E+01	1.92E+00		pCi/g		2.72	g wet		06/11/09	5	M	+
H-3	2003	3.37E+00	1.25E+00		pCi/g		2.72	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-032	Collect Start: 05/06/2009 07:50	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-35		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	2.93E+01	2.74E+00		pCi/g		2.24	g wet		06/11/09	5	M	+
H-3	2003	4.57E+00	1.58E+00		pCi/g		2.24	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-033	Collect Start: 05/06/2009 08:01	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-36		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	3.13E+01	2.72E+00		pCi/g		2.37	g wet		06/11/09	5	M	+
H-3	2003	4.56E+00	1.52E+00		pCi/g		2.37	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Sample ID: FMF-28-SOIL-034	Collect Start: 05/06/2009 08:03	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-37			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	8.69E+00	1.90E+00		pCi/g		2.11	g wet		06/11/09	5	M	+
H-3	2003	6.47E+00	1.86E+00		pCi/g		2.11	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-035	Collect Start: 05/06/2009 08:07	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-38			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	2.29E+00	1.17E+00		pCi/g		2.78	g wet		06/11/09	5	M	+
H-3	2003	4.97E+00	1.42E+00		pCi/g		2.78	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-036	Collect Start: 05/06/2009 08:12	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-39			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.95E+00	1.16E+00		pCi/g		2.74	g wet		06/11/09	5	M	+
H-3	2003	3.41E+00	1.25E+00		pCi/g		2.74	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-037	Collect Start: 05/06/2009 08:17	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-40		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	6.22E+00	1.67E+00		pCi/g		2.25	g wet		06/11/09	5	M	+
H-3	2003	4.41E+00	1.55E+00		pCi/g		2.25	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-038	Collect Start: 05/06/2009 08:22	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-41		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.64E+00	1.07E+00		pCi/g		2.92	g wet		06/11/09	5	M	+
H-3	2003	1.65E+00	9.65E-01		pCi/g		2.92	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-039	Collect Start: 05/06/2009 08:27	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-42		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.02E+01	1.93E+00		pCi/g		2.2	g wet		06/11/09	5	M	+
H-3	2003	8.24E+00	1.99E+00		pCi/g		2.2	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-040	Collect Start: 05/06/2009 09:36	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-43		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.08E+01	1.68E+00		pCi/g		2.74	g wet		06/11/09	5	M	+
H-3	2003	6.31E+00	1.56E+00		pCi/g		2.74	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-040 DUP	Collect Start: 05/06/2009 09:38	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-44		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	1.08E+01	1.84E+00		pCi/g		2.39	g wet		06/11/09	5	M	+
H-3	2003	7.15E+00	1.79E+00		pCi/g		2.39	g wet		06/11/09	5	M	+

Sample ID: FMF-28-SOIL-040 MS	Collect Start: 05/06/2009 09:41	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-45		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	2.95E+02	8.07E+00		pCi/g		2.12	g wet		06/11/09	5	M	+
H-3	2003	1.08E+02	6.62E+00		pCi/g		2.1	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-041	Collect Start: 05/06/2009 09:44	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-46		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.10E+01	2.04E+00		pCi/g		2.1	g wet		06/12/09	5	M	+
H-3	2003	8.11E+00	2.08E+00		pCi/g		2.1	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-042	Collect Start: 05/06/2009 09:48	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-47		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.81E+00	1.23E+00		pCi/g		2.92	g wet		06/12/09	5	M	+
H-3	2003	1.42E+01	2.06E+00		pCi/g		2.92	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-043	Collect Start: 05/06/2009 09:52	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-48		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.01E+00	1.01E+00		pCi/g		2.83	g wet		06/12/09	5	M	+
H-3	2003	6.95E+00	1.62E+00		pCi/g		2.83	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-044	Collect Start: 05/06/2009 09:54	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-49			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.36E+00	pCi/g		2.65	g wet		06/12/09	5	M	U
H-3	2003	6.70E+00	1.67E+00		pCi/g		2.65	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-045	Collect Start: 05/06/2009 09:57	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-50			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.05E+00	1.51E+00		pCi/g		2.23	g wet		06/12/09	5	M	+
H-3	2003	9.92E+00	2.14E+00		pCi/g		2.23	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-046	Collect Start: 05/06/2009 10:00	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-51			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.36E+00	1.97E+00		pCi/g		2.02	g wet		06/12/09	5	M	+
H-3	2003	1.11E+01	2.37E+00		pCi/g		2.02	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-047	Collect Start: 05/06/2009 10:04	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-52		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.25E+01	3.59E+00		pCi/g		2.1	g wet		06/12/09	5	M	+
H-3	2003	2.82E+01	3.32E+00		pCi/g		2.1	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-048	Collect Start: 05/06/2009 10:07	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-53		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.22E+00	1.27E+00		pCi/g		2.64	g wet		06/12/09	5	M	+
H-3	2003	1.02E+01	1.94E+00		pCi/g		2.64	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-049	Collect Start: 05/06/2009 10:09	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-54		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.65E+00	1.15E+00		pCi/g		2.88	g wet		06/12/09	5	M	+
H-3	2003	1.07E+01	1.86E+00		pCi/g		2.88	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-050	Collect Start: 05/06/2009 10:11	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-55			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.92E+00	1.51E+00		pCi/g		2.77	g wet		06/12/09	5	M	+
H-3	2003	7.98E+00	1.72E+00		pCi/g		2.77	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-051	Collect Start: 05/06/2009 10:14	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-56			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.79E+00	1.34E+00		pCi/g		2.35	g wet		06/12/09	5	M	+
H-3	2003	3.88E+00	1.57E+00		pCi/g		2.35	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-052	Collect Start: 05/06/2009 10:17	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-57			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.55E+00	1.67E+00		pCi/g		2.16	g wet		06/12/09	5	M	+
H-3	2003	4.63E+00	1.74E+00		pCi/g		2.16	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-053	Collect Start: 05/06/2009 10:20	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-58		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.62E+00	1.23E+00		pCi/g		2.35	g wet		06/12/09	5	M	+
H-3	2003	9.56E+00	2.04E+00		pCi/g		2.35	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-054	Collect Start: 05/06/2009 10:21	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-59		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.62E+00	1.24E+00		pCi/g		2.33	g wet		06/12/09	5	M	+
H-3	2003	3.54E+00	1.54E+00		pCi/g		2.33	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-055	Collect Start: 05/06/2009 10:24	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-60		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.28E+00	1.55E+00		pCi/g		2.02	g wet		06/12/09	5	M	+
H-3	2003	1.31E+01	2.51E+00		pCi/g		2.02	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-056	Collect Start: 05/06/2009 10:27	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-61		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.96E+00	1.52E+00		pCi/g		2.19	g wet		06/12/09	5	M	+
H-3	2003	1.59E+01	2.56E+00		pCi/g		2.19	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-057	Collect Start: 05/06/2009 10:30	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-62		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.72E+00	1.42E+00		pCi/g		2.8	g wet		06/12/09	5	M	+
H-3	2003	1.54E+01	2.18E+00		pCi/g		2.8	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-058	Collect Start: 05/06/2009 10:33	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-63		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.62E+00	1.29E+00		pCi/g		2.45	g wet		06/12/09	5	M	+
H-3	2003	6.16E+00	1.72E+00		pCi/g		2.45	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-059	Collect Start: 05/06/2009 10:39	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-64		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.95E+01	2.47E+00		pCi/g		2.22	g wet		06/12/09	5	M	+
H-3	2003	4.03E+00	1.65E+00		pCi/g		2.22	g wet		06/12/09	5	M	+

Sample ID: FMF-28-SOIL-060	Collect Start: 05/06/2009 10:41	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-65		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.85E+00	pCi/g		2.49	g wet		06/09/09	5	M	U
H-3	2003	6.44E+00	1.64E+00		pCi/g		2.49	g wet		06/09/09	5	M	+

Sample ID: FMF-28-SOIL-060 DUP	Collect Start: 05/06/2009 10:41	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-66		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.96E+00	1.55E+00		pCi/g		2.3	g wet		06/12/09	5	M	+
H-3	2003	5.95E+00	1.78E+00		pCi/g		2.3	g wet		06/12/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-060 MS	Collect Start: 05/06/2009 10:41	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-67			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.08E+03	1.73E+01		pCi/g		2.13	g wet		06/12/09	5	M	+
H-3	2003	1.11E+02	1.14E+01		pCi/g		2.07	g wet		06/12/09	1.5	M	+

Sample ID: FMF-28-SOIL-060 MSD	Collect Start: 05/06/2009 10:41	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-68			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.18E+03	1.71E+01		pCi/g		2.36	g wet		06/12/09	5	M	+
H-3	2003	9.10E+01	9.30E+00		pCi/g		2.41	g wet		06/12/09	1.58	M	+

Sample ID: FMF-28-SOIL-020 MSD	Collect Start: 05/05/2009 17:09	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38466-69			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.93E+02	8.04E+00		pCi/g		2.12	g wet		06/11/09	5	M	+
H-3	2003	1.21E+02	7.02E+00		pCi/g		2.09	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:20

L38466

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-28-SOIL-040 MSD	Collect Start: 05/06/2009 09:41	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38466-70		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	032-80	2.94E+02	7.99E+00		pCi/g		2.15	g wet		06/11/09	5	M	+
H-3	2003	1.10E+02	6.78E+00		pCi/g		2.04	g wet		06/11/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

QC Summary Report for L38466

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C-14

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG8027-1	C-14	WO	06/10/2009 20:06	< 4.400E+00	pCi/Total	U	P
WG8029-1	C-14	WO	06/10/2009 20:19	< 4.400E+00	pCi/Total	U	P
WG8032-1	C-14	WO	06/12/2009 11:27	< 6.600E+00	pCi/Total	U	P
WG8036-1	C-14	WO	06/09/2009 16:20	< 4.610E+00	pCi/Total	U	P
WG8082-1	C-14	WO	06/12/2009 11:44	< 6.600E+00	pCi/Total	U	P

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG8027-2	C-14	WO	06/10/2009 20:13	5.87E+02	5.740E+02	pCi/Total	97.8	70-130	+	P
Spike ID:	14C-110295									
Spike Conc:	5.87E+03									
Spike Vol:	1.00E-01									
WG8029-2	C-14	WO	06/10/2009 20:26	5.87E+02	5.200E+02	pCi/Total	88.6	70-130	+	P
Spike ID:	14C-110295									
Spike Conc:	5.87E+03									
Spike Vol:	1.00E-01									
WG8032-2	C-14	WO	06/12/2009 11:34	5.87E+02	5.820E+02	pCi/Total	99.2	70-130	+	P
Spike ID:	14C-110295									
Spike Conc:	5.87E+03									
Spike Vol:	1.00E-01									
WG8036-2	C-14	WO	06/09/2009 16:27	5.87E+02	5.950E+02	pCi/Total	101.4	70-130	+	P
Spike ID:	14C-110295									
Spike Conc:	5.87E+03									
Spike Vol:	1.00E-01									
WG8082-2	C-14	WO	06/12/2009 11:51	5.87E+02	5.750E+02	pCi/Total	98.0	70-130	+	P
Spike ID:	14C-110295									
Spike Conc:	5.87E+03									
Spike Vol:	1.00E-01									

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
L38466-22 L38466-21	C-14	S	06/10/2009 22:45	1.690E+01	2.100E+01	pCi/g Wet	21.6	<50	+	P
L38466-44 L38466-43	C-14	S	06/11/2009 01:10	1.080E+01	1.080E+01	pCi/g Wet	0.0	<50	+	P
L38466-66 L38466-65	C-14	S	06/12/2009 14:18	< 1.850E+00	5.960E+00	pCi/g Wet		<50	*	NE
L38478-21R1 L38478-20R1	C-14	S	06/08/2009 22:11	5.990E+01	4.050E+01	pCi/g Wet	38.7	<50	+	P
L38478-43R2 L38478-42R2	C-14	S	06/12/2009 14:25	1.590E+02	1.310E+02	pCi/g Wet	19.3	<50	+	P
WG8032-4 L38466-46	C-14	S	06/12/2009 11:37	1.100E+01	7.830E+00	pCi/g Wet		<50	*	NE
WG8036-3 L38466-65	C-14	S	06/09/2009 16:47	< 1.850E+00	< 1.660E+00	pCi/g Wet		<50	**	NE
WG8082-3 L38466-1	C-14	S	06/12/2009 11:54	< 1.610E+00	< 1.670E+00	pCi/g Wet		<50	**	NE

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Matrix Spike Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Decay Corrected		MS Result	Units	Spike Recovery	Range	Qualifier	P/F
				Spike Value	Original Result						
L38466-23 L38466-21	C-14	S	06/10/2009 22:51	2.53E+02	1.690E+01	3.370E+02	pCi/g Wet	126.3	60-140	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38466-45 L38466-43	C-14	S	06/11/2009 01:17	2.76E+02	1.080E+01	2.950E+02	pCi/g Wet	102.9	60-140	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38466-67 L38466-65	C-14	S	06/12/2009 14:25	1.47E+03	< 1.850E+00	1.080E+03	pCi/g Wet	73.3	60-140	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											
L38478-22R1 L38478-20R1	C-14	S	06/08/2009 22:18	2.51E+02	5.990E+01	3.280E+02	pCi/g Wet	106.7	60-140	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38478-44R2 L38478-42R2	C-14	S	06/12/2009 14:29	1.51E+03	1.590E+02	1.600E+03	pCi/g Wet	95.5	60-140	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Matrix Spike Duplicate Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Decay Corrected		MSD Recovery	Units	RPD	Range	Qualifier	P/F
				Spike Value	MSD Result						
L38466-68 L38466-67	C-14	S	06/12/2009 14:29	1.33E+03	1.180E+03	88.7	pCi/g Wet	19.0	<50	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											
L38466-69 L38466-23	C-14	S	06/11/2009 01:24	2.76E+02	2.930E+02	100	pCi/g Wet	23.3	<50	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38466-70 L38466-45	C-14	S	06/11/2009 01:30	2.72E+02	2.940E+02	104	pCi/g Wet	1.1	<50	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38478-45R2 L38478-44R2	C-14	S	06/12/2009 14:18	1.55E+03	1.560E+03	90.1	pCi/g Wet	5.7	<50	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											
L38478-46R1 L38478-22R1	C-14	S	06/09/2009 00:57	2.48E+02	3.250E+02	106.9	pCi/g Wet	0.2	<50	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Associated Samples for

WG8027

<u>Sample #</u>	<u>Client ID</u>
L38466-2	FMF-28-SOIL-001
L38466-3	FMF-28-SOIL-002
L38466-4	FMF-28-SOIL-003
L38466-5	FMF-28-SOIL-004
L38466-6	FMF-28-SOIL-005
L38466-7	FMF-28-SOIL-006
L38466-8	FMF-28-SOIL-007
L38466-9	FMF-28-SOIL-008
L38466-10	FMF-28-SOIL-009
L38466-11	FMF-28-SOIL-010
L38466-12	FMF-28-SOIL-011
L38466-13	FMF-28-SOIL-012
L38466-14	FMF-28-SOIL-013
L38466-15	FMF-28-SOIL-014
L38466-16	FMF-28-SOIL-015
L38466-17	FMF-28-SOIL-016
L38466-18	FMF-28-SOIL-017
L38466-19	FMF-28-SOIL-018
L38466-20	FMF-28-SOIL-019
L38466-21	FMF-28-SOIL-020
L38466-22	FMF-28-SOIL-020 DUP
L38466-23	FMF-28-SOIL-020 MS
L38466-69	FMF-28-SOIL-020 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Associated Samples for

WG8029

<u>Sample #</u>	<u>Client ID</u>
L38466-24	FMF-28-SOIL-021
L38466-25	FMF-28-SOIL-022
L38466-26	FMF-28-SOIL-023
L38466-27	FMF-28-SOIL-024
L38466-28	FMF-28-SOIL-025
L38466-29	FMF-28-SOIL-026
L38466-30	FMF-28-SOIL-027
L38466-31	FMF-28-SOIL-028
L38466-32	FMF-28-SOIL-029
L38466-33	FMF-28-SOIL-030
L38466-34	FMF-28-SOIL-031
L38466-35	FMF-28-SOIL-032
L38466-36	FMF-28-SOIL-033
L38466-37	FMF-28-SOIL-034
L38466-38	FMF-28-SOIL-035
L38466-39	FMF-28-SOIL-036
L38466-40	FMF-28-SOIL-037
L38466-41	FMF-28-SOIL-038
L38466-42	FMF-28-SOIL-039
L38466-43	FMF-28-SOIL-040
L38466-44	FMF-28-SOIL-040 DUP
L38466-45	FMF-28-SOIL-040 MS
L38466-70	FMF-28-SOIL-040 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Associated Samples for

WG8032

<u>Sample #</u>	<u>Client ID</u>
L38466-46	FMF-28-SOIL-041
L38466-47	FMF-28-SOIL-042
L38466-48	FMF-28-SOIL-043
L38466-49	FMF-28-SOIL-044
L38466-50	FMF-28-SOIL-045
L38466-51	FMF-28-SOIL-046
L38466-52	FMF-28-SOIL-047
L38466-53	FMF-28-SOIL-048
L38466-54	FMF-28-SOIL-049
L38466-55	FMF-28-SOIL-050
L38466-56	FMF-28-SOIL-051
L38466-57	FMF-28-SOIL-052
L38466-58	FMF-28-SOIL-053
L38466-59	FMF-28-SOIL-054
L38466-60	FMF-28-SOIL-055
L38466-61	FMF-28-SOIL-056
L38466-62	FMF-28-SOIL-057
L38466-63	FMF-28-SOIL-058
L38466-64	FMF-28-SOIL-059
L38466-66	FMF-28-SOIL-060 DUP
L38466-67	FMF-28-SOIL-060 MS
L38466-68	FMF-28-SOIL-060 MSD

C-14

Associated Samples for

WG8036

<u>Sample #</u>	<u>Client ID</u>
L38466-65	FMF-28-SOIL-060

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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Associated Samples for

WG8082

Sample #

Client ID

L38466-1

FMF-BACKGROUND

+ Positive Result
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
* < 5 times the MDC are not evaluated
** Nuclide not detected
*** Spiking level < 5 times activity
P Pass
F Fail
NE Not evaluated

QC Summary Report for L38466

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H-3

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG8026-1	H-3	WO	06/11/2009 02:09	< 3.150E+00	pCi/Total	U	P
WG8028-1	H-3	WO	06/11/2009 02:24	< 3.150E+00	pCi/Total	U	P
WG8031-1	H-3	WO	06/12/2009 11:27	< 5.060E+00	pCi/Total	U	P
WG8035-1	H-3	WO	06/09/2009 17:31	< 2.990E+00	pCi/Total	U	P
WG8081-1	H-3	WO	06/12/2009 11:44	< 5.060E+00	pCi/Total	U	P

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

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H-3

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG8026-2	H-3	WO	06/11/2009 02:16	2.52E+02	2.420E+02	pCi/Total	95.9	70-130	+	P
Spike ID:	3H-041706-1									
Spike Conc:	5.05E+02									
Spike Vol:	5.00E-01									
WG8028-2	H-3	WO	06/11/2009 02:31	2.52E+02	2.660E+02	pCi/Total	105.4	70-130	+	P
Spike ID:	3H-041706-1									
Spike Conc:	5.05E+02									
Spike Vol:	5.00E-01									
WG8031-2	H-3	WO	06/12/2009 11:34	2.52E+02	2.700E+02	pCi/Total	107.0	70-130	+	P
Spike ID:	3H-041706-1									
Spike Conc:	5.05E+02									
Spike Vol:	5.00E-01									
WG8035-2	H-3	WO	06/09/2009 17:39	2.52E+02	2.530E+02	pCi/Total	100.2	70-130	+	P
Spike ID:	3H-041706-1									
Spike Conc:	5.05E+02									
Spike Vol:	5.00E-01									
WG8081-2	H-3	WO	06/12/2009 11:51	2.52E+02	2.520E+02	pCi/Total	99.8	70-130	+	P
Spike ID:	3H-041706-1									
Spike Conc:	5.05E+02									
Spike Vol:	5.00E-01									

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

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H-3

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
L38466-22 L38466-21	H-3	S	06/11/2009 05:21	2.180E+01	1.860E+01	pCi/g Wet	15.8	<50	+	P
L38466-44 L38466-43	H-3	S	06/11/2009 08:47	6.310E+00	7.150E+00	pCi/g Wet	12.5	<50	+	P
L38466-66 L38466-65	H-3	S	06/12/2009 14:18	6.440E+00	5.950E+00	pCi/g Wet		<50	*	NE
WG8031-4 L38466-46	H-3	S	06/12/2009 11:37	8.110E+00	7.740E+00	pCi/g Wet		<50	*	NE
WG8035-3 L38466-65	H-3	S	06/09/2009 18:02	6.440E+00	5.720E+00	pCi/g Wet	11.8	<50	+	P
WG8081-3 L38466-1	H-3	S	06/12/2009 11:54	< 1.970E+00	2.820E+00	pCi/g Wet		<50	*	NE

Matrix Spike Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>			<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>Original Result</u>	<u>MS Result</u>					
L38466-23 L38466-21	H-3	S	06/11/2009 05:30	9.19E+01	2.180E+01	1.050E+02	pCi/g Wet	90.5	60-140	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38466-45 L38466-43	H-3	S	06/11/2009 08:58	1.01E+02	6.310E+00	1.080E+02	pCi/g Wet	100.6	60-140	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38466-67 L38466-65	H-3	S	06/12/2009 14:25	1.03E+02	6.440E+00	1.110E+02	pCi/g Wet	102.0	60-140	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

06/12/2009 15:31

H-3

Matrix Spike Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>		<u>MSD Recovery</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>MSD Result</u>						
L38466-68 L38466-67	H-3	S	06/12/2009 14:29	8.81E+01	9.100E+01	96	pCi/g Wet	6.0	<50	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38466-69 L38466-23	H-3	S	06/11/2009 09:09	1.02E+02	1.210E+02	97.7	pCi/g Wet	7.6	<50	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38466-70 L38466-45	H-3	S	06/11/2009 09:21	1.04E+02	1.100E+02	99.7	pCi/g Wet	1.0	<50	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

06/12/2009 15:31

H-3

H-3

Associated Samples for

WG8026

<u>Sample #</u>	<u>Client ID</u>
L38466-2	FMF-28-SOIL-001
L38466-3	FMF-28-SOIL-002
L38466-4	FMF-28-SOIL-003
L38466-5	FMF-28-SOIL-004
L38466-6	FMF-28-SOIL-005
L38466-7	FMF-28-SOIL-006
L38466-8	FMF-28-SOIL-007
L38466-9	FMF-28-SOIL-008
L38466-10	FMF-28-SOIL-009
L38466-11	FMF-28-SOIL-010
L38466-12	FMF-28-SOIL-011
L38466-13	FMF-28-SOIL-012
L38466-14	FMF-28-SOIL-013
L38466-15	FMF-28-SOIL-014
L38466-16	FMF-28-SOIL-015
L38466-17	FMF-28-SOIL-016
L38466-18	FMF-28-SOIL-017
L38466-19	FMF-28-SOIL-018
L38466-20	FMF-28-SOIL-019
L38466-21	FMF-28-SOIL-020
L38466-22	FMF-28-SOIL-020 DUP
L38466-23	FMF-28-SOIL-020 MS
L38466-69	FMF-28-SOIL-020 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

06/12/2009 15:31

H-3

H-3

Associated Samples for

WG8028

<u>Sample #</u>	<u>Client ID</u>
L38466-24	FMF-28-SOIL-021
L38466-25	FMF-28-SOIL-022
L38466-26	FMF-28-SOIL-023
L38466-27	FMF-28-SOIL-024
L38466-28	FMF-28-SOIL-025
L38466-29	FMF-28-SOIL-026
L38466-30	FMF-28-SOIL-027
L38466-31	FMF-28-SOIL-028
L38466-32	FMF-28-SOIL-029
L38466-33	FMF-28-SOIL-030
L38466-34	FMF-28-SOIL-031
L38466-35	FMF-28-SOIL-032
L38466-36	FMF-28-SOIL-033
L38466-37	FMF-28-SOIL-034
L38466-38	FMF-28-SOIL-035
L38466-39	FMF-28-SOIL-036
L38466-40	FMF-28-SOIL-037
L38466-41	FMF-28-SOIL-038
L38466-42	FMF-28-SOIL-039
L38466-43	FMF-28-SOIL-040
L38466-44	FMF-28-SOIL-040 DUP
L38466-45	FMF-28-SOIL-040 MS
L38466-70	FMF-28-SOIL-040 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

06/12/2009 15:31

H-3

H-3

Associated Samples for

WG8031

<u>Sample #</u>	<u>Client ID</u>
L38466-46	FMF-28-SOIL-041
L38466-47	FMF-28-SOIL-042
L38466-48	FMF-28-SOIL-043
L38466-49	FMF-28-SOIL-044
L38466-50	FMF-28-SOIL-045
L38466-51	FMF-28-SOIL-046
L38466-52	FMF-28-SOIL-047
L38466-53	FMF-28-SOIL-048
L38466-54	FMF-28-SOIL-049
L38466-55	FMF-28-SOIL-050
L38466-56	FMF-28-SOIL-051
L38466-57	FMF-28-SOIL-052
L38466-58	FMF-28-SOIL-053
L38466-59	FMF-28-SOIL-054
L38466-60	FMF-28-SOIL-055
L38466-61	FMF-28-SOIL-056
L38466-62	FMF-28-SOIL-057
L38466-63	FMF-28-SOIL-058
L38466-64	FMF-28-SOIL-059
L38466-66	FMF-28-SOIL-060 DUP
L38466-67	FMF-28-SOIL-060 MS
L38466-68	FMF-28-SOIL-060 MSD

H-3

Associated Samples for

WG8035

<u>Sample #</u>	<u>Client ID</u>
L38466-65	FMF-28-SOIL-060

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38466

PH001-3EREGMA-06

06/12/2009 15:31

H-3

H-3

Associated Samples for

WG8081

Sample #

Client ID

L38466-1

FMF-BACKGROUND

+ Positive Result
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
* < 5 times the MDC are not evaluated
** Nuclide not detected
*** Spiking level < 5 times activity
P Pass
F Fail
NE Not evaluated



RED COOLERS (67 Samples Total)

**Analysis Request
Chain of Custody**

E - Environmental: X
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: 38466
 Variance Report: _____

Client name: Philotechnics, Ltd.
 Client address: 25 Mall Road
 Suite 301
 Burlington, Ma 01803
 Phone Number: 781-222-5047
 Fax Number: 781-229-0732
 Contact: Matthew Norton CIH, CSP

Project Number: 5614 N.B.

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time	Volume	Units	Matrix or type	Analysis Request
				Start				
	FMF-Background	SOIL		5/5/09 1443	1110	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-001	SOIL		5/5/09 1535	1015	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-002	SOIL		5/5/09 1542	818	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-003	SOIL		5/5/09 1544	1458	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-004	SOIL		5/5/09 1549	985	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-005	SOIL		5/5/09 1551	789	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-006	SOIL		5/5/09 1554	1239	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-007	SOIL		5/5/09 1556	1203	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-008	SOIL		5/5/09 1557	1017	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-009	SOIL		5/5/09 1601	841	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-010	SOIL		5/5/09 1613	844	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-011	SOIL		5/5/09 1618	882	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-012	SOIL		5/5/09 1621	1011	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-013	SOIL		5/5/09 1628	805	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-014	SOIL		5/5/09 1632	969	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-015	SOIL		5/5/09 1645	984	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-016	SOIL		5/5/09 1649	939	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-017	SOIL		5/5/09 1653	1021	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-018	SOIL		5/5/09 1658	709	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-019	SOIL		5/5/09 1702	724	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-020	SOIL		5/5/09 1709	827	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-020 DUP	SOIL		5/5/09 1709	551	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-020 MS/MSD	SOIL		5/5/09 1709	549	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-021	SOIL		5/6/09 0715	580	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-022	SOIL		5/6/09 0718	634	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS

Special Instructions: _____

Relinquished by: James M. Clemens Date: 5/6/09 Relinquished by: _____ Date: _____ Relinquished by: _____ Date: _____
 Received by: Jonathan Date: 5/8/09 Received by: _____ Date: _____ Received by: _____ Date: _____



Analysis Request Chain of Custody

E - Environmental: X
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: _____
Variance Report: _____

Project Number: 5614 N.B.

Client name: <u> Philotechnics, Ltd. </u>
Client address: <u> 25 Mall Road </u> <u> Suite 301 </u> <u> Burlington, Ma 01803 </u>
Phone Number: <u> 781-222-5047 </u>
Fax Number: <u> 781-229-0732 </u>
Contact: <u> Matthew Norton CIH, CSP </u>

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time	Volume	Units	Matrix or type	Analysis Request
				Start				
	FMF-28-SOIL-023	SOIL		5/6/09 0721	698	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-024	SOIL		5/6/09 0724	663	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-025	SOIL		5/6/09 0727	716	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-026	SOIL		5/6/09 0729	651	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-027	SOIL		5/6/09 0733	554	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-028	SOIL		5/6/09 0737	680	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-029	SOIL		5/6/09 0739	475	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-030	SOIL		5/6/09 0743	442	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-031	SOIL		5/6/09 0746	582	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-032	SOIL		5/6/09 0750	402	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-033	SOIL		5/6/09 0801	595	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-034	SOIL		5/6/09 0803	481	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-035	SOIL		5/6/09 0807	609	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-036	SOIL		5/6/09 0812	650	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-037	SOIL		5/6/09 0817	636	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-038	SOIL		5/6/09 0822	545	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-039	SOIL		5/6/09 0827	493	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-040	SOIL		5/6/09 0936	373	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-040 DUP	SOIL		5/6/09 0938 *	365	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-040 MS/MSD	SOIL		5/6/09 0941 *	361	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-041	SOIL		5/6/09 0944	468	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-042	SOIL		5/6/09 0948	570	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-043	SOIL		5/6/09 0952	492	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-044	SOIL		5/6/09 0954	463	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-045	SOIL		5/6/09 0957	500	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS

Special Instructions: _____

Relinquished by: <u> Leaie M. O'Leary </u>	Date: <u> 5/6/09 </u>	Relinquished by: _____	Date: _____
Received by: <u> Jonathan L. Linn </u>	Date: <u> 6/5/09 </u>	Received by: _____	Date: _____



Analysis Request Chain of Custody

E - Environmental: X
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: _____
Variance Report: _____

Project Number: 5614 N.B.

Client name: <u> Philotechnics, Ltd. </u>
Client address: <u> 25 Mall Road </u>
<u> Suite 301 </u>
<u> Burlington, Ma 01803 </u>
Phone Number: <u> 781-222-5047 </u>
Fax Number: <u> 781-229-0732 </u>
Contact: <u> Matthew Norton CIH, CSP </u>

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time	Volume	Units	Matrix or type	Analysis Request
				Start				
	FMF-28-SOIL-046	SOIL		5/6/09 1000	302	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-047	SOIL		5/6/09 1004	417	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-048	SOIL		5/6/09 1007	493	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-049	SOIL		5/6/09 1009	593	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-050	SOIL		5/6/09 1011	512	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-051	SOIL		5/6/09 1014	375	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-052	SOIL		5/6/09 1017	322	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-053	SOIL		5/6/09 1020	483	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-054	SOIL		5/6/09 1021	594	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-055	SOIL		5/6/09 1024	532	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-056	SOIL		5/6/09 1027	307	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-057	SOIL		5/6/09 1030	378	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-058	SOIL		5/6/09 1033	463	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-059	SOIL		5/6/09 1039	520	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-060	SOIL		5/6/09 1041	507	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-060 DUP	SOIL		5/6/09 1041	380	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-28-SOIL-060 MS/MSD	SOIL		5/6/09 1041	345	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS

Special Instructions: _____

Relinquished by: <u> [Signature] </u>	Date: <u> 5/6/09 </u>	Relinquished by: _____	Date: _____	Relinquished by: _____	Date: _____
Received by: <u> [Signature] </u>	Date: <u> 5/8/09 </u>	Received by: _____	Date: _____	Received by: _____	Date: _____

Appendix B

Survey Unit 29



**Sigma Aldrich
Fort Mims Facility D&D
Final Status Survey Package**

Building: <u>FMF</u>	Survey Unit: <u>029</u>	Page ___ of ___
Classification: <input checked="" type="checkbox"/> Class 1 - Impacted <input type="checkbox"/> Class 2 - Impacted <input type="checkbox"/> Class 3 - Impacted		

Applicable Nuclides of Concern:									
Nuclide	<input checked="" type="checkbox"/> ³ H	<input checked="" type="checkbox"/> ¹⁴ C							
Screening Values (pCi/g)	110	12							

Applicable Survey Unit Surfaces:	% of Surface Requiring Scan Surveys			
<input checked="" type="checkbox"/> Soil Surface	<input type="checkbox"/> 20%	<input type="checkbox"/> 50%	<input checked="" type="checkbox"/> 100%	<input type="checkbox"/> N/A

Required Survey Instrumentation	Measurement Type	Static Count Time	Scan Rate	Based on:	Typical Static MDCR
<input checked="" type="checkbox"/> Ludlum 2350-1 w/ SPA-3	Gamma	NA	0.5 Meters/sec.	¹³⁷ Cs	N/A
<input type="checkbox"/> Other: _____ (Specify)					
<input checked="" type="checkbox"/> Soil samples collected will be sent to an off-site laboratory for analysis for all nuclides of concern.					

- | General Survey Instructions: | |
|-------------------------------------|---|
| 1. | Survey maps have been attached that include the required soil sampling locations. Soil samples shall be collected at each location in accordance with these instructions and the Philotechnics Soil and Surface Sampling Procedure. |
| 2. | Perform the required scan surveys at the rate prescribed on the previous page. Document the performance of the scan survey in the comments section of the attached survey data sheets and survey maps. |
| 3. | The estimated number of sample locations needed for the statistical evaluation of this survey unit using the Wilcoxon Rank Sum test is 14 . However, since scan surveys are ineffective for the primary nuclides of concern, additional samples are integrated into the survey design using the Hahn-Meeker approach from Visual Sample Plan. The required number has been adjusted as needed to insure that a specific sized hot spot is not missed as discussed in the Survey and Analysis Plan. This survey has been designed in accordance with this approach. |
| 4. | For Class 1 and Class 2 survey units, the locations are determined by using a random start point and a systematic spacing from this point. Due to this method, the actual number of locations may vary. Collect the samples as presented on the attached survey maps. |
| 5. | Soil samples shall be collected at depths of 0-6". Collect enough soil from each depth to make one sample of at least 1000 grams and one sample of at least 500 grams. |
| 7. | Sampling tools and equipment shall be cleaned between each sample location in accordance with the Soil Sampling Procedure. |



**Sigma Aldrich
Fort Mims Facility D&D
Final Status Survey Package**

Building: <u> FMF </u>	Survey Unit: <u> 029 </u>	Page <u> </u> of <u> </u>
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Classification: Class 1 - Impacted Class 2 - Impacted Class 3 - Impacted

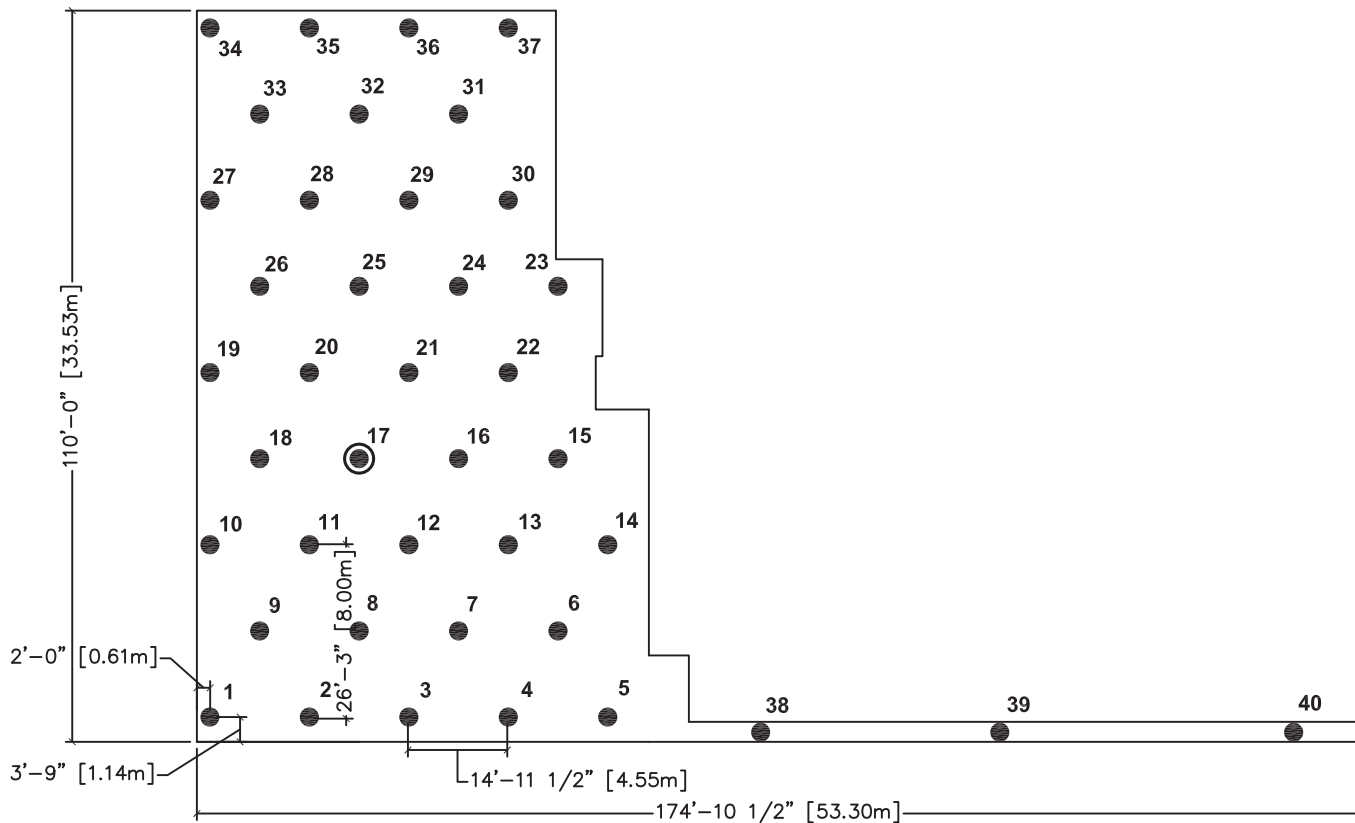
- 8. Samples shall be packaged for transport to the off-site laboratory in accordance with the Soil Sampling Procedure
- 9. A chain of custody form shall be prepared in accordance with the soil sampling procedure.
- 10. Sample result shall be forwarded to the Project Health Physics Manager or designee for review and comparison to the soil screening values and overall site release criterion of 25 mrem/yr TEDE.
- 11. Notify the Project Health Physics manager or designee if any measurement exceeds the applicable investigation level.

Investigation Levels

Survey Unit Classification	Flag Direct Measurement or Sample Result When:
Class 1	>75% of Screening Values
Class 2	>75% of Screening Values

- 12. If any sample result exceeds the investigation levels show above, additional samples may be prescribed by the Project Health Physics Manager as described in the Final Status Survey Plan.
- 13. Copies of any collection logs, chain of custody record, laboratory reports and result evaluation documentation shall be attached and maintained with this survey package.

Special Survey Instructions:



⊙ Random Start Location

● Sample Locations

Typical Spacing – 14' 11" or 4.55 m

SURVEY MAP

BUILDING: Sigma

SURVEY UNIT NUMBER: 029

PAGE OF

SURVEY TYPE (CHECK ONE):

Characterization Survey

Final Status Survey

COMMENTS:

SURVEY COMPLETED BY:

DATE COMPLETED:

RADIOLOGICAL CONTROLS SUPERVISOR REVIEW:

DATE:

Sample Results Analysis

Survey Unit

FMF-029

Sample ID: FMF-029-SOIL-001			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	34.7	2.99	
H-3	2.78	1.34	

FMF-029-SOIL-002		
Result pCi/g	Error pCi/g	MDC pCi/g
41.9	2.9	
6.82	1.63	

Sample ID: FMF-029-SOIL-003			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	37	3.09	
H-3	11	2.24	

FMF-029-SOIL-004		
Result pCi/g	Error pCi/g	MDC pCi/g
38	2.68	
9.55	1.81	

Sample ID: FMF-029-SOIL-005			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	49.3	3.2	
H-3	8.74	1.86	

FMF-029-SOIL-006		
Result pCi/g	Error pCi/g	MDC pCi/g
28.8	2.47	
3.32	1.25	

Sample ID: FMF-029-SOIL-007			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	29.7	2.92	
H-3	9.57	2.18	

FMF-029-SOIL-008		
Result pCi/g	Error pCi/g	MDC pCi/g
27.3	2.52	
5.34	1.54	

Sample ID: FMF-029-SOIL-009			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	27.8	2.35	
H-3	1.7	0.971	

FMF-029-SOIL-010		
Result pCi/g	Error pCi/g	MDC pCi/g
93.8	4.75	
14	2.54	

Sample ID: FMF-029-SOIL-011			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	85.8	4.27	
H-3	13	2.29	

FMF-029-SOIL-012		
Result pCi/g	Error pCi/g	MDC pCi/g
104	4.66	
9.88	2.03	

Sample ID: FMF-029-SOIL-013			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	63.7	4.12	
H-3	17.5	2.89	

FMF-029-SOIL-014		
Result pCi/g	Error pCi/g	MDC pCi/g
43.7	3.32	
2.92	1.38	

Sample ID: FMF-029-SOIL-015			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	305	8.14	
H-3	7.91	1.95	

FMF-029-SOIL-016		
Result pCi/g	Error pCi/g	MDC pCi/g
109	5.01	
5.6	1.72	

Sample Results Analysis

Survey Unit

FMF-029

Sample ID: FMF-029-SOIL-017			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	48.4	3.17	
H-3	3.42	1.3	

FMF-029-SOIL-018		
Result pCi/g	Error pCi/g	MDC pCi/g
57.4	3.76	
9.06	2.08	

Sample ID: FMF-029-SOIL-019			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	162	6.3	
H-3	29.4	3.65	

FMF-029-SOIL-020		
Result pCi/g	Error pCi/g	MDC pCi/g
59.9	3.85	
5.83	1.76	

Sample ID: FMF-029-SOIL-021			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	65.1	3.42	
H-3	4.13	1.3	

FMF-029-SOIL-022		
Result pCi/g	Error pCi/g	MDC pCi/g
200	5.85	
6.88	1.59	

Sample ID: FMF-029-SOIL-023			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	163	6.15	
H-3	7.02	1.9	

FMF-029-SOIL-024		
Result pCi/g	Error pCi/g	MDC pCi/g
125	5.5	
6.58	1.89	

Sample ID: FMF-029-SOIL-025			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	49.6	3.51	
H-3	2.62	1.33	

FMF-029-SOIL-026		
Result pCi/g	Error pCi/g	MDC pCi/g
95.8	4.4	
22.3	2.87	

Sample ID: FMF-029-SOIL-027			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	99.2	4.91	
H-3	8.88	2.11	

FMF-029-SOIL-028		
Result pCi/g	Error pCi/g	MDC pCi/g
40.3	2.79	
5.24	1.44	

Sample ID: FMF-029-SOIL-029			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	15.9	2.01	
H-3	2.14	1.11	

FMF-029-SOIL-030		
Result pCi/g	Error pCi/g	MDC pCi/g
257	7.58	
4.01	1.53	

Sample ID: FMF-029-SOIL-031			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	96.1	4.74	
H-3	4.46	1.59	

FMF-029-SOIL-032		
Result pCi/g	Error pCi/g	MDC pCi/g
81.4	3.98	
5.28	1.5	



Sample Results Analysis

Survey Unit

FMF-029

Sample ID: FMF-029-SOIL-033			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	25.1	2.72	
H-3	<		1.49

FMF-029-SOIL-034		
Result pCi/g	Error pCi/g	MDC pCi/g
10.2	1.79	
5.9	1.61	

Sample ID: FMF-029-SOIL-035			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	27.5	2.58	
H-3	3.13	1.3	

FMF-029-SOIL-036		
Result pCi/g	Error pCi/g	MDC pCi/g
62.8	3.95	
5.65	1.75	

Sample ID: FMF-029-SOIL-037			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	191	6.39	
H-3	10.6	2.16	

FMF-029-SOIL-038		
Result pCi/g	Error pCi/g	MDC pCi/g
95.4	4.46	
18.5	2.67	

Sample ID: FMF-029-SOIL-039			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C.-14	30.2	2.42	
H-3	7.35	1.61	

FMF-029-SOIL-040		
Result pCi/g	Error pCi/g	MDC pCi/g
159	6.18	
42.5	4	



Matt Norton
Philotechnics
25 Mall Road Suite 301

Burlington, MA 01813

Report of Analysis/Certificate of Conformance

06/12/2009

LIMS #: L38478
Project ID# PH001-3EREGMA-06
Received: 05/08/2009
Delivery Date 06/07/2009
P.O.#: PER RECEIPT
Release #
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-SOIL-001	L38478-1	
FMF-29-SOIL-002	L38478-2	
FMF-29-SOIL-003	L38478-3	
FMF-29-SOIL-004	L38478-4	
FMF-29-SOIL-005	L38478-5	
FMF-29-SOIL-006	L38478-6	
FMF-29-SOIL-007	L38478-7	
FMF-29-SOIL-008	L38478-8	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-SOIL-009	L38478-9	
FMF-29-SOIL-010	L38478-10	
FMF-29-SOIL-011	L38478-11	
FMF-29-SOIL-012	L38478-12	
FMF-29-SOIL-013	L38478-13	
FMF-29-SOIL-014	L38478-14	
FMF-29-SOIL-015	L38478-15	
FMF-29-SOIL-016	L38478-16	
FMF-29-SOIL-017	L38478-17	
FMF-29-SOIL-018	L38478-18	
FMF-29-SOIL-019	L38478-19	
FMF-29-SOIL-020	L38478-20	
FMF-29-SOIL-020 DUP	L38478-21	
FMF-29-SOIL-020 MS	L38478-22	
FMF-29-SOIL-021	L38478-23	
FMF-29-SOIL-022	L38478-24	
FMF-29-SOIL-023	L38478-25	
FMF-29-SOIL-024	L38478-26	
FMF-29-SOIL-025	L38478-27	
FMF-29-SOIL-026	L38478-28	
FMF-29-SOIL-027	L38478-29	
FMF-29-SOIL-028	L38478-30	
FMF-29-SOIL-029	L38478-31	
FMF-29-SOIL-030	L38478-32	
FMF-29-SOIL-031	L38478-33	
FMF-29-SOIL-032	L38478-34	
FMF-29-SOIL-033	L38478-35	
FMF-29-SOIL-034	L38478-36	
FMF-29-SOIL-035	L38478-37	
FMF-29-SOIL-036	L38478-38	
FMF-29-SOIL-037	L38478-39	
FMF-29-SOIL-038	L38478-40	
FMF-29-SOIL-039	L38478-41	
FMF-29-SOIL-040	L38478-42	
FMF-29-SOIL-040 DUP	L38478-43	
FMF-29-SOIL-040 MS	L38478-44	
FMF-29-SOIL-040 MSD	L38478-45	
FMF-29-SOIL-020 MSD	L38478-46	

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Report of Analysis

06/12/09 15:29

L38478

Philotechnics

PH001-3EREGMA-06

Sample ID: FMF-29-SOIL-001	Collect Start: 05/06/2009 11:11	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-1		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.47E+01	2.99E+00		pCi/g	R1	2.3	g wet		06/08/09	5	M	+
H-3	2003	2.78E+00	1.34E+00		pCi/g	R1	2.3	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-002	Collect Start: 05/06/2009 11:18	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-2		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.19E+01	2.90E+00		pCi/g	R1	2.79	g wet		06/08/09	5	M	+
H-3	2003	6.82E+00	1.63E+00		pCi/g	R1	2.79	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-003	Collect Start: 05/06/2009 11:21	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-3		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.70E+01	3.09E+00		pCi/g	R1	2.28	g wet		06/08/09	5	M	+
H-3	2003	1.10E+01	2.24E+00		pCi/g	R1	2.28	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:29

L38478

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-004	Collect Start: 05/06/2009 11:26	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-4			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.80E+01	2.68E+00		pCi/g	R1	2.98	g wet		06/08/09	5	M	+
H-3	2003	9.55E+00	1.81E+00		pCi/g	R1	2.98	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-005	Collect Start: 05/06/2009 11:30	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-5			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.93E+01	3.20E+00		pCi/g	R1	2.65	g wet		06/08/09	5	M	+
H-3	2003	8.74E+00	1.86E+00		pCi/g	R1	2.65	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-006	Collect Start: 05/06/2009 11:32	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-6			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.88E+01	2.47E+00		pCi/g	R1	2.79	g wet		06/08/09	5	M	+
H-3	2003	3.32E+00	1.25E+00		pCi/g	R1	2.79	g wet		06/09/09	5	M	+

Flag Values

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- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
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MDC - Minimum Detectable Concentration

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Report of Analysis

06/12/09 15:29

L38478

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-007	Collect Start: 05/06/2009 11:36	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-7		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.97E+01	2.92E+00		pCi/g	R1	2.16	g wet		06/08/09	5	M	+
H-3	2003	9.57E+00	2.18E+00		pCi/g	R1	2.16	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-008	Collect Start: 05/06/2009 11:42	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-8		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.73E+01	2.52E+00		pCi/g	R1	2.61	g wet		06/08/09	5	M	+
H-3	2003	5.34E+00	1.54E+00		pCi/g	R1	2.61	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-009	Collect Start: 05/06/2009 11:47	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-9		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.78E+01	2.35E+00		pCi/g	R1	2.98	g wet		06/08/09	5	M	+
H-3	2003	1.70E+00	9.71E-01		pCi/g	R1	2.98	g wet		06/09/09	5	M	+

Flag Values

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- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
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Report of Analysis

06/12/09 15:29

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-010	Collect Start: 05/06/2009 11:50	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.38E+01	4.75E+00		pCi/g	R1	2.19	g wet		06/08/09	5	M	+
H-3	2003	1.40E+01	2.54E+00		pCi/g	R1	2.19	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-011	Collect Start: 05/06/2009 13:00	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	8.58E+01	4.27E+00		pCi/g	R1	2.48	g wet		06/08/09	5	M	+
H-3	2003	1.30E+01	2.29E+00		pCi/g	R1	2.48	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-012	Collect Start: 05/06/2009 13:03	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.04E+02	4.66E+00		pCi/g	R1	2.49	g wet		06/08/09	5	M	+
H-3	2003	9.88E+00	2.03E+00		pCi/g	R1	2.49	g wet		06/09/09	5	M	+

Flag Values

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- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

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Report of Analysis

06/12/09 15:29

L38478

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-013	Collect Start: 05/06/2009 13:07	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-13		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.37E+01	4.12E+00		pCi/g	R1	2.07	g wet		06/08/09	5	M	+
H-3	2003	1.75E+01	2.89E+00		pCi/g	R1	2.07	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-014	Collect Start: 05/06/2009 13:09	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-14		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.37E+01	3.32E+00		pCi/g	R1	2.27	g wet		06/08/09	5	M	+
H-3	2003	2.92E+00	1.38E+00		pCi/g	R1	2.27	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-015	Collect Start: 05/06/2009 13:12	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-15		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.05E+02	8.14E+00		pCi/g	R1	2.29	g wet		06/08/09	5	M	+
H-3	2003	7.91E+00	1.95E+00		pCi/g	R1	2.29	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:29

L38478

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-016	Collect Start: 05/06/2009 13:15	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-16		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.09E+02	5.01E+00		pCi/g	R1	2.25	g wet		06/08/09	5	M	+
H-3	2003	5.60E+00	1.72E+00		pCi/g	R1	2.25	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-017	Collect Start: 05/06/2009 13:16	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-17		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.84E+01	3.17E+00		pCi/g	R1	2.66	g wet		06/08/09	5	M	+
H-3	2003	3.42E+00	1.30E+00		pCi/g	R1	2.66	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-018	Collect Start: 05/06/2009 13:19	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-18		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.74E+01	3.76E+00		pCi/g	R1	2.24	g wet		06/08/09	5	M	+
H-3	2003	9.06E+00	2.08E+00		pCi/g	R1	2.24	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:29

L38478

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-019	Collect Start: 05/06/2009 13:22	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-19			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.62E+02	6.30E+00		pCi/g	R1	2.09	g wet		06/08/09	5	M	+
H-3	2003	2.94E+01	3.65E+00		pCi/g	R1	2.09	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-020	Collect Start: 05/06/2009 13:25	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-20			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.99E+01	3.85E+00		pCi/g	R1	2.22	g wet		06/08/09	5	M	+
H-3	2003	5.83E+00	1.76E+00		pCi/g	R1	2.22	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-020 DUP	Collect Start: 05/06/2009 13:25	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-21			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.05E+01	3.22E+00		pCi/g	R1	2.26	g wet		06/08/09	5	M	+
H-3	2003	3.76E+00	1.49E+00		pCi/g	R1	2.26	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-020 MS	Collect Start: 05/06/2009 13:25	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-22		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.28E+02	8.36E+00		pCi/g	R1	2.33	g wet		06/08/09	5	M	+
H-3	2003	9.30E+01	5.76E+00		pCi/g	R1	2.52	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-021	Collect Start: 05/06/2009 13:27	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-23		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.51E+01	3.42E+00		pCi/g	R1	2.95	g wet		06/08/09	5	M	+
H-3	2003	4.13E+00	1.30E+00		pCi/g	R1	2.95	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-022	Collect Start: 05/06/2009 13:29	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-24		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.00E+02	5.85E+00		pCi/g	R1	2.92	g wet		06/08/09	5	M	+
H-3	2003	6.88E+00	1.59E+00		pCi/g	R1	2.92	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-023	Collect Start: 05/06/2009 13:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-25		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.63E+02	6.15E+00		pCi/g	R1	2.2	g wet		06/08/09	5	M	+
H-3	2003	7.02E+00	1.90E+00		pCi/g	R1	2.2	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-024	Collect Start: 05/06/2009 13:35	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-26		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.25E+02	5.50E+00		pCi/g	R1	2.14	g wet		06/08/09	5	M	+
H-3	2003	6.58E+00	1.89E+00		pCi/g	R1	2.14	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-025	Collect Start: 05/06/2009 13:37	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-27		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.96E+01	3.51E+00		pCi/g	R1	2.27	g wet		06/08/09	5	M	+
H-3	2003	2.62E+00	1.33E+00		pCi/g	R1	2.27	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-026	Collect Start: 05/06/2009 13:39	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-28		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.58E+01	4.40E+00		pCi/g	R1	2.57	g wet		06/08/09	5	M	+
H-3	2003	2.23E+01	2.87E+00		pCi/g	R1	2.57	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-027	Collect Start: 05/06/2009 13:42	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-29		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.92E+01	4.91E+00		pCi/g	R1	2.16	g wet		06/08/09	5	M	+
H-3	2003	8.88E+00	2.11E+00		pCi/g	R1	2.16	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-028	Collect Start: 05/06/2009 13:45	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-30		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.03E+01	2.79E+00		pCi/g	R1	2.89	g wet		06/08/09	5	M	+
H-3	2003	5.24E+00	1.44E+00		pCi/g	R1	2.89	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-029	Collect Start: 05/06/2009 13:48	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-31			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.59E+01	2.01E+00		pCi/g	R1	2.7	g wet		06/08/09	5	M	+
H-3	2003	2.14E+00	1.11E+00		pCi/g	R1	2.7	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-030	Collect Start: 05/06/2009 13:51	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-32			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.57E+02	7.58E+00		pCi/g	R1	2.24	g wet		06/08/09	5	M	+
H-3	2003	4.01E+00	1.53E+00		pCi/g	R1	2.24	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-031	Collect Start: 05/06/2009 13:55	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-33			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.61E+01	4.74E+00		pCi/g	R1	2.25	g wet		06/08/09	5	M	+
H-3	2003	4.46E+00	1.59E+00		pCi/g	R1	2.25	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:29

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-032	Collect Start: 05/06/2009 14:01	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-34			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	8.14E+01	3.98E+00		pCi/g	R1	2.7	g wet		06/08/09	5	M	+
H-3	2003	5.28E+00	1.50E+00		pCi/g	R1	2.7	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-033	Collect Start: 05/06/2009 14:10	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-35			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.51E+01	2.72E+00		pCi/g	R1	2.18	g wet		06/08/09	5	M	+
H-3	2003	<		1.49E+00	pCi/g	R1	2.18	g wet		06/09/09	5	M	U

Sample ID: FMF-29-SOIL-034	Collect Start: 05/06/2009 14:13	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-36			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.02E+01	1.79E+00		pCi/g	R1	2.58	g wet		06/08/09	5	M	+
H-3	2003	5.90E+00	1.61E+00		pCi/g	R1	2.58	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-035	Collect Start: 05/06/2009 14:15	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-37			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.75E+01	2.58E+00		pCi/g	R1	2.53	g wet		06/08/09	5	M	+
H-3	2003	3.13E+00	1.30E+00		pCi/g	R1	2.53	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-036	Collect Start: 05/06/2009 14:18	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-38			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.28E+01	3.95E+00		pCi/g	R1	2.2	g wet		06/09/09	5	M	+
H-3	2003	5.65E+00	1.75E+00		pCi/g	R1	2.2	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-037	Collect Start: 05/06/2009 14:20	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-39			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.91E+02	6.39E+00		pCi/g	R1	2.36	g wet		06/09/09	5	M	+
H-3	2003	1.06E+01	2.16E+00		pCi/g	R1	2.36	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-038	Collect Start: 05/06/2009 14:24	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-40		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.54E+01	4.46E+00		pCi/g	R1	2.5	g wet		06/09/09	5	M	+
H-3	2003	1.85E+01	2.67E+00		pCi/g	R1	2.5	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-039	Collect Start: 05/06/2009 14:28	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-41		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.02E+01	2.42E+00		pCi/g	R1	3	g wet		06/09/09	5	M	+
H-3	2003	7.35E+00	1.61E+00		pCi/g	R1	3	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-040	Collect Start: 05/06/2009 14:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-42		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.59E+02	6.18E+00		pCi/g	R2	2.48	g wet		06/12/09	5	M	+
H-3	2003	4.25E+01	4.00E+00		pCi/g	R1	2.44	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

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L38478

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-040 DUP	Collect Start: 05/06/2009 14:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-43		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.31E+02	5.67E+00		pCi/g	R2	2.44	g wet		06/12/09	5	M	+
H-3	2003	6.73E+01	5.45E+00		pCi/g	R1	2.06	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-040 MS	Collect Start: 05/06/2009 14:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-44		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.60E+03	2.12E+01		pCi/g	R2	2.08	g wet		06/12/09	5	M	+
H-3	2003	1.37E+02	7.14E+00		pCi/g	R1	2.4	g wet		06/09/09	5	M	+

Sample ID: FMF-29-SOIL-040 MSD	Collect Start: 05/06/2009 14:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/08/2009	% Moisture:
LIMS Number: L38478-45		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.56E+03	2.12E+01		pCi/g	R2	2.02	g wet		06/12/09	5	M	+
H-3	2003	1.67E+02	8.17E+00		pCi/g	R1	2.24	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/12/09 15:29

L38478

Philotechnics

PH001-3EREGMA-06

Matt Norton

Sample ID: FMF-29-SOIL-020 MSD	Collect Start: 05/06/2009 13:25	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/08/2009	% Moisture:	
LIMS Number: L38478-46			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.25E+02	8.28E+00		pCi/g	R1	2.36	g wet		06/09/09	5	M	+
H-3	2003	1.02E+02	6.05E+00		pCi/g	R1	2.5	g wet		06/09/09	5	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- **** Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

C-14

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG8063-1	C-14	WO	06/08/2009 19:32	< 4.830E+00	pCi/Total	U	P
WG8065-1	C-14	WO	06/08/2009 19:45	< 4.830E+00	pCi/Total	U	P
WG8082-1	C-14	WO	06/12/2009 11:44	< 6.600E+00	pCi/Total	U	P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG8063-2	C-14	WO	06/08/2009 19:39	5.87E+02	6.890E+02	pCi/Total	117.4	70-130	+	P
Spike ID: 14C-110295										
Spike Conc: 5.87E+03										
Spike Vol: 1.00E-01										
WG8065-2	C-14	WO	06/08/2009 19:52	5.87E+02	6.590E+02	pCi/Total	112.3	70-130	+	P
Spike ID: 14C-110295										
Spike Conc: 5.87E+03										
Spike Vol: 1.00E-01										
WG8082-2	C-14	WO	06/12/2009 11:51	5.87E+02	5.750E+02	pCi/Total	98.0	70-130	+	P
Spike ID: 14C-110295										
Spike Conc: 5.87E+03										
Spike Vol: 1.00E-01										

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

C-14

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
L38478-21R1 L38478-20R1	C-14	S	06/08/2009 22:11	5.990E+01	4.050E+01	pCi/g Wet	38.7	<50	+	P
L38478-43R2 L38478-42R2	C-14	S	06/12/2009 14:25	1.590E+02	1.310E+02	pCi/g Wet	19.3	<50	+	P
WG8082-3 L38466-1	C-14	S	06/12/2009 11:54	< 1.610E+00	< 1.670E+00	pCi/g Wet		<50	**	NE

Matrix Spike Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>			<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>Original Result</u>	<u>MS Result</u>					
L38478-22R1 L38478-20R1	C-14	S	06/08/2009 22:18	2.51E+02	5.990E+01	3.280E+02	pCi/g Wet	106.7	60-140	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											
L38478-44R2 L38478-42R2	C-14	S	06/12/2009 14:29	1.51E+03	1.590E+02	1.600E+03	pCi/g Wet	95.5	60-140	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

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Matrix Spike Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>		<u>MSD Recovery</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>MSD Result</u>						
L38478-45R2 L38478-44R2	C-14	S	06/12/2009 14:18	1.55E+03	1.560E+03	90.1	pCi/g Wet	5.7	<50	+	P
Spike ID: 14C-071905											
Spike Conc: 6.29E+04											
Spike Vol: 5.00E-02											
L38478-46R1 L38478-22R1	C-14	S	06/09/2009 00:57	2.48E+02	3.250E+02	106.9	pCi/g Wet	0.2	<50	+	P
Spike ID: 14C-110295											
Spike Conc: 5.87E+03											
Spike Vol: 1.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

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Associated Samples for

WG8063

<u>Sample #</u>	<u>Client ID</u>
L38478-1R1	FMF-29-SOIL-001
L38478-2R1	FMF-29-SOIL-002
L38478-3R1	FMF-29-SOIL-003
L38478-4R1	FMF-29-SOIL-004
L38478-5R1	FMF-29-SOIL-005
L38478-6R1	FMF-29-SOIL-006
L38478-7R1	FMF-29-SOIL-007
L38478-8R1	FMF-29-SOIL-008
L38478-9R1	FMF-29-SOIL-009
L38478-10R1	FMF-29-SOIL-010
L38478-11R1	FMF-29-SOIL-011
L38478-12R1	FMF-29-SOIL-012
L38478-13R1	FMF-29-SOIL-013
L38478-14R1	FMF-29-SOIL-014
L38478-15R1	FMF-29-SOIL-015
L38478-16R1	FMF-29-SOIL-016
L38478-17R1	FMF-29-SOIL-017
L38478-18R1	FMF-29-SOIL-018
L38478-19R1	FMF-29-SOIL-019
L38478-20R1	FMF-29-SOIL-020
L38478-21R1	FMF-29-SOIL-020 DUP
L38478-22R1	FMF-29-SOIL-020 MS
L38478-46R1	FMF-29-SOIL-020 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

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Associated Samples for

WG8065

<u>Sample #</u>	<u>Client ID</u>
L38478-23R1	FMF-29-SOIL-021
L38478-24R1	FMF-29-SOIL-022
L38478-25R1	FMF-29-SOIL-023
L38478-26R1	FMF-29-SOIL-024
L38478-27R1	FMF-29-SOIL-025
L38478-28R1	FMF-29-SOIL-026
L38478-29R1	FMF-29-SOIL-027
L38478-30R1	FMF-29-SOIL-028
L38478-31R1	FMF-29-SOIL-029
L38478-32R1	FMF-29-SOIL-030
L38478-33R1	FMF-29-SOIL-031
L38478-34R1	FMF-29-SOIL-032
L38478-35R1	FMF-29-SOIL-033
L38478-36R1	FMF-29-SOIL-034
L38478-37R1	FMF-29-SOIL-035
L38478-38R1	FMF-29-SOIL-036
L38478-39R1	FMF-29-SOIL-037
L38478-40R1	FMF-29-SOIL-038
L38478-41R1	FMF-29-SOIL-039

C-14

Associated Samples for

WG8082

<u>Sample #</u>	<u>Client ID</u>
L38478-42R2	FMF-29-SOIL-040
L38478-43R2	FMF-29-SOIL-040 DUP
L38478-44R2	FMF-29-SOIL-040 MS
L38478-45R2	FMF-29-SOIL-040 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

H-3

Method Blank Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Blank Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>P/F</u>
WG7997-1	H-3	WO	05/30/2009 02:00	< 5.220E+00	pCi/Total	U	P
WG8062-1	H-3	WO	06/09/2009 01:35	< 3.230E+00	pCi/Total	U	P
WG8064-1	H-3	WO	06/09/2009 01:51	< 3.230E+00	pCi/Total	U	P

LCS Sample Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Spike Value</u>	<u>LCS Result</u>	<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
WG7997-2	H-3	WO	05/30/2009 02:08	2.52E+02	2.930E+02	pCi/Total	116.1	70-130	+	P
Spike ID: 3H-041706-1 Spike Conc: 5.05E+02 Spike Vol: 5.00E-01										
WG8062-2	H-3	WO	06/09/2009 01:43	2.52E+02	2.680E+02	pCi/Total	106.2	70-130	+	P
Spike ID: 3H-041706-1 Spike Conc: 5.05E+02 Spike Vol: 5.00E-01										
WG8064-2	H-3	WO	06/09/2009 01:59	2.52E+02	2.570E+02	pCi/Total	101.8	70-130	+	P
Spike ID: 3H-041706-1 Spike Conc: 5.05E+02 Spike Vol: 5.00E-01										

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

H-3

Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Original Result</u>	<u>DUP Result</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
L38478-21R1 L38478-20R1	H-3	S	06/09/2009 04:51	5.830E+00	3.760E+00	pCi/g Wet		<50	*	NE
L38478-43R1 L38478-42R1	H-3	S	06/09/2009 08:18	4.250E+01	6.730E+01	pCi/g Wet	45.2	<50	+	P

Matrix Spike Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>			<u>Units</u>	<u>Spike Recovery</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>Original Result</u>	<u>MS Result</u>					
L38478-22R1 L38478-20R1	H-3	S	06/09/2009 05:00	8.42E+01	5.830E+00	9.300E+01	pCi/g Wet	103.5	60-140	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38478-44R1 L38478-42R1	H-3	S	06/09/2009 08:29	8.84E+01	4.250E+01	1.370E+02	pCi/g Wet	106.9	60-140	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

H-3

Matrix Spike Duplicate Summary

<u>TBE Sample ID</u>	<u>Radionuclide</u>	<u>Matrix</u>	<u>Count Date/Time</u>	<u>Decay Corrected</u>		<u>MSD Recovery</u>	<u>Units</u>	<u>RPD</u>	<u>Range</u>	<u>Qualifier</u>	<u>P/F</u>
				<u>Spike Value</u>	<u>MSD Result</u>						
L38478-45R1 L38478-44R1	H-3	S	06/09/2009 08:41	9.47E+01	1.670E+02	131.4	pCi/g Wet	20.6	<50	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											
L38478-46R1 L38478-22R1	H-3	S	06/09/2009 08:52	8.49E+01	1.020E+02	113.3	pCi/g Wet	9.0	<50	+	P
Spike ID: 3H-041706-1											
Spike Conc: 5.05E+02											
Spike Vol: 5.00E-01											

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

H-3

H-3

Associated Samples for

WG8062

<u>Sample #</u>	<u>Client ID</u>
L38478-1R1	FMF-29-SOIL-001
L38478-2R1	FMF-29-SOIL-002
L38478-3R1	FMF-29-SOIL-003
L38478-4R1	FMF-29-SOIL-004
L38478-5R1	FMF-29-SOIL-005
L38478-6R1	FMF-29-SOIL-006
L38478-7R1	FMF-29-SOIL-007
L38478-8R1	FMF-29-SOIL-008
L38478-9R1	FMF-29-SOIL-009
L38478-10R1	FMF-29-SOIL-010
L38478-11R1	FMF-29-SOIL-011
L38478-12R1	FMF-29-SOIL-012
L38478-13R1	FMF-29-SOIL-013
L38478-14R1	FMF-29-SOIL-014
L38478-15R1	FMF-29-SOIL-015
L38478-16R1	FMF-29-SOIL-016
L38478-17R1	FMF-29-SOIL-017
L38478-18R1	FMF-29-SOIL-018
L38478-19R1	FMF-29-SOIL-019
L38478-20R1	FMF-29-SOIL-020
L38478-21R1	FMF-29-SOIL-020 DUP
L38478-22R1	FMF-29-SOIL-020 MS
L38478-46R1	FMF-29-SOIL-020 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

QC Summary Report for L38478

PH001-3EREGMA-06

06/12/2009 16:00

H-3

H-3

Associated Samples for

WG8064

<u>Sample #</u>	<u>Client ID</u>
L38478-23R1	FMF-29-SOIL-021
L38478-24R1	FMF-29-SOIL-022
L38478-25R1	FMF-29-SOIL-023
L38478-26R1	FMF-29-SOIL-024
L38478-27R1	FMF-29-SOIL-025
L38478-28R1	FMF-29-SOIL-026
L38478-29R1	FMF-29-SOIL-027
L38478-30R1	FMF-29-SOIL-028
L38478-31R1	FMF-29-SOIL-029
L38478-32R1	FMF-29-SOIL-030
L38478-33R1	FMF-29-SOIL-031
L38478-34R1	FMF-29-SOIL-032
L38478-35R1	FMF-29-SOIL-033
L38478-36R1	FMF-29-SOIL-034
L38478-37R1	FMF-29-SOIL-035
L38478-38R1	FMF-29-SOIL-036
L38478-39R1	FMF-29-SOIL-037
L38478-40R1	FMF-29-SOIL-038
L38478-41R1	FMF-29-SOIL-039
L38478-42R1	FMF-29-SOIL-040
L38478-43R1	FMF-29-SOIL-040 DUP
L38478-44R1	FMF-29-SOIL-040 MS
L38478-45R1	FMF-29-SOIL-040 MSD

- + Positive Result
- U Compound/analyte was analyzed, peak not identified and/or not detected above MDC
- * < 5 times the MDC are not evaluated
- ** Nuclide not detected
- *** Spiking level < 5 times activity
- P Pass
- F Fail
- NE Not evaluated

BLUE COOLER (44 samples)



Analysis Request Chain of Custody

D6A

E - Environmental: X
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: 38478
 Variance Report: _____

Client name: Philotechnics, Ltd.
 Client address: 25 Mall Road
Suite 301
Burlington, Ma 01803
 Phone Number: 781-222-5047
 Fax Number: 781-229-0732
 Contact: Matthew Norton CIH, CSP

Project Number: 5614 N.B.

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time	Volume	Units	Matrix or type	Analysis Request
				Start				
	FMF-29-SOIL-001	SOIL		5/6/09 1111	601	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-002	SOIL		5/6/09 1118	619	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-003	SOIL		5/6/09 1121	440	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-004	SOIL		5/6/09 1126	537	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-005	SOIL		5/6/09 1130	562	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-006	SOIL		5/6/09 1132	489	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-007	SOIL		5/6/09 1136	354	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-008	SOIL		5/6/09 1142	544	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-009	SOIL		5/6/09 1147	427	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-010	SOIL		5/6/09 1150	359	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-011	SOIL		5/6/09 1300	375	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-012	SOIL		5/6/09 1303	461	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-013	SOIL		5/6/09 1307	426	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-014	SOIL		5/6/09 1309	568	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-015	SOIL		5/6/09 1312	411	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-016	SOIL		5/6/09 1315	455	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-017	SOIL		5/6/09 1316	427	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-018	SOIL		5/6/09 1319	335	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-019	SOIL		5/6/09 1322	298	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-020	SOIL		5/6/09 1325	457	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-020 DUP	SOIL		5/6/09 1325	292	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-020 MS/MSD	SOIL		5/6/09 1325	274	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-021	SOIL		5/6/09 1327	548	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-022	SOIL		5/6/09 1329	340	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-023	SOIL		5/6/09 1332	332	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS

Special Instructions: _____

Relinquished by: Tracee M. Clemons Date: 5/6/09 | Relinquished by: _____ Date: _____ | Relinquished by: _____ Date: _____
 Received by: Jonathan Date: 5/8/09 | Received by: _____ Date: _____ | Received by: _____ Date: _____



Analysis Request Chain of Custody

E - Environmental: X
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: _____
Variance Report: _____

Project Number: 5614 N.B.

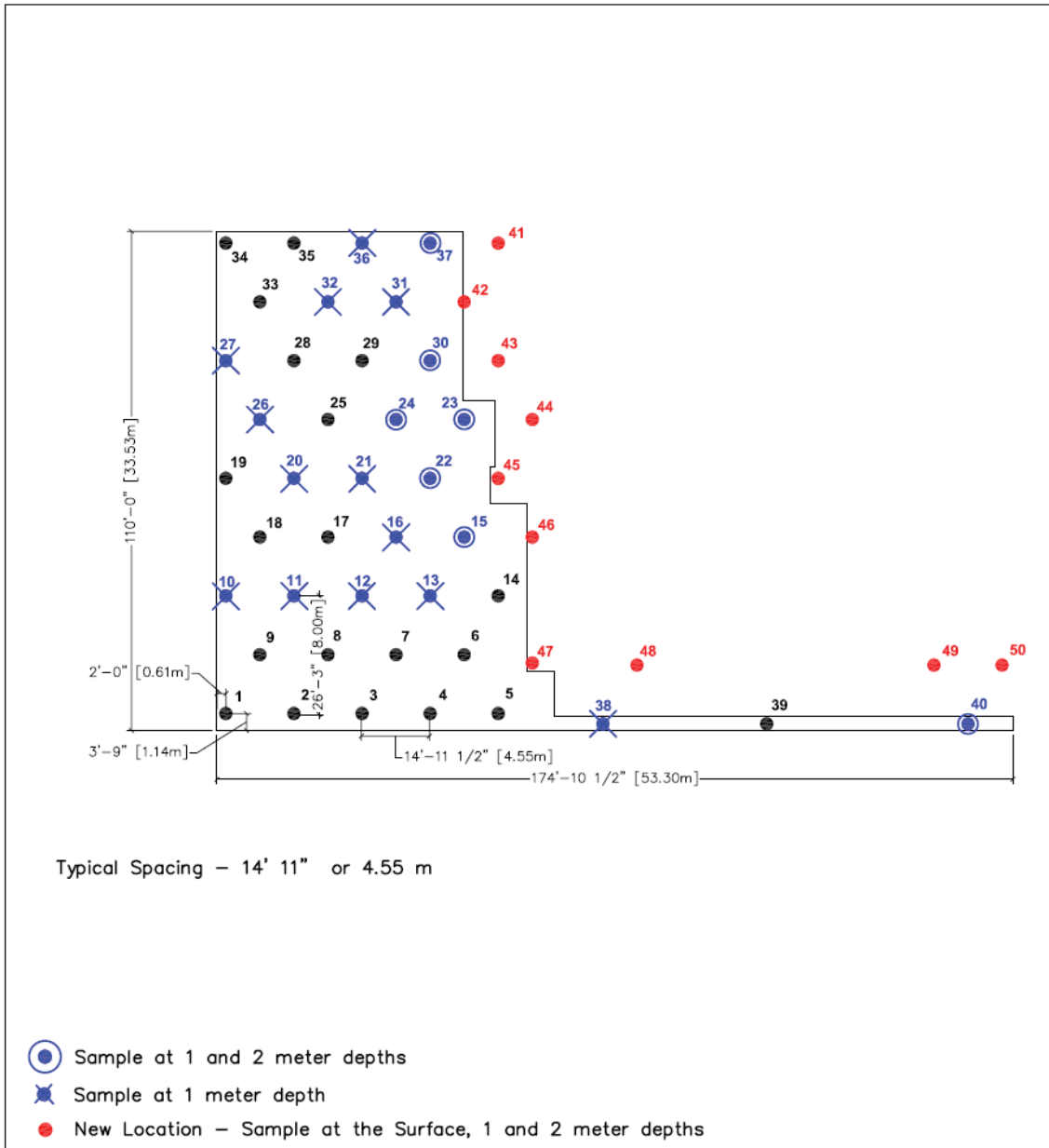
Client name: <u> Philotechnics, Ltd. </u>
Client address: <u> 25 Mall Road </u>
<u> Suite 301 </u>
<u> Burlington, Ma 01803 </u>
Phone Number: <u> 781-222-5047 </u>
Fax Number: <u> 781-229-0732 </u>
Contact: <u> Matthew Norton CIH, CSP </u>

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time	Volume	Units	Matrix or type	Analysis Request
				Start				
	FMF-29-SOIL-024	SOIL		5/6/09 1335	305	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-025	SOIL		5/6/09 1337	399	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-026	SOIL		5/6/09 1339	438	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-027	SOIL		5/6/09 1342	453	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-028	SOIL		5/6/09 1345	278	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-029	SOIL		5/6/09 1348	394	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-030	SOIL		5/6/09 1351	481	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-031	SOIL		5/6/09 1355	255	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-032	SOIL		5/6/09 1401	398	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-033	SOIL		5/6/09 1410	382	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-034	SOIL		5/6/09 1413	427	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-035	SOIL		5/6/09 1415	369	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-036	SOIL		5/6/09 1418	482	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-037	SOIL		5/6/09 1420	478	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-038	SOIL		5/6/09 1424	441	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-039	SOIL		5/6/09 1428	770	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-040	SOIL		5/6/09 1432	334	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-040 DUP	SOIL		5/6/09 1432	162	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS
	FMF-29-SOIL-040 MS/MSD	SOIL		5/6/09 1432	134	GRAMS	SOIL	H-3 AND C-14 OXIDATION ANALYSIS

Special Instructions: _____

Relinquished by: <u> Terence M. Clemens </u>	Date: <u> 5/6/09 </u>	Relinquished by: _____	Date: _____	Relinquished by: _____	Date: _____
Received by: <u> Jonathan </u>	Date: <u> 5/8/09 </u>	Received by: _____	Date: _____	Received by: _____	Date: _____

Attachment A Survey Unit Overview Maps



SURVEY MAP		
BUILDING: Sigma	SURVEY UNIT NUMBER: 029	PAGE OF
SURVEY TYPE (CHECK ONE): <input type="checkbox"/> Characterization Survey <input checked="" type="checkbox"/> Final Status Survey		
COMMENTS: _____ _____		
SURVEY COMPLETED BY:		DATE COMPLETED:
RADIOLOGICAL CONTROLS SUPERVISOR REVIEW:		DATE:

Sample Results Analysis

Survey Unit **FMF-029**

Phase II Additional Sampling

Sample ID: FMF-029-SOIL-010-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	3.55	0.891	
H-3	2.39	0.901	

Sample ID: FMF-029-SOIL-011-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	17.2	1.27	
C-14	2	0.869	

Sample ID: FMF-029-SOIL-012-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.51
H-3	4.19	1.22	

Sample ID: FMF-029-SOIL-013-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	4.38	1.11	
C-14	<		1.11

Sample ID: FMF-029-SOIL-015-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	4.14	1.09	
H-3	1.61	0.935	

Sample ID: FMF-029-SOIL-016-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.32
C-14	1.86	0.857	

Sample ID: FMF-029-SOIL-015--2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	17.5	3.73	
H-3	3.52	1.22	

Sample ID: FMF-029-SOIL-020-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.45
H-3	<		1.02

Sample ID: FMF-029-SOIL-021-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.86	0.925	
C-14	1.75	0.839	

Sample ID: FMF-029-SOIL-022-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	59.9	2.28	
H-3	3.06	1.14	

Sample ID: FMF-029-SOIL-023-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	38.2	1.8	
C-14	2.23	0.966	

Sample ID: FMF-029-SOIL-022-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	6.07	0.956	
H-3	<		0.876

Sample ID: FMF-029-SOIL-023-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.75	1.18	
C-14	<		1.04

Sample Results Analysis

Survey Unit FMF-029

Sample ID: FMF-029-SOIL-024-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	8.75	0.887	
H-3	<		0.946

Sample ID: FMF-029-SOIL-024-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	1.85	0.992	
H-3	<		1.07

Sample ID: FMF-029-SOIL-027-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	25.2	1.33	
H-3	2.21	0.871	

Sample ID: FMF-029-SOIL-031-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	6.31	0.99	
H-3	1.99	0.863	

Sample ID: FMF-029-SOIL-036-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.59
H-3	<		1.12

Sample ID: FMF-029-SOIL-038-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	3.01	0.954	
H-3	2.33	0.957	

Phase II Additional Sampling

Sample ID: FMF-029-SOIL-026-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.71	1.18	
C-14	1.54	0.874	

Sample ID: FMF-029-SOIL-030-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.74	1.15	
C-14	1.74	0.876	

Sample ID: FMF-029-SOIL-030-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.78	1.06	
C-14	1.56	0.847	

Sample ID: FMF-029-SOIL-032-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.59
C-14	<		1.12

Sample ID: FMF-029-SOIL-037-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.94	0.985	
C-14	1.72	0.902	

Sample ID: FMF-029-SOIL-037-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.44	0.938	
C-14	<		0.985

Sample ID: FMF-029-SOIL-040-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	120	2.71	
C-14	3.32	1	

Sample ID: FMF-029-SOIL-040-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	27.5	1.58	
C-14	3.61	1.12	

Sample Results Analysis

Survey Unit FMF-029

Phase II Additional Sampling

Sample ID: FMF-029-SOIL-041- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.65
H-3	<		1.16
Sample ID: FMF-029-SOIL-041-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.56
H-3	2.48	1.05	
Sample ID: FMF-029-SOIL-041-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	2.32	0.979	
H-3	1.64	0.902	

Sample ID: FMF-029-SOIL-042- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	17.5	1.34	
C-14	3.13	1.08	
Sample ID: FMF-029-SOIL-042-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	8.39	1.11	
C-14	1.71	0.867	
Sample ID: FMF-029-SOIL-042-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	1.33	0.806	
C-14	1.33	0.754	

Sample ID: FMF-029-SOIL-043- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	7.61	1.27	
H-3	<		1.18
Sample ID: FMF-029-SOIL-043-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.57
H-3	<		1.1
Sample ID: FMF-029-SOIL-043-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	5.8	1.1	
H-3	<		1.04

Sample ID: FMF-029-SOIL-044- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	43.2	1.98	
C-14	<		1.09
Sample ID: FMF-029-SOIL-044-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	31.7	1.49	
C-14	<		0.839
Sample ID: FMF-029-SOIL-044-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	1.96	0.895	
C-14	<		0.954

Sample ID: FMF-029-SOIL-045- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	129	26	
H-3	10.5	1.75	
Sample ID: FMF-029-SOIL-045-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	Refusal		
H-3			
Sample ID: FMF-029-SOIL-045-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	Refusal		
H-3			

Sample ID: FMF-029-SOIL-046- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	36.6	1.8	
C-14	<		1.04
Sample ID: FMF-029-SOIL-046-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	11.8	1.32	
C-14	<		1.1
Sample ID: FMF-029-SOIL-046-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	1.8	0.764	
C-14	<		0.846

Sample Results Analysis

Survey Unit

FMF-029

Phase II Additional Sampling

Sample ID: FMF-029-SOIL-047- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	12.1	1.36	
H-3	<		1.19

Sample ID: FMF-029-SOIL-047-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	26.5	1.42	
H-3	<		0.902

Sample ID: FMF-029-SOIL-047-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	30.8	1.71	
H-3	6.92	1.5	

Sample ID: FMF-029-SOIL-048- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	71.8	2.41	
C-14	2.27	1.01	

Sample ID: FMF-029-SOIL-048-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	96.9	2.78	
C-14	3.6	1.19	

Sample ID: FMF-029-SOIL-048-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	Refusal		
C-14			

Sample ID: FMF-029-SOIL-049- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	38.4	1.71	
H-3	13	1.82	

Sample ID: FMF-029-SOIL-049-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	987	19.9	
H-3	11.6	1.89	

Sample ID: FMF-029-SOIL-049-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	109	2.69	
H-3	4.51	1.19	

Sample ID: FMF-029-SOIL-050- .2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	122	3.05	
C-14	<		1.13

Sample ID: FMF-029-SOIL-050-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.35	1.16	
C-14	<		1.18

Sample ID: FMF-029-SOIL-050-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	14.6	1.4	
C-14	<		1.17



Glen Marshall, CHP
Philotechnics
201 Renovare Blvd

Oak Ridge, TN 37831-4489

Report of Analysis/Certificate of Conformance

12/22/2009

LIMS #: L40471
Project ID#: PH001-3EREGGM-06
Received: 11/10/2009
Delivery Date: 12/10/2009
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-10-1	L40471-1	
FMF-29-11-1	L40471-2	
FMF-29-12-1	L40471-3	
FMF-29-13-1	L40471-4	
FMF-29-16-1	L40471-5	
FMF-29-20-1	L40471-6	
FMF-29-21-1	L40471-7	
FMF-29-26-1	L40471-8	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-27-1	L40471-9	
FMF-29-31-1	L40471-10	
FMF-29-32-1	L40471-11	
FMF-29-36-1	L40471-12	
FMF-29-38-1	L40471-13	
FMF-29-15-1	L40471-14	
FMF-29-15-2	L40471-15	
FMF-29-22-1	L40471-16	
FMF-29-22-2	L40471-17	
FMF-29-23-1	L40471-18	
FMF-29-23-2	L40471-19	
FMF-29-24-1	L40471-20	
FMF-29-24-2	L40471-21	
FMF-29-30-1	L40471-22	
FMF-29-30-2	L40471-23	
FMF-29-37-1	L40471-24	
FMF-29-37-2	L40471-25	
FMF-29-40-1	L40471-26	
FMF-29-40-2	L40471-27	
FMF-29-41-1	L40471-28	
FMF-29-41-2	L40471-29	
FMF-29-41-.2	L40471-30	
FMF-29-48-.2	L40471-31	
FMF-29-48-1	L40471-32	
FMF-29-44-.2	L40471-33	
FMF-29-44-1	L40471-34	
FMF-29-44-2	L40471-35	
FMF-29-43-.2	L40471-36	
FMF-29-43-1	L40471-37	
FMF-29-43-2	L40471-38	
FMF-29-45-.2	L40471-39	

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Report of Analysis

12/22/09 12:51

L40471

Philotechnics

PH001-3EREGGM-06

Sample ID: FMF-29-10-1	Collect Start: 11/04/2009 12:13	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-1		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.55E+00	8.91E-01		pCi/g		2.66	g wet		12/21/09	15	M	+
H-3	2003	2.39E+00	9.01E-01		pCi/g		2.66	g wet		12/22/09	7	M	+

Sample ID: FMF-29-11-1	Collect Start: 11/04/2009 12:40	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-2		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.72E+01	1.27E+00		pCi/g		2.59	g wet		12/21/09	15	M	+
H-3	2003	2.00E+00	8.69E-01		pCi/g		2.59	g wet		12/22/09	7	M	+

Sample ID: FMF-29-12-1	Collect Start: 11/04/2009 02:25	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-3		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.51E+00	pCi/g		2.24	g wet		12/21/09	15	M	U
H-3	2003	4.19E+00	1.22E+00		pCi/g		2.24	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected, Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 12:51

L40471

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-13-1	Collect Start: 11/04/2009 02:15	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-4			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.38E+00	1.11E+00		pCi/g		2.13	g wet		12/21/09	15	M	+
H-3	2003	<		1.11E+00	pCi/g		2.13	g wet		12/22/09	7	M	U

Sample ID: FMF-29-16-1	Collect Start: 11/04/2009 02:05	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-5			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.32E+00	pCi/g		2.56	g wet		12/21/09	15	M	U
H-3	2003	1.86E+00	8.57E-01		pCi/g		2.56	g wet		12/22/09	7	M	+

Sample ID: FMF-29-20-1	Collect Start: 11/04/2009 15:22	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-6			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.45E+00	pCi/g		2.33	g wet		12/21/09	15	M	U
H-3	2003	<		1.02E+00	pCi/g		2.33	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 12:51

L40471

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-21-1	Collect Start: 11/04/2009 15:29	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-7		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.86E+00	9.25E-01		pCi/g		2.58	g wet		12/21/09	15	M	+
H-3	2003	1.75E+00	8.39E-01		pCi/g		2.58	g wet		12/22/09	7	M	+

Sample ID: FMF-29-26-1	Collect Start: 11/04/2009 15:38	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-8		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.71E+00	1.18E+00		pCi/g		2.33	g wet		12/21/09	15	M	+
H-3	2003	1.54E+00	8.74E-01		pCi/g		2.33	g wet		12/22/09	7	M	+

Sample ID: FMF-29-27-1	Collect Start: 11/04/2009 15:46	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-9		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.52E+01	1.33E+00		pCi/g		2.96	g wet		12/21/09	15	M	+
H-3	2003	2.21E+00	8.17E-01		pCi/g		2.96	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 12:51

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PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-31-1	Collect Start: 11/04/2009 15:58	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.31E+00	9.90E-01		pCi/g		2.61	g wet		12/21/09	15	M	+
H-3	2003	1.99E+00	8.63E-01		pCi/g		2.61	g wet		12/22/09	7	M	+

Sample ID: FMF-29-32-1	Collect Start: 11/04/2009 16:10	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.59E+00	pCi/g		2.12	g wet		12/21/09	15	M	U
H-3	2003	<		1.12E+00	pCi/g		2.12	g wet		12/22/09	7	M	U

Sample ID: FMF-29-36-1	Collect Start: 11/04/2009 16:32	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.59E+00	pCi/g		2.12	g wet		12/21/09	15	M	U
H-3	2003	<		1.12E+00	pCi/g		2.12	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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Report of Analysis

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Glen Marshall, CHP

Sample ID: FMF-29-38-1	Collect Start: 11/05/2009 07:39	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-13			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.01E+00	9.54E-01		pCi/g		2.41	g wet		12/21/09	15	M	+
H-3	2003	2.33E+00	9.57E-01		pCi/g		2.41	g wet		12/22/09	7	M	+

Sample ID: FMF-29-15-1	Collect Start: 11/05/2009 07:55	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-14			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.14E+00	1.09E+00		pCi/g		2.16	g wet		12/21/09	15	M	+
H-3	2003	1.61E+00	9.35E-01		pCi/g		2.16	g wet		12/22/09	7	M	+

Sample ID: FMF-29-15-2	Collect Start: 11/05/2009 08:40	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-15			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.75E+02	3.73E+00		pCi/g		2.05	g wet		12/21/09	15	M	+
H-3	2003	3.52E+00	1.22E+00		pCi/g		2.05	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

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Sample ID: FMF-29-22-1	Collect Start: 11/05/2009 09:35	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-16		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.99E+01	2.28E+00		pCi/g		2.12	g wet		12/21/09	15	M	+
H-3	2003	3.06E+00	1.14E+00		pCi/g		2.12	g wet		12/22/09	7	M	+

Sample ID: FMF-29-22-2	Collect Start: 11/05/2009 10:03	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-17		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.07E+00	9.56E-01		pCi/g		2.7	g wet		12/22/09	15	M	+
H-3	2003	<		8.76E-01	pCi/g		2.7	g wet		12/22/09	7	M	U

Sample ID: FMF-29-23-1	Collect Start: 11/05/2009 10:18	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-18		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.82E+01	1.80E+00		pCi/g		2.33	g wet		12/22/09	15	M	+
H-3	2003	2.23E+00	9.66E-01		pCi/g		2.33	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

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Glen Marshall, CHP

Sample ID: FMF-29-23-2	Collect Start: 11/05/2009 10:40	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-19			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	8.75E+00	1.18E+00		pCi/g		2.28	g wet		12/22/09	15	M	+
H-3	2003	<		1.04E+00	pCi/g		2.28	g wet		12/22/09	7	M	U

Sample ID: FMF-29-24-1	Collect Start: 11/05/2009 11:10	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-20			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.92E+00	8.87E-01		pCi/g		2.5	g wet		12/22/09	15	M	+
H-3	2003	<		9.46E-01	pCi/g		2.5	g wet		12/22/09	7	M	U

Sample ID: FMF-29-24-2	Collect Start: 11/05/2009 11:38	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-21			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.85E+00	9.92E-01		pCi/g		2.21	g wet		12/22/09	15	M	+
H-3	2003	<		1.07E+00	pCi/g		2.21	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

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PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-30-1	Collect Start: 11/05/2009 11:54	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-22			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.74E+00	1.15E+00		pCi/g		2.42	g wet		12/22/09	15	M	+
H-3	2003	1.74E+00	8.76E-01		pCi/g		2.42	g wet		12/22/09	7	M	+

Sample ID: FMF-29-30-2	Collect Start: 11/05/2009 12:20	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-23			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.78E+00	1.06E+00		pCi/g		2.44	g wet		12/22/09	15	M	+
H-3	2003	1.56E+00	8.47E-01		pCi/g		2.44	g wet		12/22/09	7	M	+

Sample ID: FMF-29-37-1	Collect Start: 11/05/2009 13:15	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-24			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.94E+00	9.85E-01		pCi/g		2.32	g wet		12/22/09	15	M	+
H-3	2003	1.72E+00	9.02E-01		pCi/g		2.32	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected, Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 12:51

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PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-37-2	Collect Start: 11/05/2009 13:30	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-25		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.44E+00	9.38E-01		pCi/g		2.4	g wet		12/22/09	15	M	+
H-3	2003	<		9.85E-01	pCi/g		2.4	g wet		12/22/09	7	M	U

Sample ID: FMF-29-40-1	Collect Start: 11/05/2009 15:15	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-26		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.20E+02	2.71E+00		pCi/g		2.67	g wet		12/22/09	15	M	+
H-3	2003	3.32E+00	1.00E+00		pCi/g		2.67	g wet		12/22/09	7	M	+

Sample ID: FMF-29-40-2	Collect Start: 11/05/2009 15:34	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40471-27		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.75E+01	1.58E+00		pCi/g		2.37	g wet		12/22/09	15	M	+
H-3	2003	3.61E+00	1.12E+00		pCi/g		2.37	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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Report of Analysis

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PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-41-1		Collect Start: 11/05/2009 14:02				Matrix: Soil (S)							
Station:		Collect Stop:				Volume:							
Description:		Receive Date: 11/10/2009				% Moisture:							
LIMS Number: L40471-28													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.56E+00	pCi/g		2.16	g wet		12/22/09	15	M	U
H-3	2003	2.48E+00	1.05E+00		pCi/g		2.16	g wet		12/22/09	7	M	+
Sample ID: FMF-29-41-2		Collect Start: 11/05/2009 14:16				Matrix: Soil (S)							
Station:		Collect Stop:				Volume:							
Description:		Receive Date: 11/10/2009				% Moisture:							
LIMS Number: L40471-29													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.32E+00	9.79E-01		pCi/g		2.28	g wet		12/22/09	15	M	+
H-3	2003	1.64E+00	9.02E-01		pCi/g		2.28	g wet		12/22/09	7	M	+
Sample ID: FMF-29-41-2		Collect Start: 11/05/2009 13:41				Matrix: Soil (S)							
Station:		Collect Stop:				Volume:							
Description:		Receive Date: 11/10/2009				% Moisture:							
LIMS Number: L40471-30													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.65E+00	pCi/g		2.04	g wet		12/22/09	15	M	U
H-3	2003	<		1.16E+00	pCi/g		2.04	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

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Glen Marshall, CHP

Sample ID: FMF-29-48-2	Collect Start: 11/05/2009 11:26	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-31			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.18E+01	2.41E+00		pCi/g		2.2	g wet		12/22/09	15	M	+
H-3	2003	2.27E+00	1.01E+00		pCi/g		2.2	g wet		12/22/09	7	M	+

Sample ID: FMF-29-48-1	Collect Start: 11/05/2009 06:10	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-32			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.69E+01	2.78E+00		pCi/g		2.15	g wet		12/22/09	15	M	+
H-3	2003	3.60E+00	1.19E+00		pCi/g		2.15	g wet		12/22/09	7	M	+

Sample ID: FMF-29-44-2	Collect Start: 11/05/2009 16:05	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-33			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.32E+01	1.98E+00		pCi/g		2.16	g wet		12/22/09	15	M	+
H-3	2003	<		1.09E+00	pCi/g		2.16	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

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PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-44-1	Collect Start: 11/05/2009 16:15	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-34			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.17E+01	1.49E+00		pCi/g		2.82	g wet		12/22/09	15	M	+
H-3	2003	<		8.39E-01	pCi/g		2.82	g wet		12/22/09	7	M	U

Sample ID: FMF-29-44-2	Collect Start: 11/05/2009 16:20	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-35			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.96E+00	8.95E-01		pCi/g		2.48	g wet		12/22/09	15	M	+
H-3	2003	<		9.54E-01	pCi/g		2.48	g wet		12/22/09	7	M	U

Sample ID: FMF-29-43-2	Collect Start: 11/05/2009 14:20	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-36			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.61E+00	1.27E+00		pCi/g		2.01	g wet		12/22/09	15	M	+
H-3	2003	<		1.18E+00	pCi/g		2.01	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 12:51

L40471

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-43-1	Collect Start: 11/05/2009 14:37	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-37			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.57E+00	pCi/g		2.15	g wet		12/22/09	15	M	U
H-3	2003	<		1.10E+00	pCi/g		2.15	g wet		12/22/09	7	M	U

Sample ID: FMF-29-43-2	Collect Start: 11/05/2009 14:47	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-38			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.80E+00	1.10E+00		pCi/g		2.27	g wet		12/22/09	15	M	+
H-3	2003	<		1.04E+00	pCi/g		2.27	g wet		12/22/09	7	M	U

Sample ID: FMF-29-45-2	Collect Start: 11/05/2009 14:53	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40471-39			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.29E+03	2.60E+01		pCi/g		2.27	g wet		12/22/09	1.92	M	+
H-3	2003	1.05E+01	1.75E+00		pCi/g		2.27	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration



Analysis Request Chain of Custody

L 40471
E3A

E - Environmental: _____
P - 10CFR61, 10CFR50, Other high level: _____
Turn-around-time 30 days
Purchase order: _____

LIMS #: _____
Variance Report: _____
(for lab use)

Client name: **Philotechnics**
Client address: **201 Renovare Blvd**
Oak Ridge, TN 37830
Phone Number **865-285-3018**
Fax Number: **865-220-0686**
Contact: **Glenn Marshall**

Project Number: _____

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time		Volume	Units	Matrix or type	Analysis Request
				Start	Stop				
	FME-29-10-1 ✓			11/4/09	12:13	500g	grams	SO:6	14C and 3H Oxidation analysis
	FME-29-11-1 ✓				12:40	500g	grams		
	FME-29-12-1 ✓				2:25				
*	FME-29-13-1 ✓			2:58	2:15 *				
*	FME-29-16-1 ✓			1:50	2:05 *				
	FME-29-20-1 ✓				15:22				
	FME-29-21-1 ✓				15:29				
	FME-29-26-1 ✓				15:38				
	FME-29-27-1 ✓				15:46				
	FME-29-31-1 ✓				15:58				
	FME-29-32-1 ✓				16:10				
	FME-29-36-1 ✓				16:32				
*	FME-29-38-1 ✓			11/5/09 1:10	7:39 *				
	FME-29-15-1 ✓				2:55				
	FME-29-19-2 ✓				2:40				
	FME-29-22-1 ✓				2:00				
	FME-29-22-2 ✓				10:03				
	FME-29-23-1 ✓				10:18				

Special Instructions: _____

Relinquished by: <u>[Signature]</u>	Date: <u>11/6/09</u>	Relinquished by: <u>[Signature]</u>	Date: <u>11/10/09</u>	Relinquished by: _____	Date: _____
Received by: _____	Date: _____	Received by: <u>[Signature]</u>	Date: <u>11/17/09</u>	Received by: _____	Date: _____

11/17/09
JMS
10:00



Analysis Request Chain of Custody

E - Environmental: _____
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time 30 days
 Purchase order: _____

LIMS #: _____
Variance Report: _____ (for lab use)

Project Number: _____

Client name: Philotechnics
Client address: 201 Renovare Blvd Oak Ridge, TN 37830
Phone Number 865-285-3018
Fax Number: 865-220-0686
Contact: Glenn Marshall

T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time		Volume	Units	Matrix or type	Analysis Request
				Start	Stop				
	FME-29-23-2 ✓			11/5/09	10:40	500	grams	Soil	¹⁴ C and ³ H Radiation Analyzers
	FME-29-24-1 ✓				11:10				
	FME-29-24-2 ✓				11:30				
*	FME-29-30-1 ✓			11:59	11:54 *				
	FME-29-30-2 ✓				12:20 *				
	FME-29-37-1 ✓				13:15				
	FME-29-37-2 ✓				13:30				
	FME-29-40-1 ✓				15:15				
	FME-29-40-2 ✓				15:34				
	FME-29-41-1 ✓				14:02				
	FME-29-41-2 ✓				14:16				
	FME-29-41-02 ✓				13:41				
	FME-29-48-02 ✓				11:28				
	FME-29-48-1 ✓				6:10 pm				
	FME-29-44-02 ✓				16:05				
	FME-29-44-02 ✓				16:15				
	FME-29-44-2 ✓				16:20				
	FME-29-43-02 ✓				14:20				

Special Instructions: _____

Relinquished by:	Date: <u>11/6/09</u>	Relinquished by:	Date: <u>11/10/09</u>	Relinquished by: _____	Date: _____
Received by:	Date: _____	Received by:	Date: <u>11/10/09</u>	Received by: _____	Date: _____

10:00

11/18/09 10:31

Teledyne Brown Engineering
Sample Receipt Verification/Variance Report

SR #: SR22352

Client: Philotechnics

Project #: PH001-3EREGGM-06

LIMS #: L40471

Initiated By: JSIMMONS

Init Date: 11/18/09

Receive Date: 11/18/09

Notification of Variance

Person Notified:

Contacted By:

Notify Date:

Notify Method:

Notify Comment:

Client Response

Person Responding:

Response Date:

Response Method:

Response Comment

Criteria	Yes	No	NA	Comment
1 Shipping container custody seals present and intact.			NA	
2 Sample container custody seals present and intact.			NA	
3 Sample containers received in good condition		Y		
4 Chain of custody received with samples		Y		
5 All samples listed on chain of custody received		Y		
6 Sample container labels present and legible.			N	Sample ID's were present but some were very difficult to read.
7 Information on container labels correspond with chain of custody			N	
30-1				Time on coc says 11:54 but 11:59 on sample
16-1				Time on coc says 2:05 but 1:50 on sample
13-1				Time on coc says 2:15 but 2:58 on sample
38-1				Time on coc says 7:39 but 7:40 on sample
8 Sample(s) properly preserved and in appropriate container(s)			NA	
9 Other (Describe)			NA	

use coc - per Matt Norton 12/21/09 2 pit/g MAR



Glen Marshall, CHP
Philotechnics
201 Renovare Blvd

Oak Ridge, TN 37831-4489

Report of Analysis/Certificate of Conformance

12/22/2009

LIMS #: L40441
Project ID#: PH001-3EREGGM-06
Received: 11/10/2009
Delivery Date: 12/10/2009
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-42-.2	L40441-1	FMF-29-42-.2
FMF-29-42-1	L40441-2	FMF-29-42-1
FMF-29-42-2	L40441-3	FMF-29-42-2
FMF-29-46-.2	L40441-4	FMF-29-46-.2
FMF-29-46-1	L40441-5	FMF-29-46-1
FMF-29-46-2	L40441-6	FMF-29-46-2
FMF-29-47-.2	L40441-7	FMF-29-47-.2
FMF-29-47-1	L40441-8	FMF-29-47-1



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-29-47-2	L40441-9	FMF-29-47-2
FMF-29-49-.2	L40441-10	FMF-29-49-.2
FMF-29-49-1	L40441-11	FMF-29-49-1
FMF-29-49-2	L40441-12	FMF-29-49-2
FMF-29-50-.2	L40441-13	FMF-29-50-.2
FMF-29-50-1	L40441-14	FMF-29-50-1
FMF-29-50-2	L40441-15	FMF-29-50-2

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Report of Analysis

12/22/09 14:54

L40441

Philotechnics

PH001-3EREGGM-06

Sample ID: FMF-29-42-.2	Collect Start: 11/05/2009 15:40	Matrix: Soil	(S)
Station: FMF-29-42-.2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-1			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.75E+01	1.34E+00		pCi/g		2.31	g wet		12/22/09	15	M	+
H-3	2003	3.13E+00	1.08E+00		pCi/g		2.31	g wet		12/22/09	7	M	+

Sample ID: FMF-29-42-1	Collect Start: 11/05/2009 15:56	Matrix: Soil	(S)
Station: FMF-29-42-1	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-2			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	8.39E+00	1.11E+00		pCi/g		2.44	g wet		12/22/09	15	M	+
H-3	2003	1.71E+00	8.67E-01		pCi/g		2.44	g wet		12/22/09	7	M	+

Sample ID: FMF-29-42-2	Collect Start: 11/05/2009 16:03	Matrix: Soil	(S)
Station: FMF-29-42-2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-3			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.33E+00	8.06E-01		pCi/g		2.7	g wet		12/22/09	15	M	+
H-3	2003	1.33E+00	7.54E-01		pCi/g		2.7	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 14:54

L40441

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-46-2	Collect Start: 11/05/2009 16:26	Matrix: Soil (S)
Station: FMF-29-46-2	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-4		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.66E+01	1.80E+00		pCi/g		2.27	g wet		12/22/09	15	M	+
H-3	2003	<		1.04E+00	pCi/g		2.27	g wet		12/22/09	7	M	U

Sample ID: FMF-29-46-1	Collect Start: 11/05/2009 16:36	Matrix: Soil (S)
Station: FMF-29-46-1	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-5		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.18E+01	1.32E+00		pCi/g		2.15	g wet		12/22/09	15	M	+
H-3	2003	<		1.10E+00	pCi/g		2.15	g wet		12/22/09	7	M	U

Sample ID: FMF-29-46-2	Collect Start: 11/05/2009 17:35	Matrix: Soil (S)
Station: FMF-29-46-2	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-6		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.80E+00	7.64E-01		pCi/g		2.92	g wet		12/22/09	15	M	+
H-3	2003	<		8.46E-01	pCi/g		2.92	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 14:54

L40441

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-47-2	Collect Start: 11/05/2009 17:36	Matrix: Soil (S)
Station: FMF-29-47-.2	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-7		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.21E+01	1.36E+00		pCi/g		2.08	g wet		12/22/09	15	M	+
H-3	2003	<		1.19E+00	pCi/g		2.08	g wet		12/22/09	7	M	U

Sample ID: FMF-29-47-1	Collect Start: 11/05/2009 17:45	Matrix: Soil (S)
Station: FMF-29-47-1	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-8		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.65E+01	1.42E+00		pCi/g		2.74	g wet		12/22/09	15	M	+
H-3	2003	<		9.02E-01	pCi/g		2.74	g wet		12/22/09	7	M	U

Sample ID: FMF-29-47-2	Collect Start: 11/05/2009 17:55	Matrix: Soil (S)
Station: FMF-29-47-2	Collect Stop:	Volume:
Description:	Receive Date: 11/10/2009	% Moisture:
LIMS Number: L40441-9		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.08E+01	1.71E+00		pCi/g		2.23	g wet		12/22/09	15	M	+
H-3	2003	6.92E+00	1.50E+00		pCi/g		2.23	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 14:54

L40441

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-49-2	Collect Start: 11/05/2009 18:01	Matrix: Soil	(S)
Station: FMF-29-49-.2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-10			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.84E+01	1.71E+00		pCi/g		2.55	g wet		12/22/09	15	M	+
H-3	2003	1.30E+01	1.82E+00		pCi/g		2.55	g wet		12/22/09	7	M	+

Sample ID: FMF-29-49-1	Collect Start: 11/05/2009 18:10	Matrix: Soil	(S)
Station: FMF-29-49-1	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-11			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.87E+02	1.99E+01		pCi/g		2.16	g wet		12/22/09	2.64	M	+
H-3	2003	1.16E+01	1.89E+00		pCi/g		2.16	g wet		12/22/09	7	M	+

Sample ID: FMF-29-49-2	Collect Start: 11/05/2009 18:20	Matrix: Soil	(S)
Station: FMF-29-49-2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-12			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.09E+02	2.69E+00		pCi/g		2.5	g wet		12/22/09	15	M	+
H-3	2003	4.51E+00	1.19E+00		pCi/g		2.5	g wet		12/22/09	7	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

12/22/09 14:54

L40441

Philotechnics

PH001-3EREGGM-06

Glen Marshall, CHP

Sample ID: FMF-29-50-2	Collect Start: 11/05/2009 18:25	Matrix: Soil	(S)
Station: FMF-29-50-.2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-13			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.22E+02	3.05E+00		pCi/g		2.19	g wet		12/22/09	15	M	+
H-3	2003	<		1.13E+00	pCi/g		2.19	g wet		12/22/09	7	M	U

Sample ID: FMF-29-50-1	Collect Start: 11/05/2009 18:35	Matrix: Soil	(S)
Station: FMF-29-50-1	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-14			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.35E+00	1.16E+00		pCi/g		2.09	g wet		12/22/09	15	M	+
H-3	2003	<		1.18E+00	pCi/g		2.09	g wet		12/22/09	7	M	U

Sample ID: FMF-29-50-2	Collect Start: 11/05/2009 18:45	Matrix: Soil	(S)
Station: FMF-29-50-2	Collect Stop:	Volume:	
Description:	Receive Date: 11/10/2009	% Moisture:	
LIMS Number: L40441-15			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.46E+01	1.40E+00		pCi/g		2.12	g wet		12/22/09	15	M	+
H-3	2003	<		1.17E+00	pCi/g		2.12	g wet		12/22/09	7	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration



Analysis Request Chain of Custody

L 40441
E3A

E - Environmental: _____
 P - 10CFR61, 10CFR50, Other high level: _____
 Turn-around-time: 30 days
 Purchase order: _____

LIMS #: _____
 Variance Report: _____
 (for lab use)

Project Number: _____

Client name: **Philotechnics**
 Client address: **201 Renovare Blvd**
Oak Ridge, TN 37830
 Phone Number **865-285-3018**
 Fax Number: **865-220-0686**
 Contact: **Glenn Marshall**

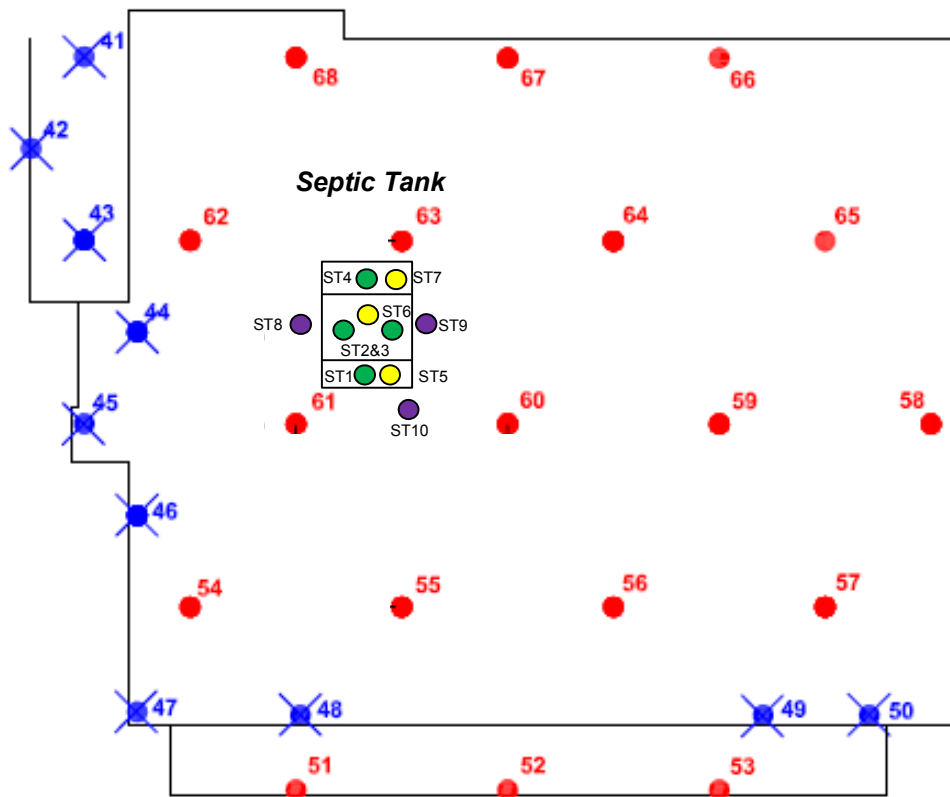
T.I. Number (for lab use)	Client Sample ID	Description	Station	Collection Date/Time		Volume	Units	Matrix or type	Analysis Request
				Start	Stop				
	FME-29-42-.2			11/5/09	1540 ✓	500	GRAMS	SOIL	¹⁴ C and ³ H Oxidation Analysis
	FME-29-42-1				1556 ✓				
	FME-29-42-2				1603 ✓				
	FME-29-46-.2				1626 ✓				
	FME-29-46-1			*	1636 ✓				
	FME-29-46-2				1735 ✓				
	FME-29-47-.2				1736 ✓				
	FME-29-47-1				1745 ✓				
	FME-29-47-2				1755 ✓				
	FME-29-49-.2				1801 ✓				
	FME-29-49-1				1810 ✓				
	FME-29-49-2				1820 ✓				
	FME-29-50-.2				1825 ✓				
	FME-29-50-1				1835 ✓				
	FME-29-50-2				1845 ✓				

Special Instructions: _____

Relinquished by: Date: 11/6/09 Relinquished by: Date: 11/10/09 Relinquished by: _____ Date: _____
 Received by: _____ Date: _____ Received by: _____ Date: _____

10:00

C-14 Rad
H-3 Rad



Typical Spacing – 29' 10" or 9.10 m

- ✕ Previous Sampling Location
- New Location – Sample at the Surface, 1 and 2 meter depths
- New Location – Sludge Sample
- New Location – Liquid Sample
- New Location – Judgmental Sample

Sample Results Analysis

Survey Unit **FMF-029**

Phase III Additional Sampling

Sample ID: FMF-029-SOIL-051-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	95	2.87	
H-3	4.42	1.32	
Sample ID: FMF-029-SOIL-051-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	145	3.67	
H-3	4.48	1.42	
Sample ID: FMF-029-SOIL-051-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	74.3	2.98	
H-3	<		2.23

Sample ID: FMF-029-SOIL-052-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	11.5	1.44	
C-14	<		2.09
Sample ID: FMF-029-SOIL-052-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	18.6	1.64	
C-14	<		2.04
Sample ID: FMF-029-SOIL-052-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.77	1.23	
C-14	<		2.09

Sample ID: FMF-029-SOIL-053-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	25.3	1.9	
H-3	<		2.18
Sample ID: FMF-029-SOIL-053-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	5.43	1.28	
H-3	<		2.23
Sample ID: FMF-029-SOIL-053-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	12.6	1.36	
H-3	<		1.87

Sample ID: FMF-029-SOIL-054-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	35.2	2.05	
C-14	<		2.01
Sample ID: FMF-029-SOIL-054-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	6.47	1.19	
C-14	<		1.96
Sample ID: FMF-029-SOIL-054-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	14.5	1.33	
C-14	<		1.69

Sample ID: FMF-029-SOIL-055-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	108	3.46	
H-3	3.22	1.5	
Sample ID: FMF-029-SOIL-055-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	3.47	1.11	
H-3	<		1.97
Sample ID: FMF-029-SOIL-055-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	16.6	1.52	
H-3	<		1.88

Sample ID: FMF-029-SOIL-056-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	34	2.11	
C-14	<		2.1
Sample ID: FMF-029-SOIL-056-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.56
C-14	<		1.97
Sample ID: FMF-029-SOIL-056-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.35	0.962	
C-14	<		1.68

Sample Results Analysis

Survey Unit **FMF-029**

Phase III Additional Sampling

Sample ID: FMF-029-SOIL-057-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	24.9	1.93	
H-3	<		2.18

Sample ID: FMF-029-SOIL-057-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.78
H-3	<		2.24

Sample ID: FMF-029-SOIL-057-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	11.1	1.49	
H-3	<		2.16

Sample ID: FMF-029-SOIL-058-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	12.7	1.32	
C-14	<		1.72

Sample ID: FMF-029-SOIL-058-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.7	1.08	
C-14	<		1.89

Sample ID: FMF-029-SOIL-058-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.83	1.1	
C-14	<		2.01

Sample ID: FMF-029-SOIL-059-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	2.14	1.13	
H-3	<		2.14

Sample ID: FMF-029-SOIL-059-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	10.2	1.28	
H-3	<		1.8

Sample ID: FMF-029-SOIL-059-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	4.58	1.14	
H-3	<		1.93

Sample ID: FMF-029-SOIL-060-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.95	1.12	
C-14	3.21	1.41	

Sample ID: FMF-029-SOIL-060-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.52
C-14	<		1.92

Sample ID: FMF-029-SOIL-060-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.53	0.991	
C-14	<		1.81

Sample Results Analysis

Survey Unit **FMF-029**

Phase III Additional Sampling

Sample ID: FMF-029-SOIL-061-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	483	9.81	
H-3	6.83	1.76	

Sample ID: FMF-029-SOIL-061-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	128	3.4	
H-3	2.88	1.26	

Sample ID: FMF-029-SOIL-061-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	398	8.1	
H-3	7.39	1.65	

Sample ID: FMF-029-SOIL-063-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	3.32	1.01	
H-3	<		1.77

Sample ID: FMF-029-SOIL-063-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.77
H-3	<		2.23

Sample ID: FMF-029-SOIL-063-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.62
H-3	<		2.04

Sample ID: FMF-029-SOIL-062-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.3	0.951	
C-14	<		1.66

Sample ID: FMF-029-SOIL-062-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.35	1.28	
C-14	<		2.16

Sample ID: FMF-029-SOIL-062-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	3.71	1.04	
C-14	<		1.8

Sample ID: FMF-029-SOIL-064-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.44
C-14	<		1.81

Sample ID: FMF-029-SOIL-064-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.37
C-14	<		1.73

Sample ID: FMF-029-SOIL-064-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.42
C-14	1.99	1.23	

Sample Results Analysis

Survey Unit **FMF-029**

Phase III Additional Sampling

Sample ID: FMF-029-SOIL-065-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	5.03	1.11	
H-3	<		1.83

Sample ID: FMF-029-SOIL-065-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.49
H-3	<		1.87

Sample ID: FMF-029-SOIL-065-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.47
H-3	<		1.86

Sample ID: FMF-029-SOIL-067-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	12.3	1.33	
H-3	2.21	1.26	

Sample ID: FMF-029-SOIL-067-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	3.81	1.06	
H-3	3.12	1.36	

Sample ID: FMF-029-SOIL-067-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	<		1.67
H-3	<		2.19

Sample ID: FMF-029-SOIL-066-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.48
C-14	<		2

Sample ID: FMF-029-SOIL-066-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.57
C-14	<		2.06

Sample ID: FMF-029-SOIL-066-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	15.4	1.41	
C-14	<		1.79

Sample ID: FMF-029-SOIL-068-0-02			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	5.3	1.1	
C-14	<		1.85

Sample ID: FMF-029-SOIL-068-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	2.7	1.07	
C-14	3.96	1.5	

Sample ID: FMF-029-SOIL-068-2			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.47
C-14	<		1.92

Sample Results Analysis

Survey Unit

FMF-ST

Phase III Septic Tank Investigation Samples

Sample ID: FMF-ST-LIQUID-01			
Nuclide	Result pCi/ml	Error pCi/ml	MDC pCi/ml
C-14	7.87	1.97	
H-3	11.5	3.08	

Sample ID: FMF-ST-LIQUID-02			
Nuclide	Result pCi/ml	Error pCi/ml	MDC pCi/ml
H-3	19.4	2.17	
C-14	16.6	3.22	

Sample ID: FMF-ST-LIQUID-03			
Nuclide	Result pCi/ml	Error pCi/ml	MDC pCi/ml
C-14	20	2.18	
H-3	16.1	3.2	

Sample ID: FMF-ST-LIQUID-04			
Nuclide	Result pCi/ml	Error pCi/ml	MDC pCi/ml
H-3	7.9	1.97	
C-14	12.5	3.11	

Sample ID: FMF-ST-SLUDGE-05			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
C-14	792	15.9	
H-3	13.4	2.03	

Sample ID: FMF-ST-SLUDGE-06			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	28.3	1.97	
C-14	<		2.28

Sample ID: FMF-ST-SLUDGE-07			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	161	3.9	
C-14	8.17	1.73	

Sample ID: FMF-ST-SOIL-08- 0.05			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	22.9	1.7	
C-14	3.98	1.5	

Sample ID: FMF-ST-SOIL-08-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	9.54	1.18	
C-14	<		1.8

Sample ID: FMF-ST-SOIL-09- 0.05			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	136	3.47	
C-14	<		1.89

Sample ID: FMF-ST-SOIL-09-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	43.8	2.14	
C-14	2.41	1.36	

Sample ID: FMF-ST-SOIL-010- 0.05			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	21.1	1.64	
C-14	<		2.03

Sample ID: FMF-ST-SOIL-010-1			
Nuclide	Result pCi/g	Error pCi/g	MDC pCi/g
H-3	<		1.47
C-14	<		2.01



Ryan Fahey
Philotechnics
85 Brainerd Rd TH 9

Allston, MA 01234

Report of Analysis/Certificate of Conformance

06/17/2010

LIMS #: L42355
Project ID#: PH001-3EREGMA-10
Received: 05/26/2010
Delivery Date: 06/16/2010
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-051-0-02	L42355-1	
FMF-029-051-1	L42355-2	
FMF-029-051-2	L42355-3	
FMF-029-052-0-02	L42355-4	
FMF-029-052-1	L42355-5	
FMF-029-052-2	L42355-6	
FMF-029-053-0-02	L42355-7	
FMF-029-053-1	L42355-8	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-053-2	L42355-9	
FMF-029-054-0-02	L42355-10	
FMF-029-054-1	L42355-11	
FMF-029-054-2	L42355-12	
FMF-029-066-0-02	L42355-13	
FMF-029-066-1	L42355-14	
FMF-029-066-2	L42355-15	
FMF-029-067-0-02	L42355-16	
FMF-029-067-1	L42355-17	
FMF-029-067-2	L42355-18	
FMF-029-068-0-02	L42355-19	
FMF-029-068-1	L42355-20	
FMF-029-068-2	L42355-21	

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Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Sample ID: FMF-029-051-0-02		Collect Start: 05/24/2010 07:30		Matrix: Soil		(S)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 05/26/2010		% Moisture:									
LIMS Number: L42355-1													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.50E+01	2.87E+00		pCi/g		2.71	g wet		06/16/10	10	M	+
H-3	2003	4.42E+00	1.32E+00		pCi/g		2.71	g wet		06/16/10	10	M	+
Sample ID: FMF-029-051-1		Collect Start: 05/24/2010 07:35		Matrix: Soil		(S)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 05/26/2010		% Moisture:									
LIMS Number: L42355-2													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.45E+02	3.67E+00		pCi/g		2.47	g wet		06/16/10	10	M	+
H-3	2003	4.48E+00	1.42E+00		pCi/g		2.47	g wet		06/16/10	10	M	+
Sample ID: FMF-029-051-2		Collect Start: 05/24/2010 07:45		Matrix: Soil		(S)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 05/26/2010		% Moisture:									
LIMS Number: L42355-3													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.43E+01	2.98E+00		pCi/g		2.06	g wet		06/16/10	10	M	+
H-3	2003	<		2.23E+00	pCi/g		2.06	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-052-0-02	Collect Start: 05/24/2010 08:00	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-4		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.15E+01	1.44E+00		pCi/g		2.2	g wet		06/16/10	10	M	+
H-3	2003	<		2.09E+00	pCi/g		2.2	g wet		06/16/10	10	M	U

Sample ID: FMF-029-052-1	Collect Start: 05/24/2010 08:05	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-5		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.86E+01	1.64E+00		pCi/g		2.25	g wet		06/16/10	10	M	+
H-3	2003	<		2.04E+00	pCi/g		2.25	g wet		06/16/10	10	M	U

Sample ID: FMF-029-052-2	Collect Start: 05/24/2010 08:15	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-6		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.77E+00	1.23E+00		pCi/g		2.2	g wet		06/16/10	10	M	+
H-3	2003	<		2.09E+00	pCi/g		2.2	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-053-0-02	Collect Start: 05/24/2010 08:30	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-7		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.53E+01	1.90E+00		pCi/g		2.11	g wet		06/16/10	10	M	+
H-3	2003	<		2.18E+00	pCi/g		2.11	g wet		06/16/10	10	M	U

Sample ID: FMF-029-053-1	Collect Start: 05/24/2010 08:35	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-8		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.43E+00	1.28E+00		pCi/g		2.06	g wet		06/16/10	10	M	+
H-3	2003	<		2.23E+00	pCi/g		2.06	g wet		06/16/10	10	M	U

Sample ID: FMF-029-053-2	Collect Start: 05/24/2010 08:40	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-9		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.26E+01	1.36E+00		pCi/g		2.46	g wet		06/16/10	10	M	+
H-3	2003	<		1.87E+00	pCi/g		2.46	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-054-0-02	Collect Start: 05/24/2010 08:50	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.52E+01	2.05E+00		pCi/g		2.29	g wet		06/16/10	10	M	+
H-3	2003	<		2.01E+00	pCi/g		2.29	g wet		06/16/10	10	M	U

Sample ID: FMF-029-054-1	Collect Start: 05/24/2010 08:55	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	6.47E+00	1.19E+00		pCi/g		2.35	g wet		06/16/10	10	M	+
H-3	2003	<		1.96E+00	pCi/g		2.35	g wet		06/16/10	10	M	U

Sample ID: FMF-029-054-2	Collect Start: 05/24/2010 09:05	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.45E+01	1.33E+00		pCi/g		2.72	g wet		06/16/10	10	M	+
H-3	2003	<		1.69E+00	pCi/g		2.72	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected, Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-066-0-02	Collect Start: 05/24/2010 14:20	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-13		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.48E+00	pCi/g		2.36	g wet		06/16/10	10	M	U
H-3	2003	<		2.00E+00	pCi/g		2.3	g wet		06/16/10	10	M	U

Sample ID: FMF-029-066-1	Collect Start: 05/24/2010 14:23	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-14		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.57E+00	pCi/g		2.23	g wet		06/16/10	10	M	U
H-3	2003	<		2.06E+00	pCi/g		2.23	g wet		06/16/10	10	M	U

Sample ID: FMF-029-066-2	Collect Start: 05/24/2010 14:25	Matrix: Soil (S)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42355-15		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.54E+01	1.41E+00		pCi/g		2.57	g wet		06/16/10	10	M	+
H-3	2003	<		1.79E+00	pCi/g		2.57	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-067-0-02	Collect Start: 05/24/2010 14:30	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-16			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.23E+01	1.33E+00		pCi/g		2.51	g wet		06/16/10	10	M	+
H-3	2003	2.21E+00	1.26E+00		pCi/g		2.51	g wet		06/16/10	10	M	+

Sample ID: FMF-029-067-1	Collect Start: 05/24/2010 14:35	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-17			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.81E+00	1.06E+00		pCi/g		2.42	g wet		06/16/10	10	M	+
H-3	2003	3.12E+00	1.36E+00		pCi/g		2.42	g wet		06/16/10	10	M	+

Sample ID: FMF-029-067-2	Collect Start: 05/24/2010 14:40	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-18			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.67E+00	pCi/g		2.1	g wet		06/16/10	10	M	U
H-3	2003	<		2.19E+00	pCi/g		2.1	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:46

L42355

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-068-0-02	Collect Start: 05/24/2010 14:40	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-19			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.30E+00	1.10E+00		pCi/g		2.48	g wet		06/16/10	10	M	+
H-3	2003	<		1.85E+00	pCi/g		2.48	g wet		06/16/10	10	M	U

Sample ID: FMF-029-068-1	Collect Start: 05/24/2010 14:50	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-20			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.70E+00	1.07E+00		pCi/g		2.25	g wet		06/16/10	10	M	+
H-3	2003	3.96E+00	1.50E+00		pCi/g		2.25	g wet		06/16/10	10	M	+

Sample ID: FMF-029-068-2	Collect Start: 05/24/2010 15:00	Matrix: Soil	(S)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42355-21			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.47E+00	pCi/g		2.39	g wet		06/16/10	10	M	U
H-3	2003	<		1.92E+00	pCi/g		2.39	g wet		06/16/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

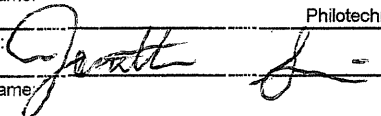
142355
W116E

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931

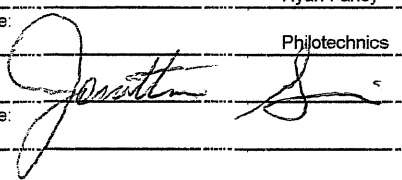
Page 1 of 1

ATTN: Sample Receiving

Customer Information				Project Information					Analyses / Method			
Project Name		Sigma Aldrich		Purchase Order					A. Tritium (H-3)			
Quote#				Project Number		5614			B. Carbon 14 (C-14)			
Company		Philotechnics		Bill To		Philotechnics			C. Oxidation			
Send Report To:		Ryan Fahey		Invoice Attn		Pam Sewall			D.			
Address:		85 Brainerd Rd TH 9		Address:		201 Renoware Blvd			E.			
City/State/Zip		Allston, MA 01234		City/State/Zip		Oak Ridge, TN 37830			F.			
Phone		978-844-4560		Phone		(865)285-3017			G.			
Fax		(865) 285-0586		Fax		(865)285-0586			H.			
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	Ivo. of Bottles	A	B	C		
FMF-029-051-0 02	750 gram	5/24	7:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-051-1	750 gram	5/24	7:35	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-051-2	750 gram	5/24	7:45	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-052-0 02	750 gram	5/24	8:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-052-1	750 gram	5/24	8:05	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-052-2	750 gram	5/24	8:15	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-053-0 02	750 gram	5/24	8:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-053-1	750 gram	5/24	8:35	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-053-2	750 gram	5/24	8:40	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-054-0 02	750 gram	5/24	8:50	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-054-1	750 gram	5/24	8:55	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
FMF-029-054-2	750 gram	5/24	9:05	Soil	Plastic Bag	None	1	X	X	X	Non-Haz	
Disposal of samples by Lab				Shipment Method:				Airbill No.:		21- Day		
Relinquished by:				Date		Time		Date		Time		
Ryan Fahey				5/24/2010		21:00						
Company Name:				Date		Time		Date		Time		
Philotechnics				5/26/10		1:00						
Received by:				Date		Time		Date		Time		
				5/26/10		1:00						
Company Name:				Date		Time		Date		Time		

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931

Customer Information				Project Information				Analyses / Method			
Project Name		Sigma Aldrich		Purchase Order				A. Tritium (H-3)			
Quote#				Project Number		5614		B. Carbon 14 (C-14)			
Company		Philotechnics		Bill To		Philotechnics		C. Oxidation			
Send Report To:		Ryan Fahey		Invoice Attn		Pam Sewell		D.			
Address:		85 Brainerd Rd TH 9		Address:		201 Renoware Blvd		E.			
City/State/Zip		Allston, MA 01234		City/State/Zip		Oak Ridge, TN 37830		F.			
Phone		978-844-4560		Phone		(865)285-3017		G.			
Fax		(865) 285-0586		Fax		(865)285-0586		H.			
I.											
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	Ivo. of Bottles	A	B	C	
FMF-029-066-0 02	750 gram	5/24	14:20	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-066-1	750 gram	5/24	14:23	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-066-2	750 gram	5/24	14:25	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-067-0 02	750 gram	5/24	14:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-067-1	750 gram	5/24	14:35	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-067-2	750 gram	5/24	14:40	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-068-0 02	750 gram	5/24	14:40	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-068-1	750 gram	5/24	14:50	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-068-2	750 gram	5/24	15:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
Disposal of samples by Lab				Shipment Method:			Drop Off		Airbil No.:		21- Day
Relinquished by:			Date					Date			
Ryan Fahey			5/24/2010								
Company Name:			Time					Time			
Philotechnics			21:00								
Received by:			Date					Date			
			5/26/10					1:00			
Company Name:			Time					Time			



Ryan Fahey
Philotechnics
85 Brainerd Rd TH 9

Allston, MA 01234

Report of Analysis/Certificate of Conformance

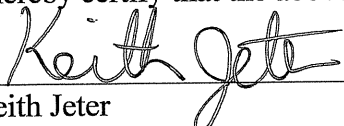
06/17/2010

LIMS #: L42361
Project ID#: PH001-3EREGMA-10
Received: 05/26/2010
Delivery Date: 06/16/2010
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-055-0.02	L42361-1	FMF-029-055-0.02
FMF-029-055-1	L42361-2	FMF-029-055-1
FMF-029-055-2	L42361-3	FMF-029-055-2
FMF-029-056-0.02	L42361-4	FMF-029-056-0.02
FMF-029-056-1	L42361-5	FMF-029-056-1
FMF-029-056-2	L42361-6	FMF-029-056-2
FMF-029-057-0.02	L42361-7	FMF-029-057-0.02
FMF-029-057-1	L42361-8	FMF-029-057-1



**TELEDYNE
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company

2508 Quality Lane

Knoxville, TN 37931-3133

865-690-6819

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-057-2	L42361-9	FMF-029-057-2
FMF-029-058-0.02	L42361-10	FMF-029-058-0.02
FMF-029-058-1	L42361-11	FMF-029-058-1
FMF-029-058-2	L42361-12	FMF-029-058-2
FMF-029-059-0.02	L42361-13	FMF-029-059-0.02
FMF-029-059-1	L42361-14	FMF-029-059-1
FMF-029-059-2	L42361-15	FMF-029-059-2
FMF-029-060-0.02	L42361-16	FMF-029-060-0.02
FMF-029-060-1	L42361-17	FMF-029-060-1
FMF-029-060-2	L42361-18	FMF-029-060-2

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Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Sample ID: FMF-029-055-0.02	Collect Start: 05/24/2010 09:10	Matrix: Soil	(S)
Station: FMF-029-055-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-1			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.08E+02	3.46E+00		pCi/g		2.18	g wet		06/16/10	10	M	+
H-3	2003	3.22E+00	1.50E+00		pCi/g		2.18	g wet		06/17/10	10	M	+

Sample ID: FMF-029-055-1	Collect Start: 05/24/2010 09:15	Matrix: Soil	(S)
Station: FMF-029-055-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-2			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.47E+00	1.11E+00		pCi/g		2.33	g wet		06/17/10	10	M	+
H-3	2003	<		1.97E+00	pCi/g		2.33	g wet		06/17/10	10	M	U

Sample ID: FMF-029-055-2	Collect Start: 05/24/2010 09:20	Matrix: Soil	(S)
Station: FMF-029-055-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-3			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.66E+01	1.52E+00		pCi/g		2.45	g wet		06/17/10	10	M	+
H-3	2003	<		1.88E+00	pCi/g		2.45	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-056-0.02	Collect Start: 05/24/2010 09:30	Matrix: Soil	(S)
Station: FMF-029-056-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-4			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.40E+01	2.11E+00		pCi/g		2.19	g wet		06/17/10	10	M	+
H-3	2003	<		2.10E+00	pCi/g		2.19	g wet		06/17/10	10	M	U

Sample ID: FMF-029-056-1	Collect Start: 05/24/2010 09:40	Matrix: Soil	(S)
Station: FMF-029-056-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-5			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.56E+00	pCi/g		2.34	g wet		06/17/10	10	M	U
H-3	2003	<		1.97E+00	pCi/g		2.34	g wet		06/17/10	10	M	U

Sample ID: FMF-029-056-2	Collect Start: 05/24/2010 09:50	Matrix: Soil	(S)
Station: FMF-029-056-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-6			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.35E+00	9.62E-01		pCi/g		2.74	g wet		06/17/10	10	M	+
H-3	2003	<		1.68E+00	pCi/g		2.74	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-057-0.02 Collect Start: 05/24/2010 09:53 Matrix: Soil (S)													
Station: FMF-029-057-0.02 Collect Stop: Volume:													
Description: Receive Date: 05/26/2010 % Moisture:													
LIMS Number: L42361-7													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.49E+01	1.93E+00		pCi/g		2.11	g wet		06/17/10	10	M	+
H-3	2003	<		2.18E+00	pCi/g		2.11	g wet		06/17/10	10	M	U
Sample ID: FMF-029-057-1 Collect Start: 05/24/2010 10:00 Matrix: Soil (S)													
Station: FMF-029-057-1 Collect Stop: Volume:													
Description: Receive Date: 05/26/2010 % Moisture:													
LIMS Number: L42361-8													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.78E+00	pCi/g		2.05	g wet		06/17/10	10	M	U
H-3	2003	<		2.24E+00	pCi/g		2.05	g wet		06/17/10	10	M	U
Sample ID: FMF-029-057-2 Collect Start: 05/24/2010 10:10 Matrix: Soil (S)													
Station: FMF-029-057-2 Collect Stop: Volume:													
Description: Receive Date: 05/26/2010 % Moisture:													
LIMS Number: L42361-9													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.11E+01	1.49E+00		pCi/g		2.13	g wet		06/17/10	10	M	+
H-3	2003	<		2.16E+00	pCi/g		2.13	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- H = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-058-0.02	Collect Start: 05/24/2010 10:15	Matrix: Soil (S)
Station: FMF-029-058-0.02	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.27E+01	1.32E+00		pCi/g		2.67	g wet		06/17/10	10	M	+
H-3	2003	<		1.72E+00	pCi/g		2.67	g wet		06/17/10	10	M	U

Sample ID: FMF-029-058-1	Collect Start: 05/24/2010 10:20	Matrix: Soil (S)
Station: FMF-029-058-1	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.70E+00	1.08E+00		pCi/g		2.44	g wet		06/17/10	10	M	+
H-3	2003	<		1.89E+00	pCi/g		2.44	g wet		06/17/10	10	M	U

Sample ID: FMF-029-058-2	Collect Start: 05/24/2010 10:30	Matrix: Soil (S)
Station: FMF-029-058-2	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.83E+00	1.10E+00		pCi/g		2.29	g wet		06/17/10	10	M	+
H-3	2003	<		2.01E+00	pCi/g		2.29	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-059-0.02	Collect Start: 05/24/2010 10:35	Matrix: Soil (S)
Station: FMF-029-059-0.02	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-13		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.14E+00	1.13E+00		pCi/g		2.15	g wet		06/17/10	10	M	+
H-3	2003	<		2.14E+00	pCi/g		2.15	g wet		06/17/10	10	M	U

Sample ID: FMF-029-059-1	Collect Start: 05/24/2010 10:40	Matrix: Soil (S)
Station: FMF-029-059-1	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-14		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.02E+01	1.28E+00		pCi/g		2.56	g wet		06/17/10	10	M	+
H-3	2003	<		1.80E+00	pCi/g		2.56	g wet		06/17/10	10	M	U

Sample ID: FMF-029-059-2	Collect Start: 05/24/2010 10:45	Matrix: Soil (S)
Station: FMF-029-059-2	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42361-15		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.58E+00	1.14E+00		pCi/g		2.38	g wet		06/17/10	10	M	+
H-3	2003	<		1.93E+00	pCi/g		2.38	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42361

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-060-0.02	Collect Start: 05/24/2010 10:50	Matrix: Soil	(S)
Station: FMF-029-060-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-16			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.95E+00	1.12E+00		pCi/g		2.35	g wet		06/17/10	10	M	+
H-3	2003	3.21E+00	1.41E+00		pCi/g		2.35	g wet		06/17/10	10	M	+

Sample ID: FMF-029-060-1	Collect Start: 05/24/2010 10:55	Matrix: Soil	(S)
Station: FMF-029-060-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-17			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.52E+00	pCi/g		2.4	g wet		06/17/10	10	M	U
H-3	2003	<		1.92E+00	pCi/g		2.4	g wet		06/17/10	10	M	U

Sample ID: FMF-029-060-2	Collect Start: 05/24/2010 11:00	Matrix: Soil	(S)
Station: FMF-029-060-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42361-18			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.53E+00	9.91E-01		pCi/g		2.54	g wet		06/17/10	10	M	+
H-3	2003	<		1.81E+00	pCi/g		2.54	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

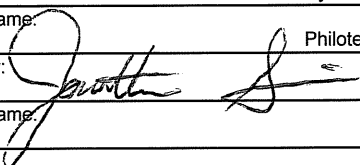
MDC - Minimum Detectable Concentration

L42361

Teledyne Brown Engineering

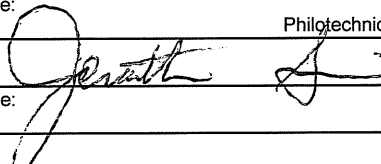
WH16F

2508 Quality Lane
Knoxville, TN 37931

Customer Information				Project Information				Analyses / Method			
Project Name	Sigma Aldrich			Purchase Order				A. Tritium (H-3)			
Quote#				Project Number	5614			B. Carbon 14 (C-14)			
Company	Philotechnics			Bill To	Philotechnics			C. Oxidation			
Send Report To:	Ryan Fahey			Invoice Attn	Pam Sewell			D.			
Address:	85 Brainerd Rd TH 9			Address:	201 Renovare Blvd			E.			
City/State/Zip	Allston, MA 01234			City/State/Zip	Oak Ridge, TN 37830			F.			
Phone	978-844-4560			Phone	(865)285-3017			G.			
Fax	(865) 285-0686			Fax	(865)285-0686			H.			
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Bottles	A	B	C	
FMF-029-055-0.02	750 gram	5/24	9:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-055-1	750 gram	5/24	9:15	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-055-2	750 gram	5/24	9:20	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-056-0.02	750 gram	5/24	9:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-056-1	750 gram	5/24	9:40	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-056-2	750 gram	5/24	9:50	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-057-0.02	750 gram	5/24	9:53	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-057-1	750 gram	5/24	10:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-057-2	750 gram	5/24	10:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-058-0.02	750 gram	5/24	10:15	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-058-1	750 gram	5/24	10:20	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-058-2	750 gram	5/24	10:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
Disposal of samples by Lab				Shipment Method: Drop Off			Airbill No.:		21- Day		
Relinquished by: Ryan Fahey				Date: 5/24/2010				Date:			
Company Name: Philotechnics				Time: 21:00				Time:			
Received by: 				Date: 5/26/10 1:00				Date:			
Company Name:				Time:				Time:			

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931
ATTN: Sample Receiving

Customer Information				Project Information				Analyses / Method			
Project Name		Sigma Aldrich		Purchase Order				A. Tritium (H-3)			
Quote#				Project Number		5614		B. Carbon 14 (C-14)			
Company		Philotechnics		Bill To		Philotechnics		C. Oxidation			
Send Report To:		Ryan Fahey		Invoice Attn		Pam Sewell		D.			
Address:		85 Brainerd Rd TH 9		Address:		201 Renovare Blvd		E.			
City/State/Zip		Allston, MA 01234		City/State/Zip		Oak Ridge, TN 37830		F.			
Phone		978-844-4560		Phone		(865)285-3017		G.			
Fax		(865) 285-0686		Fax		(865)285-0686		H.			
I.											
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Bottles	A	B	C	
FMF-029-059-0.02	750 gram	5/24	10:35	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-059-1	750 gram	5/24	10:40	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-059-2	750 gram	5/24	10:45	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-060-0.02	750 gram	5/24	10:50	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-060-1	750 gram	5/24	10:55	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-060-2	750 gram	5/24	11:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
Disposal of samples by Lab				Shipment Method: Drop Off				Airbill No.:		21- Day	
Relinquished by: Ryan Fahey			Date: 5/24/2010						Date		
Company Name: Philotechnics			Time: 21:00						Time		
Received by: 			Date: 5/26/10 1:00						Date		
Company Name:			Time:						Time		



**TELEDYNE
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company
2508 Quality Lane
Knoxville, TN 37931-3133
865-690-6819

Ryan Fahey
Philotechnics
85 Brainerd Rd TH 9

Allston, MA 01234

Report of Analysis/Certificate of Conformance

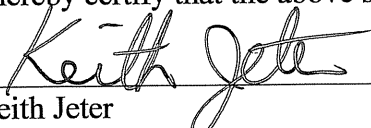
06/17/2010

LIMS #: L42362
Project ID#: PH001-3EREGMA-10
Received: 05/26/2010
Delivery Date: 06/16/2010
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-061-0.02	L42362-1	FMF-029-061-0.02
FMF-029-061-1	L42362-2	FMF-029-061-1
FMF-029-061-2	L42362-3	FMF-029-061-2
FMF-029-062-0.02	L42362-4	FMF-029-062-0.02
FMF-029-062-0.02-QC	L42362-5	FMF-029-062-0.02-QC
FMF-029-062-1	L42362-6	FMF-029-062-1
FMF-029-062-2	L42362-7	FMF-029-062-2
FMF-029-063-0.02	L42362-8	FMF-029-063-0.02



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-029-063-1	L42362-9	FMF-029-063-1
FMF-029-063-2	L42362-10	FMF-029-063-2
FMF-029-064-0.02	L42362-11	FMF-029-064-0.02
FMF-029-064-1	L42362-12	FMF-029-064-1
FMF-029-064-1-QC	L42362-13	FMF-029-064-1-QC
FMF-029-064-2	L42362-14	FMF-029-064-2
FMF-029-065-0.02	L42362-15	FMF-029-065-0.02
FMF-029-065-1	L42362-16	FMF-029-065-1
FMF-029-065-2	L42362-17	FMF-029-065-2
FMF-029-065-2-QC	L42362-18	FMF-029-065-2-QC

This report shall not be reproduced or distributed except in its entirety.

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Sample ID: FMF-029-061-0.02	Collect Start: 05/24/2010 11:05	Matrix: Soil	(S)
Station: FMF-029-061-0.02	Collect Stop:	Volume:	
Description: N. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-1			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.83E+02	9.81E+00		pCi/g		2.11	g wet		06/17/10	5.35	M	+
H-3	2003	6.83E+00	1.76E+00		pCi/g		2.11	g wet		06/17/10	10	M	+

Sample ID: FMF-029-061-1	Collect Start: 05/24/2010 11:10	Matrix: Soil	(S)
Station: FMF-029-061-1	Collect Stop:	Volume:	
Description: N. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-2			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.28E+02	3.40E+00		pCi/g		2.62	g wet		06/17/10	10	M	+
H-3	2003	2.88E+00	1.26E+00		pCi/g		2.62	g wet		06/17/10	10	M	+

Sample ID: FMF-029-061-2	Collect Start: 05/24/2010 11:15	Matrix: Soil	(S)
Station: FMF-029-061-2	Collect Stop:	Volume:	
Description: N. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-3			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.98E+02	8.10E+00		pCi/g		2.36	g wet		06/17/10	5.79	M	+
H-3	2003	7.39E+00	1.65E+00		pCi/g		2.36	g wet		06/17/10	10	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-062-0.02	Collect Start: 05/24/2010 13:00	Matrix: Soil	(S)
Station: FMF-029-062-0.02	Collect Stop:	Volume:	
Description: N. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-4			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.30E+00	9.51E-01		pCi/g		2.77	g wet		06/17/10	10	M	+
H-3	2003	<		1.66E+00	pCi/g		2.77	g wet		06/17/10	10	M	U

Sample ID: FMF-029-062-0.02-QC	Collect Start: 05/24/2010 13:00	Matrix: Soil	(S)
Station: FMF-029-062-0.02-QC	Collect Stop:	Volume:	
Description: N. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-5			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.30E+00	1.01E+00		pCi/g		2.86	g wet		06/17/10	10	M	+
H-3	2003	<		1.61E+00	pCi/g		2.86	g wet		06/17/10	10	M	U

Sample ID: FMF-029-062-1	Collect Start: 05/24/2010 13:04	Matrix: Soil	(S)
Station: FMF-029-062-1	Collect Stop:	Volume:	
Description: S. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-6			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.35E+00	1.28E+00		pCi/g		2.13	g wet		06/17/10	10	M	+
H-3	2003	<		2.16E+00	pCi/g		2.13	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-062-2	Collect Start: 05/24/2010 13:13	Matrix: Soil	(S)
Station: FMF-029-062-2	Collect Stop:	Volume:	
Description: S. Fence Line Env't.	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-7			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.71E+00	1.04E+00		pCi/g		2.55	g wet		06/17/10	10	M	+
H-3	2003	<		1.80E+00	pCi/g		2.55	g wet		06/17/10	10	M	U

Sample ID: FMF-029-063-0.02	Collect Start: 05/24/2010 13:23	Matrix: Soil	(S)
Station: FMF-029-063-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-8			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	3.32E+00	1.01E+00		pCi/g		2.6	g wet		06/17/10	10	M	+
H-3	2003	<		1.77E+00	pCi/g		2.6	g wet		06/17/10	10	M	U

Sample ID: FMF-029-063-1	Collect Start: 05/24/2010 13:27	Matrix: Soil	(S)
Station: FMF-029-063-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-9			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.77E+00	pCi/g		2.06	g wet		06/17/10	10	M	U
H-3	2003	<		2.23E+00	pCi/g		2.06	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-063-2	Collect Start: 05/24/2010 13:32	Matrix: Soil	(S)
Station: FMF-029-063-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-10			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.62E+00	pCi/g		2.25	g wet		06/17/10	10	M	U
H-3	2003	<		2.04E+00	pCi/g		2.25	g wet		06/17/10	10	M	U

Sample ID: FMF-029-064-0.02	Collect Start: 05/24/2010 13:36	Matrix: Soil	(S)
Station: FMF-029-064-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-11			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.44E+00	pCi/g		2.54	g wet		06/17/10	10	M	U
H-3	2003	<		1.81E+00	pCi/g		2.54	g wet		06/17/10	10	M	U

Sample ID: FMF-029-064-1	Collect Start: 05/24/2010 13:42	Matrix: Soil	(S)
Station: FMF-029-064-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-12			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.37E+00	pCi/g		2.66	g wet		06/17/10	10	M	U
H-3	2003	<		1.73E+00	pCi/g		2.66	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-064-1-QC	Collect Start: 05/24/2010 13:42	Matrix: Soil	(S)
Station: FMF-029-064-1-QC	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-13			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.73E+00	pCi/g		2.11	g wet		06/17/10	10	M	U
H-3	2003	<		2.18E+00	pCi/g		2.11	g wet		06/17/10	10	M	U

Sample ID: FMF-029-064-2	Collect Start: 05/24/2010 13:48	Matrix: Soil	(S)
Station: FMF-029-064-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-14			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.42E+00	pCi/g		2.57	g wet		06/17/10	10	M	U
H-3	2003	1.99E+00	1.23E+00		pCi/g		2.57	g wet		06/17/10	10	M	+

Sample ID: FMF-029-065-0.02	Collect Start: 05/24/2010 14:00	Matrix: Soil	(S)
Station: FMF-029-065-0.02	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-15			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	5.03E+00	1.11E+00		pCi/g		2.51	g wet		06/17/10	10	M	+
H-3	2003	<		1.83E+00	pCi/g		2.51	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Bolded text indicates reportable value.

Report of Analysis

06/17/10 17:47

L42362

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-029-065-1	Collect Start: 05/24/2010 14:05	Matrix: Soil	(S)
Station: FMF-029-065-1	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-16			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.49E+00	pCi/g		2.46	g wet		06/17/10	10	M	U
H-3	2003	<		1.87E+00	pCi/g		2.46	g wet		06/17/10	10	M	U

Sample ID: FMF-029-065-2	Collect Start: 05/24/2010 14:10	Matrix: Soil	(S)
Station: FMF-029-065-2	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-17			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.47E+00	pCi/g		2.48	g wet		06/17/10	10	M	U
H-3	2003	<		1.86E+00	pCi/g		2.48	g wet		06/17/10	10	M	U

Sample ID: FMF-029-065-2-QC	Collect Start: 05/24/2010 14:10	Matrix: Soil	(S)
Station: FMF-029-065-2-QC	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42362-18			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.74E+00	pCi/g		2.1	g wet		06/17/10	10	M	U
H-3	2003	<		2.19E+00	pCi/g		2.1	g wet		06/17/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

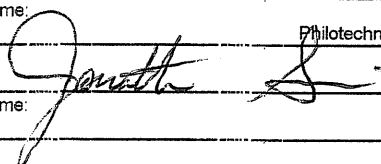
L42362

WHITE

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931

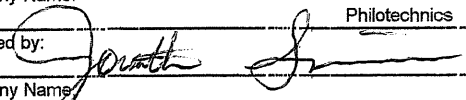
ATTN: Sample Receiving

Customer Information				Project Information				Analysis / Method			
Project Name		Sigma Aldrich		Purchase Order				A. Tritium (H-3)			
Quote#				Project Number		5614		B. Carbon 14 (C-14)			
Company		Philotechnics		Bill To		Philotechnics		C. Oxidation			
Send Report To:		Ryan Fahey		Invoice Attn		Pam Sewill		D.			
Address:		85 Brainerd Rd TH 9		Address:		201 Renoware Blvd		E.			
City/State/Zip		Allston, MA 01234		City/State/Zip		Oak Ridge, TN 37830		F.			
Phone		978-844-4560		Phone		(865)285-3017		G.			
Fax		(865) 285-0583		Fax		(865)285-0586		H.			
I.											
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	Iv. of Bottles	A	B	C	
FMF-029-061-0 02	750 gram	5/24	11:05	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-061-1	750 gram	5/24	11:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-061-2	750 gram	5/24	11:15	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-062-0 02	750 gram	5/24	13:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-062-0 02-QC	750 gram	5/24	13:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-062-1	750 gram	5/24	13:04	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-062-2	750 gram	5/24	13:13	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-063-0 02	750 gram	5/24	13:23	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-063-1	750 gram	5/24	13:27	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-063-2	750 gram	5/24	13:32	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-064-0 02	750 gram	5/24	13:36	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-064-1	750 gram	5/24	13:42	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-064-1-QC	750 gram	5/24	13:42	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
Disposal of samples by Lab				Shipment Method:				Airbil No.:		21- Day	
Relinquished by:				Date						Date	
Ryan Fahey				5/24/2010							
Company Name:				Time						Time	
Philotechnics				21:00							
Received by:				Date						Date	
				5/26/10 1:00							
Company Name:				Time						Time	

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931

ATTN: Sample Receiving

Customer Information			Project Information					Analysis / Method			
Project Name		Sigma Aldrich	Purchase Order					A. Tritium (H-3)			
Quote#			Project Number		5614			B. Carbon 14 (C-14)			
Company		Philotechnics	Bill To		Philotechnics			C. Oxidation			
Send Report To:		Ryan Fahey	Invoice Attn		Pam Sewell			D.			
Address:		85 Brainerd Rd TH 9	Address:		201 Renovare Blvd			E.			
City/State/Zip		Allston, MA 01234	City/State/Zip		Oak Ridge, TN 37830			F.			
Phone		978-844-4560	Phone		(865)285-0017			G.			
Fax		(865) 285-0686	Fax		(865)285-0686			H.			
Sx No.	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Bottles	A	B	C	
FMF-029-064-2	750 gram	5/24	13:48	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-065-0 02	750 gram	5/24	14:00	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-065-1	750 gram	5/24	14:05	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-065-2	750 gram	5/24	14:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
FMF-029-065-2-QC	750 gram	5/24	14:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz
Disposal of samples by Lab			Shipment Method:				Drop Off		Airbil No.:		21- Day
Relinquished by:			Date					Date			
Ryan Fahey			5/24/2010								
Company Name:			Time					Time			
Philotechnics			21:00								
Received by:			Date					Date			
			5/24/10		1:00						
Company Name:			Time					Time			



Ryan Fahey
Philotechnics
85 Brainerd Rd TH 9

Allston, MA 01234

Report of Analysis/Certificate of Conformance

06/04/2010

LIMS #: L42358
Project ID#: PH001-3EREGMA-10
Received: 05/26/2010
Delivery Date: 06/02/2010
P.O.#: PO-0000881
Release #:
SDG#:

This is to certify that Teledyne Brown Engineering - Environmental Services located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples, as received by the laboratory, as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.



Keith Jeter
Operations Manager

Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-ST1	L42358-1	
FMF-ST2	L42358-2	
FMF-ST3	L42358-3	
FMF-ST4	L42358-4	
FMF-ST5	L42358-5	
FMF-ST6	L42358-6	
FMF-ST7	L42358-7	
FMF-ST8-0.05	L42358-8	



Cross Reference Table

Client ID	Laboratory ID	Station ID (if applicable)
FMF-ST8-1	L42358-9	
FMF-ST9-0.05	L42358-10	
FMF-ST9-1	L42358-11	
FMF-ST10-0.5	L42358-12	
FMF-ST10-1	L42358-13	

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Case Narrative

06/04/2010 12:03

L42358

PH001-3EREGMA-10

Philotechnics

The duplicate RPD for these samples was 54.8. QC limits are 50. The sample was analyzed wet. The samples were difficult to homogenize wet, which led to the discrepancy between the sample and its duplicate.

Report of Analysis

06/04/10 11:07

L42358

Philotechnics

PH001-3EREGMA-10

Sample ID: FMF-ST1	Collect Start: 05/19/2010 11:30	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-1		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.87E+03	1.97E+03		pCi/L		.5	ml		06/04/10	60	M	+
H-3	2003	1.15E+04	3.08E+03		pCi/L		.5	ml		06/04/10	60	M	+

Sample ID: FMF-ST2	Collect Start: 05/19/2010 11:33	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-2		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.94E+04	2.17E+03		pCi/L		.5	ml		06/04/10	60	M	+
H-3	2003	1.66E+04	3.22E+03		pCi/L		.5	ml		06/04/10	60	M	+

Sample ID: FMF-ST3	Collect Start: 05/19/2010 11:35	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-3		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.00E+04	2.18E+03		pCi/L		.5	ml		06/04/10	60	M	+
H-3	2003	1.61E+04	3.20E+03		pCi/L		.5	ml		06/04/10	60	M	+

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

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MDC - Minimum Detectable Concentration

Report of Analysis

06/04/10 11:07

L42358

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-ST4	Collect Start: 05/19/2010 11:37	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-4		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.90E+03	1.97E+03		pCi/L		.5	ml		06/04/10	60	M	+
H-3	2003	1.25E+04	3.11E+03		pCi/L		.5	ml		06/04/10	60	M	+

Sample ID: FMF-ST5	Collect Start: 05/19/2010 11:45	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-5		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	7.92E+02	1.59E+01		pCi/g		2.37	g wet		06/03/10	2.91	M	+
H-3	2003	1.34E+01	2.03E+00		pCi/g		2.37	g wet		06/04/10	10	M	+

Sample ID: FMF-ST6	Collect Start: 05/19/2010 12:05	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-6		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.83E+01	1.97E+00		pCi/g		2.18	g wet		06/03/10	10	M	+
H-3	2003	<		2.28E+00	pCi/g		2.18	g wet		06/04/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/04/10 11:07

L42358

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-ST7	Collect Start: 05/19/2010 12:15	Matrix: Solids	(SD)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42358-7			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.61E+02	3.90E+00		pCi/g		2.45	g wet		06/03/10	10	M	+
H-3	2003	8.17E+00	1.73E+00		pCi/g		2.45	g wet		06/04/10	10	M	+

Sample ID: FMF-ST8-0.05	Collect Start: 05/24/2010 15:10	Matrix: Solids	(SD)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42358-8			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.29E+01	1.70E+00		pCi/g		2.43	g wet		06/03/10	10	M	+
H-3	2003	3.98E+00	1.50E+00		pCi/g		2.43	g wet		06/04/10	10	M	+

Sample ID: FMF-ST8-1	Collect Start: 05/19/2010 15:15	Matrix: Solids	(SD)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 05/26/2010	% Moisture:	
LIMS Number: L42358-9			

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	9.54E+00	1.18E+00		pCi/g		2.76	g wet		06/03/10	10	M	+
H-3	2003	<		1.80E+00	pCi/g		2.76	g wet		06/04/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/04/10 11:07

L42358

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-ST9-0.05	Collect Start: 05/19/2010 15:20	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-10		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	1.36E+02	3.47E+00		pCi/g		2.63	g wet		06/03/10	10	M	+
H-3	2003	<		1.89E+00	pCi/g		2.63	g wet		06/04/10	10	M	U

Sample ID: FMF-ST9-1	Collect Start: 05/19/2010 15:25	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-11		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	4.38E+01	2.14E+00		pCi/g		2.52	g wet		06/03/10	10	M	+
H-3	2003	2.41E+00	1.36E+00		pCi/g		2.52	g wet		06/04/10	10	M	+

Sample ID: FMF-ST10-0.5	Collect Start: 05/19/2010 15:30	Matrix: Solids (SD)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 05/26/2010	% Moisture:
LIMS Number: L42358-12		

Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	2.11E+01	1.64E+00		pCi/g		2.45	g wet		06/03/10	10	M	+
H-3	2003	<		2.03E+00	pCi/g		2.45	g wet		06/04/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- Spec = Activity concentration exceeds customer reporting value
- L = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

Report of Analysis

06/04/10 11:07

L42358

Philotechnics

PH001-3EREGMA-10

Ryan Fahey

Sample ID: FMF-ST10-1		Collect Start: 05/19/2010 15:35		Matrix: Solids		(SD)							
Station:		Collect Stop:		Volume:									
Description:		Receive Date: 05/26/2010		% Moisture:									
LIMS Number: L42358-13													
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units	Run #	Aliquot Volume	Aliquot Units	Reference Date	Count Date	Count Time	Count Units	Flag Values
C-14	2003	<		1.47E+00	pCi/g		2.47	g wet		06/03/10	10	M	U
H-3	2003	<		2.01E+00	pCi/g		2.47	g wet		06/04/10	10	M	U

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

Bolded text indicates reportable value.

No = Peak not identified in gamma spectrum

Yes = Peak identified in gamma spectrum

**** Unless otherwise noted, the analytical results reported are related only to the samples tested in the condition they are received by the laboratory.

MDC - Minimum Detectable Concentration

L42358
WALBE

Teledyne Brown Engineering

2508 Quality Lane
Knoxville, TN 37931

ATTN: Sample Receiving

Customer Information				Project Information				Analyses / Method					
Project Name	Sigma Aldrich			Purchase Order				A. Tritium (H-3)					
Quote#				Project Number	5314			B. Carbon 14 (C-14)					
Company	Philotechnics			Bill To	Philotechnics			C. Oxidation					
Send Report To:	Ryan Fahey			Invoice Attn	Pam Sewell			D.					
Address:	85 Brainerd Rd TH 9			Address:	201 Renovare Blvd			E.					
City/State/Zip	Allston, MA 01234			City/State/Zip	Oak Ridge, TN 37830			F.					
Phone	978-844-4530			Phone	(865)285-3017			G.					
Fax	(865) 285-0688			Fax	(865)285-0686			H.					
Sx No	Sample Description	Sample Date	Sample Time	Sample Matrix	Container Type	Preservative	No. of Bottles	A	B	C			
FMF-ST1	500 ml bottle (Septic Tank Sample)	5/19	11:30	Liquid	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST2	500 ml bottle (Septic Tank Sample)	5/19	11:33	Liquid	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST3	500 ml bottle (Septic Tank Sample)	5/19	11:35	Liquid	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST4	500 ml bottle (Septic Tank Sample)	5/19	11:37	Liquid	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST5	500 ml bottle (Septic Tank Sample)	5/19	11:45	Sludge	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST6	500 ml bottle (Septic Tank Sample)	5/19	12:05	Sludge	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST7	500 ml bottle (Septic Tank Sample)	5/19	12:15	Sludge	Plastic Bottle	None	1	X	X	X	Non-Haz		
FMF-ST8-0.05	750 gram	5/24	15:10	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
FMF-ST8-1	750 gram	5/24	15:15	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
FMF-ST9-0.05	750 gram	5/24	15:20	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
FMF-ST9-1	750 gram	5/24	15:25	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
FMF-ST10-0.05	750 gram	5/24	15:30	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
FMF-ST10-1	750 gram	5/24	15:35	Soil	Plastic Bag	None	1	X	X	X	Non-Haz		
Disposal of samples by Lab				Shipment Method:			Airbill No.:			7- Day			
Relinquished by: Ryan Fahey				Date	5/24/2010			Drop Off			Date		
Company Name: Philotechnics				Time	21:00						Time		
Received by: <i>[Signature]</i>				Date	5/26/10 1300						Date		
Company Name:				Time							Time		

ATTACHMENT 6 – TestAmerica Chemical Analysis of
Soil



TestAmerica Laboratories, Inc.

ANALYTICAL REPORT


Schreiber, Yonley & Associates

Lot #: F0I030547

Doug Abeln

Schreiber, Yonley & Associates
16252 Westwoods Business Park
Ellisville, MO 63021

TESTAMERICA LABORATORIES, INC.


Kay Clay
Project Manager

September 14, 2010

Case Narrative
LOT NUMBER: F0I030547

This report contains the analytical results for the sample received under chain of custody by TestAmerica St. Louis on September 3, 2010. This sample is associated with your Schreiber, Yonley & Associates project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted below.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Volatiles Method: 8260B

Batch 0252251

The Acetone and 1,1,2,2-tetrachloroethane LCS recoveries are outside the upper QC limit, indicating a potential positive bias for the analyte. The analyte 1,1,2,2-tetrachloroethane was a non-detect and the results will be reported from this run. The sample was re-prepared and re-analyzed within holding time for acetone and the sample result was less than the reporting limit but the LCS/LCSD recoveries still recovered high. Since the sample result was less than the reporting limit the sample data is reported.

Affected Sample:

F0I030547 (1): RADCHEM 1

METHODS SUMMARY

FOI030547

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Volatile Organics by GC/MS	SW846 8260B	SW846 5030B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

F0I030547

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT</u>	<u>SAMPLE ID</u>	<u>SAMPLED</u>	<u>SAMP</u>
				<u>DATE</u>	<u>TIME</u>
L6JMF	001	RADCHEM	1	09/03/10	09:30

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Cash in Advance / Prepaid Sales

Client Sample ID: RADCHEM 1

GC/MS Volatiles

Lot-Sample #...: F0I030547-001 Work Order #...: L6JMF1AG Matrix.....: SOLID
 Date Sampled...: 09/03/10 09:30 Date Received...: 09/03/10
 Prep Date.....: 09/09/10 Analysis Date...: 09/09/10
 Prep Batch #...: 0252251 Analysis Time...: 15:09
 Dilution Factor: 1
 % Moisture.....: 16 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Chloromethane	ND	12	ug/kg
Vinyl chloride	ND	6.0	ug/kg
Bromomethane	ND	12	ug/kg
Chloroethane	ND	12	ug/kg
1,1-Dichloroethene	ND	6.0	ug/kg
Methylene chloride	ND	6.0	ug/kg
Carbon disulfide	ND	6.0	ug/kg
1,1-Dichloroethane	ND	6.0	ug/kg
2-Butanone	ND	24	ug/kg
1,2-Dichloroethene (total)	ND	12	ug/kg
Chloroform	ND	6.0	ug/kg
1,1,1-Trichloroethane	ND	6.0	ug/kg
Carbon tetrachloride	ND	6.0	ug/kg
1,2-Dichloroethane	ND	6.0	ug/kg
Benzene	ND	6.0	ug/kg
Trichloroethene	ND	6.0	ug/kg
1,2-Dichloropropane	ND	6.0	ug/kg
Bromodichloromethane	ND	6.0	ug/kg
4-Methyl-2-pentanone	ND	24	ug/kg
cis-1,3-Dichloropropene	ND	6.0	ug/kg
Toluene	ND	6.0	ug/kg
trans-1,3-Dichloropropene	ND	6.0	ug/kg
1,1,2-Trichloroethane	ND	6.0	ug/kg
2-Hexanone	ND	24	ug/kg
Tetrachloroethene	ND	6.0	ug/kg
Dibromochloromethane	ND	6.0	ug/kg
Chlorobenzene	ND	6.0	ug/kg
Ethylbenzene	ND	6.0	ug/kg
Xylenes (total)	ND	12	ug/kg
Styrene	ND	6.0	ug/kg
Bromoform	ND	6.0	ug/kg
1,1,2,2-Tetrachloroethane	ND	6.0	ug/kg
1,2-Dichlorobenzene	ND	6.0	ug/kg
1,3-Dichlorobenzene	ND	6.0	ug/kg
1,4-Dichlorobenzene	ND	6.0	ug/kg

(Continued on next page)

Cash in Advance / Prepaid Sales

Client Sample ID: RADCHEM 1

GC/MS Volatiles

Lot-Sample #...: F0I030547-001 Work Order #...: L6JMF1AG Matrix.....: SOLID

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	106	(72 - 136)
Dibromofluoromethane	97	(76 - 130)
1,2-Dichloroethane-d4	106	(73 - 148)
4-Bromofluorobenzene	128	(59 - 150)

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

Cash in Advance / Prepaid Sales

Client Sample ID: RADCHEM 1

GC/MS Volatiles

Lot-Sample #...: F0I030547-001 Work Order #...: L6JMF2AG Matrix.....: SOLID
 Date Sampled...: 09/03/10 09:30 Date Received...: 09/03/10
 Prep Date.....: 09/13/10 Analysis Date...: 09/13/10
 Prep Batch #...: 0256287 Analysis Time...: 08:47
 Dilution Factor: 1
 % Moisture.....: 16 Method.....: SW846 8260B

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Acetone	8.5 J,B	24	ug/kg
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	
Toluene-d8	98	(72 - 136)	
Dibromofluoromethane	92	(76 - 130)	
1,2-Dichloroethane-d4	98	(73 - 148)	
4-Bromofluorobenzene	104	(59 - 150)	

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

Cash in Advance / Prepaid Sales

Client Sample ID: RADCHEM 1

General Chemistry

Lot-Sample #...: F0I030547-001 Work Order #...: L6JMF Matrix.....: SOLID
 Date Sampled...: 09/03/10 09:30 Date Received...: 09/03/10
 % Moisture.....: 16

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Moisture	16.4	0.10	%	MCAWW 160.3 MOD	09/08-09/09/10	0251134
		Dilution Factor: 1		Analysis Time..: 00:00		

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F0I030547
 MB Lot-Sample #: F0I090000-251

Work Order #...: L6P3G1AA

Matrix.....: SOLID

Prep Date.....: 09/09/10

Analysis Time...: 09:31

Analysis Date...: 09/09/10

Prep Batch #...: 0252251

Dilution Factor: 1

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Chloromethane	ND	10	ug/kg	SW846 8260B
Vinyl chloride	ND	5.0	ug/kg	SW846 8260B
Bromomethane	ND	10	ug/kg	SW846 8260B
Chloroethane	ND	10	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.0	ug/kg	SW846 8260B
Methylene chloride	ND	5.0	ug/kg	SW846 8260B
Carbon disulfide	ND	5.0	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Butanone	ND	20	ug/kg	SW846 8260B
1,2-Dichloroethene (total)	ND	10	ug/kg	SW846 8260B
Chloroform	ND	5.0	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.0	ug/kg	SW846 8260B
Benzene	ND	5.0	ug/kg	SW846 8260B
Trichloroethene	ND	5.0	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.0	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.0	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	20	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
Toluene	ND	5.0	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.0	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.0	ug/kg	SW846 8260B
2-Hexanone	ND	20	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.0	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.0	ug/kg	SW846 8260B
Chlorobenzene	ND	5.0	ug/kg	SW846 8260B
Ethylbenzene	ND	5.0	ug/kg	SW846 8260B
Xylenes (total)	ND	10	ug/kg	SW846 8260B
Styrene	3.3 J	5.0	ug/kg	SW846 8260B
Bromoform	ND	5.0	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	SW846 8260B
1,2-Dichlorobenzene	ND	5.0	ug/kg	SW846 8260B
1,3-Dichlorobenzene	ND	5.0	ug/kg	SW846 8260B
1,4-Dichlorobenzene	ND	5.0	ug/kg	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Toluene-d8	99	(72 - 136)
Dibromofluoromethane	89	(76 - 130)

(Continued on next page)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F0I030547

Work Order #...: L6P3G1AA

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
1,2-Dichloroethane-d4	99	(73 - 148)		
4-Bromofluorobenzene	112	(59 - 150)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6WJT1AA Matrix.....: SOLID
 MB Lot-Sample #: F0I130000-287
 Prep Date.....: 09/13/10 Analysis Time...: 08:15
 Analysis Date...: 09/13/10 Prep Batch #...: 0256287
 Dilution Factor: 1

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Acetone	9.2 J	20	ug/kg	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	100	(72 - 136)
Dibromofluoromethane	100	(76 - 130)
1,2-Dichloroethane-d4	108	(73 - 148)
4-Bromofluorobenzene	109	(59 - 150)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 J Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6P3G1AC Matrix.....: SOLID
 LCS Lot-Sample#: F0I090000-251
 Prep Date.....: 09/09/10 Analysis Date...: 09/09/10
 Prep Batch #...: 0252251 Analysis Time...: 07:53
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Chloromethane	117	(71 - 135)	SW846 8260B
Vinyl chloride	94	(68 - 140)	SW846 8260B
Bromomethane	93	(60 - 140)	SW846 8260B
Chloroethane	101	(66 - 140)	SW846 8260B
1,1-Dichloroethene	98	(72 - 127)	SW846 8260B
Methylene chloride	101	(72 - 135)	SW846 8260B
Carbon disulfide	93	(68 - 140)	SW846 8260B
1,1-Dichloroethane	106	(83 - 118)	SW846 8260B
2-Butanone	111	(71 - 132)	SW846 8260B
1,2-Dichloroethene (total)	105	(85 - 116)	SW846 8260B
Chloroform	105	(86 - 115)	SW846 8260B
1,1,1-Trichloroethane	104	(85 - 118)	SW846 8260B
Carbon tetrachloride	102	(84 - 120)	SW846 8260B
1,2-Dichloroethane	112	(83 - 118)	SW846 8260B
Benzene	103	(85 - 115)	SW846 8260B
Trichloroethene	100	(83 - 115)	SW846 8260B
1,2-Dichloropropane	108	(84 - 116)	SW846 8260B
Bromodichloromethane	102	(85 - 115)	SW846 8260B
4-Methyl-2-pentanone	118	(68 - 136)	SW846 8260B
cis-1,3-Dichloropropene	109	(83 - 121)	SW846 8260B
Toluene	99	(85 - 116)	SW846 8260B
trans-1,3-Dichloropropene	112	(82 - 123)	SW846 8260B
1,1,2-Trichloroethane	103	(85 - 115)	SW846 8260B
2-Hexanone	120	(69 - 135)	SW846 8260B
Tetrachloroethene	83	(64 - 132)	SW846 8260B
Dibromochloromethane	101	(85 - 115)	SW846 8260B
Chlorobenzene	99	(85 - 115)	SW846 8260B
Ethylbenzene	101	(84 - 120)	SW846 8260B
Styrene	93	(83 - 124)	SW846 8260B
Bromoform	110	(81 - 119)	SW846 8260B
1,1,2,2-Tetrachloroethane	120 a	(82 - 116)	SW846 8260B
1,2-Dichlorobenzene	104	(85 - 115)	SW846 8260B
1,3-Dichlorobenzene	100	(85 - 115)	SW846 8260B

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6P3G1AC Matrix.....: SOLID
 LCS Lot-Sample#: F0I090000-251

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
1,4-Dichlorobenzene	99	(85 - 115)	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	95	(85 - 116)
Dibromofluoromethane	103	(85 - 115)
1,2-Dichloroethane-d4	106	(85 - 116)
4-Bromofluorobenzene	114	(83 - 121)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6WJT1AC-LCS Matrix.....: SOLID
 LCS Lot-Sample#: F0I130000-287 L6WJT1AD-LCSD
 Prep Date.....: 09/13/10 Analysis Date...: 09/13/10
 Prep Batch #...: 0256287 Analysis Time...: 07:02
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>RPD</u>	<u>RPD LIMITS</u>	<u>METHOD</u>
Acetone	147 a	(57 - 140)			SW846 8260B
	154 a	(57 - 140)	5.0	(0-20)	SW846 8260B

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Toluene-d8	98	(85 - 116)
	102	(85 - 116)
Dibromofluoromethane	100	(85 - 115)
	97	(85 - 115)
1,2-Dichloroethane-d4	102	(85 - 116)
	102	(85 - 116)
4-Bromofluorobenzene	111	(83 - 121)
	112	(83 - 121)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6JMF1AH-MS Matrix.....: SOLID
 MS Lot-Sample #: F0I030547-001 L6JMF1AJ-MSD
 Date Sampled...: 09/03/10 09:30 Date Received...: 09/03/10
 Prep Date.....: 09/09/10 Analysis Date...: 09/09/10
 Prep Batch #...: 0252251 Analysis Time...: 15:33
 Dilution Factor: 1 % Moisture.....: 16

PARAMETER	PERCENT	RECOVERY	RPD		METHOD
	RECOVERY	LIMITS	RPD	LIMITS	
Chloromethane	118	(61 - 150)			SW846 8260B
	107	(61 - 150)	9.3	(0-30)	SW846 8260B
Vinyl chloride	95	(65 - 150)			SW846 8260B
	90	(65 - 150)	6.0	(0-30)	SW846 8260B
Bromomethane	88	(45 - 150)			SW846 8260B
	78	(45 - 150)	13	(0-30)	SW846 8260B
Chloroethane	103	(55 - 150)			SW846 8260B
	87	(55 - 150)	17	(0-30)	SW846 8260B
1,1-Dichloroethene	92	(68 - 128)			SW846 8260B
	93	(68 - 128)	0.63	(0-30)	SW846 8260B
Methylene chloride	102	(49 - 150)			SW846 8260B
	100	(49 - 150)	2.5	(0-30)	SW846 8260B
Carbon disulfide	88	(63 - 130)			SW846 8260B
	86	(63 - 130)	1.4	(0-30)	SW846 8260B
1,1-Dichloroethane	105	(78 - 133)			SW846 8260B
	103	(78 - 133)	1.5	(0-30)	SW846 8260B
2-Butanone	106	(32 - 150)			SW846 8260B
	108	(32 - 150)	2.3	(0-30)	SW846 8260B
1,2-Dichloroethene (total)	102	(73 - 128)			SW846 8260B
	101	(73 - 128)	0.10	(0-30)	SW846 8260B
Chloroform	102	(78 - 131)			SW846 8260B
	103	(78 - 131)	0.55	(0-30)	SW846 8260B
1,1,1-Trichloroethane	103	(73 - 138)			SW846 8260B
	101	(73 - 138)	2.1	(0-30)	SW846 8260B
Carbon tetrachloride	99	(66 - 142)			SW846 8260B
	100	(66 - 142)	1.1	(0-30)	SW846 8260B
1,2-Dichloroethane	107	(71 - 149)			SW846 8260B
	110	(71 - 149)	3.2	(0-30)	SW846 8260B
Benzene	102	(76 - 126)			SW846 8260B
	105	(76 - 126)	2.6	(0-30)	SW846 8260B
Trichloroethene	105	(65 - 143)			SW846 8260B
	112	(65 - 143)	6.8	(0-30)	SW846 8260B
1,2-Dichloropropane	109	(79 - 129)			SW846 8260B
	112	(79 - 129)	2.4	(0-30)	SW846 8260B
Bromodichloromethane	100	(76 - 135)			SW846 8260B
	104	(76 - 135)	3.6	(0-30)	SW846 8260B
4-Methyl-2-pentanone	113	(58 - 150)			SW846 8260B
	117	(58 - 150)	3.2	(0-30)	SW846 8260B

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6JMF1AH-MS Matrix.....: SOLID
 MS Lot-Sample #: F0I030547-001 L6JMF1AJ-MSD

PARAMETER	PERCENT	RECOVERY	RPD		METHOD
	RECOVERY	LIMITS	RPD	LIMITS	
cis-1,3-Dichloropropene	106	(74 - 138)			SW846 8260B
	114	(74 - 138)	7.2	(0-30)	SW846 8260B
Toluene	108	(62 - 142)			SW846 8260B
	111	(62 - 142)	2.4	(0-30)	SW846 8260B
trans-1,3-Dichloropropene	113	(75 - 148)			SW846 8260B
	116	(75 - 148)	2.4	(0-30)	SW846 8260B
1,1,2-Trichloroethane	108	(63 - 150)			SW846 8260B
	110	(63 - 150)	2.2	(0-30)	SW846 8260B
2-Hexanone	120	(38 - 150)			SW846 8260B
	121	(38 - 150)	0.72	(0-30)	SW846 8260B
Tetrachloroethene	85	(38 - 150)			SW846 8260B
	89	(38 - 150)	4.0	(0-30)	SW846 8260B
Dibromochloromethane	101	(73 - 138)			SW846 8260B
	104	(73 - 138)	3.1	(0-30)	SW846 8260B
Chlorobenzene	96	(74 - 123)			SW846 8260B
	101	(74 - 123)	4.5	(0-30)	SW846 8260B
Ethylbenzene	103	(70 - 130)			SW846 8260B
	107	(70 - 130)	4.4	(0-30)	SW846 8260B
Styrene	88	(67 - 133)			SW846 8260B
	94	(67 - 133)	6.4	(0-30)	SW846 8260B
Bromoform	115	(58 - 150)			SW846 8260B
	122	(58 - 150)	6.4	(0-30)	SW846 8260B
1,1,2,2-Tetrachloroethane	123	(44 - 150)			SW846 8260B
	121	(44 - 150)	1.2	(0-30)	SW846 8260B
1,2-Dichlorobenzene	100	(65 - 133)			SW846 8260B
	107	(65 - 133)	6.9	(0-30)	SW846 8260B
1,3-Dichlorobenzene	97	(69 - 125)			SW846 8260B
	105	(69 - 125)	8.8	(0-30)	SW846 8260B
1,4-Dichlorobenzene	95	(68 - 126)			SW846 8260B
	103	(68 - 126)	8.4	(0-30)	SW846 8260B

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Toluene-d8	105	(72 - 136)
	105	(72 - 136)
Dibromofluoromethane	98	(76 - 130)
	98	(76 - 130)
1,2-Dichloroethane-d4	105	(73 - 148)
	103	(73 - 148)
4-Bromofluorobenzene	122	(59 - 150)
	126	(59 - 150)

(Continued on next page)

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: F0I030547 Work Order #...: L6JMF1AH-MS Matrix.....: SOLID
 MS Lot-Sample #: F0I030547-001 L6JMF1AJ-MSD

<u>SURROGATE</u>	<u>PERCENT</u>	<u>RECOVERY</u>
	<u>RECOVERY</u>	<u>LIMITS</u>

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.



Lot #(s): F0I030547

CONDITION UPON RECEIPT FORM

Client: Schreiber, Vonley

Quote No: 86974

COC/RFA No: 171900

369

Initiated By: [Signature] Date: 9.3.10 Time: 1050

Shipping Information

Shipper: FedEx UPS DHL Courier Client Other: _____ Multiple Packages: Y N

Shipping # (s):*		Sample Temperature (s):**	
1. _____	6. _____	1. <u>15</u>	6. _____
2. _____	7. _____	2. _____	7. _____
3. _____	8. _____	3. _____	8. _____
4. _____	9. _____	4. _____	9. _____
5. _____	10. _____	5. _____	10. _____

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. Y <u>N</u>	Are there custody seals present on the cooler?	8. Y <u>N</u>	Are there custody seals present on bottles?
2. Y N <u>N/A</u>	Do custody seals on cooler appear to be tampered with?	9. Y N <u>N/A</u>	Do custody seals on bottles appear to be tampered with?
3. <u>Y</u> N	Were contents of cooler frisked after opening, but before unpacking?	10. Y N <u>N/A</u>	Was sample received with proper pH? (if not, make note below)
4. <u>Y</u> N	Sample received with Chain of Custody?	11. <u>Y</u> N	Sample received in proper containers?
5. <u>Y</u> N N/A	Does the Chain of Custody match sample ID's on the container(s)?	12. Y N <u>N/A</u>	Headspace in VOA or TOX liquid samples? (if Yes, note sample ID's below)
6. Y <u>N</u>	Was sample received broken?	13. Y N <u>N/A</u>	Was Internal COC/Workshare received?
7. <u>Y</u> N	Is sample volume sufficient for analysis?	14. Y N <u>N/A</u>	Was pH taken by original TestAmerica lab?

¹ For DOB-AL (Pantox, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Sample just collected

Corrective Action:

Client Contact Name: _____

Sample(s) processed "as is"

Sample(s) on hold until: _____

Project Management Review: Jayna Pohl

Informed by: _____

If released, notify: _____

Date: 9-7-10

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

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ATTACHMENT 7 – GeoCheck Report Summary

Attachment 7 - GeoCheck Summary



MEMORANDUM

SIGMA-ALDRICH MFG LLC

ENVIRONMENTAL, SAFETY & HEALTH

TO: Nuclear Regulatory Commission

FROM: Cheryl Stipsits, Sigma-Aldrich St. Louis EHS Director

SUBJECT: Supplementary Information to EDR Report

DATE: February 15, 2011

Within the RESRAD model using site-specific parameters, 40 meters (120 feet) was used as the estimated depth to groundwater. In order to obtain this value, Sigma-Aldrich ran a query of registered groundwater wells within a 1-mile radius of the 11542 Fort Mims Drive location through Environmental Data Resources (EDR). The EDR GeoCheck® Report provides water well data, as compiled from the US Geological Society (USGS) database, the FRDS Public Water Supply System information, and Missouri State Database Well information. The query of all information sources provided a total of 11 water wells within the 1-mile radius.

The data showed that while a couple of the wells indicated the presence of water at depths as shallow as 30-60 feet (10-20 meters) below ground surface (bgs), sustainable aquifers for potable water were not detected until 140-200 feet (47-67 meters) bgs, minimally. This site is located within an industrial/commercial setting where drinking water is provided via a public water supply, and the potential for a local receptor to obtain drinking water from a shallow well is highly unlikely. Thus, the value used within the RESRAD model (potable groundwater at 40 meters bgs) is a conservative assumption for the purpose of risk modeling based on the site-specific data.

Cheryl Stipsits

2/15/2011