Pace Analytical™
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RTI Laboratories, Inc.

Client Ref.: Fort Monmouth 1207082

Pace-Pittsburgh Project No. 3072159

Pace Analysis Services, Inc.-Pittsburgh
1638 Roseytown Road
Suites 2, 3, & 4
Greensburg, PA 15601

Phone Number: 724-850-5600 Fax Number: 724-850-5601

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Case Narrative for Pace Analytical Job Number 3072159

8/1/2012

Eight Hundred and twenty three (823) low-energy beta contamination swipe samples were received in good condition at Pace Analytical on 06/25/12. One hundred (100) of the samples received were logged for radiochemical analyses under Pace Analytical Project number 3072159 with corresponding samples IDs of 3072159001 through 3072159100. This project narrative is for the analysis of all samples for Low-Energy-Beta (LEB) content by Liquid Scintillation Counting (LSC).

Samples were analyzed as specified in the generic Scope of Work (SOW) for Analytical Chemistry Laboratory Services for Environmental Samples USACE, Baltimore District.

All work was performed under the Purchase Order (PO) agreement number 12E-183 by and between Pace Analytical Services, Inc. and RTI Laboratories, Inc.

Low-Energy-Beta (LEB) analysis by Liquid Scintillation Counting (LSC)

The SOW for this project specified that the samples were to be analyzed utilizing detector window settings sufficient to include contributions from H-3, Ni-63, and C-14. Of these radionuclides, H-3 is the weakest beta emitter and C-14 is the strongest beta emitter, with Ni-63 having the most moderate beta energy of the three listed radionuclides. The system employed for sample counting has a higher response (efficiency) with higher beta particle energies. For this project, Pace calibrated all instruments utilized using NIST-traceable quantities of Ni-63, the most moderate beta-emitter listed by the client. Instrument window settings were chosen so as to measure contributions from all of the listed radionuclides of interest for the client.

The samples received were individual LEB smear samples that were collected by the client and placed into glass scintillation vials containing 5.0 mL of ASTM Type II water. The sample vials containing water and the filter swipes were provide to the client by Pace in order to maintain product consistency between samples, laboratory calibration sources, and laboratory blanks and spikes.

To each sample, as received, Pace added 15 mL of Ultima Gold LLT (Low-Level-Tritium) cocktail and individual samples were shaken until the filter swipes dissolved and a uniform sample/cocktail mixture was obtained. The prepared samples were counted on a LSC which was calibrated with NIST-traceable quantities of Ni-63. Samples were counted for a duration sufficient to achieve the project-specified detection limit of 10 dpm/filter for an energy window setting of 1 – 160 keV.

Batch quality control analyses performed for each set of 20 samples consisted of one batch method blank (MB), one Laboratory Control Sample (LCS), and one LCS Duplicate (LCSD). The LCS and LCSD samples used were "static" sources that were prepared by Pace prior to the onset of analyses and consisted of a blank filter of the same lot as those used for sample analysis directly spiked with a quantity of Ni-63.

Case Narrative for Pace Analytical Job Number 3072159

Following analysis of many samples, it was discovered that incorrect LCS and LCSD sources were counted with sample batches. In the attached data package, any logbook or instrument printouts with recordings of LCSs and LCSDs without an accompanying five digit batch ID should be considered to be extraneous information that does not relate to this project.

Upon discovery of the issue related to counting of incorrect LCSs and LCSDs, the laboratory counted the required spike samples and all QC information has been provided.

Numerous samples and QC samples exhibited "quenching" with a corresponding instrument quench value (TSIE) that was outside of the range of the calibration curve generated. Quenching is the effect of unknown sample components which when combined with liquid scintillation cocktails may cause a suppression of the light measured by the liquid scintillation counter. For liquid scintillation analysis, compensation for quenching is made by preparing a calibration curve that relates the instrument quench values (TSIEs) to the instrument response (efficiency).

For all samples in this project with noted TSIE values outside of the calibration range, the observed sample quench was **less** than the least-quenched source utilized for calibration. The resulting calibration curves for this project were second order polynomials that showed extremely good correlation between TSIEs and system efficiency. For this reason, the calibration curves were extrapolated to determine the sample-specific efficiency for all samples, including those outside of the calibration range. It is estimated that curve extrapolation could not contribute greater than 1% difference in the results provided.

No further anomalous events were noted during the preparation or analysis of the samples for Low-Energy-Beta by Liquid Scintillation Counting. Unless indicated otherwise, all data quality objectives and quality control acceptance criteria were satisfied.

General Comments

Please note that analytical results, as well as the CSU (Combined Standard Uncertainty – a.k.a. TPU) are reported at the 1.96 sigma level for all sample analyses.

No further anomalous events were noted during the preparation or analysis of the samples referenced in this project narrative.

Unless noted otherwise, all data quality objectives and quality control acceptance criteria were satisfied.

Radiochemistry Manager or Designate

8/1/12
Date

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

July 27, 2012

Mr. Chino Ortiz
RTI Laboratories, Inc.
31628 Glendale Street
Livonia, MI 48150

RE: Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Dear Mr. Ortiz:
Enclosed are the analytical results for sample(s) received by the laboratory on June 25, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carin A. Ferris

Carin Ferris

carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4 Greensburg, PA 15601
ACLASS DOD-ELAP Accreditation #: ADE-1544
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California/TNI Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH 0694
Delaware Certification
Florida/TNI Certification #: E87683
Guam/PADEP Certification
Hawaii/PADEP Certification
Idaho Certification
Illinois/PADEP Certification
Indiana/PADEP Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana/TNI Certification #: LA080002
Louisiana/TNI Certification #: 4086
Maine Certification #: PA0091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nevada Certification
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188
Utah/TNI Certification #: ANTE
Virgin Island/PADEP Certification
Virginia Certification #: 00112
Virginia VELAP (Cert # 460198)
Washington Certification #: C868
West Virginia Certification #: 143
Wisconsin/PADEP Certification
Wyoming Certification #: 8TMS-Q

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SAMPLE SUMMARY

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072159001	SU-09-3	Wipe	06/11/12 00:01	06/25/12 10:15
3072159002	SU-09-4	Wipe	06/11/12 00:01	06/25/12 10:15
3072159003	SU-09-5	Wipe	06/11/12 00:01	06/25/12 10:15
3072159004	SU-09-6	Wipe	06/11/12 00:01	06/25/12 10:15
3072159005	SU-09-7	Wipe	06/11/12 00:01	06/25/12 10:15
3072159006	SU-09-8	Wipe	06/11/12 00:01	06/25/12 10:15
3072159007	SU-09-9	Wipe	06/11/12 00:01	06/25/12 10:15
3072159008	SU-09-10	Wipe	06/11/12 00:01	06/25/12 10:15
3072159009	SU-09-11	Wipe	06/11/12 00:01	06/25/12 10:15
3072159010	SU-09-11D	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159014	SU-09-15	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159023	SU-09-24	Wipe	06/11/12 00:01	06/25/12 10:15
3072159024	SU-09-25	Wipe	06/11/12 00:01	06/25/12 10:15
3072159025	SU-09-26	Wipe	06/11/12 00:01	06/25/12 10:15
3072159026	SU-09-27	Wipe	06/11/12 00:01	06/25/12 10:15
3072159027	SU-09-28	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159029	SU-09-30	Wipe	06/11/12 00:01	06/25/12 10:15
3072159030	SU-09-31	Wipe	06/11/12 00:01	06/25/12 10:15
3072159031	SU-09-32	Wipe	06/11/12 00:01	06/25/12 10:15
3072159032	SU-09-33	Wipe	06/11/12 00:01	06/25/12 10:15
3072159033	SU-09-34	Wipe	06/11/12 00:01	06/25/12 10:15
3072159034	SU-09-35	Wipe	06/11/12 00:01	06/25/12 10:15
3072159035	SU-09-36	Wipe	06/11/12 00:01	06/25/12 10:15
3072159036	SU-09-37	Wipe	06/11/12 00:01	06/25/12 10:15
3072159037	SU-09-37D	Wipe	06/11/12 00:01	06/25/12 10:15

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SAMPLE SUMMARY

Project: Fort Monmouth 1207082
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Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072159038	SU-09-38	Wipe	06/11/12 00:01	06/25/12 10:15
3072159039	SU-09-39	Wipe	06/11/12 00:01	06/25/12 10:15
3072159040	SU-09-40	Wipe	06/11/12 00:01	06/25/12 10:15
3072159041	SU-09-41	Wipe	06/11/12 00:01	06/25/12 10:15
3072159042	SU-09-42	Wipe	06/11/12 00:01	06/25/12 10:15
3072159043	SU-09-43	Wipe	06/11/12 00:01	06/25/12 10:15
3072159044	SU-09-44	Wipe	06/11/12 00:01	06/25/12 10:15
3072159045	SU-09-45	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159047	SU-09-47	Wipe	06/11/12 00:01	06/25/12 10:15
3072159048	SU-09-48	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159050	SU-09-49D	Wipe	06/11/12 00:01	06/25/12 10:15
3072159051	SU-09-50	Wipe	06/11/12 00:01	06/25/12 10:15
3072159052	SU-09-51	Wipe	06/11/12 00:01	06/25/12 10:15
3072159053	SU-09-52	Wipe	06/11/12 00:01	06/25/12 10:15
3072159054	SU-09-53	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159056	SU-09-55	Wipe	06/11/12 00:01	06/25/12 10:15
3072159057	SU-09-56	Wipe	06/11/12 00:01	06/25/12 10:15
3072159058	SU-09-57	Wipe	06/11/12 00:01	06/25/12 10:15
3072159059	SU-09-58	Wipe	06/11/12 00:01	06/25/12 10:15
3072159060	SU-09-59	Wipe	06/11/12 00:01	06/25/12 10:15
3072159061	SU-09-60	Wipe	06/11/12 00:01	06/25/12 10:15
3072159062	SU-09-61	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159066	SU-09-65	Wipe	06/11/12 00:01	06/25/12 10:15
3072159067	SU-09-66	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159069	SU-09-68	Wipe	06/11/12 00:01	06/25/12 10:15
3072159070	SU-09-69	Wipe	06/11/12 00:01	06/25/12 10:15
3072159071	SU-09-70	Wipe	06/11/12 00:01	06/25/12 10:15
3072159072	SU-09-71	Wipe	06/11/12 00:01	06/25/12 10:15
3072159073	SU-09-72	Wipe	06/11/12 00:01	06/25/12 10:15
3072159074	SU-09-73	Wipe	06/11/12 00:01	06/25/12 10:15

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Project: Fort Monmouth 1207082
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Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072159075	SU-09-74	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159078	SU-09-77	Wipe	06/11/12 00:01	06/25/12 10:15
3072159079	SU-09-77D	Wipe	06/11/12 00:01	06/25/12 10:15
3072159080	SU-09-78	Wipe	06/11/12 00:01	06/25/12 10:15
3072159081	SU-09-79	Wipe	06/11/12 00:01	06/25/12 10:15
3072159082	SU-09-80	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159084	SU-01-2	Wipe	06/11/12 00:01	06/25/12 10:15
3072159085	SU-01-3	Wipe	06/11/12 00:01	06/25/12 10:15
3072159086	SU-01-4	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159088	SU-01-5D	Wipe	06/11/12 00:01	06/25/12 10:15
3072159089	SU-01-6	Wipe	06/11/12 00:01	06/25/12 10:15
3072159090	SU-01-7	Wipe	06/11/12 00:01	06/25/12 10:15
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3072159093	SU-01-10	Wipe	06/11/12 00:01	06/25/12 10:15
3072159094	SU-01-11	Wipe	06/11/12 00:01	06/25/12 10:15
3072159095	SU-01-12	Wipe	06/11/12 00:01	06/25/12 10:15
3072159096	SU-01-12D	Wipe	06/11/12 00:01	06/25/12 10:15
3072159097	SU-01-13	Wipe	06/11/12 00:01	06/25/12 10:15
3072159098	SU-01-14	Wipe	06/11/12 00:01	06/25/12 10:15
3072159099	SU-01-15	Wipe	06/11/12 00:01	06/25/12 10:15
3072159100	SU-01-16	Wipe	06/11/12 00:01	06/25/12 10:15

Pace Analytical Services, Inc.
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(724)850-5600

SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072159001	SU-09-3	EPA 906.0M	MBT	1	PASI-PA
3072159002	SU-09-4	EPA 906.0M	MBT	1	PASI-PA
3072159003	SU-09-5	EPA 906.0M	MBT	1	PASI-PA
3072159004	SU-09-6	EPA 906.0M	MBT	1	PASI-PA
3072159005	SU-09-7	EPA 906.0M	MBT	1	PASI-PA
3072159006	SU-09-8	EPA 906.0M	MBT	1	PASI-PA
3072159007	SU-09-9	EPA 906.0M	MBT	1	PASI-PA
3072159008	SU-09-10	EPA 906.0M	MBT	1	PASI-PA
3072159009	SU-09-11	EPA 906.0M	MBT	1	PASI-PA
3072159010	SU-09-11D	EPA 906.0M	MBT	1	PASI-PA
3072159011	SU-09-12	EPA 906.0M	MBT	1	PASI-PA
3072159012	SU-09-13	EPA 906.0M	MBT	1	PASI-PA
3072159013	SU-09-14	EPA 906.0M	MBT	1	PASI-PA
3072159014	SU-09-15	EPA 906.0M	MBT	1	PASI-PA
3072159015	SU-09-16	EPA 906.0M	MBT	1	PASI-PA
3072159016	SU-09-17	EPA 906.0M	MBT	1	PASI-PA
3072159017	SU-09-18	EPA 906.0M	MBT	1	PASI-PA
3072159018	SU-09-19	EPA 906.0M	MBT	1	PASI-PA
3072159019	SU-09-20	EPA 906.0M	MBT	1	PASI-PA
3072159020	SU-09-21	EPA 906.0M	MBT	1	PASI-PA
3072159021	SU-09-22	EPA 906.0M	MBT	1	PASI-PA
3072159022	SU-09-23	EPA 906.0M	MBT	1	PASI-PA
3072159023	SU-09-24	EPA 906.0M	MBT	1	PASI-PA
3072159024	SU-09-25	EPA 906.0M	MBT	1	PASI-PA
3072159025	SU-09-26	EPA 906.0M	MBT	1	PASI-PA
3072159026	SU-09-27	EPA 906.0M	MBT	1	PASI-PA
3072159027	SU-09-28	EPA 906.0M	MBT	1	PASI-PA
3072159028	SU-09-29	EPA 906.0M	MBT	1	PASI-PA
3072159029	SU-09-30	EPA 906.0M	MBT	1	PASI-PA
3072159030	SU-09-31	EPA 906.0M	MBT	1	PASI-PA
3072159031	SU-09-32	EPA 906.0M	MBT	1	PASI-PA
3072159032	SU-09-33	EPA 906.0M	MBT	1	PASI-PA
3072159033	SU-09-34	EPA 906.0M	MBT	1	PASI-PA
3072159034	SU-09-35	EPA 906.0M	MBT	1	PASI-PA
3072159035	SU-09-36	EPA 906.0M	MBT	1	PASI-PA
3072159036	SU-09-37	EPA 906.0M	MBT	1	PASI-PA
3072159037	SU-09-37D	EPA 906.0M	MBT	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072159038	SU-09-38	EPA 906.0M	MBT	1	PASI-PA
3072159039	SU-09-39	EPA 906.0M	MBT	1	PASI-PA
3072159040	SU-09-40	EPA 906.0M	MBT	1	PASI-PA
3072159041	SU-09-41	EPA 906.0M	MBT	1	PASI-PA
3072159042	SU-09-42	EPA 906.0M	MBT	1	PASI-PA
3072159043	SU-09-43	EPA 906.0M	MBT	1	PASI-PA
3072159044	SU-09-44	EPA 906.0M	MBT	1	PASI-PA
3072159045	SU-09-45	EPA 906.0M	MBT	1	PASI-PA
3072159046	SU-09-46	EPA 906.0M	MBT	1	PASI-PA
3072159047	SU-09-47	EPA 906.0M	MBT	1	PASI-PA
3072159048	SU-09-48	EPA 906.0M	MBT	1	PASI-PA
3072159049	SU-09-49	EPA 906.0M	MBT	1	PASI-PA
3072159050	SU-09-49D	EPA 906.0M	MBT	1	PASI-PA
3072159051	SU-09-50	EPA 906.0M	MBT	1	PASI-PA
3072159052	SU-09-51	EPA 906.0M	MBT	1	PASI-PA
3072159053	SU-09-52	EPA 906.0M	MBT	1	PASI-PA
3072159054	SU-09-53	EPA 906.0M	MBT	1	PASI-PA
3072159055	SU-09-54	EPA 906.0M	MBT	1	PASI-PA
3072159056	SU-09-55	EPA 906.0M	MBT	1	PASI-PA
3072159057	SU-09-56	EPA 906.0M	MBT	1	PASI-PA
3072159058	SU-09-57	EPA 906.0M	MBT	1	PASI-PA
3072159059	SU-09-58	EPA 906.0M	MBT	1	PASI-PA
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3072159061	SU-09-60	EPA 906.0M	RMK	1	PASI-PA
3072159062	SU-09-61	EPA 906.0M	RMK	1	PASI-PA
3072159063	SU-09-62	EPA 906.0M	RMK	1	PASI-PA
3072159064	SU-09-63	EPA 906.0M	RMK	1	PASI-PA
3072159065	SU-09-64	EPA 906.0M	RMK	1	PASI-PA
3072159066	SU-09-65	EPA 906.0M	RMK	1	PASI-PA
3072159067	SU-09-66	EPA 906.0M	RMK	1	PASI-PA
3072159068	SU-09-67	EPA 906.0M	RMK	1	PASI-PA
3072159069	SU-09-68	EPA 906.0M	RMK	1	PASI-PA
3072159070	SU-09-69	EPA 906.0M	RMK	1	PASI-PA
3072159071	SU-09-70	EPA 906.0M	RMK	1	PASI-PA
3072159072	SU-09-71	EPA 906.0M	RMK	1	PASI-PA
3072159073	SU-09-72	EPA 906.0M	RMK	1	PASI-PA
3072159074	SU-09-73	EPA 906.0M	RMK	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072159075	SU-09-74	EPA 906.0M	RMK	1	PASI-PA
3072159076	SU-09-75	EPA 906.0M	RMK	1	PASI-PA
3072159077	SU-09-76	EPA 906.0M	RMK	1	PASI-PA
3072159078	SU-09-77	EPA 906.0M	RMK	1	PASI-PA
3072159079	SU-09-77D	EPA 906.0M	RMK	1	PASI-PA
3072159080	SU-09-78	EPA 906.0M	RMK	1	PASI-PA
3072159081	SU-09-79	EPA 906.0M	RMK	1	PASI-PA
3072159082	SU-09-80	EPA 906.0M	RMK	1	PASI-PA
3072159083	SU-01-1	EPA 906.0M	RMK	1	PASI-PA
3072159084	SU-01-2	EPA 906.0M	RMK	1	PASI-PA
3072159085	SU-01-3	EPA 906.0M	RMK	1	PASI-PA
3072159086	SU-01-4	EPA 906.0M	RMK	1	PASI-PA
3072159087	SU-01-5	EPA 906.0M	RMK	1	PASI-PA
3072159088	SU-01-5D	EPA 906.0M	RMK	1	PASI-PA
3072159089	SU-01-6	EPA 906.0M	RMK	1	PASI-PA
3072159090	SU-01-7	EPA 906.0M	RMK	1	PASI-PA
3072159091	SU-01-8	EPA 906.0M	RMK	1	PASI-PA
3072159092	SU-01-9	EPA 906.0M	RMK	1	PASI-PA
3072159093	SU-01-10	EPA 906.0M	RMK	1	PASI-PA
3072159094	SU-01-11	EPA 906.0M	RMK	1	PASI-PA
3072159095	SU-01-12	EPA 906.0M	RMK	1	PASI-PA
3072159096	SU-01-12D	EPA 906.0M	RMK	1	PASI-PA
3072159097	SU-01-13	EPA 906.0M	RMK	1	PASI-PA
3072159098	SU-01-14	EPA 906.0M	RMK	1	PASI-PA
3072159099	SU-01-15	EPA 906.0M	RMK	1	PASI-PA
3072159100	SU-01-16	EPA 906.0M	RMK	1	PASI-PA

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-3 **Lab ID: 3072159001** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**3.37J ± 3.54 (6.40)**	dpm/sample	07/19/12 15:13		

Sample: SU-09-4 **Lab ID: 3072159002** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.17U ± 3.41 (6.42)**	dpm/sample	07/19/12 15:34		

Sample: SU-09-5 **Lab ID: 3072159003** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.374U ± 3.37 (6.51)**	dpm/sample	07/19/12 15:55		

Sample: SU-09-6 **Lab ID: 3072159004** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**3.81J ± 3.57 (6.39)**	dpm/sample	07/19/12 16:16		

Sample: SU-09-7 **Lab ID: 3072159005** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.07U ± 3.26 (6.48)**	dpm/sample	07/19/12 16:37		

Sample: SU-09-8 **Lab ID: 3072159006** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.25U ± 3.42 (6.42)**	dpm/sample	07/19/12 16:59		

Sample: SU-09-9 **Lab ID: 3072159007** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.206U ± 3.36 (6.47)**	dpm/sample	07/19/12 17:20		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-10 **Lab ID: 3072159008** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.31U ± 3.25 (6.39)**	dpm/sample	07/19/12 17:41		

Sample: SU-09-11 **Lab ID: 3072159009** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.84U ± 3.38 (6.69)**	dpm/sample	07/19/12 18:02		

Sample: SU-09-11D **Lab ID: 3072159010** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.25U ± 3.27 (6.42)**	dpm/sample	07/19/12 18:23		

Sample: SU-09-12 **Lab ID: 3072159011** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.614U ± 3.30 (6.41)**	dpm/sample	07/19/12 18:44		

Sample: SU-09-13 **Lab ID: 3072159012** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.28U ± 3.22 (6.43)**	dpm/sample	07/19/12 19:05		

Sample: SU-09-14 **Lab ID: 3072159013** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.675U ± 4.01 (8.39)**	dpm/sample	07/19/12 20:25		

Sample: SU-09-15 **Lab ID: 3072159014** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.994U ± 4.08 (8.49)**	dpm/sample	07/19/12 20:38		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
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Sample: SU-09-16 **Lab ID: 3072159015** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.549U ± 3.88 (8.33)**	dpm/sample	07/19/12 20:51		

Sample: SU-09-17 **Lab ID: 3072159016** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-3.63U ± 3.67 (8.41)**	dpm/sample	07/19/12 21:04		

Sample: SU-09-18 **Lab ID: 3072159017** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.79U ± 4.08 (8.34)**	dpm/sample	07/19/12 21:17		

Sample: SU-09-19 **Lab ID: 3072159018** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.631U ± 3.98 (8.34)**	dpm/sample	07/19/12 21:30		

Sample: SU-09-20 **Lab ID: 3072159019** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.55U ± 4.13 (8.48)**	dpm/sample	07/19/12 21:42		

Sample: SU-09-21 **Lab ID: 3072159020** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.550U ± 3.98 (8.35)**	dpm/sample	07/19/12 21:55		

Sample: SU-09-22 **Lab ID: 3072159021** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.540U ± 4.06 (8.51)**	dpm/sample	07/19/12 22:47		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
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Sample: SU-09-23 **Lab ID: 3072159022** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-3.08U ± 3.72 (8.41)**	dpm/sample	07/19/12 23:00		

Sample: SU-09-24 **Lab ID: 3072159023** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.97U ± 3.81 (8.43)**	dpm/sample	07/19/12 23:13		

Sample: SU-09-25 **Lab ID: 3072159024** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.98U ± 3.96 (8.74)**	dpm/sample	07/19/12 23:26		

Sample: SU-09-26 **Lab ID: 3072159025** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.631U ± 4.01 (8.62)**	dpm/sample	07/19/12 23:38		

Sample: SU-09-27 **Lab ID: 3072159026** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.25U ± 3.80 (8.44)**	dpm/sample	07/19/12 23:51		

Sample: SU-09-28 **Lab ID: 3072159027** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.06U ± 3.84 (8.34)**	dpm/sample	07/20/12 00:04		

Sample: SU-09-29 **Lab ID: 3072159028** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.54U ± 3.84 (8.42)**	dpm/sample	07/20/12 00:17		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
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Sample: SU-09-30 **Lab ID: 3072159029** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.43U ± 3.85 (8.58)**	dpm/sample	07/20/12 00:30		

Sample: SU-09-31 **Lab ID: 3072159030** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-3.35U ± 3.70 (8.41)**	dpm/sample	07/20/12 00:43		

Sample: SU-09-32 **Lab ID: 3072159031** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.509U ± 3.89 (8.35)**	dpm/sample	07/20/12 00:56		

Sample: SU-09-33 **Lab ID: 3072159032** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.814U ± 4.00 (8.33)**	dpm/sample	07/20/12 01:09		

Sample: SU-09-34 **Lab ID: 3072159033** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.521U ± 3.98 (8.54)**	dpm/sample	07/20/12 01:22		

Sample: SU-09-35 **Lab ID: 3072159034** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.144U ± 3.98 (8.42)**	dpm/sample	07/20/12 01:35		

Sample: SU-09-36 **Lab ID: 3072159035** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.692U ± 3.99 (8.34)**	dpm/sample	07/20/12 01:48		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-37 **Lab ID: 3072159036** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.000U ± 3.96 (8.40)**	dpm/sample	07/20/12 02:01		

Sample: SU-09-37D **Lab ID: 3072159037** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.36U ± 3.80 (8.47)**	dpm/sample	07/20/12 02:14		

Sample: SU-09-38 **Lab ID: 3072159038** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.66U ± 3.88 (8.52)**	dpm/sample	07/20/12 10:09		

Sample: SU-09-39 **Lab ID: 3072159039** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.676U ± 3.90 (8.39)**	dpm/sample	07/20/12 10:22		

Sample: SU-09-40 **Lab ID: 3072159040** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.82U ± 3.78 (8.50)**	dpm/sample	07/20/12 10:35		

Sample: SU-09-41 **Lab ID: 3072159041** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.593U ± 4.15 (9.47)**	dpm/sample	07/21/12 18:40		

Sample: SU-09-42 **Lab ID: 3072159042** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.36U ± 3.83 (9.31)**	dpm/sample	07/21/12 18:48		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
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Sample: SU-09-43 **Lab ID: 3072159043** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.21U ± 3.73 (9.35)**	dpm/sample	07/21/12 18:56		

Sample: SU-09-44 **Lab ID: 3072159044** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**4.25J ± 4.62 (9.43)**	dpm/sample	07/21/12 19:04		

Sample: SU-09-45 **Lab ID: 3072159045** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.14U ± 4.13 (9.25)**	dpm/sample	07/21/12 19:12		

Sample: SU-09-46 **Lab ID: 3072159046** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.309U ± 4.01 (9.23)**	dpm/sample	07/21/12 19:20		

Sample: SU-09-47 **Lab ID: 3072159047** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-22.5U ± 11.1 (33.0)**	dpm/sample	07/21/12 19:36		

Sample: SU-09-48 **Lab ID: 3072159048** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**3.10U ± 4.42 (9.33)**	dpm/sample	07/21/12 19:44		

Sample: SU-09-49 **Lab ID: 3072159049** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.561U ± 4.21 (9.95)**	dpm/sample	07/21/12 19:52		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-49D **Lab ID: 3072159050** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.95U ± 3.83 (9.51)**	dpm/sample	07/21/12 20:00		

Sample: SU-09-50 **Lab ID: 3072159051** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**4.17J ± 4.80 (9.89)**	dpm/sample	07/21/12 20:08		

Sample: SU-09-51 **Lab ID: 3072159052** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.793U ± 3.88 (9.26)**	dpm/sample	07/21/12 20:16		

Sample: SU-09-52 **Lab ID: 3072159053** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.97U ± 4.25 (9.27)**	dpm/sample	07/21/12 20:24		

Sample: SU-09-53 **Lab ID: 3072159054** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-4.19U ± 3.48 (9.41)**	dpm/sample	07/21/12 20:32		

Sample: SU-09-54 **Lab ID: 3072159055** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.08U ± 3.84 (9.27)**	dpm/sample	07/21/12 20:40		

Sample: SU-09-55 **Lab ID: 3072159056** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.41U ± 4.16 (9.24)**	dpm/sample	07/21/12 20:48		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-56 **Lab ID: 3072159057** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.15U ± 4.18 (9.36)**	dpm/sample	07/21/12 20:56		

Sample: SU-09-57 **Lab ID: 3072159058** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.521U ± 3.91 (9.24)**	dpm/sample	07/21/12 21:04		

Sample: SU-09-58 **Lab ID: 3072159059** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.17U ± 4.15 (10.0)**	dpm/sample	07/21/12 21:12		

Sample: SU-09-59 **Lab ID: 3072159060** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-4.17U ± 3.47 (9.38)**	dpm/sample	07/21/12 21:20		

Sample: SU-09-60 **Lab ID: 3072159061** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.357U ± 4.57 (10.7)**	dpm/sample	07/20/12 18:02		

Sample: SU-09-61 **Lab ID: 3072159062** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.98U ± 4.38 (9.58)**	dpm/sample	07/20/12 18:10		

Sample: SU-09-62 **Lab ID: 3072159063** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.90U ± 3.77 (9.66)**	dpm/sample	07/20/12 18:18		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-63 **Lab ID: 3072159064** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.541U ± 4.21 (9.61)**	dpm/sample	07/20/12 18:26		

Sample: SU-09-64 **Lab ID: 3072159065** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.799U ± 4.13 (9.35)**	dpm/sample	07/20/12 18:34		

Sample: SU-09-65 **Lab ID: 3072159066** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.84U ± 3.69 (9.46)**	dpm/sample	07/20/12 18:42		

Sample: SU-09-66 **Lab ID: 3072159067** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**6.35J ± 4.84 (9.33)**	dpm/sample	07/20/12 18:50		

Sample: SU-09-67 **Lab ID: 3072159068** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-2.24U ± 3.69 (9.27)**	dpm/sample	07/20/12 18:58		

Sample: SU-09-68 **Lab ID: 3072159069** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-3.51U ± 3.72 (9.75)**	dpm/sample	07/20/12 19:06		

Sample: SU-09-69 **Lab ID: 3072159070** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.865U ± 3.94 (9.43)**	dpm/sample	07/20/12 19:14		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-70 **Lab ID: 3072159071** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.563U ± 4.38 (10.0)**	dpm/sample	07/20/12 19:22		

Sample: SU-09-71 **Lab ID: 3072159072** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.38U ± 4.25 (9.45)**	dpm/sample	07/20/12 19:30		

Sample: SU-09-72 **Lab ID: 3072159073** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.40U ± 4.31 (9.59)**	dpm/sample	07/20/12 19:38		

Sample: SU-09-73 **Lab ID: 3072159074** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.11U ± 4.24 (9.51)**	dpm/sample	07/20/12 19:46		

Sample: SU-09-74 **Lab ID: 3072159075** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**2.73U ± 4.36 (9.30)**	dpm/sample	07/20/12 19:54		

Sample: SU-09-75 **Lab ID: 3072159076** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-3.61U ± 3.50 (9.25)**	dpm/sample	07/20/12 20:03		

Sample: SU-09-76 **Lab ID: 3072159077** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**2.48U ± 4.36 (9.37)**	dpm/sample	07/20/12 20:12		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-09-77 **Lab ID: 3072159078** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.807U ± 4.17 (9.44)**	dpm/sample	07/20/12 20:20		

Sample: SU-09-77D **Lab ID: 3072159079** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.11U ± 4.23 (9.50)**	dpm/sample	07/20/12 20:28		

Sample: SU-09-78 **Lab ID: 3072159080** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-4.08U ± 3.64 (9.74)**	dpm/sample	07/20/12 20:36		

Sample: SU-09-79 **Lab ID: 3072159081** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.271U ± 4.34 (9.99)**	dpm/sample	07/20/12 21:08		

Sample: SU-09-80 **Lab ID: 3072159082** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.637U ± 4.30 (10.2)**	dpm/sample	07/20/12 21:16		

Sample: SU-01-1 **Lab ID: 3072159083** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**5.61J ± 4.81 (9.48)**	dpm/sample	07/20/12 21:24		

Sample: SU-01-2 **Lab ID: 3072159084** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.0198U ± 4.10 (9.52)**	dpm/sample	07/20/12 21:32		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-01-3 **Lab ID: 3072159085** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.871U ± 3.97 (9.50)**	dpm/sample	07/20/12 21:40		

Sample: SU-01-4 **Lab ID: 3072159086** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**3.90J ± 4.56 (9.40)**	dpm/sample	07/20/12 21:48		

Sample: SU-01-5 **Lab ID: 3072159087** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.255U ± 4.08 (9.40)**	dpm/sample	07/20/12 21:56		

Sample: SU-01-5D **Lab ID: 3072159088** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.95U ± 3.72 (9.25)**	dpm/sample	07/20/12 22:04		

Sample: SU-01-6 **Lab ID: 3072159089** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.35U ± 4.16 (9.25)**	dpm/sample	07/20/12 22:12		

Sample: SU-01-7 **Lab ID: 3072159090** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**3.57J ± 4.48 (9.32)**	dpm/sample	07/20/12 22:20		

Sample: SU-01-8 **Lab ID: 3072159091** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.91U ± 4.23 (9.25)**	dpm/sample	07/20/12 22:28		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-01-9 **Lab ID: 3072159092** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-4.17U ± 3.42 (9.25)**	dpm/sample	07/20/12 22:36		

Sample: SU-01-10 **Lab ID: 3072159093** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.791U ± 4.09 (9.26)**	dpm/sample	07/20/12 22:44		

Sample: SU-01-11 **Lab ID: 3072159094** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.35U ± 4.16 (9.26)**	dpm/sample	07/20/12 22:52		

Sample: SU-01-12 **Lab ID: 3072159095** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.814U ± 4.21 (9.53)**	dpm/sample	07/20/12 23:01		

Sample: SU-01-12D **Lab ID: 3072159096** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**2.22U ± 4.35 (9.43)**	dpm/sample	07/20/12 23:09		

Sample: SU-01-13 **Lab ID: 3072159097** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.92U ± 4.25 (9.29)**	dpm/sample	07/20/12 23:17		

Sample: SU-01-14 **Lab ID: 3072159098** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.40U ± 4.31 (9.58)**	dpm/sample	07/20/12 23:25		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

Sample: SU-01-15 **Lab ID: 3072159099** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-4.23U ± 3.47 (9.40)**	dpm/sample	07/20/12 23:33		

Sample: SU-01-16 **Lab ID: 3072159100** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-0.0193U ± 3.98 (9.26)**	dpm/sample	07/20/12 23:41		

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

QC Batch: RADC/12497 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072159001, 3072159002, 3072159003, 3072159004, 3072159005, 3072159006, 3072159007, 3072159008, 3072159009, 3072159010, 3072159011, 3072159012, 3072159013, 3072159014, 3072159015, 3072159016, 3072159017, 3072159018, 3072159019, 3072159020

METHOD BLANK: 459094 Matrix: Impact Plate
Associated Lab Samples: 3072159001, 3072159002, 3072159003, 3072159004, 3072159005, 3072159006, 3072159007, 3072159008, 3072159009, 3072159010, 3072159011, 3072159012, 3072159013, 3072159014, 3072159015, 3072159016, 3072159017, 3072159018, 3072159019, 3072159020

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	-0.149U ± 3.47 (6.68)	dpm/sample	07/19/12 14:52	

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

QC Batch: RADC/12498 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072159021, 3072159022, 3072159023, 3072159024, 3072159025, 3072159026, 3072159027, 3072159028, 3072159029, 3072159030, 3072159031, 3072159032, 3072159033, 3072159034, 3072159035, 3072159036, 3072159037, 3072159038, 3072159039, 3072159040

METHOD BLANK: 459096 Matrix: Impact Plate
Associated Lab Samples: 3072159021, 3072159022, 3072159023, 3072159024, 3072159025, 3072159026, 3072159027, 3072159028, 3072159029, 3072159030, 3072159031, 3072159032, 3072159033, 3072159034, 3072159035, 3072159036, 3072159037, 3072159038, 3072159039, 3072159040

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	0.297U ± 4.12 (8.69)	dpm/sample	07/19/12 22:34	

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

QC Batch: RADC/12499 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072159041, 3072159042, 3072159043, 3072159044, 3072159045, 3072159046, 3072159047, 3072159048, 3072159049, 3072159050, 3072159051, 3072159052, 3072159053, 3072159054, 3072159055, 3072159056, 3072159057, 3072159058, 3072159059, 3072159060

METHOD BLANK: 459097 Matrix: Impact Plate
Associated Lab Samples: 3072159041, 3072159042, 3072159043, 3072159044, 3072159045, 3072159046, 3072159047, 3072159048, 3072159049, 3072159050, 3072159051, 3072159052, 3072159053, 3072159054, 3072159055, 3072159056, 3072159057, 3072159058, 3072159059, 3072159060

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	2.32U ± 4.43 (9.58)	dpm/sample	07/21/12 18:32	

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

QC Batch: RADC/12500 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072159061, 3072159062, 3072159063, 3072159064, 3072159065, 3072159066, 3072159067, 3072159068, 3072159069, 3072159070, 3072159071, 3072159072, 3072159073, 3072159074, 3072159075, 3072159076, 3072159077, 3072159078, 3072159079, 3072159080

METHOD BLANK: 459098 Matrix: Impact Plate
Associated Lab Samples: 3072159061, 3072159062, 3072159063, 3072159064, 3072159065, 3072159066, 3072159067, 3072159068, 3072159069, 3072159070, 3072159071, 3072159072, 3072159073, 3072159074, 3072159075, 3072159076, 3072159077, 3072159078, 3072159079, 3072159080

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	-0.0199U ± 4.11 (9.56)	dpm/sample	07/20/12 17:53	

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

QC Batch: RADC/12501 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072159081, 3072159082, 3072159083, 3072159084, 3072159085, 3072159086, 3072159087, 3072159088, 3072159089, 3072159090, 3072159091, 3072159092, 3072159093, 3072159094, 3072159095, 3072159096, 3072159097, 3072159098, 3072159099, 3072159100

METHOD BLANK: 459100 Matrix: Impact Plate
Associated Lab Samples: 3072159081, 3072159082, 3072159083, 3072159084, 3072159085, 3072159086, 3072159087, 3072159088, 3072159089, 3072159090, 3072159091, 3072159092, 3072159093, 3072159094, 3072159095, 3072159096, 3072159097, 3072159098, 3072159099, 3072159100

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.66U ± 4.29 (9.46)	dpm/sample	07/20/12 21:00	

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QUALIFIERS

Project: Fort Monmouth 1207082
Pace Project No.: 3072159

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty

(MDC) - Minimum Detectable Concentration

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Project Number: 3072159

Chain of Custody
And
Sample Receiving Conditions Upon Receipt Form

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Pace Quote Reference:	
Pace Project Manager:	Carin Ferris
Pace Profile #:	

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☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
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396	SU-08-28	WP	G	NA	NA	06/11/12		NA	1	X								N	X		
397	SU-08-29	WP	G	NA	NA	06/11/12		NA	1	X									X		
398	SU-08-30	WP	G	NA	NA	06/11/12		NA	1	X									X		
399	SU-09-1	WP	G	NA	NA	06/11/12		NA	1	X									X		
400	SU-09-2	WP	G	NA	NA	06/11/12		NA	1	X									X		
401	SU-09-3	WP	G	NA	NA	06/11/12		NA	1	X									X		001
402	SU-09-4	WP	G	NA	NA	06/11/12		NA	1	X									X		002
403	SU-09-5	WP	G	NA	NA	06/11/12		NA	1	X									X		003
404	SU-09-6	WP	G	NA	NA	06/11/12		NA	1	X									X		004
405	SU-09-7	WP	G	NA	NA	06/11/12		NA	1	X									X		005
406	SU-09-8	WP	G	NA	NA	06/11/12		NA	1	X									X		006
407	SU-09-9	WP	G	NA	NA	06/11/12		NA	1	X									X		007
408	SU-09-10	WP	G	NA	NA	06/11/12		NA	1	X									X		008
409	SU-09-11	WP	G	NA	NA	06/11/12		NA	1	X									X		009
410	SU-09-11D	WP	G	NA	NA	06/11/12		NA	1	X									X		010
411	SU-09-12	WP	G	NA	NA	06/11/12		NA	1	X									X		011
412	SU-09-13	WP	G	NA	NA	06/11/12		NA	1	X									X		012
413	SU-09-14	WP	G	NA	NA	06/11/12		NA	1	X									X		013
414	SU-09-15	WP	G	NA	NA	06/11/12		NA	1	X									X		014
415	SU-09-16	WP	G	NA	NA	06/11/12		NA	1	X									X		015
416	SU-09-17	WP	G	NA	NA	06/11/12		NA	1	X									X		016
417	SU-09-18	WP	G	NA	NA	06/11/12		NA	1	X									X		017

3072150

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Pace Quote Reference:	
Pace Project Manager:	Carin Ferris
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
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418	SU-09-19	WP	G	NA	NA	06/11/12		NA	1	X									X		018
419	SU-09-20	WP	G	NA	NA	06/11/12		NA	1	X									X		019
420	SU-09-21	WP	G	NA	NA	06/11/12		NA	1	X									X		020
421	SU-09-22	WP	G	NA	NA	06/11/12		NA	1	X									X		021
422	SU-09-23	WP	G	NA	NA	06/11/12		NA	1	X									X		022
423	SU-09-24	WP	G	NA	NA	06/11/12		NA	1	X									X		023
424	SU-09-25	WP	G	NA	NA	06/11/12		NA	1	X									X		024
425	SU-09-26	WP	G	NA	NA	06/11/12		NA	1	X									X		025
426	SU-09-27	WP	G	NA	NA	06/11/12		NA	1	X									X		026
427	SU-09-28	WP	G	NA	NA	06/11/12		NA	1	X									X		027
428	SU-09-29	WP	G	NA	NA	06/11/12		NA	1	X									X		028
429	SU-09-30	WP	G	NA	NA	06/11/12		NA	1	X									X		029
430	SU-09-31	WP	G	NA	NA	06/11/12		NA	1	X									X		030
431	SU-09-32	WP	G	NA	NA	06/11/12		NA	1	X									X		031
432	SU-09-33	WP	G	NA	NA	06/11/12		NA	1	X									X		032
433	SU-09-34	WP	G	NA	NA	06/11/12		NA	1	X									X		033
434	SU-09-35	WP	G	NA	NA	06/11/12		NA	1	X									X		034
435	SU-09-36	WP	G	NA	NA	06/11/12		NA	1	X									X		035
436	SU-09-37	WP	G	NA	NA	06/11/12		NA	1	X									X		036
437	SU-09-37D	WP	G	NA	NA	06/11/12		NA	1	X									X		037
438	SU-09-38	WP	G	NA	NA	06/11/12		NA	1	X									X		038
439	SU-09-39	WP	G	NA	NA	06/11/12		NA	1	X									X		039

6/25/12 1015

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Attention:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Carin Ferris
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

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440	SU-09-40	WP	G	NA	NA	06/11/12		NA	1	X								N	X		040
441	SU-09-41	WP	G	NA	NA	06/11/12		NA	1	X									X		041
442	SU-09-42	WP	G	NA	NA	06/11/12		NA	1	X									X		042
443	SU-09-43	WP	G	NA	NA	06/11/12		NA	1	X									X		043
444	SU-09-44	WP	G	NA	NA	06/11/12		NA	1	X									X		044
445	SU-09-45	WP	G	NA	NA	06/11/12		NA	1	X									X		045
446	SU-09-46	WP	G	NA	NA	06/11/12		NA	1	X									X		046
447	SU-09-47	WP	G	NA	NA	06/11/12		NA	1	X									X		047
448	SU-09-48	WP	G	NA	NA	06/11/12		NA	1	X									X		048
449	SU-09-49	WP	G	NA	NA	06/11/12		NA	1	X									X		049
450	SU-09-49D	WP	G	NA	NA	06/11/12		NA	1	X									X		050
451	SU-09-50	WP	G	NA	NA	06/11/12		NA	1	X									X		051
452	SU-09-51	WP	G	NA	NA	06/11/12		NA	1	X									X		052
453	SU-09-52	WP	G	NA	NA	06/11/12		NA	1	X									X		053
454	SU-09-53	WP	G	NA	NA	06/11/12		NA	1	X									X		054
455	SU-09-54	WP	G	NA	NA	06/11/12		NA	1	X									X		055
456	SU-09-55	WP	G	NA	NA	06/11/12		NA	1	X									X		056
457	SU-09-56	WP	G	NA	NA	06/11/12		NA	1	X									X		057
458	SU-09-57	WP	G	NA	NA	06/11/12		NA	1	X									X		058
459	SU-09-58	WP	G	NA	NA	06/11/12		NA	1	X									X		059
460	SU-09-59	WP	G	NA	NA	06/11/12		NA	1	X									X		060
461	SU-09-60	WP	G	NA	NA	06/11/12		NA	1	X									X		061

6/25/12 1015

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REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
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Requested Analysis Filtered (Y/N)

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462	SU-09-61	WP	G	NA	NA	06/11/12		NA	1	X								X	X		062
463	SU-09-62	WP	G	NA	NA	06/11/12		NA	1	X								X	X		063
464	SU-09-63	WP	G	NA	NA	06/11/12		NA	1	X								X	X		064
465	SU-09-64	WP	G	NA	NA	06/11/12		NA	1	X								X	X		065
466	SU-09-65	WP	G	NA	NA	06/11/12		NA	1	X								X	X		066
467	SU-09-66	WP	G	NA	NA	06/11/12		NA	1	X								X	X		067
468	SU-09-67	WP	G	NA	NA	06/11/12		NA	1	X								X	X		068
469	SU-09-68	WP	G	NA	NA	06/11/12		NA	1	X								X	X		069
470	SU-09-69	WP	G	NA	NA	06/11/12		NA	1	X								X	X		070
471	SU-09-70	WP	G	NA	NA	06/11/12		NA	1	X								X	X		071
472	SU-09-71	WP	G	NA	NA	06/11/12		NA	1	X								X	X		072
473	SU-09-72	WP	G	NA	NA	06/11/12		NA	1	X								X	X		073
474	SU-09-73	WP	G	NA	NA	06/11/12		NA	1	X								X	X		074
475	SU-09-74	WP	G	NA	NA	06/11/12		NA	1	X								X	X		075
476	SU-09-75	WP	G	NA	NA	06/11/12		NA	1	X								X	X		076
477	SU-09-76	WP	G	NA	NA	06/11/12		NA	1	X								X	X		077
478	SU-09-77	WP	G	NA	NA	06/11/12		NA	1	X								X	X		078
479	SU-09-77D	WP	G	NA	NA	06/11/12		NA	1	X								X	X		079
480	SU-09-78	WP	G	NA	NA	06/11/12		NA	1	X								X	X		080
481	SU-09-79	WP	G	NA	NA	06/11/12		NA	1	X								X	X		081
482	SU-09-80	WP	G	NA	NA	06/11/12		NA	1	X								X	X		082
483	SU-01-1	WP	G	NA	NA	06/11/12		NA	1	X								X	X		083

6/25/12 1015

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										Requested Analysis Filtered (Y/N)								Y/N	N		3072159
484	SU-01-2	WP	G	NA	NA	06/11/12		NA	1	X									X		084
485	SU-01-3	WP	G	NA	NA	06/11/12		NA	1	X									X		085
486	SU-01-4	WP	G	NA	NA	06/11/12		NA	1	X									X		086
487	SU-01-5	WP	G	NA	NA	06/11/12		NA	1	X									X		087
488	SU-01-5D	WP	G	NA	NA	06/11/12		NA	1	X									X		088
489	SU-01-6	WP	G	NA	NA	06/11/12		NA	1	X									X		089
490	SU-01-7	WP	G	NA	NA	06/11/12		NA	1	X									X		090
491	SU-01-8	WP	G	NA	NA	06/11/12		NA	1	X									X		091
492	SU-01-9	WP	G	NA	NA	06/11/12		NA	1	X									X		092
493	SU-01-10	WP	G	NA	NA	06/11/12		NA	1	X									X		093
494	SU-01-11	WP	G	NA	NA	06/11/12		NA	1	X									X		094
495	SU-01-12	WP	G	NA	NA	06/11/12		NA	1	X									X		095
496	SU-01-12D	WP	G	NA	NA	06/11/12		NA	1	X									X		096
497	SU-01-13	WP	G	NA	NA	06/11/12		NA	1	X									X		097
498	SU-01-14	WP	G	NA	NA	06/11/12		NA	1	X									X		098
499	SU-01-15	WP	G	NA	NA	06/11/12		NA	1	X									X		099
500	SU-01-16	WP	G	NA	NA	06/11/12		NA	1	X									X		100
501	SU-01-17	WP	G	NA	NA	06/11/12		NA	1	X									X		
502	SU-01-18	WP	G	NA	NA	06/11/12		NA	1	X									X		
503	SU-01-19	WP	G	NA	NA	06/11/12		NA	1	X									X		
504	SU-01-20	WP	G	NA	NA	06/11/12		NA	1	X									X		
505	SU-01-21	WP	G	NA	NA	06/11/12		NA	1	X									X		

6/25/12 1015

Sample Condition Upon Receipt

Pace Analytical

Client Name: PTI Project # 3072159

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ______

Tracking #: 875928653764

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other CARdboard

Thermometer Used 5 6 7 Type of Ice: Wet Blue (None) ☑ Samples on ice, cooling process has begun

Cooler Temperature NA Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: VR 6/25/12

				Comments:
Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☑No	☐N/A	3.
Sampler Name & Signature on COC:	☐Yes	☑No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☑Yes	☐No	☐N/A	
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WP				
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes	☐No	☑N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes	☑No		Initial when completed VR; Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	15.
Trip Blank Present:	☐Yes	☐No	☑N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):______				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ______

Project Manager Review: [signature] Date: 6/27/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

F-ALL-C003-6 SCURF front 2April2012.xls

Pace Analytical

Project Number: 3072151

Client Name: RTI

Item No.	Matrix Code	Glass Jar (120 / 250 / 500 / 1L)	Soil kit (2 SB, 1M, soil jar)	Chemistry (250 / 500 / 1L)	Organics (1L)	Nutrient (250 / 500)	Phenolics (250 ml)	TOC (40 ml / 250 ml)	TOX (250 ml)	Total Metals	Dissolved Metals preserved Y N	O & G (1L)	TPH (1L)	VOA (40 ml 30 ml)	Cyanide (250 ml)	Sulfide (500 ml)	Bacteria (120 ml)	Wipes / swipe/ smear/ filter	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
1-18	WP																	1						
18	↓																	↓						

SCURF Back (C018-4 15May2012).xls

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12497	**HBN**	91070
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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2 459094-BLANK for HBN 91070 [RADC/1249

Type BLANK **Matrix** Impact Plate **Collected** **% Moisture**
Client QCACCOUNT **WO** **Work ID**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12497 **Prep Date** 7/19/2012 14:52 **Dilution**
Method EPA 906.0M **HBN** 91070 **Hold Date** 12/25/2012 23:59 **Analyst** MBT
Schedule 2860653 **Instru** NONE **CC** OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 14:52 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** MBT
Schedule 2860653 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.149U ± 3.47 (6.68)	dpm/sa	-0.149U ± 3.47 (6.68)			dpm/sa

4 3072159001-SU-09-3

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12497 **Prep Date** 7/19/2012 15:13 **Dilution**
Method EPA 906.0M **HBN** 91070 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2860654 **Instru** NONE **CC** OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 15:13 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2860654 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	3.37J ± 3.54 (6.40)	dpm/sa	3.37J ± 3.54 (6.40)					dpm/sa

6 3072159002-SU-09-4

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	**HBN**	91070
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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6 3072159002-SU-09-4

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 15:34	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860655		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 15:34	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860655		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.17U ± 3.41 (6.42)	dpm/sa	1.17U ± 3.41 (6.42)		dpm/sa		

8 3072159003-SU-09-5

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 15:55	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860657		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 15:55	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860657		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.374U ± 3.37 (6.51)	dpm/sa	-0.374U ± 3.37 (6.51)		dpm/sa		

10 3072159004-SU-09-6

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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10 3072159004-SU-09-6

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 16:16	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860658	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 16:16	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860658	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.81J ± 3.57 (6.39)	dpm/sa	3.81J ± 3.57 (6.39)		dpm/sa		

12 3072159005-SU-09-7

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 16:37	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860659	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 16:37	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860659	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.07U ± 3.26 (6.48)	dpm/sa	-2.07U ± 3.26 (6.48)		dpm/sa		

14 3072159006-SU-09-8

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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14 3072159006-SU-09-8

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860660

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 16:59
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860660

Instru NONE
Col ID
File

Run Date 7/19/2012 16:59
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.25U ± 3.42 (6.42)	dpm/sa	1.25U ± 3.42 (6.42)		dpm/sa		

16 3072159007-SU-09-9

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860661

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 17:20
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860661

Instru NONE
Col ID
File

Run Date 7/19/2012 17:20
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.206U ± 3.36 (6.47)	dpm/sa	-0.206U ± 3.36 (6.47)		dpm/sa		

18 3072159008-SU-09-10

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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18 3072159008-SU-09-10

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 17:41	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860662	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 17:41	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860662	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.31U ± 3.25 (6.39)	dpm/sa	-1.31U ± 3.25 (6.39)		dpm/sa		

20 3072159009-SU-09-11

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 18:02	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860663	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 18:02	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860663	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.84U ± 3.38 (6.69)	dpm/sa	-1.84U ± 3.38 (6.69)		dpm/sa		

22 3072159010-SU-09-11D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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22 3072159010-SU-09-11D

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 18:23	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860664		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 18:23	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860664		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.25U ± 3.27 (6.42)	dpm/sa	-1.25U ± 3.27 (6.42)		dpm/sa		

24 3072159011-SU-09-12

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 18:44	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860665		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 18:44	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860665		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.614U ± 3.30 (6.41)	dpm/sa	-0.614U ± 3.30 (6.41)		dpm/sa		

26 3072159012-SU-09-13

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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26 3072159012-SU-09-13

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860666

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 19:05
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860666

Instru NONE
Col ID
File

Run Date 7/19/2012 19:05
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.28U ± 3.22 (6.43)	dpm/sa	-2.28U ± 3.22 (6.43)		dpm/sa		

28 3072159013-SU-09-14

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860667

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 20:25
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860667

Instru NONE
Col ID
File

Run Date 7/19/2012 20:25
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.675U ± 4.01 (8.39)	dpm/sa	0.675U ± 4.01 (8.39)		dpm/sa		

30 3072159014-SU-09-15

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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30 3072159014-SU-09-15

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 20:38	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860668		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 20:38	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860668		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.994U ± 4.08 (8.49)	dpm/sa	0.994U ± 4.08 (8.49)		dpm/sa		

32 3072159015-SU-09-16

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 20:51	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860669		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 20:51	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860669		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.549U ± 3.88 (8.33)	dpm/sa	-0.549U ± 3.88 (8.33)		dpm/sa		

34 3072159016-SU-09-17

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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34 3072159016-SU-09-17

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 21:04	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860670	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 21:04	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860670	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.63U ± 3.67 (8.41)	dpm/sa	-3.63U ± 3.67 (8.41)		dpm/sa		

36 3072159017-SU-09-18

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12497	**Prep Date**	7/19/2012 21:17	**Dilution**	
Method	EPA 906.0M	**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860671	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 21:17	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860671	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.79U ± 4.08 (8.34)	dpm/sa	1.79U ± 4.08 (8.34)		dpm/sa		

38 3072159018-SU-09-19

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	HBN	91070
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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38 3072159018-SU-09-19

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860672

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 21:30
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860672

Instru NONE
Col ID
File

Run Date 7/19/2012 21:30
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.631U ± 3.98 (8.34)	dpm/sa	0.631U ± 3.98 (8.34)		dpm/sa		

40 3072159019-SU-09-20

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860673

Batch RADC/12497
HBN 91070
Instru NONE

Prep Date 7/19/2012 21:42
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860673

Instru NONE
Col ID
File

Run Date 7/19/2012 21:42
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.55U ± 4.13 (8.48)	dpm/sa	1.55U ± 4.13 (8.48)		dpm/sa		

42 3072159020-SU-09-21

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12497	**HBN**	91070
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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42 3072159020-SU-09-21

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12497	**Prep Date**	7/19/2012 21:55	**Dilution**
Method	EPA 906.0M		**HBN**	91070	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860674		**Instru**	NONE			**CC** OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 21:55	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860674		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.550U ± 3.98 (8.35)	dpm/sa	0.550U ± 3.98 (8.35)		dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:54	Assigned Analyst	MBT
Batch ID	12497	Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB 9060W	HBN	91070
Method	EPA 906.0M EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459094	BLANK	IP		QCACCOUNT	-0.149U	3.47	6.68	7/19/12 14:52
3072159	3072159001	PS	WP	6/11/2012 0:01	RTI	3.37J	3.54	6.40	7/19/12 15:13
3072159	3072159002	PS	WP	6/11/2012 0:01	RTI	1.17U	3.41	6.42	7/19/12 15:34
3072159	3072159003	PS	WP	6/11/2012 0:01	RTI	-0.374U	3.37	6.51	7/19/12 15:55
3072159	3072159004	PS	WP	6/11/2012 0:01	RTI	3.81J	3.57	6.39	7/19/12 16:16
3072159	3072159005	PS	WP	6/11/2012 0:01	RTI	-2.07U	3.26	6.48	7/19/12 16:37
3072159	3072159006	PS	WP	6/11/2012 0:01	RTI	1.25U	3.42	6.42	7/19/12 16:59
3072159	3072159007	PS	WP	6/11/2012 0:01	RTI	-0.206U	3.36	6.47	7/19/12 17:20
3072159	3072159008	PS	WP	6/11/2012 0:01	RTI	-1.31U	3.25	6.39	7/19/12 17:41
3072159	3072159009	PS	WP	6/11/2012 0:01	RTI	-1.84U	3.38	6.69	7/19/12 18:02
3072159	3072159010	PS	WP	6/11/2012 0:01	RTI	-1.25U	3.27	6.42	7/19/12 18:23
3072159	3072159011	PS	WP	6/11/2012 0:01	RTI	-0.614U	3.30	6.41	7/19/12 18:44
3072159	3072159012	PS	WP	6/11/2012 0:01	RTI	-2.28U	3.22	6.43	7/19/12 19:05
3072159	3072159013	PS	WP	6/11/2012 0:01	RTI	0.675U	4.01	8.39	7/19/12 20:25
3072159	3072159014	PS	WP	6/11/2012 0:01	RTI	0.994U	4.08	8.49	7/19/12 20:38
3072159	3072159015	PS	WP	6/11/2012 0:01	RTI	-0.549U	3.88	8.33	7/19/12 20:51
3072159	3072159016	PS	WP	6/11/2012 0:01	RTI	-3.63U	3.67	8.41	7/19/12 21:04
3072159	3072159017	PS	WP	6/11/2012 0:01	RTI	1.79U	4.08	8.34	7/19/12 21:17
3072159	3072159018	PS	WP	6/11/2012 0:01	RTI	0.631U	3.98	8.34	7/19/12 21:30
3072159	3072159019	PS	WP	6/11/2012 0:01	RTI	1.55U	4.13	8.48	7/19/12 21:42
3072159	3072159020	PS	WP	6/11/2012 0:01	RTI	0.550U	3.98	8.35	7/19/12 21:55

7/23/12 7/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
Matrix Smear
Batch ID 12497
Prep Start 7/16/2012 12:00
Prep Finish 7/16/2012
Act. Rpt Units dpm

Analyst MBT
PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a
Aliq. Rpt Units Sample

Bkg CPM 8.32
Bkg Duration 30.0 min
Bkg Ref BKG 7/19/2012
Bkg Ct Date/Time: 7/19/2012 11:41
Instrument ID: System #2

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459094	1.0	7/19/12 14:52	20.0	7/19/12 14:52	8.25	314.0	dpm/S	High, Evaluate
3072159001	1.0	6/11/12 0:01	20.0	7/19/12 15:13	9.97	272.7	dpm/S	Pass
3072159002	1.0	6/11/12 0:01	20.0	7/19/12 15:34	8.89	279.0	dpm/S	Pass
3072159003	1.0	6/11/12 0:01	20.0	7/19/12 15:55	8.14	294.1	dpm/S	Pass
3072159004	1.0	6/11/12 0:01	20.0	7/19/12 16:16	10.19	268.7	dpm/S	Pass
3072159005	1.0	6/11/12 0:01	20.0	7/19/12 16:37	7.32	289.4	dpm/S	Pass
3072159006	1.0	6/11/12 0:01	20.0	7/19/12 16:59	8.93	280.2	dpm/S	Pass
3072159007	1.0	6/11/12 0:01	20.0	7/19/12 17:20	8.22	288.5	dpm/S	Pass
3072159008	1.0	6/11/12 0:01	20.0	7/19/12 17:41	7.68	271.7	dpm/S	Pass
3072159009	1.0	6/11/12 0:01	20.0	7/19/12 18:02	7.46	311.6	dpm/S	High, Evaluate
3072159010	1.0	6/11/12 0:01	20.0	7/19/12 18:23	7.71	280.0	dpm/S	Pass
3072159011	1.0	6/11/12 0:01	20.0	7/19/12 18:44	8.02	277.6	dpm/S	Pass
3072159012	1.0	6/11/12 0:01	20.0	7/19/12 19:05	7.21	281.7	dpm/S	Pass
3072159013	1.0	6/11/12 0:01	12.0	7/19/12 20:25	8.65	278.0	dpm/S	Pass
3072159014	1.0	6/11/12 0:01	12.0	7/19/12 20:38	8.80	291.5	dpm/S	Pass
3072159015	1.0	6/11/12 0:01	12.0	7/19/12 20:51	8.05	261.7	dpm/S	Pass
3072159016	1.0	6/11/12 0:01	12.0	7/19/12 21:04	6.55	281.6	dpm/S	Pass
3072159017	1.0	6/11/12 0:01	12.0	7/19/12 21:17	9.20	265.5	dpm/S	Pass
3072159018	1.0	6/11/12 0:01	12.0	7/19/12 21:30	8.63	264.7	dpm/S	Pass
3072159019	1.0	6/11/12 0:01	12.0	7/19/12 21:42	9.07	291.1	dpm/S	Pass
3072159020	1.0	6/11/12 0:01	12.0	7/19/12 21:55	8.59	269.8	dpm/S	Pass

7/23/12 7/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	MBT
Matrix	Smear	**PrepSOP1**	0
Batch ID	12497	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459094	0.4691	0.0000	1.0000	-0.149	3.470	3.470	6.682	2.929	0.444	3.470	1.00
3072159001	0.4931	0.1058	0.9941	3.366	3.522	3.545	6.395	2.803	0.425	3.522	1.00
3072159002	0.4913	0.1058	0.9941	1.167	3.410	3.413	6.419	2.813	0.426	3.410	1.00
3072159003	0.4842	0.1059	0.9941	-0.374	3.368	3.368	6.512	2.854	0.433	3.368	1.00
3072159004	0.4938	0.1059	0.9941	3.809	3.541	3.570	6.385	2.799	0.424	3.541	1.00
3072159005	0.4868	0.1059	0.9941	-2.066	3.248	3.258	6.477	2.839	0.430	3.248	1.00
3072159006	0.4908	0.1060	0.9941	1.250	3.417	3.421	6.424	2.816	0.427	3.417	1.00
3072159007	0.4873	0.1060	0.9941	-0.206	3.357	3.357	6.471	2.836	0.430	3.357	1.00
3072159008	0.4933	0.1061	0.9941	-1.305	3.250	3.254	6.392	2.802	0.425	3.250	1.00
3072159009	0.4713	0.1061	0.9941	-1.836	3.374	3.381	6.691	2.932	0.445	3.374	1.00
3072159010	0.4909	0.1061	0.9941	-1.250	3.270	3.273	6.423	2.815	0.427	3.270	1.00
3072159011	0.4917	0.1062	0.9941	-0.614	3.302	3.303	6.413	2.811	0.426	3.302	1.00
3072159012	0.4903	0.1062	0.9941	-2.277	3.212	3.223	6.432	2.819	0.427	3.212	1.00
3072159013	0.4916	0.1064	0.9941	0.675	4.007	4.008	8.385	3.327	0.651	4.007	1.00
3072159014	0.4857	0.1064	0.9941	0.994	4.081	4.083	8.487	3.367	0.659	4.081	1.00
3072159015	0.4946	0.1064	0.9941	-0.549	3.882	3.882	8.334	3.306	0.647	3.882	1.00
3072159016	0.4903	0.1064	0.9941	-3.631	3.648	3.674	8.407	3.335	0.653	3.648	1.00
3072159017	0.4943	0.1065	0.9941	1.791	4.076	4.081	8.340	3.308	0.647	4.076	1.00
3072159018	0.4944	0.1065	0.9941	0.631	3.981	3.982	8.338	3.308	0.647	3.981	1.00
3072159019	0.4859	0.1065	0.9941	1.553	4.124	4.128	8.483	3.365	0.659	4.124	1.00
3072159020	0.4937	0.1065	0.9941	0.550	3.980	3.981	8.350	3.313	0.648	3.980	1.00

7/23/12 7/23/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/31/2012	**Method:**	EPA 906.0M
Worklist:	12497	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459094

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	-0.1490	3.4700	6.6820	2.92900		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/21/12 15:00	7/21/12 15:07				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.916	1184.916				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.492	118.492				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	107.218	115.043				
1.96 Sigma Unc:	18.376	19.309				
% Recovery:	90.49%	97.09%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12497					
Duplicate Sample I.D.	LCSD12497					
Sample Result (DPM/Sample, g, F):	107.2180					
1.96 Sigma Unc:	18.3760					
ple Duplicate Result (DPM/Sample, g, F):	115.0430					
Duplicate Sample 1.96 Sigma Unc.	19.3090					
Either results below MDC?	NO					
Relative Percent Difference:	7.04%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment

Analyte:			
Sample Collection Date:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (DPM/Sample):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(DPM/Sample, g, F):			
MSD Aliquot (L, g, F):			
MSD Target Conc. (DPM/Sample, g, F):			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.:			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.:			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment

Analyte:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12497

Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

7/23/12

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	relative	of Critical	Uncertainty	Uncertainty
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	relative	of Critical	Uncertainty	Uncertainty
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	Maximum	of Critical	Uncertainty	Uncertainty
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	Maximum	of Critical	Uncertainty	Uncertainty
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

7/23/12

Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\20120719_1140.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\12476.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H-3_C-14_C.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 30.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	0.00
B	2.0	160.0	2.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

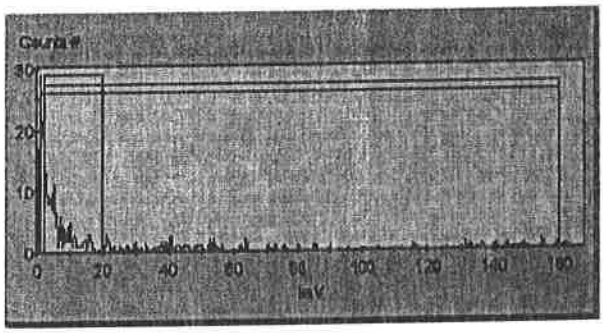
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM

14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM
3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		BKG	7/19/2012		4.45	322.0	6.72	8.32	
1	26	11:41:32 AM	9	7/19/12					

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\20120719_1451.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\12480.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14_B.lsa

Count Conditions-

Nuclide: FILTER
   Quench Indicator: tSIE
   External Std Terminator (sec): 0.5 2s%
   Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 20.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	2.00
B	2.0	160.0	0.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

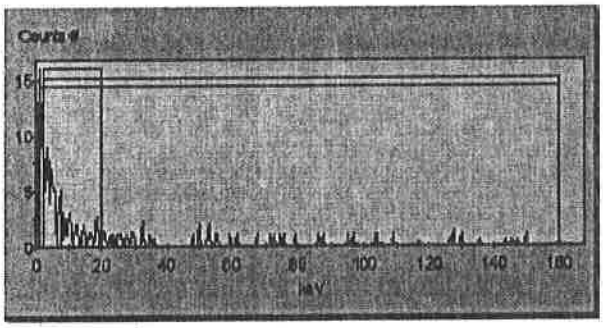
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM
14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM

3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

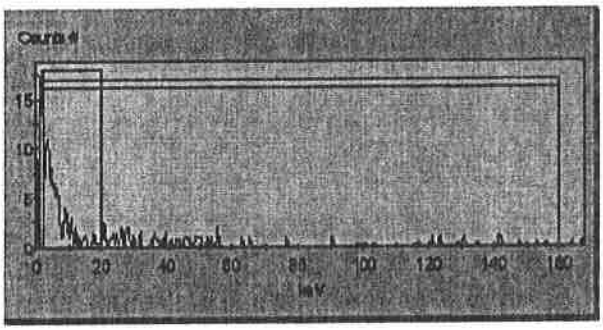
S#	PID	TIME	SMPL_ID LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		459094	MB	20	7/19/12	4.45	314.0	6.85	8.25	
1	12	2:52:25 PM	7							

SpectraView Block Data



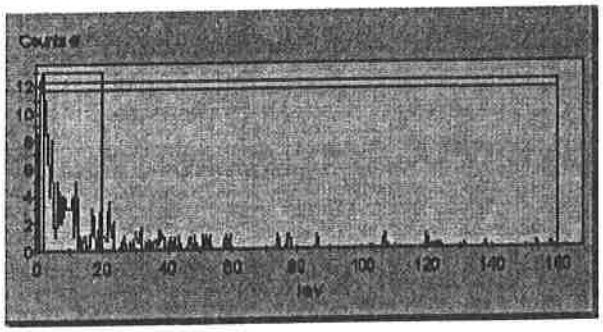
		30720	159-1	20	7/19/12	5.38	272.7	8.28	9.97	
2	12	3:13:30 PM	5							

SpectraView Block Data



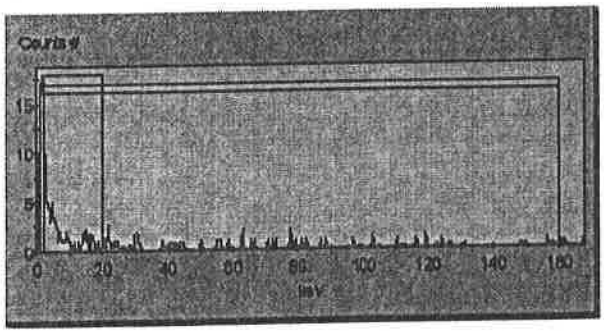
		3072	159-2	20	7/19/12	5.47	279.0	7.69	8.89	
3	12	3:34:33 PM	5							

SpectraView Block Data



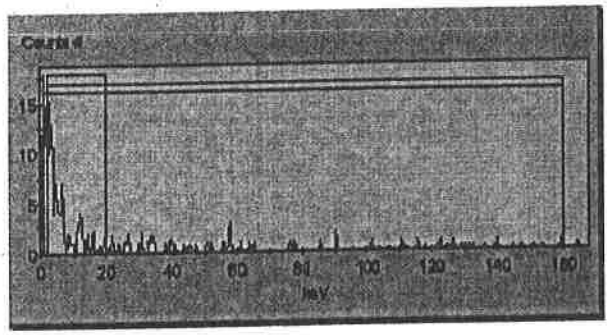
		159-3	20	7/19/12	3.68	294.1	6.49	8.14
4	12	3:55:47 PM	8					

SpectraView Block Data



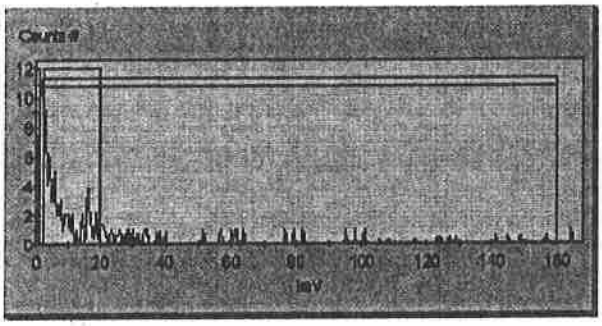
		159-4	20	7/19/12	5.81	268.7	8.74	10.19
5	12	4:16:52 PM	6					

SpectraView Block Data



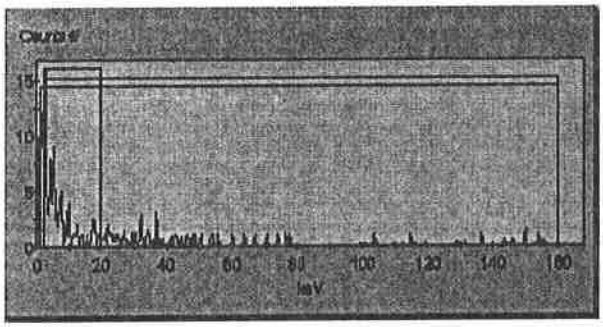
		159-5	20	7/19/12	4.37	289.4	6.17	7.32
6	12	4:37:57 PM	9					

SpectraView Block Data



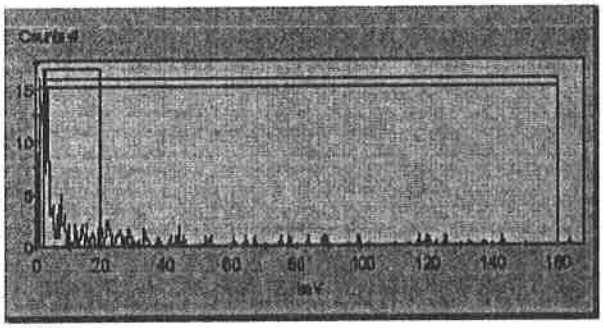
159-6 20 7/19/12 4.83 280.2 7.72 8.93
7 12 4:59:01 PM 8

SpectraView Block Data



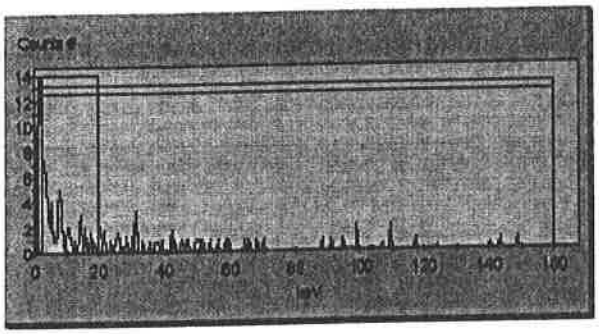
159-7 20 7/19/12 4.46 288.5 6.78 8.22
8 12 5:20:26 PM 11

SpectraView Block Data



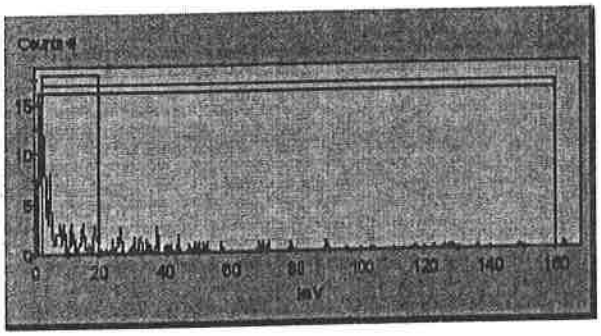
159-8 20 7/19/12 3.67 271.7 6.28 7.68
9 12 5:41:31 PM 8

SpectraView Block Data



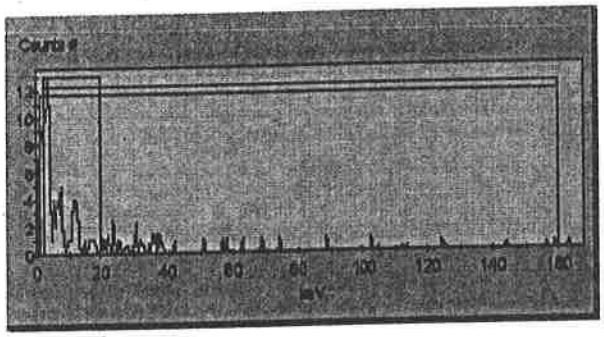
	159-9	20	7/19/12	4.71	311.6	6.56	7.46
10	12	6:02:35 PM	8				

SpectraView Block Data



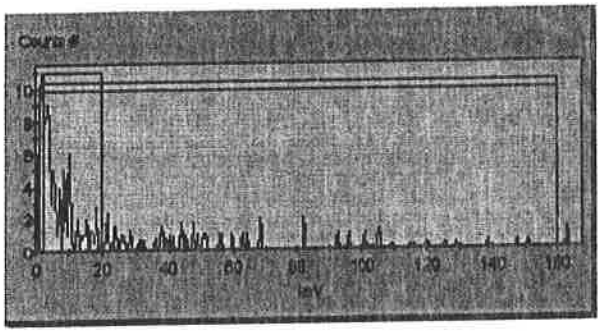
	159-10	20	7/19/12	4.93	280.0	6.91	7.71
11	12	6:23:39 PM	7				

SpectraView Block Data



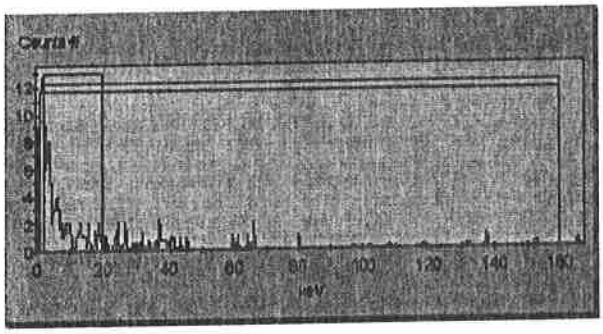
	159-11	20	7/19/12	4.72	277.6	7.07	8.02
12	12	6:44:42 PM	7				

SpectraView Block Data



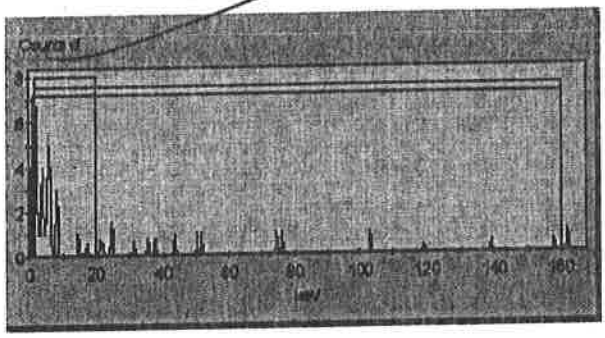
159-12 20 7/19/12 4.39 281.7 6.06 7.21
13 17 7:05:52 PM 9

SpectraView Block Data



159-13 9 12/31/69 3.91 267.9 5.33 6.34
14 17 7:00:00 PM 12

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\20120719_2012.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\12480.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14_B.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 12.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	2.00
B	2.0	160.0	0.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM
14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM

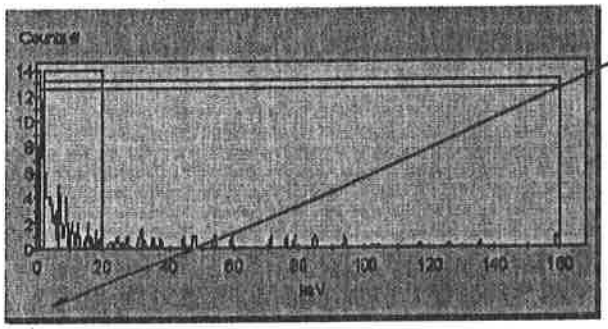
3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	SMPL_ID TIME	LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	17	159-12 8:12:42 PM	8	12	7/19/12	5.03	282.1	7.35	9.44	

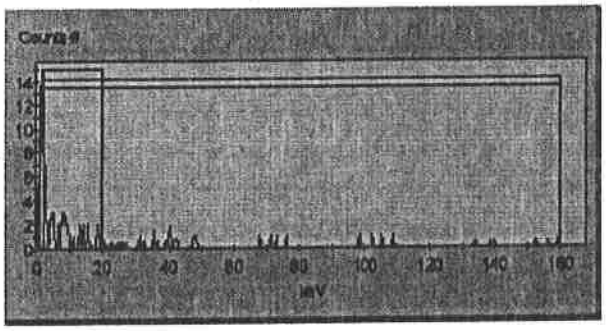
WOS Needed 7/21/12

SpectraView Block Data



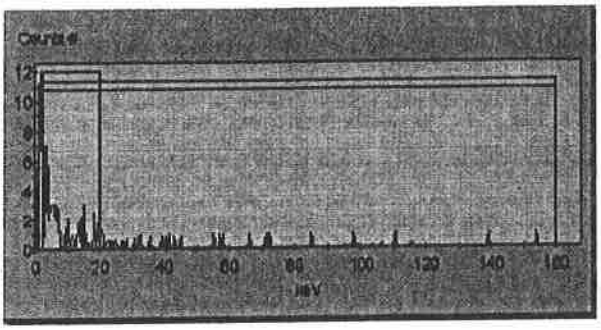
S#	PID	SMPL_ID TIME	LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
2	17	159-13 8:25:36 PM	9	12	7/19/12	4.17	278.0	6.56	8.65	

SpectraView Block Data



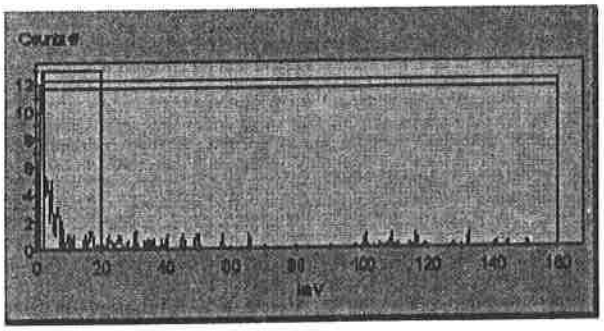
S#	PID	SMPL_ID TIME	LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
3	17	159-14 8:38:30 PM	7	12	7/19/12	4.82	291.5	7.05	8.80	

SpectraView Block Data



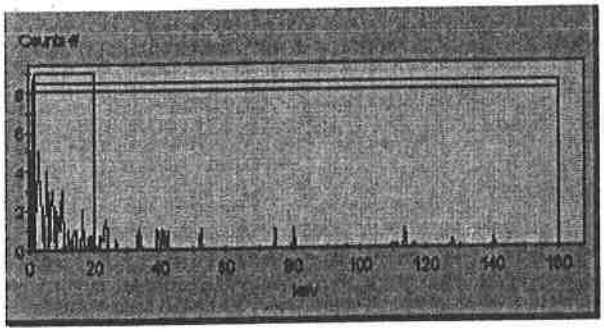
159-15 12 7/19/12 4.08 261.7 6.22 8.05
4 17 8:51:23 PM 7

SpectraView Block Data



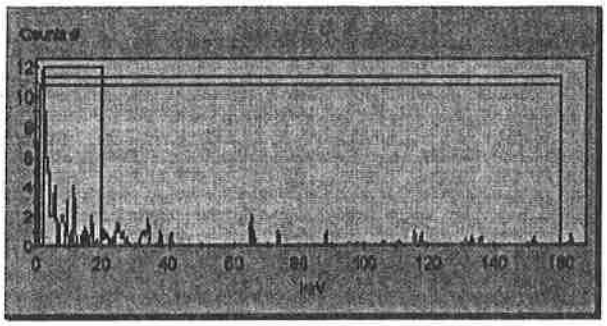
159-16 12 7/19/12 3.71 281.6 5.14 6.55
5 17 9:04:17 PM 5

SpectraView Block Data



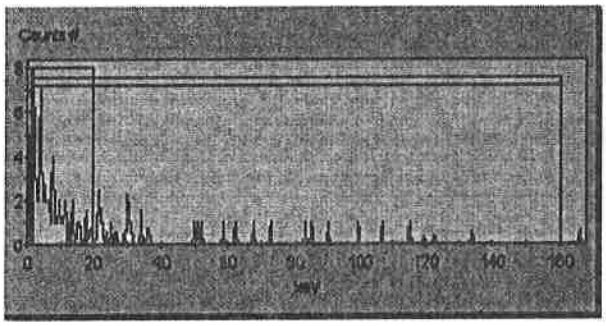
159-17 12 7/19/12 5.24 265.5 7.53 9.20
6 17 9:17:10 PM 7

SpectraView Block Data



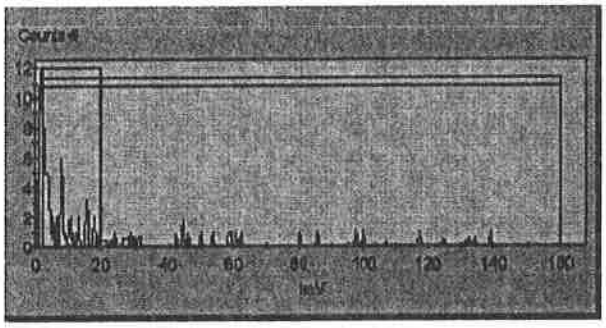
159-18 12 7/19/12 4.79 264.7 7.29 8.63
7 17 9:30:03 PM 7

SpectraView Block Data



159-19 12 7/19/12 5.23 291.1 7.49 9.07
8 17 9:42:58 PM 8

SpectraView Block Data



159-20 12 7/19/12 5.32 269.8 7.43 8.59
9 17 9:55:50 PM 6

SpectraView Block Data

Pace Analytical™ www.pacelabs.com

Pace Analytical Services, Inc.-Pittsurgh

Liquid Scintillation Counter Run Log System 2

Logbook ID: 6-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
H3 20120718-109	[illegible]	Swpe C14 H3	31	10	7/19/12 0900	5	[illegible]	[illegible]
↓ -1010	↓	↓	↓	↓	↓	↓	↓	↓
MB 459094	12497	Swipe C14 B	12	5	7/19/12 0900	20	[illegible]	[illegible]
3072 159001	↓	↓	↓	↓	↓	↓	↓	↓
002								
003								
004								
005								
006								
007								
008								
009								
010								
011			↓			↓		
012			17					
013			↓			12		
014						↓		
015								
016								
017								
018								
019								
↓ 020						↓	↓	↓
LCS	↓	↓	↓	↓	↓			

Run comments:

Peer Review:

J:\QAQC\Master\Document Management\Radiological\Liquid Scintillation Runlog (R023-3 7Oct2010).XLS

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
Matrix Smear
Batch ID 12476
Prep Start 7/16/2012 12:00
Prep Finish 7/16/2012
Act. Rpt Units dpm

Analyst RMK
PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a
Aliq. Rpt Units Sample

Bkg CPM 8.26
Bkg Duration 30.0 min
Bkg Ref BKG7/21/2012
Bkg Ct Date/Time: 7/21/2012 16:46
Instrument ID: System #2

Pace Analytical™
www.pacelabs.com

Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459058	1.0	1/0/00 0:00	6.0				dpm/S	Low, Reprep
LCS12481	1.0	7/21/12 13:56	6.0	7/21/12 13:56	58.29	319.0	dpm/S	High, Evaluate
LCSD12481	1.0	7/21/12 14:03	6.0	7/21/12 14:03	55.60	305.5	dpm/S	High, Evaluate
LCS12482	1.0	7/21/12 14:10	6.0	7/21/12 14:10	59.00	254.8	dpm/S	Pass
LCSD12482	1.0	7/21/12 14:17	6.0	7/21/12 14:17	54.73	307.6	dpm/S	High, Evaluate
LCS12483	1.0	7/21/12 14:23	6.0	7/21/12 14:23	60.56	288.2	dpm/S	Pass
LCSD12483	1.0	7/21/12 14:30	6.0	7/21/12 14:30	56.15	301.0	dpm/S	High, Evaluate
LCS12484	1.0	7/21/12 14:37	6.0	7/21/12 14:37	56.94	319.9	dpm/S	High, Evaluate
LCSD12484	1.0	7/21/12 14:44	6.0	7/21/12 14:44	59.13	309.0	dpm/S	High, Evaluate
LCSD12485	1.0	7/21/12 14:58	6.0	7/21/12 14:53	54.06	312.4	dpm/S	High, Evaluate
LCS12497	1.0	7/21/12 15:05	6.0	7/21/12 15:00	58.81	311.4	dpm/S	High, Evaluate
LCSD12497	1.0	7/21/12 15:12	6.0	7/21/12 15:07	62.56	310.8	dpm/S	High, Evaluate
LCS12485	1.0	7/28/12 15:29	12.0	7/28/12 15:29	51.27	299.3	dpm/S	Pass

LEB Data Input
Printed 7/31/2012 at 8:42 AM

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12476	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0696	0.0000	1.0000	118.714	-14.781	16.497	-84.905	-30.480	-8.466	-8.466	1.00
LCS12481	0.4643	0.0000	1.0000	107.761	13.344	18.527	12.724	4.568	1.269	13.344	1.00
LCSD12481	0.4764	0.0000	1.0000	99.373	12.709	17.378	12.401	4.452	1.237	12.709	1.00
LCS12482	0.4945	0.0000	1.0000	102.607	12.602	17.566	11.946	4.289	1.191	12.602	1.00
LCSD12482	0.4747	0.0000	1.0000	97.892	12.657	17.220	12.445	4.468	1.241	12.657	1.00
LCS12483	0.4874	0.0000	1.0000	107.296	12.948	18.205	12.120	4.351	1.209	12.948	1.00
LCSD12483	0.4797	0.0000	1.0000	99.823	12.681	17.394	12.314	4.421	1.228	12.681	1.00
LCS12484	0.4634	0.0000	1.0000	105.061	13.219	18.214	12.750	4.577	1.271	13.219	1.00
LCSD12484	0.4735	0.0000	1.0000	107.425	13.174	18.377	12.475	4.478	1.244	13.174	1.00
LCSD12485	0.4706	0.0000	1.0000	97.327	12.692	17.200	12.554	4.507	1.252	12.692	1.00
LCS12497	0.4715	0.0000	1.0000	107.218	13.197	18.376	12.530	4.498	1.249	13.197	1.00
LCSD12497	0.4720	0.0000	1.0000	115.043	13.585	19.309	12.516	4.493	1.248	13.585	1.00
LCS12485	0.4809	0.0000	1.0000	89.431	8.691	13.759	8.491	3.368	0.662	8.691	1.00

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12476

Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\20120721_1645.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\12482.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H-3_C-14_E.lsa

Count Conditions-

Nuclide: FILTER
   Quench Indicator: tSIE
   External Std Terminator (sec): 0.5 2s%
   Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 30.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
A	2.0	20.0
B	2.0	160.0
C	1.0	160.0

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

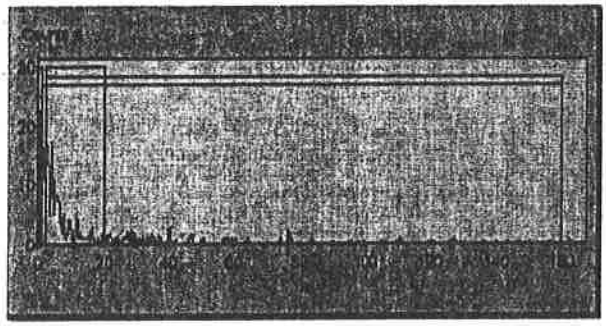
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 18.13 Date Processed: 7/21/12 4:45:38 PM

14C Chi Square: 18.58 Date Processed: 7/21/12 4:45:38 PM
3H E^2/B (1-18.6 keV): 308.22 Date Processed: 7/21/12 4:45:38 PM
14C E^2/B (4-156 keV): 562.59 Date Processed: 7/21/12 4:45:38 PM
3H Efficiency (0-18.6 keV): 62.32 Date Processed: 7/21/12 4:45:38 PM
14C Efficiency (0-156 keV): 95.60 Date Processed: 7/21/12 4:45:38 PM
IPA Background Date Processed: 7/21/12 4:45:38 PM
3H Background CPM (0-18.6 keV): 12.50 Date Processed: 7/21/12 4:45:38 PM
14C Background CPM (0-156 keV): 19.42 Date Processed: 7/21/12 4:45:38 PM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/21/12 4:45:38 PM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		BKG	7/21/2012	30 7/21/12	4.92	291.6	6.89	8.26	
1	10	4:46:13 PM	15						

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\20120721_1356.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\12480.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14_B.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 6.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
A	2.0	20.0
B	2.0	160.0
C	1.0	160.0

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

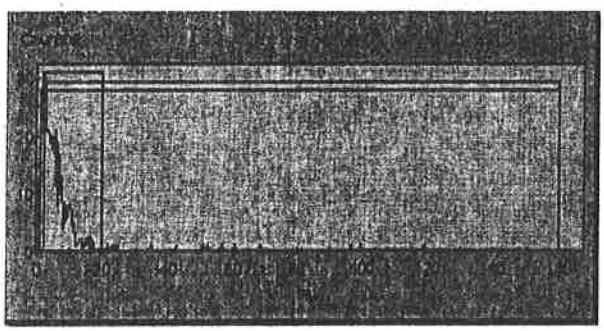
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.53 Date Processed: 7/20/12 8:36:50 PM
14C Chi Square: 11.84 Date Processed: 7/20/12 8:36:50 PM

3H E^2/B (1-18.6 keV): 311.34 Date Processed: 7/20/12 8:36:50 PM
14C E^2/B (4-156 keV): 556.50 Date Processed: 7/20/12 8:36:50 PM
3H Efficiency (0-18.6 keV): 61.98 Date Processed: 7/20/12 8:36:50 PM
14C Efficiency (0-156 keV): 94.97 Date Processed: 7/20/12 8:36:50 PM
IPA Background Date Processed: 7/20/12 8:36:50 PM
3H Background CPM (0-18.6 keV): 12.27 Date Processed: 7/20/12 8:36:50 PM
14C Background CPM (0-156 keV): 20.03 Date Processed: 7/20/12 8:36:50 PM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/20/12 8:36:50 PM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

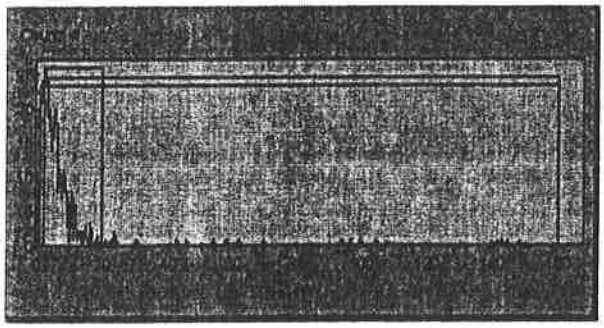
S#	PID	SMPL_ID TIME LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	17	LCS12481 1:56:51 PM 1	6	7/21/12	47.38	319.0	49.79	58.29	

SpectraView Block Data



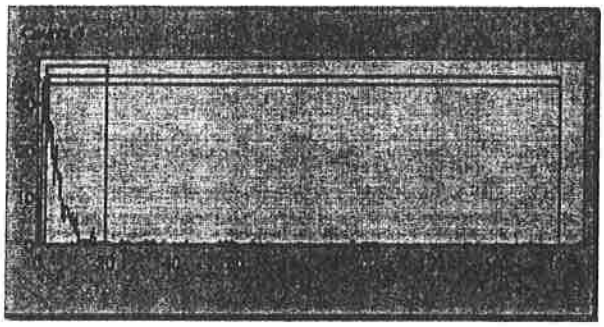
2	17	LCSD12481 2:03:37 PM 1	6	7/21/12	46.04	305.5	49.27	55.60	

SpectraView Block Data



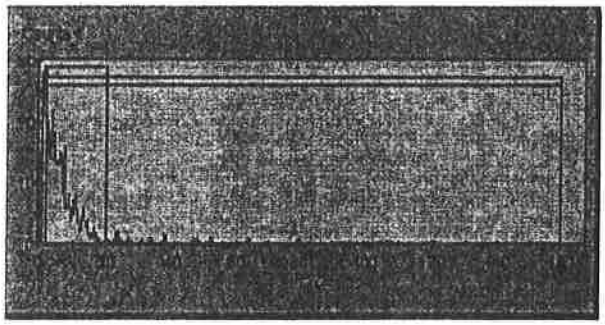
3	17	LCS12482 2:10:23 PM 1	6	7/21/12	48.40	254.8	51.17	59.00	

SpectraView Block Data



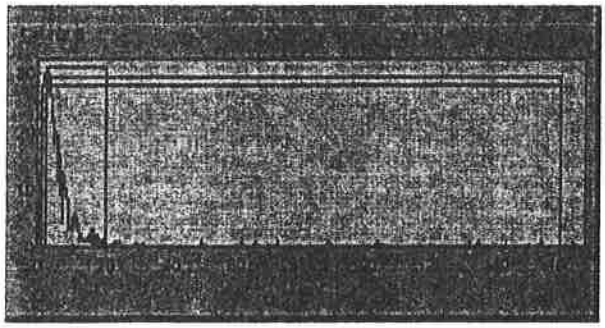
LCSD12482 6 7/21/12 43.13 307.6 45.73 54.73
4 17 2:17:08 PM 1

SpectraView Block Data



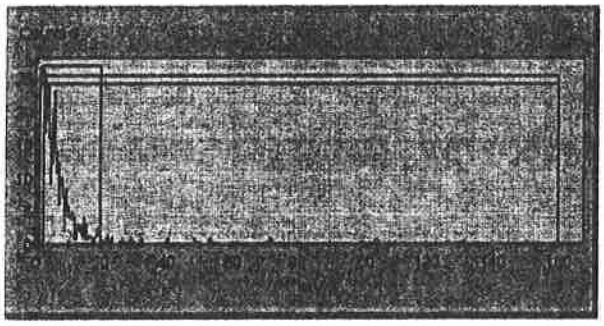
LCS12483 6 7/21/12 49.79 288.2 52.06 60.56
5 17 2:23:53 PM 1

SpectraView Block Data



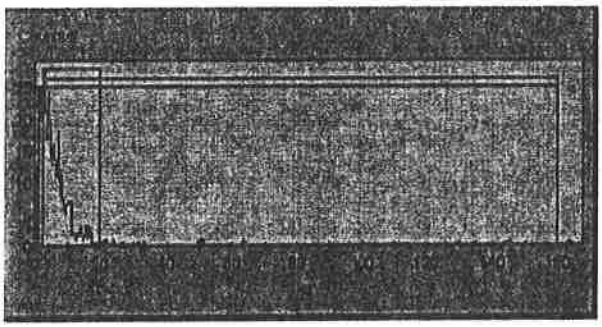
LCSD12483 6 7/21/12 45.19 301.0 47.31 56.15
6 17 2:30:38 PM 1

SpectraView Block Data



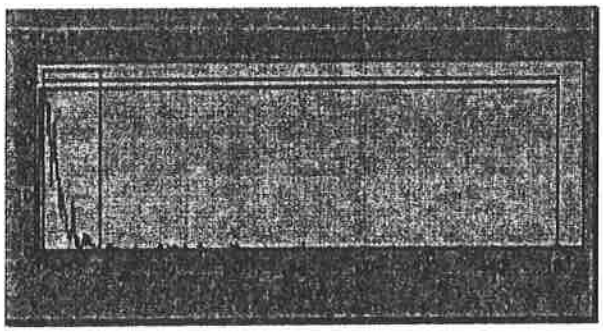
LCS12484 6 7/21/12 48.35 319.9 50.27 56.94
7 17 2:37:23 PM 1

SpectraView Block Data



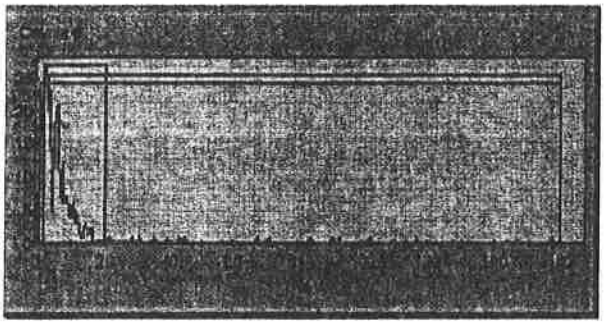
LCSD12484 6 7/21/12 51.38 309.0 53.46 59.13
8 17 2:44:09 PM 1

SpectraView Block Data



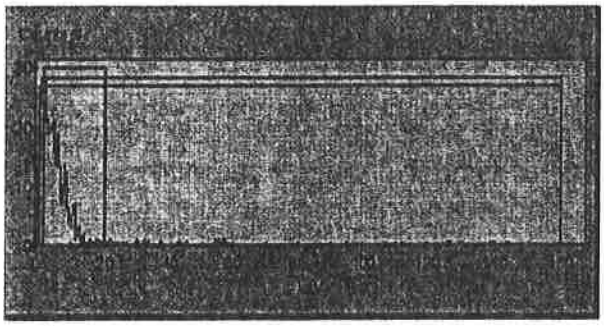
Missing vial 9.
LCSD12485 6 7/21/12 45.33 312.4 48.73 54.06
10 17 2:53:58 PM 2

SpectraView Block Data



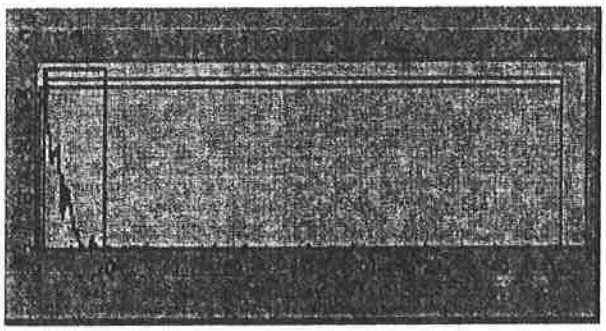
LCS12497 6 7/21/12 48.38 311.4 50.98 58.81
11 17 3:00:44 PM 1

SpectraView Block Data



LCSD12497 6 7/21/12 51.69 310.8 53.23 62.56
12 17 3:07:29 PM 1

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\20120728_1515.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\12476.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14.lsa

Count Conditions-

Nuclide: FILTER
   Quench Indicator: tSIE
   External Std Terminator (sec): 0.5 2s%
   Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 12.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
A	2.0	20.0
B	2.0	160.0
C	1.0	160.0

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

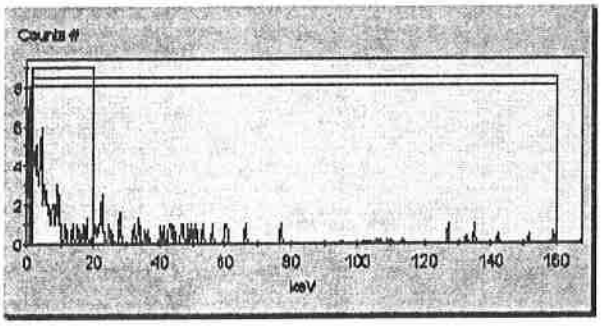
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 18.77 Date Processed: 7/28/12 3:15:37 PM
14C Chi Square: 19.53 Date Processed: 7/28/12 3:15:37 PM

3H E^2/B (1-18.6 keV): 309.97 Date Processed: 7/28/12 3:15:37 PM
14C E^2/B (4-156 keV): 578.03 Date Processed: 7/28/12 3:15:37 PM
3H Efficiency (0-18.6 keV): 62.71 Date Processed: 7/28/12 3:15:37 PM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/28/12 3:15:36 PM
IPA Background Date Processed: 7/28/12 3:15:37 PM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/28/12 3:15:37 PM
14C Background CPM (0-156 keV): 19.20 Date Processed: 7/28/12 3:15:37 PM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/28/12 3:15:37 PM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	TIME	SMPL_ID LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
			BKG	12	7/28/12	4.47	319.7	7.39	8.47	
1	6	3:16:11 PM	5							

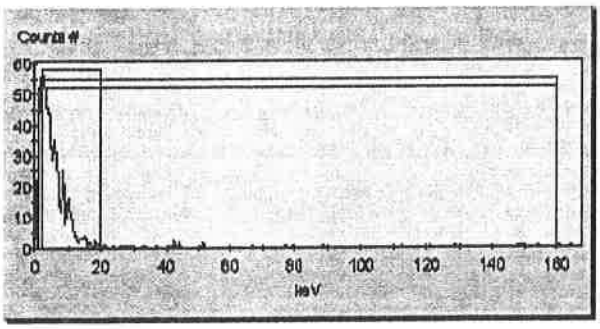
SpectraView Block Data



12485

			LCS	12	7/28/12	49.13	299.3	51.27	58.19	
2	6	3:29:02 PM	1							

SpectraView Block Data



jm 7/31/12

Pace Analytical™

Pace Analytical Services, Inc.-Pittsurgh

Liquid Scintillation Counter Run Log System 2

Logbook ID: 8-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
30 [illegible] 040	NA	Supe H3C14	9	12	7/20/12 1500	~~13~~ 12	NA	Q
LCS	↓	↓	↓	↓	↓	OP 7/20/12	↓	↓
LCSD	↓	↓	↓	↓	↓	↓	↓	↓
BLK 7/21/12	↓	Supe H3C14E	10	3	7/21/12 1355	30	↓	↓
30731156014	↓	Supe H3C14D	26	19	↓	12	↓	↓
17	↓	↓	↓	↓	↓	↓	↓	↓
33	↓	↓	↓	↓	↓	↓	↓	↓
34	↓	↓	↓	↓	↓	↓	↓	↓
44	↓	↓	↓	↓	↓	↓	↓	↓
69	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12481	↓	Supe H3C14B	17	5	7/21/12 1355	6	↓	Q
LCSD 12481	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12482	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12482	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12483	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12483	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12484	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12484	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12485	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12485	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12487	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12487	↓	↓	↓	↓	↓	↓	↓	↓

Run comments:

Peer Review: G 7/24/12

J:\QAQC\Master\Document Management\Radiological\Liquid Scintillation Runlog (R023-3 7Oct2010).XLS

Pace Analytical

Pace Analytical Services, Inc.-Pittsurgh

Liquid Scintillation Counter Run Log System 2

Logbook ID: 8-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
30730069008	12701	Pu241 CHRM B	16	6	7-26-12 15:20	120	N/A	CAL
LCS12701	↓	↓	↓	↓	↓	↓	↓	↓
LCSD12701	↓	↓	↓	↓	↓	↓	↓	↓
BKG	CIA	Super-H3 44	6	2	7/27/12 1030	12	N/A	Q
LW 13485	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: ______

Peer Review: ______

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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2 459096-BLANK for HBN 91071 [RADC/1249

Type BLANK **Matrix** Impact Plate **Collected** **% Moisture**
Client QCACCOUNT **WO** **Work ID**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12498 **Prep Date** 7/19/2012 22:34 **Dilution**
Method EPA 906.0M **HBN** 91071 **Hold Date** 12/25/2012 23:59 **Analyst** MBT
Schedule 2860697 **Instru** NONE **CC** OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 22:34 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** MBT
Schedule 2860697 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.297U ± 4.12 (8.69)	dpm/sa	0.297U ± 4.12 (8.69)			dpm/sa

4 3072159021-SU-09-22

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12498 **Prep Date** 7/19/2012 22:47 **Dilution**
Method EPA 906.0M **HBN** 91071 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2860698 **Instru** NONE **CC** OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 22:47 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2860698 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	0.540U ± 4.06 (8.51)	dpm/sa	0.540U ± 4.06 (8.51)					dpm/sa

6 3072159022-SU-09-23

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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6 3072159022-SU-09-23

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/19/2012 23:00	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860720	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 23:00	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860720	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.08U ± 3.72 (8.41)	dpm/sa	-3.08U ± 3.72 (8.41)		dpm/sa		

8 3072159023-SU-09-24

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/19/2012 23:13	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860742	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 23:13	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860742	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.97U ± 3.81 (8.43)	dpm/sa	-1.97U ± 3.81 (8.43)		dpm/sa		

10 3072159024-SU-09-25

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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10 3072159024-SU-09-25

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/19/2012 23:26	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860747	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 23:26	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860747	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.98U ± 3.96 (8.74)	dpm/sa	-1.98U ± 3.96 (8.74)		dpm/sa		

12 3072159025-SU-09-26

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/19/2012 23:38	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860748	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 23:38	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860748	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.631U ± 4.01 (8.62)	dpm/sa	-0.631U ± 4.01 (8.62)		dpm/sa		

14 3072159026-SU-09-27

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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14 3072159026-SU-09-27

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12498	**Prep Date**	7/19/2012 23:51	**Dilution**
Method	EPA 906.0M		**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860749		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 23:51	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860749		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.25U ± 3.80 (8.44)	dpm/sa	-2.25U ± 3.80 (8.44)		dpm/sa		

16 3072159027-SU-09-28

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12498	**Prep Date**	7/20/2012 00:04	**Dilution**
Method	EPA 906.0M		**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860750		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 00:04	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2860750		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.06U ± 3.84 (8.34)	dpm/sa	-1.06U ± 3.84 (8.34)		dpm/sa		

18 3072159028-SU-09-29

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	**HBN**	91071
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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18 3072159028-SU-09-29

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860751

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 00:17
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860751

Instru NONE
Col ID
File

Run Date 7/20/2012 00:17
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.54U ± 3.84 (8.42)	dpm/sa	-1.54U ± 3.84 (8.42)		dpm/sa		

20 3072159029-SU-09-30

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860752

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 00:30
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860752

Instru NONE
Col ID
File

Run Date 7/20/2012 00:30
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.43U ± 3.85 (8.58)	dpm/sa	-2.43U ± 3.85 (8.58)		dpm/sa		

22 3072159030-SU-09-31

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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22 3072159030-SU-09-31

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/20/2012 00:43	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860753	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 00:43	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860753	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.35U ± 3.70 (8.41)	dpm/sa	-3.35U ± 3.70 (8.41)		dpm/sa		

24 3072159031-SU-09-32

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/20/2012 00:56	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860754	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 00:56	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860754	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.509U ± 3.89 (8.35)	dpm/sa	-0.509U ± 3.89 (8.35)		dpm/sa		

26 3072159032-SU-09-33

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	**HBN**	91071
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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26 3072159032-SU-09-33

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860755

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 01:09
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860755

Instru NONE
Col ID
File

Run Date 7/20/2012 01:09
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.814U ± 4.00 (8.33)	dpm/sa	0.814U ± 4.00 (8.33)		dpm/sa		

28 3072159033-SU-09-34

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860756

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 01:22
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860756

Instru NONE
Col ID
File

Run Date 7/20/2012 01:22
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.521U ± 3.98 (8.54)	dpm/sa	-0.521U ± 3.98 (8.54)		dpm/sa		

30 3072159034-SU-09-35

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	**HBN**	91071
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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30 3072159034-SU-09-35

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860757

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 01:35
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860757

Instru NONE
Col ID
File

Run Date 7/20/2012 01:35
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.144U ± 3.98 (8.42)	dpm/sa	0.144U ± 3.98 (8.42)		dpm/sa		

32 3072159035-SU-09-36

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860758

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 01:48
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860758

Instru NONE
Col ID
File

Run Date 7/20/2012 01:48
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.692U ± 3.99 (8.34)	dpm/sa	0.692U ± 3.99 (8.34)		dpm/sa		

34 3072159036-SU-09-37

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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34 3072159036-SU-09-37

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860759

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 02:01
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860759

Instru NONE
Col ID
File

Run Date 7/20/2012 02:01
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.000U ± 3.96 (8.40)	dpm/sa	0.000U ± 3.96 (8.40)		dpm/sa		

36 3072159037-SU-09-37D

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860760

Batch RADC/12498
HBN 91071
Instru NONE

Prep Date 7/20/2012 02:14
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2860760

Instru NONE
Col ID
File

Run Date 7/20/2012 02:14
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.36U ± 3.80 (8.47)	dpm/sa	-2.36U ± 3.80 (8.47)		dpm/sa		

38 3072159038-SU-09-38

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

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Batch	RADC/12498	HBN	91071
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

38 3072159038-SU-09-38

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/20/2012 10:09
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59
Schedule	2860761	**Instru**	NONE		

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 10:09
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2860761	**File**			

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.66U ± 3.88 (8.52)	dpm/sa	-1.66U ± 3.88 (8.52)		dpm/sa		

40 3072159039-SU-09-39

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/20/2012 10:22
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59
Schedule	2860766	**Instru**	NONE		

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 10:22
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2860766	**File**			

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.676U ± 3.90 (8.39)	dpm/sa	-0.676U ± 3.90 (8.39)		dpm/sa		

42 3072159040-SU-09-40

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12498	**HBN**	91071
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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42 3072159040-SU-09-40

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12498	**Prep Date**	7/20/2012 10:35	**Dilution**	
Method	EPA 906.0M	**HBN**	91071	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860767	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 10:35	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2860767	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-2.82U ± 3.78 (8.50)	dpm/sa	-2.82U ± 3.78 (8.50)			dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:55	Assigned Analyst	MBT
Batch ID	12498	Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB 9060W	HBN	91071
Method	EPA 906.0M EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459096	BLANK	IP		QCACCOUNT	0.297U	4.12	8.69	7/19/12 22:34
3072159	3072159021	PS	WP	6/11/2012 0:01	RTI	0.540U	4.06	8.51	7/19/12 22:47
3072159	3072159022	PS	WP	6/11/2012 0:01	RTI	-3.08U	3.72	8.41	7/19/12 23:00
3072159	3072159023	PS	WP	6/11/2012 0:01	RTI	-1.97U	3.81	8.43	7/19/12 23:13
3072159	3072159024	PS	WP	6/11/2012 0:01	RTI	-1.98U	3.96	8.74	7/19/12 23:26
3072159	3072159025	PS	WP	6/11/2012 0:01	RTI	-0.631U	4.01	8.62	7/19/12 23:38
3072159	3072159026	PS	WP	6/11/2012 0:01	RTI	-2.25U	3.80	8.44	7/19/12 23:51
3072159	3072159027	PS	WP	6/11/2012 0:01	RTI	-1.06U	3.84	8.34	7/20/12 0:04
3072159	3072159028	PS	WP	6/11/2012 0:01	RTI	-1.54U	3.84	8.42	7/20/12 0:17
3072159	3072159029	PS	WP	6/11/2012 0:01	RTI	-2.43U	3.85	8.58	7/20/12 0:30
3072159	3072159030	PS	WP	6/11/2012 0:01	RTI	-3.35U	3.70	8.41	7/20/12 0:43
3072159	3072159031	PS	WP	6/11/2012 0:01	RTI	-0.509U	3.89	8.35	7/20/12 0:56
3072159	3072159032	PS	WP	6/11/2012 0:01	RTI	0.814U	4.00	8.33	7/20/12 1:09
3072159	3072159033	PS	WP	6/11/2012 0:01	RTI	-0.521U	3.98	8.54	7/20/12 1:22
3072159	3072159034	PS	WP	6/11/2012 0:01	RTI	0.144U	3.98	8.42	7/20/12 1:35
3072159	3072159035	PS	WP	6/11/2012 0:01	RTI	0.692U	3.99	8.34	7/20/12 1:48
3072159	3072159036	PS	WP	6/11/2012 0:01	RTI	0.000U	3.96	8.40	7/20/12 2:01
3072159	3072159037	PS	WP	6/11/2012 0:01	RTI	-2.36U	3.80	8.47	7/20/12 2:14
3072159	3072159038	PS	WP	6/11/2012 0:01	RTI	-1.66U	3.88	8.52	7/20/12 10:09
3072159	3072159039	PS	WP	6/11/2012 0:01	RTI	-0.676U	3.90	8.39	7/20/12 10:22
3072159	3072159040	PS	WP	6/11/2012 0:01	RTI	-2.82U	3.78	8.50	7/20/12 10:35

7/27/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	MBT		
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	8.32
Batch ID	12498	**PrepSOP2**	n/a	**Bkg Duration**	30.0 min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG 7/19/2012
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/19/2012 11:41
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #2

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459096	1.0	7/19/12 22:34	12.0	7/19/12 22:34	8.46	311.1	dpm/S	High, Evaluate
3072159021	1.0	6/11/12 0:01	12.0	7/19/12 22:47	8.58	294.2	dpm/S	Pass
3072159022	1.0	6/11/12 0:01	12.0	7/19/12 23:00	6.82	282.6	dpm/S	Pass
3072159023	1.0	6/11/12 0:01	12.0	7/19/12 23:13	7.36	284.2	dpm/S	Pass
3072159024	1.0	6/11/12 0:01	12.0	7/19/12 23:26	7.39	311.1	dpm/S	High, Evaluate
3072159025	1.0	6/11/12 0:01	12.0	7/19/12 23:38	8.02	302.8	dpm/S	High, Evaluate
3072159026	1.0	6/11/12 0:01	12.0	7/19/12 23:51	7.23	286.7	dpm/S	Pass
3072159027	1.0	6/11/12 0:01	12.0	7/20/12 0:04	7.80	253.7	dpm/S	Pass
3072159028	1.0	6/11/12 0:01	12.0	7/20/12 0:17	7.57	283.8	dpm/S	Pass
3072159029	1.0	6/11/12 0:01	12.0	7/20/12 0:30	7.16	299.9	dpm/S	Pass
3072159030	1.0	6/11/12 0:01	12.0	7/20/12 0:43	6.69	282.1	dpm/S	Pass
3072159031	1.0	6/11/12 0:01	12.0	7/20/12 0:56	8.07	269.0	dpm/S	Pass
3072159032	1.0	6/11/12 0:01	12.0	7/20/12 1:09	8.72	260.3	dpm/S	Pass
3072159033	1.0	6/11/12 0:01	12.0	7/20/12 1:22	8.07	296.8	dpm/S	Pass
3072159034	1.0	6/11/12 0:01	12.0	7/20/12 1:35	8.39	283.3	dpm/S	Pass
3072159035	1.0	6/11/12 0:01	12.0	7/20/12 1:48	8.66	254.3	dpm/S	Pass
3072159036	1.0	6/11/12 0:01	12.0	7/20/12 2:01	8.32	280.9	dpm/S	Pass
3072159037	1.0	6/11/12 0:01	12.0	7/20/12 2:14	7.18	289.4	dpm/S	Pass
3072159038	1.0	6/11/12 0:01	12.0	7/20/12 10:09	7.52	294.4	dpm/S	Pass
3072159039	1.0	6/11/12 0:01	12.0	7/20/12 10:22	7.99	279.0	dpm/S	Pass
3072159040	1.0	6/11/12 0:01	12.0	7/20/12 10:35	6.96	292.3	dpm/S	Pass
LCS12498	1.0	7/20/12 10:48	12.0	7/20/12 10:48	58.44	300.5	dpm/S	High, Evaluate
LCSD12498	1.0	7/20/12 11:01	12.0	7/20/12 11:01	60.74	304.7	dpm/S	High, Evaluate

7/23/12 7/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	MBT
Matrix	Smear	**PrepSOP1**	0
Batch ID	12498	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459096	0.4717	0.0000	1.0000	0.297	4.118	4.118	8.687	3.446	0.674	4.118	1.00
3072159021	0.4842	0.1066	0.9941	0.540	4.057	4.057	8.514	3.378	0.661	4.057	1.00
3072159022	0.4899	0.1067	0.9941	-3.080	3.701	3.719	8.414	3.338	0.653	3.701	1.00
3072159023	0.4893	0.1067	0.9941	-1.974	3.803	3.810	8.425	3.342	0.654	3.803	1.00
3072159024	0.4717	0.1067	0.9941	-1.983	3.950	3.957	8.738	3.467	0.678	3.950	1.00
3072159025	0.4784	0.1067	0.9941	-0.631	4.008	4.008	8.616	3.418	0.669	4.008	1.00
3072159026	0.4882	0.1068	0.9941	-2.246	3.789	3.798	8.444	3.350	0.656	3.789	1.00
3072159027	0.4944	0.1068	0.9941	-1.058	3.840	3.842	8.337	3.308	0.647	3.840	1.00
3072159028	0.4894	0.1068	0.9941	-1.542	3.839	3.843	8.422	3.341	0.654	3.839	1.00
3072159029	0.4805	0.1068	0.9941	-2.428	3.836	3.847	8.579	3.403	0.666	3.836	1.00
3072159030	0.4901	0.1069	0.9941	-3.346	3.676	3.697	8.410	3.337	0.653	3.676	1.00
3072159031	0.4938	0.1069	0.9941	-0.509	3.892	3.892	8.348	3.312	0.648	3.892	1.00
3072159032	0.4946	0.1069	0.9941	0.814	3.994	3.995	8.334	3.306	0.647	3.994	1.00
3072159033	0.4826	0.1069	0.9941	-0.521	3.982	3.983	8.542	3.389	0.663	3.982	1.00
3072159034	0.4896	0.1070	0.9941	0.144	3.979	3.979	8.419	3.340	0.654	3.979	1.00
3072159035	0.4945	0.1070	0.9941	0.692	3.986	3.986	8.337	3.307	0.647	3.986	1.00
3072159036	0.4906	0.1070	0.9941	0.000	3.960	3.960	8.403	3.333	0.652	3.960	1.00
3072159037	0.4868	0.1070	0.9941	-2.356	3.790	3.800	8.468	3.359	0.657	3.790	1.00
3072159038	0.4841	0.1079	0.9940	-1.663	3.873	3.878	8.517	3.379	0.661	3.873	1.00
3072159039	0.4913	0.1080	0.9940	-0.676	3.898	3.899	8.392	3.329	0.652	3.898	1.00
3072159040	0.4853	0.1080	0.9940	-2.819	3.762	3.777	8.495	3.370	0.660	3.762	1.00
LCS12498	0.4801	0.0000	1.0000	104.395	9.262	15.519	8.535	3.386	0.663	9.262	1.00
LCSD12498	0.4770	0.0000	1.0000	109.893	9.494	16.184	8.590	3.408	0.667	9.494	1.00

7/23/12 7/23/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/31/2012	**Method:**	EPA 906.0M
Worklist:	12498	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459096

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	0.2970	4.1180	8.6870	3.44600		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 10:48	7/20/12 11:01				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.942	1184.942				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	104.395	109.893				
1.96 Sigma Unc:	15.519	16.184				
% Recovery:	88.10%	92.74%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12498					
Duplicate Sample I.D.	LCSD12498					
Sample Result (DPM/Sample, g, F):	104.3950					
1.96 Sigma Unc:	15.5190					
ple Duplicate Result (DPM/Sample, g, F):	109.8930					
Duplicate Sample 1.96 Sigma Unc.	16.1840					
Either results below MDC?	NO					
Relative Percent Difference:	5.13%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment

Analyte:			
Sample Collection Date:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (DPM/Sample):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(DPM/Sample, g, F):			
MSD Aliquot (L, g, F):			
MSD Target Conc. (DPM/Sample, g, F):			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.:			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.:			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment

Analyte:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12498

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Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\20120719_1140.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_C\12476.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H-3_C-14_C.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 30.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	0.00
B	2.0	160.0	2.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

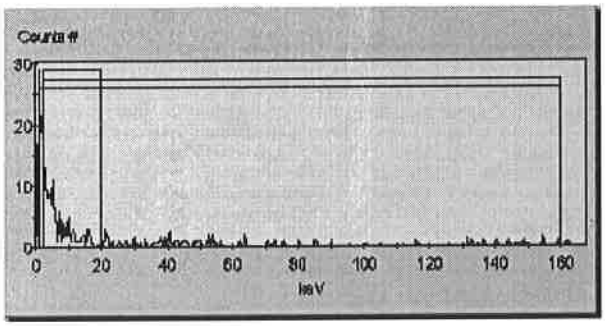
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM

14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM
3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	26	BKG 7/19/2012 11:41:32 AM	30 9	7/19/12	4.45	322.0	6.72	8.32	

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\20120719_1451.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\12480.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14_B.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 20.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	2.00
B	2.0	160.0	0.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

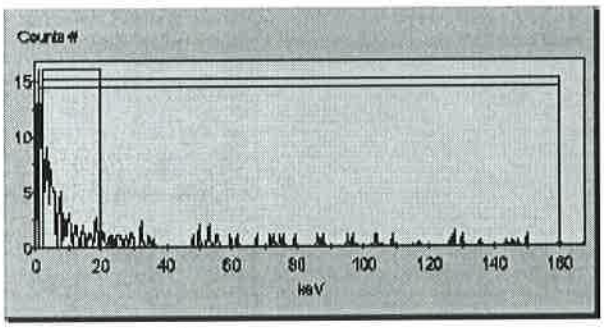
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM
14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM

3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

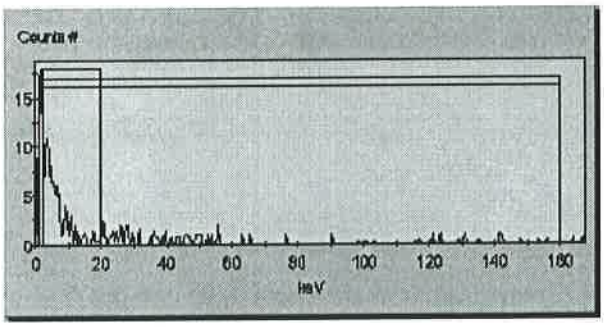
S#	PID	TIME	SMPL_ID LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	12	2:52:25 PM	459094 MB 7	20	7/19/12	4.45	314.0	6.85	8.25	

SpectraView Block Data



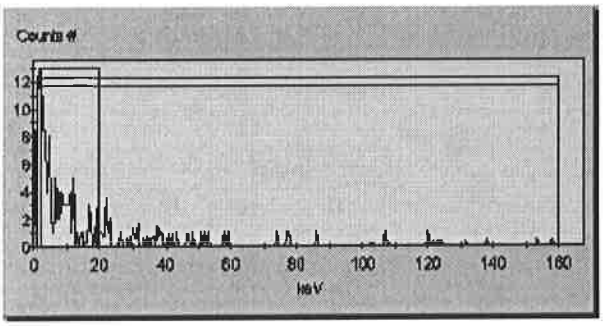
2	12	3:13:30 PM	3072 159-1 5	20	7/19/12	5.38	272.7	8.28	9.97	

SpectraView Block Data



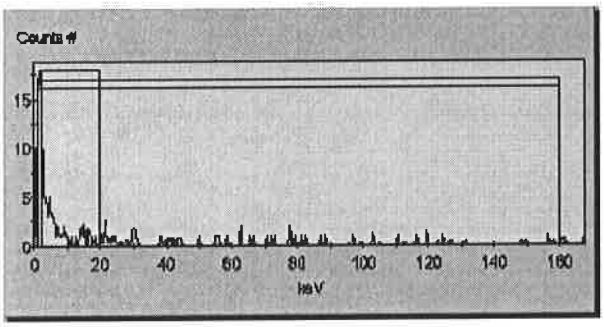
3	12	3:34:33 PM	3072 159-2 5	20	7/19/12	5.47	279.0	7.69	8.89	

SpectraView Block Data



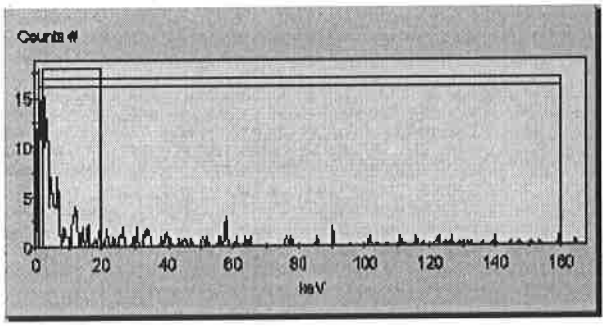
159-3 20 7/19/12 3.68 294.1 6.49 8.14
4 12 3:55:47 PM 8

SpectraView Block Data



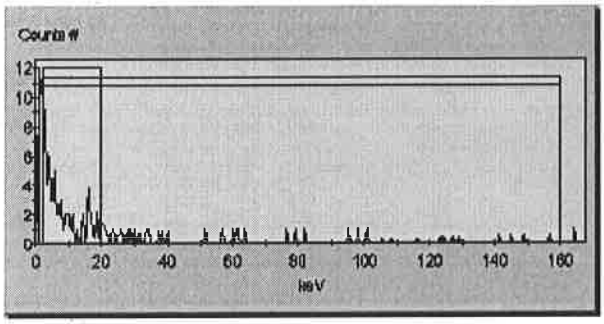
159-4 20 7/19/12 5.81 268.7 8.74 10.19
5 12 4:16:52 PM 6

SpectraView Block Data



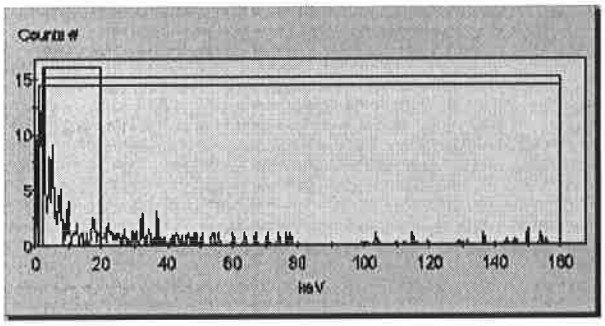
159-5 20 7/19/12 4.37 289.4 6.17 7.32
6 12 4:37:57 PM 9

SpectraView Block Data



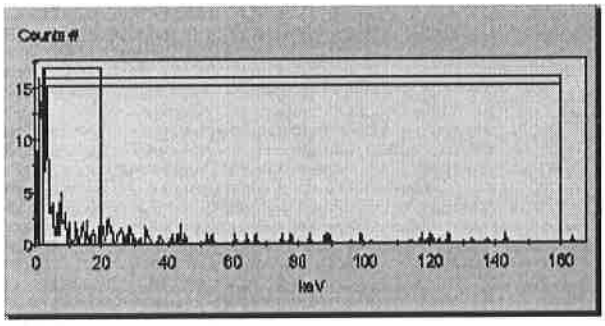
159-6 20 7/19/12 4.83 280.2 7.72 8.93
7 12 4:59:01 PM 8

SpectraView Block Data



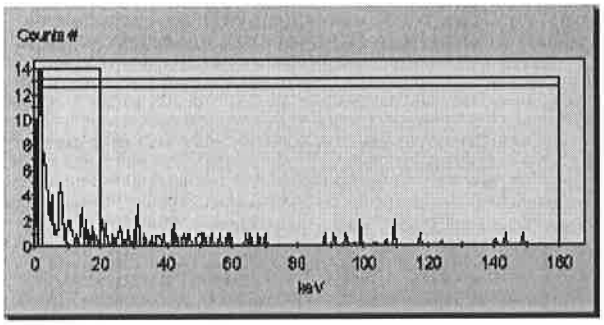
159-7 20 7/19/12 4.46 288.5 6.78 8.22
8 12 5:20:26 PM 11

SpectraView Block Data



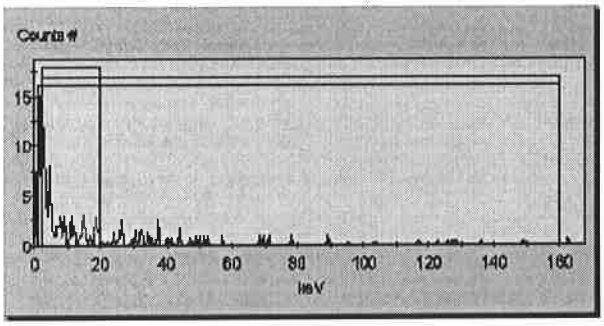
159-8 20 7/19/12 3.67 271.7 6.28 7.68
9 12 5:41:31 PM 8

SpectraView Block Data



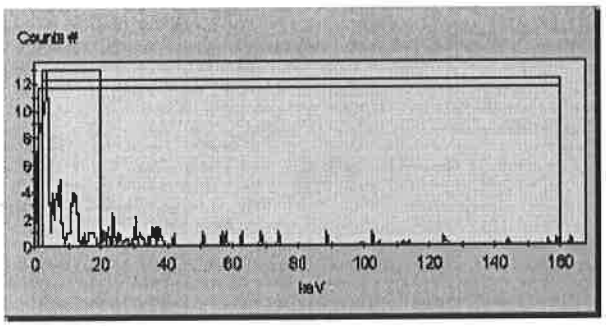
159-9 20 7/19/12 4.71 311.6 6.56 7.46
10 12 6:02:35 PM 8

SpectraView Block Data



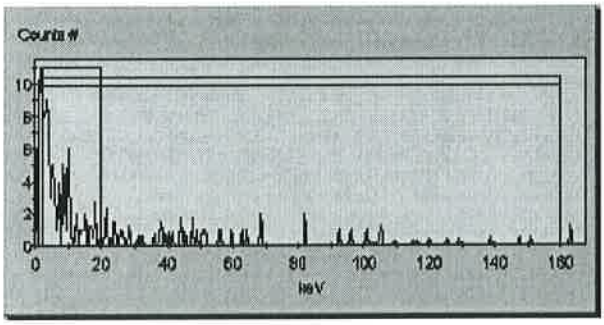
159-10 20 7/19/12 4.93 280.0 6.91 7.71
11 12 6:23:39 PM 7

SpectraView Block Data



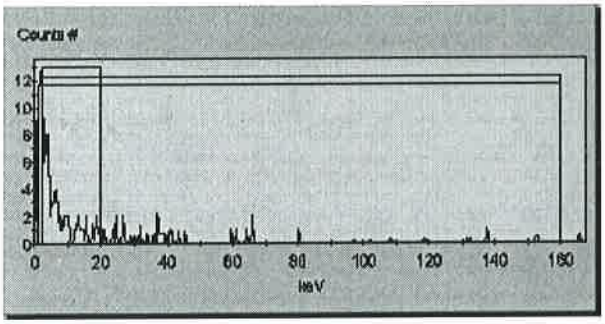
159-11 20 7/19/12 4.72 277.6 7.07 8.02
12 12 6:44:42 PM 7

SpectraView Block Data



159-12 20 7/19/12 4.39 281.7 6.06 7.21
13 17 7:05:52 PM 9

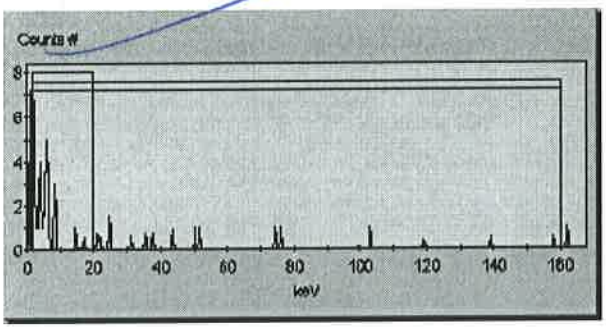
SpectraView Block Data



Didn't finish 7/21/12

159-13 9 12/31/69 3.91 267.9 5.33 6.34
14 17 7:00:00 PM 12

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\20120719_2012.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14_B\12480.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14_B.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 12.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	2.00
B	2.0	160.0	0.00
C	1.0	160.0	0.00

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

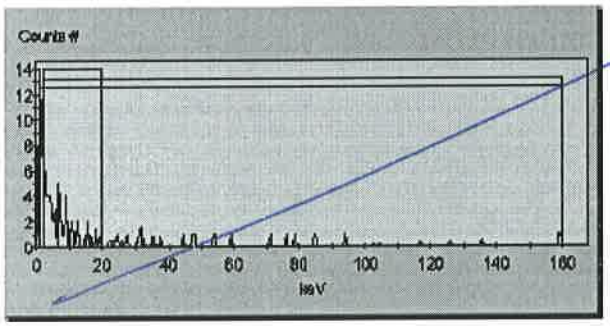
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM
14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM

3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		159-12	12	7/19/12	5.03	282.1	7.35	9.44	
1	17	8:12:42 PM	8						

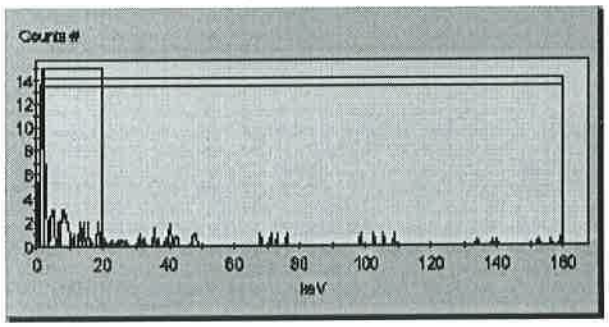
SpectraView Block Data



WR needed 7/21/12

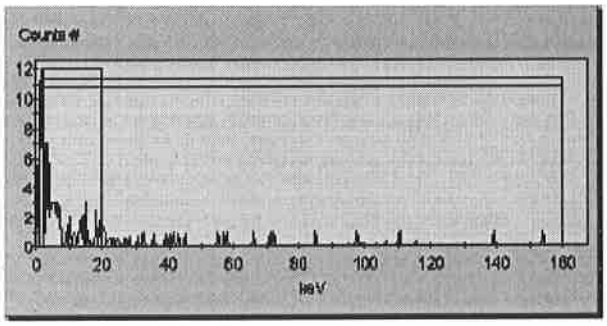
		159-13	12	7/19/12	4.17	278.0	6.56	8.65	
2	17	8:25:36 PM	9						

SpectraView Block Data



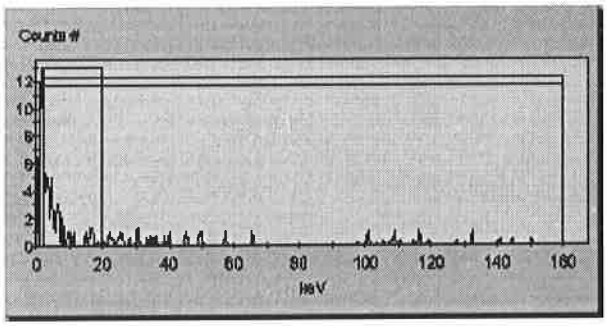
		159-14	12	7/19/12	4.82	291.5	7.05	8.80	
3	17	8:38:30 PM	7						

SpectraView Block Data



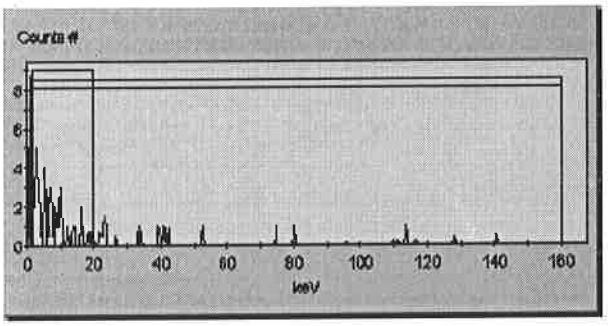
159-15 12 7/19/12 4.08 261.7 6.22 8.05
4 17 8:51:23 PM 7

SpectraView Block Data



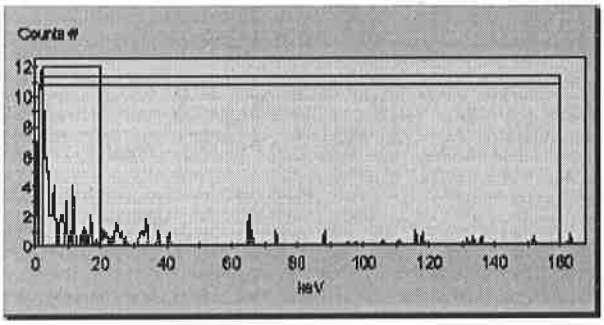
159-16 12 7/19/12 3.71 281.6 5.14 6.55
5 17 9:04:17 PM 5

SpectraView Block Data



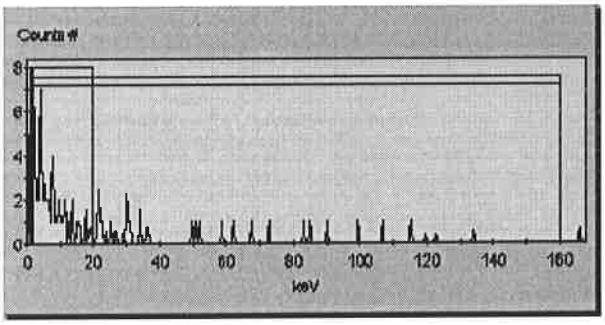
159-17 12 7/19/12 5.24 265.5 7.53 9.20
6 17 9:17:10 PM 7

SpectraView Block Data



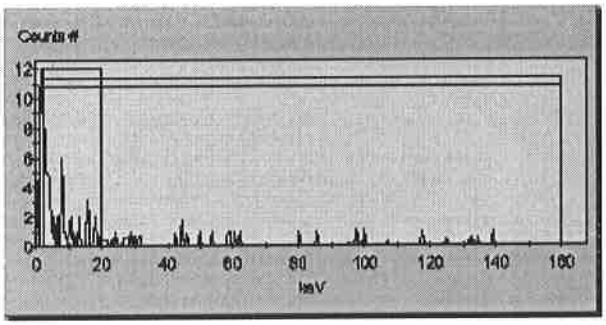
159-18 12 7/19/12 4.79 264.7 7.29 8.63
7 17 9:30:03 PM 7

SpectraView Block Data



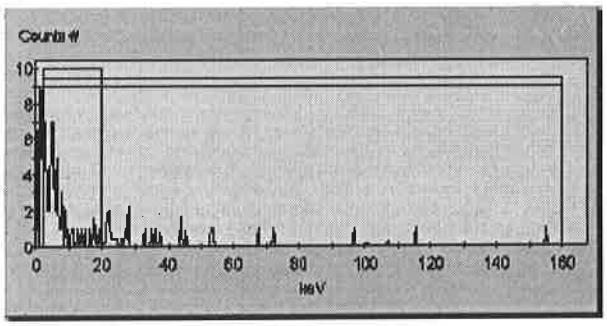
159-19 12 7/19/12 5.23 291.1 7.49 9.07
8 17 9:42:58 PM 8

SpectraView Block Data



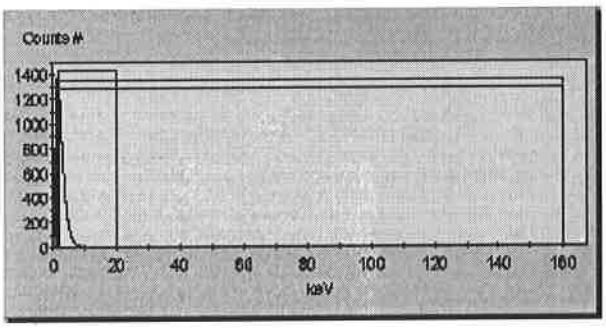
159-20 12 7/19/12 5.32 269.8 7.43 8.59
9 17 9:55:50 PM 6

SpectraView Block Data



		LCS-3	12	7/19/12	403.38	302.3	405.66	625.32
10	17	10:08:44 PM	0					

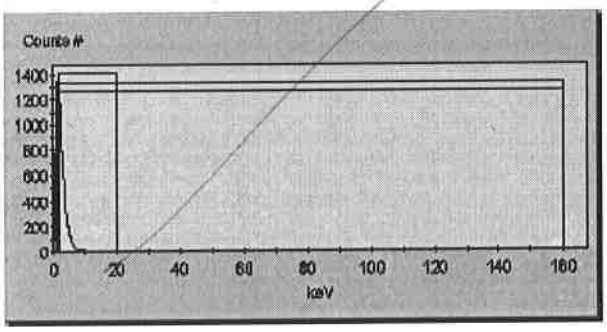
SpectraView Block Data



Not used JA 7/31/12

		LCSD-4	12	7/19/12	384.18	313.7	386.77	600.52
11	17	10:21:38 PM	0					

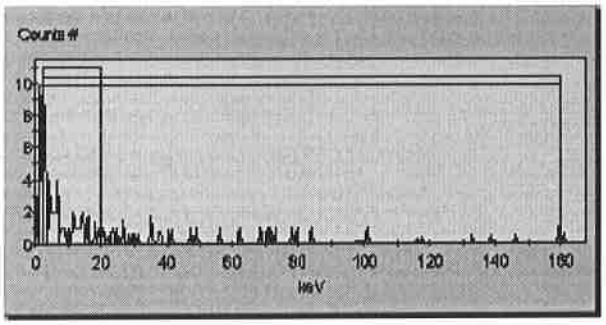
SpectraView Block Data



459096

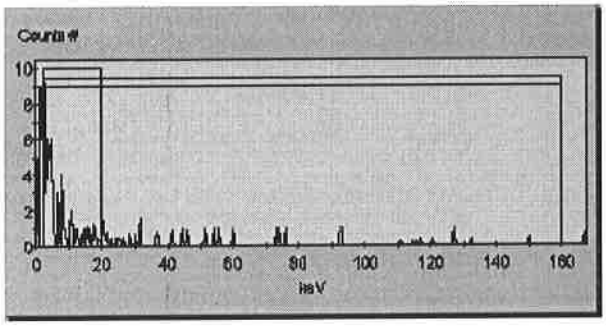
		~~MB~~	12	7/19/12	5.18	311.1	7.79	8.46
12	17	10:34:32 PM	8	JA 7/31/12				

SpectraView Block Data



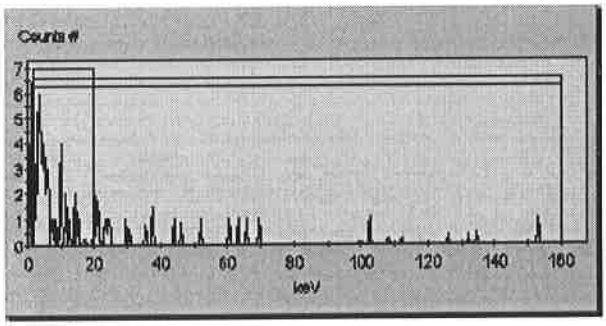
159-21 12 7/19/12 5.36 294.2 7.50 8.58
13 15 10:47:30 PM 6

SpectraView Block Data



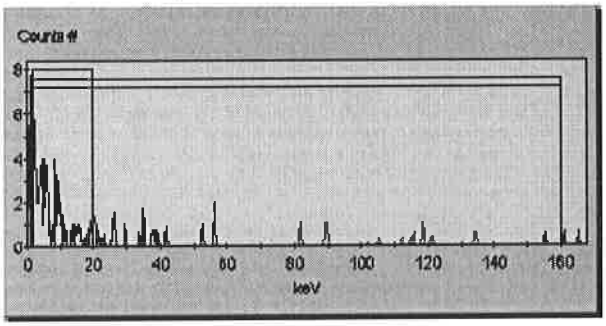
159-22 12 7/19/12 3.86 282.6 5.82 6.82
14 15 11:00:18 PM 5

SpectraView Block Data



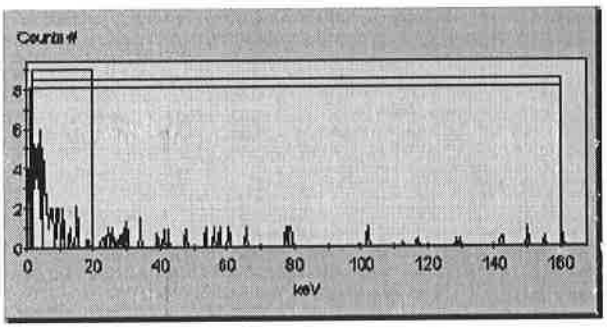
159-23 12 7/19/12 4.17 284.2 6.11 7.36
15 15 11:13:10 PM 11

SpectraView Block Data



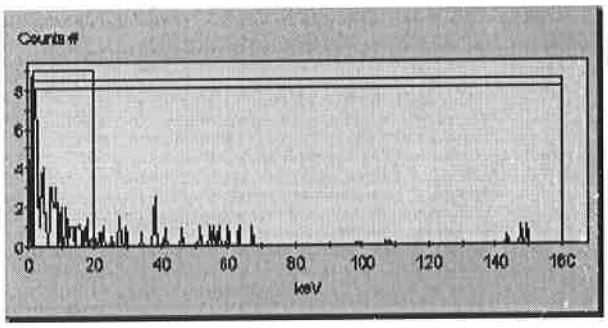
159-24 12 7/19/12 4.16 311.1 6.22 7.39
16 15 11:26:02 PM 6

SpectraView Block Data



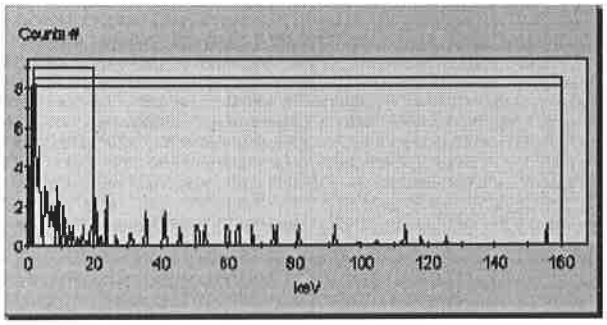
159-25 12 7/19/12 4.79 302.8 6.60 8.02
17 15 11:38:55 PM 6

SpectraView Block Data



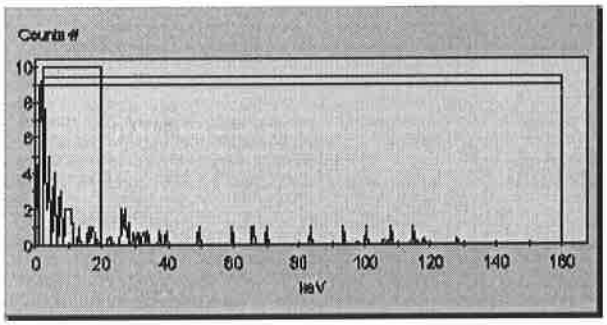
159-26 12 7/19/12 3.96 286.7 6.31 7.23
18 15 11:51:47 PM 8

SpectraView Block Data



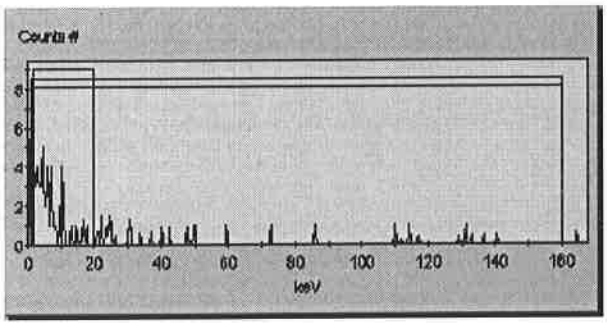
159-27 12 7/20/12 4.55 253.7 6.64 7.80
19 15 12:04:39 AM 6

SpectraView Block Data



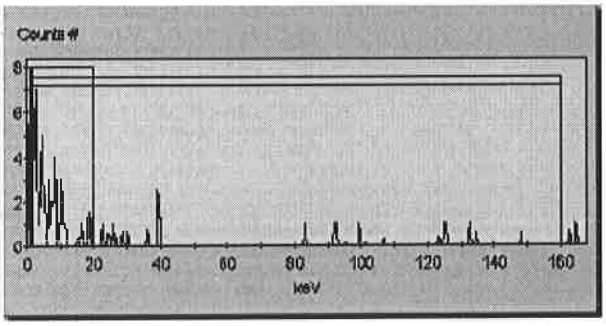
159-28 12 7/20/12 4.28 283.8 6.24 7.57
20 15 12:17:32 AM 7

SpectraView Block Data



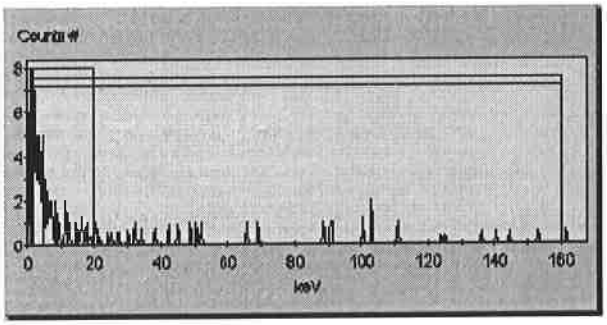
159-29 12 7/20/12 4.60 299.9 6.16 7.16
21 15 12:30:45 AM 10

SpectraView Block Data



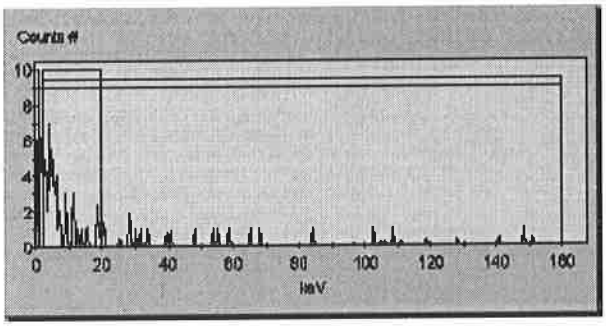
159-30 12 7/20/12 3.65 282.1 5.60 6.69
22 15 12:43:40 AM 8

SpectraView Block Data



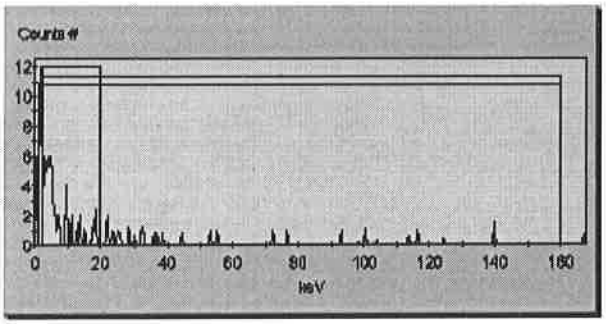
159-31 12 7/20/12 4.91 269.0 6.82 8.07
23 15 12:56:32 AM 7

SpectraView Block Data



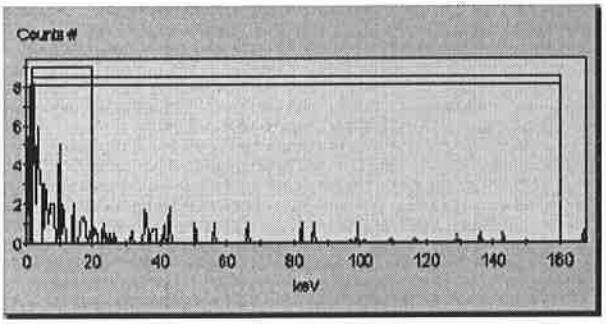
159-32 12 7/20/12 5.11 260.3 7.05 8.72
24 15 1:09:24 AM 5

SpectraView Block Data



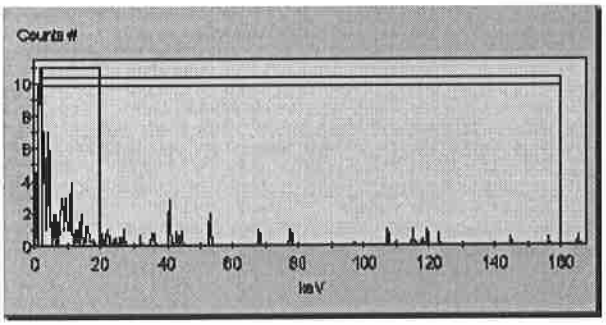
159-33 12 7/20/12 4.98 296.8 6.74 8.07
25 12 1:22:23 AM 8

SpectraView Block Data



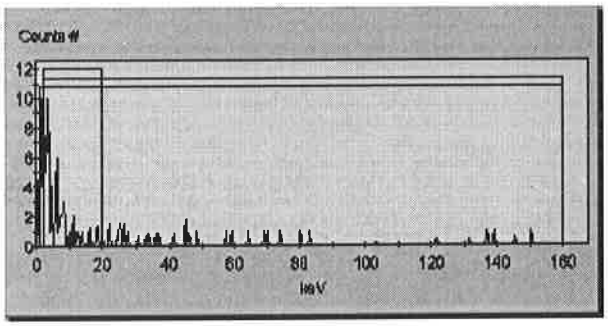
159-34 12 7/20/12 5.10 283.3 6.89 8.39
26 12 1:35:16 AM 6

SpectraView Block Data



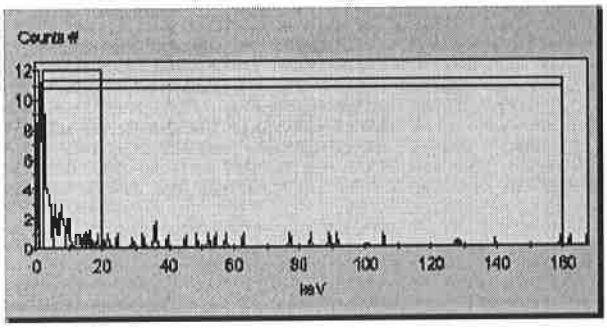
159-35 12 7/20/12 5.51 254.3 7.82 8.66
27 12 1:48:09 AM 6

SpectraView Block Data



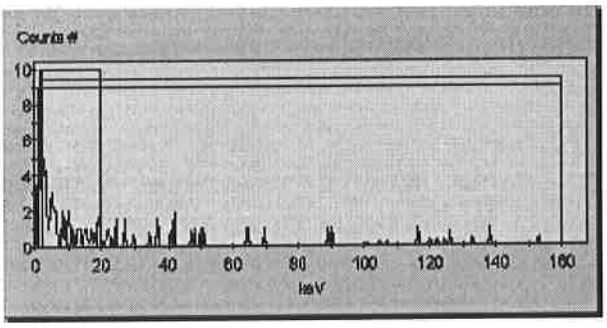
159-36 12 7/20/12 4.59 280.9 6.41 8.32
28 12 2:01:02 AM 9

SpectraView Block Data



159-37 12 7/20/12 3.60 289.4 5.84 7.18
29 12 2:13:56 AM 8

SpectraView Block Data



Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\20120720_1009.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\12476.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H3_C14.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 12.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
A	2.0	20.0
B	2.0	160.0
C	1.0	160.0

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

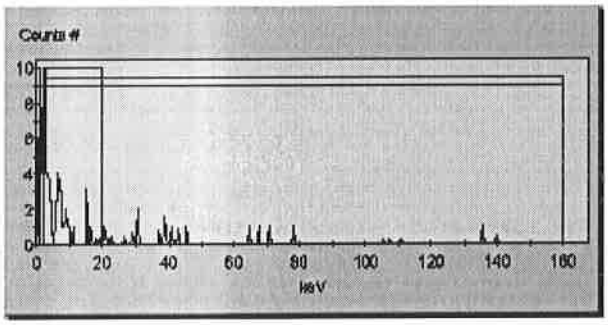
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM
14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM

3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

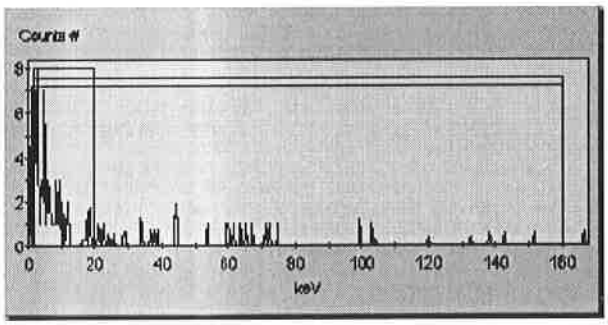
S#	PID	SMPL_ID TIME	LUM	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		159-38		12	7/20/12	4.84	294.4	6.35	7.52	
1	12	10:09:50 AM	7							

SpectraView Block Data



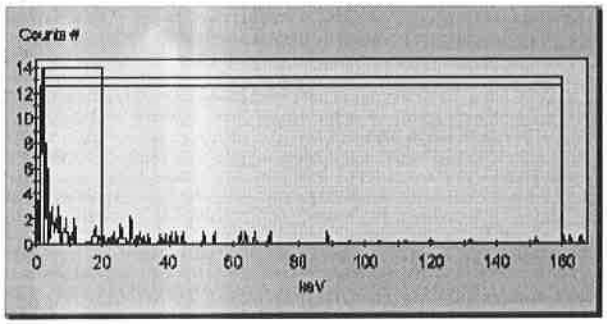
		159-39		12	7/20/12	4.61	279.0	6.91	7.99	
2	12	10:22:43 AM	7							

SpectraView Block Data



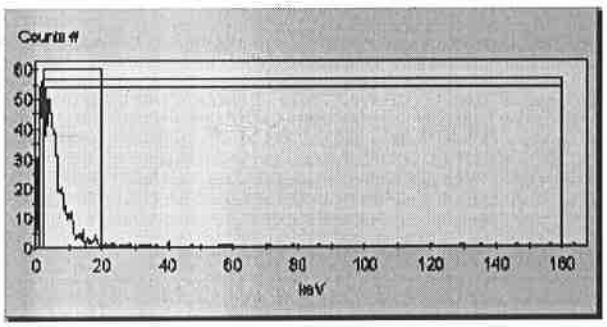
		159-40		12	7/20/12	3.19	292.3	5.29	6.96	
3	12	10:35:35 AM	8							

SpectraView Block Data



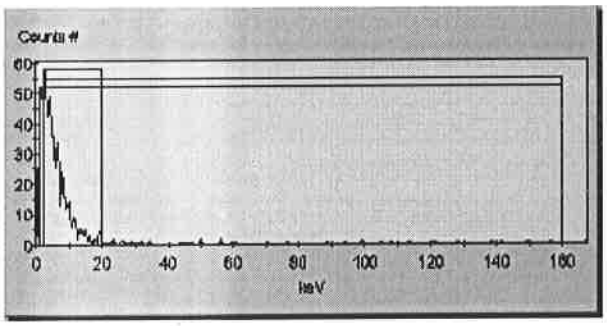
4	12	10:48:28 AM	LCS 1	12	7/20/12	49.17	300.5	51.44	58.44

SpectraView Block Data



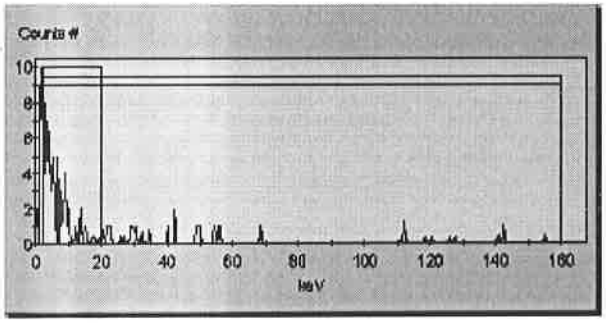
5	12	11:01:22 AM	LCSD 1	12	7/20/12	49.95	304.7	53.16	60.74

SpectraView Block Data



6	12	11:14:15 AM	BKG 7	12	7/20/12	5.44	315.4	7.65	8.73

SpectraView Block Data


Counts #
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
keV

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Pace Analytical Services, Inc.-Pittsurgh

Liquid Scintillation Counter Run Log System 2

Logbook ID: 6-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
LLSD	12497	Sample 43C14	17	5	7/19/12 0900	12	aut	[illegible]
MB 459096	12498		↓					
30721S9021			15					
022								
023								
024								
025								
026								
027								
028								
029								
030								
031								
032								
033			12					
034								
035								
036								
037								
038								
039								
040								
LCS 12498								
LCSD 12498								

Run comments: ______

Peer Review: ______

Low Energy Beta Sample Analysis Data

Quality Control Review

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Batch	RADC/12499	HBN	91072
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

1 459097-BLANK for HBN 91072 [RADC/1249

Type BLANK
Client QCACCOUNT
Matrix Impact Plate
WO
Collected
Work ID
% Moisture

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2796242
Batch RADC/12499
HBN 91072
Instru NONE
Prep Date 7/21/2012 18:32
Hold Date 12/25/2012 23:59
Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2796242
Instru NONE
Col ID
File
Run Date 7/21/2012 18:32
Hold Date 12/25/2012 23:59
Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.32U ± 4.43 (9.58)	dpm/sa	2.32U ± 4.43 (9.58)		dpm/sa	

2 3072159041-SU-09-41

Type PS
Client RTI
Matrix Wipe
WO 3072159
Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082
% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790507
Batch RADC/12499
HBN 91072
Instru NONE
Prep Date 7/21/2012 18:40
Hold Date 12/8/2012 23:59
Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790507
Instru NONE
Col ID
File
Run Date 7/21/2012 18:40
Hold Date 12/8/2012 23:59
Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.593U ± 4.15 (9.47)	dpm/sa	0.593U ± 4.15 (9.47)		dpm/sa		

3 3072159042-SU-09-42

Type PS
Client RTI
Matrix Wipe
WO 3072159
Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082
% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch RADC/12499 HBN 91072
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst MBT

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3 3072159042-SU-09-42

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790508

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 18:48
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790508

Instru NONE
Col ID
File

Run Date 7/21/2012 18:48
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.36U ± 3.83 (9.31)	dpm/sa	-1.36U ± 3.83 (9.31)		dpm/sa		

4 3072159043-SU-09-43

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790509

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 18:56
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790509

Instru NONE
Col ID
File

Run Date 7/21/2012 18:56
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.21U ± 3.73 (9.35)	dpm/sa	-2.21U ± 3.73 (9.35)		dpm/sa		

5 3072159044-SU-09-44

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12499	**HBN**	91072
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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5 3072159044-SU-09-44

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12499	**Prep Date**	7/21/2012 19:04	**Dilution**
Method	EPA 906.0M		**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790510		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/21/2012 19:04	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790510		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.25J ± 4.62 (9.43)	dpm/sa	4.25J ± 4.62 (9.43)		dpm/sa		

6 3072159045-SU-09-45

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12499	**Prep Date**	7/21/2012 19:12	**Dilution**
Method	EPA 906.0M		**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790511		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/21/2012 19:12	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790511		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.14U ± 4.13 (9.25)	dpm/sa	1.14U ± 4.13 (9.25)		dpm/sa		

7 3072159046-SU-09-46

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12499	**HBN**	91072
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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7 3072159046-SU-09-46

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12499	**Prep Date**	7/21/2012 19:20	**Dilution**
Method	EPA 906.0M		**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790512		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/21/2012 19:20	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790512		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.309U ± 4.01 (9.23)	dpm/sa	0.309U ± 4.01 (9.23)		dpm/sa		

8 3072159047-SU-09-47

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12499	**Prep Date**	7/21/2012 19:36	**Dilution**
Method	EPA 906.0M		**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790513		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/21/2012 19:36	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** MBT
Schedule	2790513		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-22.5U ± 11.1 (33.0)	dpm/sa	-22.5U ± 11.1 (33.0)		dpm/sa		

9 3072159048-SU-09-48

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

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Batch	RADC/12499	**HBN**	91072
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

9 3072159048-SU-09-48

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790514

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 19:44
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790514

Instru NONE
Col ID
File

Run Date 7/21/2012 19:44
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.10U ± 4.42 (9.33)	dpm/sa	3.10U ± 4.42 (9.33)		dpm/sa		

10 3072159049-SU-09-49

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790515

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 19:52
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790515

Instru NONE
Col ID
File

Run Date 7/21/2012 19:52
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.561U ± 4.21 (9.95)	dpm/sa	-0.561U ± 4.21 (9.95)		dpm/sa		

11 3072159050-SU-09-49D

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch RADC/12499 HBN 91072
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst MBT

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11 3072159050-SU-09-49D

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790516

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:00
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790516

Instru NONE
Col ID
File

Run Date 7/21/2012 20:00
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.95U ± 3.83 (9.51)	dpm/sa	-1.95U ± 3.83 (9.51)		dpm/sa		

12 3072159051-SU-09-50

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790517

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:08
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790517

Instru NONE
Col ID
File

Run Date 7/21/2012 20:08
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.17J ± 4.80 (9.89)	dpm/sa	4.17J ± 4.80 (9.89)		dpm/sa		

13 3072159052-SU-09-51

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

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Batch	RADC/12499	HBN	91072
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

13 3072159052-SU-09-51

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790518

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:16
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790518

Instru NONE
Col ID
File

Run Date 7/21/2012 20:16
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.793U ± 3.88 (9.26)	dpm/sa	-0.793U ± 3.88 (9.26)		dpm/sa		

14 3072159053-SU-09-52

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790519

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:24
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790519

Instru NONE
Col ID
File

Run Date 7/21/2012 20:24
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.97U ± 4.25 (9.27)	dpm/sa	1.97U ± 4.25 (9.27)		dpm/sa		

15 3072159054-SU-09-53

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

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Batch	RADC/12499	HBN	91072
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

15 3072159054-SU-09-53

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790520

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:32
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790520

Instru NONE
Col ID
File

Run Date 7/21/2012 20:32
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-4.19U ± 3.48 (9.41)	dpm/sa	-4.19U ± 3.48 (9.41)		dpm/sa		

16 3072159055-SU-09-54

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790521

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 20:40
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790521

Instru NONE
Col ID
File

Run Date 7/21/2012 20:40
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.08U ± 3.84 (9.27)	dpm/sa	-1.08U ± 3.84 (9.27)		dpm/sa		

17 3072159056-SU-09-55

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12499	HBN	91072
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	MBT

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17 3072159056-SU-09-55

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12499	**Prep Date**	7/21/2012 20:48	**Dilution**	
Method	EPA 906.0M	**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2790522	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/21/2012 20:48	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2790522	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.41U ± 4.16 (9.24)	dpm/sa	1.41U ± 4.16 (9.24)		dpm/sa		

18 3072159057-SU-09-56

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12499	**Prep Date**	7/21/2012 20:56	**Dilution**	
Method	EPA 906.0M	**HBN**	91072	**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2790523	**Instru**	NONE			**CC**	OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/21/2012 20:56	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	MBT
Schedule	2790523	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.15U ± 4.18 (9.36)	dpm/sa	1.15U ± 4.18 (9.36)		dpm/sa		

19 3072159058-SU-09-57

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch RADC/12499 HBN 91072
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst MBT

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19 3072159058-SU-09-57

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790524

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 21:04
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790524

Instru NONE
Col ID
File

Run Date 7/21/2012 21:04
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.521U ± 3.91 (9.24)	dpm/sa	-0.521U ± 3.91 (9.24)		dpm/sa		

20 3072159059-SU-09-58

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790525

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 21:12
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790525

Instru NONE
Col ID
File

Run Date 7/21/2012 21:12
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.17U ± 4.15 (10.0)	dpm/sa	-1.17U ± 4.15 (10.0)		dpm/sa		

21 3072159060-SU-09-59

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12499	**HBN**	91072
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	MBT

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21 3072159060-SU-09-59

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790526

Batch RADC/12499
HBN 91072
Instru NONE

Prep Date 7/21/2012 21:20
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790526

Instru NONE
Col ID
File

Run Date 7/21/2012 21:20
Hold Date 12/8/2012 23:59

Dilution
Analyst MBT
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-4.17U ± 3.47 (9.38)	dpm/sa	-4.17U ± 3.47 (9.38)			dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:55		Assigned Analyst	MBT
Batch ID	12499		Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB	9060W	HBN	91072
Method	EPA 906.0M	EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459097	BLANK	IP		QCACCOUNT	2.32U	4.43	9.58	7/21/12 18:32
3072159	3072159041	PS	WP	6/11/2012 0:01	RTI	0.593U	4.15	9.47	7/21/12 18:40
3072159	3072159042	PS	WP	6/11/2012 0:01	RTI	-1.36U	3.83	9.31	7/21/12 18:48
3072159	3072159043	PS	WP	6/11/2012 0:01	RTI	-2.21U	3.73	9.35	7/21/12 18:56
3072159	3072159044	PS	WP	6/11/2012 0:01	RTI	4.25J	4.62	9.43	7/21/12 19:04
3072159	3072159045	PS	WP	6/11/2012 0:01	RTI	1.14U	4.13	9.25	7/21/12 19:12
3072159	3072159046	PS	WP	6/11/2012 0:01	RTI	0.309U	4.01	9.23	7/21/12 19:20
3072159	3072159047	PS	WP	6/11/2012 0:01	RTI	-22.5U	11.1	33.0	7/21/12 19:36
3072159	3072159048	PS	WP	6/11/2012 0:01	RTI	3.10U	4.42	9.33	7/21/12 19:44
3072159	3072159049	PS	WP	6/11/2012 0:01	RTI	-0.561U	4.21	9.95	7/21/12 19:52
3072159	3072159050	PS	WP	6/11/2012 0:01	RTI	-1.95U	3.83	9.51	7/21/12 20:00
3072159	3072159051	PS	WP	6/11/2012 0:01	RTI	4.17J	4.80	9.89	7/21/12 20:08
3072159	3072159052	PS	WP	6/11/2012 0:01	RTI	-0.793U	3.88	9.26	7/21/12 20:16
3072159	3072159053	PS	WP	6/11/2012 0:01	RTI	1.97U	4.25	9.27	7/21/12 20:24
3072159	3072159054	PS	WP	6/11/2012 0:01	RTI	-4.19U	3.48	9.41	7/21/12 20:32
3072159	3072159055	PS	WP	6/11/2012 0:01	RTI	-1.08U	3.84	9.27	7/21/12 20:40
3072159	3072159056	PS	WP	6/11/2012 0:01	RTI	1.41U	4.16	9.24	7/21/12 20:48
3072159	3072159057	PS	WP	6/11/2012 0:01	RTI	1.15U	4.18	9.36	7/21/12 20:56
3072159	3072159058	PS	WP	6/11/2012 0:01	RTI	-0.521U	3.91	9.24	7/21/12 21:04
3072159	3072159059	PS	WP	6/11/2012 0:01	RTI	-1.17U	4.15	10.0	7/21/12 21:12
3072159	3072159060	PS	WP	6/11/2012 0:01	RTI	-4.17U	3.47	9.38	7/21/12 21:20

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
Matrix Smear
Batch ID 12499
Prep Start 7/16/2012 12:00
Prep Finish 7/16/2012
Act. Rpt Units dpm

Analyst MBT
PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a
Aliq. Rpt Units Sample

Bkg CPM 6.27
Bkg Duration 30.0 min
Bkg Ref BKG 7/21/2012
Bkg Ct Date/Time: 7/21/2012 2:54
Instrument ID: System #3

Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459097	1.0	7/21/12 18:32	7.0	7/21/12 18:32	7.43	324.1	dpm/S	High, Evaluate
3072159041	1.0	6/11/12 0:01	7.0	7/21/12 18:40	6.57	311.5	dpm/S	Pass
3072159042	1.0	6/11/12 0:01	7.0	7/21/12 18:48	5.57	295.1	dpm/S	Pass
3072159043	1.0	6/11/12 0:01	7.0	7/21/12 18:56	5.14	299.9	dpm/S	Pass
3072159044	1.0	6/11/12 0:01	7.0	7/21/12 19:04	8.43	308.0	dpm/S	Pass
3072159045	1.0	6/11/12 0:01	7.0	7/21/12 19:12	6.86	283.5	dpm/S	Pass
3072159046	1.0	6/11/12 0:01	7.0	7/21/12 19:20	6.43	276.1	dpm/S	Pass
3072159047	1.0	6/11/12 0:01	7.0	7/21/12 19:36	3.00	49.3	dpm/S	Low, Reprep
3072159048	1.0	6/11/12 0:01	7.0	7/21/12 19:44	7.86	296.9	dpm/S	Pass
3072159049	1.0	6/11/12 0:01	7.0	7/21/12 19:52	6.00	340.2	dpm/S	High, Evaluate
3072159050	1.0	6/11/12 0:01	7.0	7/21/12 20:00	5.29	314.8	dpm/S	High, Evaluate
3072159051	1.0	6/11/12 0:01	7.0	7/21/12 20:08	8.29	337.4	dpm/S	High, Evaluate
3072159052	1.0	6/11/12 0:01	7.0	7/21/12 20:16	5.86	284.5	dpm/S	Pass
3072159053	1.0	6/11/12 0:01	7.0	7/21/12 20:24	7.29	286.8	dpm/S	Pass
3072159054	1.0	6/11/12 0:01	7.0	7/21/12 20:32	4.14	306.4	dpm/S	Pass
3072159055	1.0	6/11/12 0:01	7.0	7/21/12 20:40	5.71	287.3	dpm/S	Pass
3072159056	1.0	6/11/12 0:01	7.0	7/21/12 20:48	7.00	278.2	dpm/S	Pass
3072159057	1.0	6/11/12 0:01	7.0	7/21/12 20:56	6.86	300.9	dpm/S	Pass
3072159058	1.0	6/11/12 0:01	7.0	7/21/12 21:04	6.00	280.9	dpm/S	Pass
3072159059	1.0	6/11/12 0:01	7.0	7/21/12 21:12	5.71	342.9	dpm/S	High, Evaluate
3072159060	1.0	6/11/12 0:01	7.0	7/21/12 21:20	4.14	302.7	dpm/S	Pass
LCS12499	1.0	7/21/12 21:28	7.0	7/21/12 21:28	61.43	320.5	dpm/S	High, Evaluate
LCSD12499	1.0	7/21/12 21:36	7.0	7/21/12 21:36	57.00	327.4	dpm/S	High, Evaluate

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	MBT
Matrix	Smear	**PrepSOP1**	0
Batch ID	12499	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459097	0.4996	0.0000	1.0000	2.322	4.422	4.430	9.583	3.471	1.025	4.422	1.00
3072159041	0.5089	0.1116	0.9938	0.593	4.152	4.153	9.468	3.429	1.012	4.152	1.00
3072159042	0.5173	0.1117	0.9938	-1.362	3.822	3.825	9.314	3.374	0.996	3.822	1.00
3072159043	0.5153	0.1117	0.9938	-2.207	3.717	3.727	9.350	3.387	1.000	3.717	1.00
3072159044	0.5110	0.1117	0.9938	4.253	4.588	4.616	9.428	3.415	1.008	4.588	1.00
3072159045	0.5207	0.1117	0.9938	1.140	4.130	4.132	9.252	3.351	0.989	4.130	1.00
3072159046	0.5218	0.1117	0.9938	0.309	4.013	4.014	9.233	3.344	0.987	4.013	1.00
3072159047	0.1461	0.1117	0.9938	-22.517	10.777	11.106	32.971	11.942	3.525	10.777	1.00
3072159048	0.5166	0.1118	0.9938	3.097	4.406	4.422	9.327	3.378	0.997	4.406	1.00
3072159049	0.4843	0.1118	0.9938	-0.561	4.205	4.206	9.949	3.604	1.064	4.205	1.00
3072159050	0.5067	0.1118	0.9938	-1.946	3.823	3.830	9.508	3.444	1.017	3.823	1.00
3072159051	0.4872	0.1118	0.9938	4.172	4.779	4.804	9.890	3.582	1.057	4.779	1.00
3072159052	0.5205	0.1118	0.9938	-0.793	3.876	3.877	9.256	3.353	0.990	3.876	1.00
3072159053	0.5200	0.1118	0.9938	1.974	4.242	4.248	9.266	3.356	0.991	4.242	1.00
3072159054	0.5120	0.1119	0.9938	-4.187	3.447	3.483	9.411	3.409	1.006	3.447	1.00
3072159055	0.5198	0.1119	0.9938	-1.084	3.841	3.843	9.268	3.357	0.991	3.841	1.00
3072159056	0.5216	0.1119	0.9938	1.408	4.158	4.161	9.237	3.346	0.988	4.158	1.00
3072159057	0.5148	0.1119	0.9938	1.153	4.178	4.180	9.359	3.390	1.001	4.178	1.00
3072159058	0.5212	0.1119	0.9938	-0.521	3.907	3.908	9.244	3.348	0.988	3.907	1.00
3072159059	0.4813	0.1119	0.9938	-1.171	4.148	4.150	10.010	3.626	1.070	4.148	1.00
3072159060	0.5139	0.1119	0.9938	-4.171	3.434	3.469	9.375	3.396	1.002	3.434	1.00
LCS12499	0.5025	0.0000	1.0000	109.769	11.691	17.553	9.528	3.451	1.019	11.691	1.00
LCSD12499	0.4968	0.0000	1.0000	102.110	11.401	16.683	9.637	3.491	1.030	11.401	1.00

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: MBT
Date: 7/27/2012 **Method:** EPA 906.0M
Worklist: 12499 **SOP:**
Matrix: Filter **MB Sample ID:** 459097

Method Blank Assessment						
Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	2.3220	4.4300	9.5830	3.47100		

Laboratory Control Sample Assessment						
	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/21/12 21:28	7/21/12 21:36				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (pCi/L):	1184.910	1184.910				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (pCi/L, g, F):	118.491	118.491				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (pCi/L, g, F):	109.769	102.110				
1.96 Sigma Unc:	17.553	16.683				
% Recovery:	92.64%	86.18%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment						
LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12499					
Duplicate Sample I.D.	LCSD12499					
Sample Result (pCi/L, g, F):	109.7690					
1.96 Sigma Unc:	17.5530					
Sample Duplicate Result (pCi/L, g, F):	102.1100					
Duplicate Sample 1.96 Sigma Unc.	16.6830					
Either results below MDC?	NO					
Relative Percent Difference:	7.23%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment			
Analyte:			
Sample Collection Date:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (pCi/L):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(pCi/L, g, F):			
MSD Aliquot (L, g, F):			
MSD Target Conc. (pCi/L, g, F):			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.:			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.:			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment			
Analyte:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12499

Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

CSU (TPU) for Preparation **5.39%**

Description	relative	of Critical	Uncertainty	Uncertainty
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

CSU (TPU) for Yield Correction **1.00%**

Description	relative	of Critical	Uncertainty	Uncertainty
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

CSU (TPU) for Analysis **10.60%**

Description	Maximum	of Critical	Uncertainty	Uncertainty
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	Maximum	of Critical	Uncertainty	Uncertainty
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	3.10	6.47	6.27	300.24	3

SYSTEM NORMALIZED

C14 IPA DATA PROCESSED

H3 IPA DATA PROCESSED

BKG IPA DATA PROCESSED

BKG072112

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/21/2012 18:39
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/21/2012 18:32	459097
2	15	7/21/2012 18:40	3072159041
3	23	7/21/2012 18:48	3072159042
4	31	7/21/2012 18:56	3072159043
5	39	7/21/2012 19:04	3072159044
6	47	7/21/2012 19:12	3072159045
7	55	7/21/2012 19:20	3072159046
8	71	7/21/2012 19:36	3072159047
9	79	7/21/2012 19:44	3072159048
10	87	7/21/2012 19:52	3072159049
11	95	7/21/2012 20:00	3072159050
12	103	7/21/2012 20:08	3072159051
13	111	7/21/2012 20:16	3072159052
14	119	7/21/2012 20:24	3072159053
15	127	7/21/2012 20:32	3072159054
16	135	7/21/2012 20:40	3072159055
17	143	7/21/2012 20:48	3072159056
18	151	7/21/2012 20:56	3072159057
19	159	7/21/2012 21:04	3072159058
20	167	7/21/2012 21:12	3072159059
21	175	7/21/2012 21:20	3072159060
22	183	7/21/2012 21:28	LCS12499
23	191	7/21/2012 21:36	LCSD12499

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	25%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	0.0	0.00
Region C:	1.0 -	160	0	3.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	EL TIME	CPMA	CPMB	CPMC	tSIE	LUM
27	1	7.00	7	5.57	7.71	7.43	324.11	4
27	2	7.00	15	3.86	6.71	6.57	311.54	3
27	3	7.00	23	2.57	5.86	5.57	295.09	4
27	4	7.00	31	2.71	5.29	5.14	299.85	3
27	5	7.00	39	4.86	8.43	8.43	308.00	2
27	6	7.00	47	3.86	7.00	6.86	283.45	3
27	7	7.00	55	3.86	6.57	6.43	276.09	3
27	8	7.00	71	0.00	3.00	3.00	49.332	3
27	9	7.00	79	5.00	7.71	7.86	296.91	2
27	10	7.00	87	3.43	6.00	6.00	340.17	3
27	11	7.00	95	3.29	5.43	5.29	314.75	5
27	12	7.00	103	6.00	8.14	8.29	337.41	3
27	13	7.00	111	3.71	6.00	5.86	284.46	3
27	14	7.00	119	3.86	7.00	7.29	286.78	2
27	15	7.00	127	1.57	4.43	4.14	306.38	4
27	16	7.00	135	3.29	5.86	5.71	287.25	3
27	17	7.00	143	3.71	7.14	7.00	278.24	3
27	18	7.00	151	3.14	6.86	6.86	300.91	5
27	19	7.00	159	2.71	6.14	6.00	280.94	4
27	20	7.00	167	3.00	6.00	5.71	342.85	3
27	21	7.00	175	1.29	4.57	4.14	302.71	5
27	22	7.00	183	45.43	60.71	61.43	320.51	0
27	23	7.00	191	40.57	56.57	57.00	327.37	1

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
Ni63 20120719 N2	N.63 Cal	Swipe H3C14	5	1	7/19/12 1330	7	NA	
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
Ni3 (459097)	12499	Swipe H3C14	27	45	7/20/12 0900			
30 72159041								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52			23					
53								
54								

Run comments: _____

Peer Review: _____

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
307215905S	12499	Swipe_H3C14	23	15	7/20/12 0900	7	NA	R
56								
57								
58								
59								
60								
LCS 12499								
LCSD 12499								
MB (459098)	12500							
307215G061			4					
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73			13					
74								
75								

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

7/22/12

Quality Control Review

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Batch	RADC/12500	HBN	91073
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

1 459098-BLANK for HBN 91073 [RADC/1250

Type BLANK **Matrix** Impact Plate **Collected** **% Moisture**
Client QCACCOUNT **WO** **Work ID**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12500 **Prep Date** 7/20/2012 17:53 **Dilution**
Method EPA 906.0M **HBN** 91073 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796262 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 17:53 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796262 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.0199U ± 4.11 (9.56)	dpm/sa	-0.0199U ± 4.11 (9.56)			dpm/sa

2 3072159061-SU-09-60

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12500 **Prep Date** 7/20/2012 18:02 **Dilution**
Method EPA 906.0M **HBN** 91073 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790527 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 18:02 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790527 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-0.357U ± 4.57 (10.7)	dpm/sa	-0.357U ± 4.57 (10.7)					dpm/sa

3 3072159062-SU-09-61

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

7/23/12

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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3 3072159062-SU-09-61

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:10	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790528		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:10	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790528		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.98U ± 4.38 (9.58)	dpm/sa	1.98U ± 4.38 (9.58)		dpm/sa		

4 3072159063-SU-09-62

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:18	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790529		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:18	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790529		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.90U ± 3.77 (9.66)	dpm/sa	-2.90U ± 3.77 (9.66)		dpm/sa		

5 3072159064-SU-09-63

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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5 3072159064-SU-09-63

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:26	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790530		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:26	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790530		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.541U ± 4.21 (9.61)	dpm/sa	0.541U ± 4.21 (9.61)		dpm/sa		

6 3072159065-SU-09-64

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:34	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790531		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:34	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790531		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.799U ± 4.13 (9.35)	dpm/sa	0.799U ± 4.13 (9.35)		dpm/sa		

7 3072159066-SU-09-65

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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7 3072159066-SU-09-65

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:42
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59
Schedule	2790532	**Instru**	NONE		

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 18:42
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790532	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.84U ± 3.69 (9.46)	dpm/sa	-2.84U ± 3.69 (9.46)		dpm/sa		

8 3072159067-SU-09-66

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:50
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59
Schedule	2790533	**Instru**	NONE		

Initial Volume	1 mL	Default	1 mL	
Final Volume,	1 mL	Default	1 mL	

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 18:50
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790533	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	6.35J ± 4.84 (9.33)	dpm/sa	6.35J ± 4.84 (9.33)		dpm/sa		

9 3072159068-SU-09-67

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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9 3072159068-SU-09-67

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:58	**Dilution**	
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790534	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 18:58	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790534	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.24U ± 3.69 (9.27)	dpm/sa	-2.24U ± 3.69 (9.27)		dpm/sa		

10 3072159069-SU-09-68

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:06	**Dilution**	
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790535	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 19:06	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790535	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.51U ± 3.72 (9.75)	dpm/sa	-3.51U ± 3.72 (9.75)		dpm/sa		

11 3072159070-SU-09-69

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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11 3072159070-SU-09-69

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:14	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790536		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:14	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790536		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.865U ± 3.94 (9.43)	dpm/sa	-0.865U ± 3.94 (9.43)		dpm/sa		

12 3072159071-SU-09-70

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:22	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790537		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:22	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790537		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.563U ± 4.38 (10.0)	dpm/sa	0.563U ± 4.38 (10.0)		dpm/sa		

13 3072159072-SU-09-71

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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13 3072159072-SU-09-71

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790538

Batch RADC/12500
HBN 91073
Instru NONE

Prep Date 7/20/2012 19:30
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790538

Instru NONE
Col ID
File

Run Date 7/20/2012 19:30
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.38U ± 4.25 (9.45)	dpm/sa	1.38U ± 4.25 (9.45)		dpm/sa		

14 3072159073-SU-09-72

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790539

Batch RADC/12500
HBN 91073
Instru NONE

Prep Date 7/20/2012 19:38
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790539

Instru NONE
Col ID
File

Run Date 7/20/2012 19:38
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.40U ± 4.31 (9.59)	dpm/sa	1.40U ± 4.31 (9.59)		dpm/sa		

15 3072159074-SU-09-73

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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15 3072159074-SU-09-73

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:46	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790540		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:46	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790540		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.11U ± 4.24 (9.51)	dpm/sa	1.11U ± 4.24 (9.51)		dpm/sa		

16 3072159075-SU-09-74

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:54	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790541		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:54	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790541		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.73U ± 4.36 (9.30)	dpm/sa	2.73U ± 4.36 (9.30)		dpm/sa		

17 3072159076-SU-09-75

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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17 3072159076-SU-09-75

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:03	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790542		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:03	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790542		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.61U ± 3.50 (9.25)	dpm/sa	-3.61U ± 3.50 (9.25)		dpm/sa		

18 3072159077-SU-09-76

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:12	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790543		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:12	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790543		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.48U ± 4.36 (9.37)	dpm/sa	2.48U ± 4.36 (9.37)		dpm/sa		

19 3072159078-SU-09-77

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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19 3072159078-SU-09-77

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:20	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790544		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:20	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790544		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.807U ± 4.17 (9.44)	dpm/sa	0.807U ± 4.17 (9.44)		dpm/sa		

20 3072159079-SU-09-77D

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:28	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790545		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:28	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790545		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.11U ± 4.23 (9.50)	dpm/sa	1.11U ± 4.23 (9.50)		dpm/sa		

21 3072159080-SU-09-78

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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21 3072159080-SU-09-78

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:36	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790546		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:36	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790546		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-4.08U ± 3.64 (9.74)	dpm/sa	-4.08U ± 3.64 (9.74)			dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:56	Assigned Analyst	RMK
Batch ID	12500	Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB 9060W	HBN	91073
Method	EPA 906.0M EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459098	BLANK	IP		QCACCOUNT	-0.0199U	4.11	9.56	7/20/12 17:53
3072159	3072159061	PS	WP	6/11/2012 0:01	RTI	-0.357U	4.57	10.7	7/20/12 18:02
3072159	3072159062	PS	WP	6/11/2012 0:01	RTI	1.98U	4.38	9.58	7/20/12 18:10
3072159	3072159063	PS	WP	6/11/2012 0:01	RTI	-2.90U	3.77	9.66	7/20/12 18:18
3072159	3072159064	PS	WP	6/11/2012 0:01	RTI	0.541U	4.21	9.61	7/20/12 18:26
3072159	3072159065	PS	WP	6/11/2012 0:01	RTI	0.799U	4.13	9.35	7/20/12 18:34
3072159	3072159066	PS	WP	6/11/2012 0:01	RTI	-2.84U	3.69	9.46	7/20/12 18:42
3072159	3072159067	PS	WP	6/11/2012 0:01	RTI	6.35J	4.84	9.33	7/20/12 18:50
3072159	3072159068	PS	WP	6/11/2012 0:01	RTI	-2.24U	3.69	9.27	7/20/12 18:58
3072159	3072159069	PS	WP	6/11/2012 0:01	RTI	-3.51U	3.72	9.75	7/20/12 19:06
3072159	3072159070	PS	WP	6/11/2012 0:01	RTI	-0.865U	3.94	9.43	7/20/12 19:14
3072159	3072159071	PS	WP	6/11/2012 0:01	RTI	0.563U	4.38	10.0	7/20/12 19:22
3072159	3072159072	PS	WP	6/11/2012 0:01	RTI	1.38U	4.25	9.45	7/20/12 19:30
3072159	3072159073	PS	WP	6/11/2012 0:01	RTI	1.40U	4.31	9.59	7/20/12 19:38
3072159	3072159074	PS	WP	6/11/2012 0:01	RTI	1.11U	4.24	9.51	7/20/12 19:46
3072159	3072159075	PS	WP	6/11/2012 0:01	RTI	2.73U	4.36	9.30	7/20/12 19:54
3072159	3072159076	PS	WP	6/11/2012 0:01	RTI	-3.61U	3.50	9.25	7/20/12 20:03
3072159	3072159077	PS	WP	6/11/2012 0:01	RTI	2.48U	4.36	9.37	7/20/12 20:12
3072159	3072159078	PS	WP	6/11/2012 0:01	RTI	0.807U	4.17	9.44	7/20/12 20:20
3072159	3072159079	PS	WP	6/11/2012 0:01	RTI	1.11U	4.23	9.50	7/20/12 20:28
3072159	3072159080	PS	WP	6/11/2012 0:01	RTI	-4.08U	3.64	9.74	7/20/12 20:36

7/22/12 7/23/12

LIMS Load
Printed 7/21/2012 at 8:35 PM

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK		
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	6.30
Batch ID	12500	**PrepSOP2**	n/a	**Bkg Duration**	30.0 min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG072012
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/20/2012 9:55
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3

Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459098	1.0	7/20/12 17:53	7.0	7/20/12 17:53	6.29	321.4	dpm/S	High, Evaluate
3072159061	1.0	6/11/12 0:01	7.0	7/20/12 18:02	6.14	366.6	dpm/S	High, Evaluate
3072159062	1.0	6/11/12 0:01	7.0	7/20/12 18:10	7.29	318.7	dpm/S	High, Evaluate
3072159063	1.0	6/11/12 0:01	7.0	7/20/12 18:18	4.86	324.0	dpm/S	High, Evaluate
3072159064	1.0	6/11/12 0:01	7.0	7/20/12 18:26	6.57	320.8	dpm/S	High, Evaluate
3072159065	1.0	6/11/12 0:01	7.0	7/20/12 18:34	6.71	298.1	dpm/S	Pass
3072159066	1.0	6/11/12 0:01	7.0	7/20/12 18:42	4.86	309.6	dpm/S	Pass
3072159067	1.0	6/11/12 0:01	7.0	7/20/12 18:50	9.57	294.0	dpm/S	Pass
3072159068	1.0	6/11/12 0:01	7.0	7/20/12 18:58	5.14	283.0	dpm/S	Pass
3072159069	1.0	6/11/12 0:01	7.0	7/20/12 19:06	4.57	329.1	dpm/S	High, Evaluate
3072159070	1.0	6/11/12 0:01	7.0	7/20/12 19:14	5.86	306.5	dpm/S	Pass
3072159071	1.0	6/11/12 0:01	7.0	7/20/12 19:22	6.57	341.5	dpm/S	High, Evaluate
3072159072	1.0	6/11/12 0:01	7.0	7/20/12 19:30	7.00	308.1	dpm/S	Pass
3072159073	1.0	6/11/12 0:01	7.0	7/20/12 19:38	7.00	319.3	dpm/S	High, Evaluate
3072159074	1.0	6/11/12 0:01	7.0	7/20/12 19:46	6.86	313.6	dpm/S	High, Evaluate
3072159075	1.0	6/11/12 0:01	7.0	7/20/12 19:54	7.71	290.6	dpm/S	Pass
3072159076	1.0	6/11/12 0:01	7.0	7/20/12 20:03	4.43	277.3	dpm/S	Pass
3072159077	1.0	6/11/12 0:01	7.0	7/20/12 20:12	7.57	300.2	dpm/S	Pass
3072159078	1.0	6/11/12 0:01	7.0	7/20/12 20:20	6.71	307.6	dpm/S	Pass
3072159079	1.0	6/11/12 0:01	7.0	7/20/12 20:28	6.86	312.2	dpm/S	Pass
3072159080	1.0	6/11/12 0:01	7.0	7/20/12 20:36	4.29	328.7	dpm/S	High, Evaluate
LCS12500	1.0	7/20/12 20:44	7.0	7/20/12 20:44	56.14	329.8	dpm/S	High, Evaluate
LCSD12500	1.0	7/20/12 20:52	7.0	7/20/12 20:52	61.43	320.4	dpm/S	High, Evaluate

7/22/12 7/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12500	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459098	0.5018	0.0000	1.0000	-0.020	4.112	4.112	9.562	3.464	1.020	4.112	1.00
3072159061	0.4504	0.1088	0.9940	-0.357	4.565	4.565	10.720	3.883	1.144	4.565	1.00
3072159062	0.5039	0.1088	0.9939	1.977	4.378	4.384	9.581	3.471	1.022	4.378	1.00
3072159063	0.4997	0.1089	0.9939	-2.899	3.753	3.769	9.661	3.500	1.031	3.753	1.00
3072159064	0.5023	0.1089	0.9939	0.541	4.208	4.208	9.612	3.482	1.025	4.208	1.00
3072159065	0.5161	0.1089	0.9939	0.799	4.131	4.132	9.355	3.389	0.998	4.131	1.00
3072159066	0.5101	0.1089	0.9939	-2.840	3.676	3.692	9.465	3.429	1.010	3.676	1.00
3072159067	0.5177	0.1089	0.9939	6.355	4.784	4.843	9.325	3.378	0.995	4.784	1.00
3072159068	0.5208	0.1089	0.9939	-2.241	3.679	3.689	9.270	3.358	0.989	3.679	1.00
3072159069	0.4952	0.1090	0.9939	-3.515	3.699	3.722	9.749	3.532	1.040	3.699	1.00
3072159070	0.5119	0.1090	0.9939	-0.865	3.942	3.943	9.431	3.417	1.006	3.942	1.00
3072159071	0.4828	0.1090	0.9939	0.563	4.378	4.378	10.000	3.623	1.067	4.378	1.00
3072159072	0.5110	0.1090	0.9939	1.378	4.245	4.248	9.448	3.423	1.008	4.245	1.00
3072159073	0.5035	0.1090	0.9939	1.399	4.309	4.312	9.589	3.474	1.023	4.309	1.00
3072159074	0.5075	0.1090	0.9939	1.110	4.238	4.240	9.512	3.446	1.015	4.238	1.00
3072159075	0.5189	0.1090	0.9939	2.734	4.352	4.365	9.305	3.371	0.993	4.352	1.00
3072159076	0.5217	0.1091	0.9939	-3.606	3.470	3.497	9.254	3.352	0.987	3.470	1.00
3072159077	0.5151	0.1091	0.9939	2.481	4.350	4.361	9.372	3.395	1.000	4.350	1.00
3072159078	0.5113	0.1091	0.9939	0.807	4.169	4.170	9.442	3.421	1.007	4.169	1.00
3072159079	0.5084	0.1091	0.9939	1.108	4.231	4.233	9.496	3.440	1.013	4.231	1.00
3072159080	0.4956	0.1091	0.9939	-4.080	3.609	3.642	9.741	3.529	1.039	3.609	1.00
LCS12500	0.4947	0.0000	1.0000	100.757	11.367	16.542	9.701	3.514	1.035	11.367	1.00
LCSD12500	0.5026	0.0000	1.0000	109.689	11.690	17.544	9.547	3.459	1.018	11.690	1.00

7/22/12 7/23/12

Quality Control Sample Performance Assessment

RCDU Upload

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Analyst:	RMK		
Date:	7/21/2012	**Method:**	EPA 906.0M
Worklist:	12500	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459098

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	-0.0200	4.1120	9.5620	3.46400		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 20:44	7/20/12 20:52				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.933	1184.933				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F)	1.000	1.000				
Target Conc. (DPM/Sample, g, F)	118.493	118.493				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F)	100.757	109.689				
1.96 Sigma Unc:	16.542	17.544				
% Recovery:	85.03%	92.57%				
Assessment:	Pass	Pass				
Upper % Recovery Limits	125.00%	125.00%				
Lower % Recovery Limits	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12500					
Duplicate Sample I.D	LCSD12500					
Sample Result (DPM/Sample, g, F):	100.7570					
1.96 Sigma Unc:	16.5420					
ple Duplicate Result (DPM/Sample, g, F):	109.6890					
Duplicate Sample 1.96 Sigma Unc.	17.5440					
Either results below MDC?	NO					
Relative Percent Difference	8.49%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment

Analyte:			
Sample Collection Date			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (DPM/Sample):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(DPM/Sample, g, F)			
MSD Aliquot (L, g, F):			
MSD Target Conc. (DPM/Sample, g, F)			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment

Analyte:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

7/22/12 7/23/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12500

Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

7/23/12

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

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Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

7/23/12

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 16:32
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 16:25	3072159052
2	15	7/20/2012 16:33	3072159053
3	23	7/20/2012 16:41	3072159054
4	31	7/20/2012 16:49	3072159055
5	39	7/20/2012 16:57	3072159056
6	47	7/20/2012 17:05	3072159057
7	55	7/20/2012 17:13	3072159058
8	63	7/20/2012 17:21	3072159059
9	71	7/20/2012 17:29	3072159060
10	79	7/20/2012 17:37	LCS12499
11	87	7/20/2012 17:45	LCSD12499
12	95	7/20/2012 17:53	459098
13	104	7/20/2012 18:02	3072159061
14	112	7/20/2012 18:10	3072159062
15	120	7/20/2012 18:18	3072159063
16	128	7/20/2012 18:26	3072159064
17	136	7/20/2012 18:34	3072159065
18	144	7/20/2012 18:42	3072159066
19	152	7/20/2012 18:50	3072159067
20	160	7/20/2012 18:58	3072159068
21	168	7/20/2012 19:06	3072159069
22	176	7/20/2012 19:14	3072159070
23	184	7/20/2012 19:22	3072159071
24	192	7/20/2012 19:30	3072159072
25	200	7/20/2012 19:38	3072159073
26	208	7/20/2012 19:46	3072159074
27	216	7/20/2012 19:54	3072159075
28	225	7/20/2012 20:03	3072159076
29	234	7/20/2012 20:12	3072159077
30	242	7/20/2012 20:20	3072159078
31	250	7/20/2012 20:28	3072159079
32	258	7/20/2012 20:36	3072159080
33	266	7/20/2012 20:44	LCS12500
34	274	7/20/2012 20:52	LCSD12500

7/23/12

7/22/12

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	0.0	0.00
Region C:	1.0 -	160	0	3.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
15	1	7.00	7	3.00	6.43	6.29	288.02	4
15	2	7.00	15	2.71	5.00	4.57	290.89	5
15	3	7.00	23	3.71	5.86	5.57	309.82	3
15	4	7.00	31	3.43	7.14	7.14	280.71	3
15	5	7.00	39	1.43	5.29	5.14	285.43	4
15	6	7.00	47	4.71	7.86	8.00	304.49	1
15	7	7.00	55	4.43	8.00	8.29	284.99	2
15	8	7.00	63	3.14	5.86	5.71	332.72	3
15	9	7.00	71	3.71	5.86	5.71	301.33	4
15	10	7.00	79	44.71	57.29	57.71	320.44	0
15	11	7.00	87	42.29	56.57	57.00	318.39	0
15	12	7.00	95	3.43	6.29	6.29	321.38	3
15	13	7.00	104	4.29	6.43	6.14	366.56	3
15	14	7.00	112	4.29	7.43	7.29	318.69	2
15	15	7.00	120	3.14	5.00	4.86	324.02	3
15	16	7.00	128	3.71	6.71	6.57	320.83	3
15	17	7.00	136	3.86	6.86	6.71	298.05	2
15	18	7.00	144	2.14	5.00	4.86	309.58	4
15	19	7.00	152	5.71	9.71	9.57	293.99	2
15	20	7.00	160	2.71	5.29	5.14	283.01	3
15	21	7.00	168	3.00	4.71	4.57	329.14	3
15	22	7.00	176	3.57	6.00	5.86	306.47	4
15	23	7.00	184	4.86	6.43	6.57	341.54	2
15	24	7.00	192	4.57	7.00	7.00	308.10	2
15	25	7.00	200	4.29	7.00	7.00	319.28	2
15	26	7.00	208	3.57	6.86	6.86	313.56	3
15	27	7.00	216	4.71	7.57	7.71	290.62	2
15	28	7.00	225	2.14	4.57	4.43	277.28	4
15	29	7.00	234	4.43	7.57	7.57	300.22	1
15	30	7.00	242	3.43	6.86	6.71	307.55	3
15	31	7.00	250	3.71	6.86	6.86	312.23	2
15	32	7.00	258	3.29	4.71	4.29	328.70	5
15	33	7.00	266	40.86	56.00	56.14	329.77	1
15	34	7.00	274	47.29	61.00	61.43	320.39	0

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
307215905S	12499	Swipe_H3C14	23	15	7/20/12 0900	7	NA	A
56								
57								
58								
59								
60								
LCS 12499								
LCSD 12499								
MB (459098)	12500							
307215061			4					
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73			13					
74								
75								

Run comments: _____

Peer Review: _____

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072159076	12500	Swipe_43_C14	13	15	7/20/12 0900	7	NA	
77								
78								
79								
80								
LCS 12500								
LCSD 12500								
MB (459100)	12501		20	20				
3072159081								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92			14					
93								
94								
95								
96								

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

7/22/12

Quality Control Review

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Batch	RADC/12500	HBN	91073
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

1 459098-BLANK for HBN 91073 [RADC/1250

Type BLANK **Matrix** Impact Plate **Collected** **% Moisture**
Client QCACCOUNT **WO** **Work ID**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12500 **Prep Date** 7/20/2012 17:53 **Dilution**
Method EPA 906.0M **HBN** 91073 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796262 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 17:53 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796262 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.0199U ± 4.11 (9.56)	dpm/sa	-0.0199U ± 4.11 (9.56)			dpm/sa

2 3072159061-SU-09-60

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12500 **Prep Date** 7/20/2012 18:02 **Dilution**
Method EPA 906.0M **HBN** 91073 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790527 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 18:02 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790527 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-0.357U ± 4.57 (10.7)	dpm/sa	-0.357U ± 4.57 (10.7)					dpm/sa

3 3072159062-SU-09-61

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

7/23/12

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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3 3072159062-SU-09-61

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:10	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790528		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:10	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790528		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.98U ± 4.38 (9.58)	dpm/sa	1.98U ± 4.38 (9.58)		dpm/sa		

4 3072159063-SU-09-62

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:18	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790529		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:18	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790529		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.90U ± 3.77 (9.66)	dpm/sa	-2.90U ± 3.77 (9.66)		dpm/sa		

5 3072159064-SU-09-63

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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5 3072159064-SU-09-63

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:26	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790530		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:26	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790530		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.541U ± 4.21 (9.61)	dpm/sa	0.541U ± 4.21 (9.61)		dpm/sa		

6 3072159065-SU-09-64

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:34	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790531		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 18:34	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790531		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.799U ± 4.13 (9.35)	dpm/sa	0.799U ± 4.13 (9.35)		dpm/sa		

7 3072159066-SU-09-65

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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7 3072159066-SU-09-65

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790532

Batch RADC/12500
HBN 91073
Instru NONE

Prep Date 7/20/2012 18:42
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790532

Instru NONE
Col ID
File

Run Date 7/20/2012 18:42
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.84U ± 3.69 (9.46)	dpm/sa	-2.84U ± 3.69 (9.46)		dpm/sa		

8 3072159067-SU-09-66

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790533

Batch RADC/12500
HBN 91073
Instru NONE

Prep Date 7/20/2012 18:50
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790533

Instru NONE
Col ID
File

Run Date 7/20/2012 18:50
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	6.35J ± 4.84 (9.33)	dpm/sa	6.35J ± 4.84 (9.33)		dpm/sa		

9 3072159068-SU-09-67

Type PS
Client RTI

Matrix Wipe
WO 3072159

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207082

% Moisture
Location

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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9 3072159068-SU-09-67

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 18:58	**Dilution**	
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790534	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 18:58	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790534	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-2.24U ± 3.69 (9.27)	dpm/sa	-2.24U ± 3.69 (9.27)		dpm/sa		

10 3072159069-SU-09-68

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:06	**Dilution**	
Method	EPA 906.0M	**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790535	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 19:06	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790535	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.51U ± 3.72 (9.75)	dpm/sa	-3.51U ± 3.72 (9.75)		dpm/sa		

11 3072159070-SU-09-69

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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11 3072159070-SU-09-69

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:14	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790536		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:14	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790536		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.865U ± 3.94 (9.43)	dpm/sa	-0.865U ± 3.94 (9.43)		dpm/sa		

12 3072159071-SU-09-70

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:22	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790537		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:22	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790537		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.563U ± 4.38 (10.0)	dpm/sa	0.563U ± 4.38 (10.0)		dpm/sa		

13 3072159072-SU-09-71

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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13 3072159072-SU-09-71

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:30	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790538		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:30	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790538		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.38U ± 4.25 (9.45)	dpm/sa	1.38U ± 4.25 (9.45)		dpm/sa		

14 3072159073-SU-09-72

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:38	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790539		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:38	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790539		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.40U ± 4.31 (9.59)	dpm/sa	1.40U ± 4.31 (9.59)		dpm/sa		

15 3072159074-SU-09-73

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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15 3072159074-SU-09-73

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:46	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790540		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:46	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790540		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.11U ± 4.24 (9.51)	dpm/sa	1.11U ± 4.24 (9.51)		dpm/sa		

16 3072159075-SU-09-74

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 19:54	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790541		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 19:54	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790541		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.73U ± 4.36 (9.30)	dpm/sa	2.73U ± 4.36 (9.30)		dpm/sa		

17 3072159076-SU-09-75

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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17 3072159076-SU-09-75

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:03	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790542		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:03	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790542		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-3.61U ± 3.50 (9.25)	dpm/sa	-3.61U ± 3.50 (9.25)		dpm/sa		

18 3072159077-SU-09-76

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:12	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790543		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:12	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790543		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.48U ± 4.36 (9.37)	dpm/sa	2.48U ± 4.36 (9.37)		dpm/sa		

19 3072159078-SU-09-77

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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19 3072159078-SU-09-77

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:20	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790544		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:20	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790544		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.807U ± 4.17 (9.44)	dpm/sa	0.807U ± 4.17 (9.44)		dpm/sa		

20 3072159079-SU-09-77D

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:28	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790545		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:28	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790545		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.11U ± 4.23 (9.50)	dpm/sa	1.11U ± 4.23 (9.50)		dpm/sa		

21 3072159080-SU-09-78

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12500	**HBN**	91073
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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21 3072159080-SU-09-78

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12500	**Prep Date**	7/20/2012 20:36	**Dilution**
Method	EPA 906.0M		**HBN**	91073	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790546		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 20:36	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790546		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-4.08U ± 3.64 (9.74)	dpm/sa	-4.08U ± 3.64 (9.74)			dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:56	Assigned Analyst	RMK
Batch ID	12500	Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB 9060W	HBN	91073
Method	EPA 906.0M EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459098	BLANK	IP		QCACCOUNT	-0.0199U	4.11	9.56	7/20/12 17:53
3072159	3072159061	PS	WP	6/11/2012 0:01	RTI	-0.357U	4.57	10.7	7/20/12 18:02
3072159	3072159062	PS	WP	6/11/2012 0:01	RTI	1.98U	4.38	9.58	7/20/12 18:10
3072159	3072159063	PS	WP	6/11/2012 0:01	RTI	-2.90U	3.77	9.66	7/20/12 18:18
3072159	3072159064	PS	WP	6/11/2012 0:01	RTI	0.541U	4.21	9.61	7/20/12 18:26
3072159	3072159065	PS	WP	6/11/2012 0:01	RTI	0.799U	4.13	9.35	7/20/12 18:34
3072159	3072159066	PS	WP	6/11/2012 0:01	RTI	-2.84U	3.69	9.46	7/20/12 18:42
3072159	3072159067	PS	WP	6/11/2012 0:01	RTI	6.35J	4.84	9.33	7/20/12 18:50
3072159	3072159068	PS	WP	6/11/2012 0:01	RTI	-2.24U	3.69	9.27	7/20/12 18:58
3072159	3072159069	PS	WP	6/11/2012 0:01	RTI	-3.51U	3.72	9.75	7/20/12 19:06
3072159	3072159070	PS	WP	6/11/2012 0:01	RTI	-0.865U	3.94	9.43	7/20/12 19:14
3072159	3072159071	PS	WP	6/11/2012 0:01	RTI	0.563U	4.38	10.0	7/20/12 19:22
3072159	3072159072	PS	WP	6/11/2012 0:01	RTI	1.38U	4.25	9.45	7/20/12 19:30
3072159	3072159073	PS	WP	6/11/2012 0:01	RTI	1.40U	4.31	9.59	7/20/12 19:38
3072159	3072159074	PS	WP	6/11/2012 0:01	RTI	1.11U	4.24	9.51	7/20/12 19:46
3072159	3072159075	PS	WP	6/11/2012 0:01	RTI	2.73U	4.36	9.30	7/20/12 19:54
3072159	3072159076	PS	WP	6/11/2012 0:01	RTI	-3.61U	3.50	9.25	7/20/12 20:03
3072159	3072159077	PS	WP	6/11/2012 0:01	RTI	2.48U	4.36	9.37	7/20/12 20:12
3072159	3072159078	PS	WP	6/11/2012 0:01	RTI	0.807U	4.17	9.44	7/20/12 20:20
3072159	3072159079	PS	WP	6/11/2012 0:01	RTI	1.11U	4.23	9.50	7/20/12 20:28
3072159	3072159080	PS	WP	6/11/2012 0:01	RTI	-4.08U	3.64	9.74	7/20/12 20:36

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LIMS Load
Printed 7/21/2012 at 8:35 PM

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK			
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	6.30	
Batch ID	12500	**PrepSOP2**	n/a	**Bkg Duration**	30.0	min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG072012	
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/20/2012 9:55	
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3	

Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459098	1.0	7/20/12 17:53	7.0	7/20/12 17:53	6.29	321.4	dpm/S	High, Evaluate
3072159061	1.0	6/11/12 0:01	7.0	7/20/12 18:02	6.14	366.6	dpm/S	High, Evaluate
3072159062	1.0	6/11/12 0:01	7.0	7/20/12 18:10	7.29	318.7	dpm/S	High, Evaluate
3072159063	1.0	6/11/12 0:01	7.0	7/20/12 18:18	4.86	324.0	dpm/S	High, Evaluate
3072159064	1.0	6/11/12 0:01	7.0	7/20/12 18:26	6.57	320.8	dpm/S	High, Evaluate
3072159065	1.0	6/11/12 0:01	7.0	7/20/12 18:34	6.71	298.1	dpm/S	Pass
3072159066	1.0	6/11/12 0:01	7.0	7/20/12 18:42	4.86	309.6	dpm/S	Pass
3072159067	1.0	6/11/12 0:01	7.0	7/20/12 18:50	9.57	294.0	dpm/S	Pass
3072159068	1.0	6/11/12 0:01	7.0	7/20/12 18:58	5.14	283.0	dpm/S	Pass
3072159069	1.0	6/11/12 0:01	7.0	7/20/12 19:06	4.57	329.1	dpm/S	High, Evaluate
3072159070	1.0	6/11/12 0:01	7.0	7/20/12 19:14	5.86	306.5	dpm/S	Pass
3072159071	1.0	6/11/12 0:01	7.0	7/20/12 19:22	6.57	341.5	dpm/S	High, Evaluate
3072159072	1.0	6/11/12 0:01	7.0	7/20/12 19:30	7.00	308.1	dpm/S	Pass
3072159073	1.0	6/11/12 0:01	7.0	7/20/12 19:38	7.00	319.3	dpm/S	High, Evaluate
3072159074	1.0	6/11/12 0:01	7.0	7/20/12 19:46	6.86	313.6	dpm/S	High, Evaluate
3072159075	1.0	6/11/12 0:01	7.0	7/20/12 19:54	7.71	290.6	dpm/S	Pass
3072159076	1.0	6/11/12 0:01	7.0	7/20/12 20:03	4.43	277.3	dpm/S	Pass
3072159077	1.0	6/11/12 0:01	7.0	7/20/12 20:12	7.57	300.2	dpm/S	Pass
3072159078	1.0	6/11/12 0:01	7.0	7/20/12 20:20	6.71	307.6	dpm/S	Pass
3072159079	1.0	6/11/12 0:01	7.0	7/20/12 20:28	6.86	312.2	dpm/S	Pass
3072159080	1.0	6/11/12 0:01	7.0	7/20/12 20:36	4.29	328.7	dpm/S	High, Evaluate
LCS12500	1.0	7/20/12 20:44	7.0	7/20/12 20:44	56.14	329.8	dpm/S	High, Evaluate
LCSD12500	1.0	7/20/12 20:52	7.0	7/20/12 20:52	61.43	320.4	dpm/S	High, Evaluate

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Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12500	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459098	0.5018	0.0000	1.0000	-0.020	4.112	4.112	9.562	3.464	1.020	4.112	1.00
3072159061	0.4504	0.1088	0.9940	-0.357	4.565	4.565	10.720	3.883	1.144	4.565	1.00
3072159062	0.5039	0.1088	0.9939	1.977	4.378	4.384	9.581	3.471	1.022	4.378	1.00
3072159063	0.4997	0.1089	0.9939	-2.899	3.753	3.769	9.661	3.500	1.031	3.753	1.00
3072159064	0.5023	0.1089	0.9939	0.541	4.208	4.208	9.612	3.482	1.025	4.208	1.00
3072159065	0.5161	0.1089	0.9939	0.799	4.131	4.132	9.355	3.389	0.998	4.131	1.00
3072159066	0.5101	0.1089	0.9939	-2.840	3.676	3.692	9.465	3.429	1.010	3.676	1.00
3072159067	0.5177	0.1089	0.9939	6.355	4.784	4.843	9.325	3.378	0.995	4.784	1.00
3072159068	0.5208	0.1089	0.9939	-2.241	3.679	3.689	9.270	3.358	0.989	3.679	1.00
3072159069	0.4952	0.1090	0.9939	-3.515	3.699	3.722	9.749	3.532	1.040	3.699	1.00
3072159070	0.5119	0.1090	0.9939	-0.865	3.942	3.943	9.431	3.417	1.006	3.942	1.00
3072159071	0.4828	0.1090	0.9939	0.563	4.378	4.378	10.000	3.623	1.067	4.378	1.00
3072159072	0.5110	0.1090	0.9939	1.378	4.245	4.248	9.448	3.423	1.008	4.245	1.00
3072159073	0.5035	0.1090	0.9939	1.399	4.309	4.312	9.589	3.474	1.023	4.309	1.00
3072159074	0.5075	0.1090	0.9939	1.110	4.238	4.240	9.512	3.446	1.015	4.238	1.00
3072159075	0.5189	0.1090	0.9939	2.734	4.352	4.365	9.305	3.371	0.993	4.352	1.00
3072159076	0.5217	0.1091	0.9939	-3.606	3.470	3.497	9.254	3.352	0.987	3.470	1.00
3072159077	0.5151	0.1091	0.9939	2.481	4.350	4.361	9.372	3.395	1.000	4.350	1.00
3072159078	0.5113	0.1091	0.9939	0.807	4.169	4.170	9.442	3.421	1.007	4.169	1.00
3072159079	0.5084	0.1091	0.9939	1.108	4.231	4.233	9.496	3.440	1.013	4.231	1.00
3072159080	0.4956	0.1091	0.9939	-4.080	3.609	3.642	9.741	3.529	1.039	3.609	1.00
LCS12500	0.4947	0.0000	1.0000	100.757	11.367	16.542	9.701	3.514	1.035	11.367	1.00
LCSD12500	0.5026	0.0000	1.0000	109.689	11.690	17.544	9.547	3.459	1.018	11.690	1.00

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Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/21/2012	**Method:**	EPA 906.0M
Worklist:	12500	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459098

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	-0.0200	4.1120	9.5620	3.46400		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 20:44	7/20/12 20:52				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.933	1184.933				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F)	1.000	1.000				
Target Conc. (DPM/Sample, g, F)	118.493	118.493				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F)	100.757	109.689				
1.96 Sigma Unc:	16.542	17.544				
% Recovery:	85.03%	92.57%				
Assessment:	Pass	Pass				
Upper % Recovery Limits	125.00%	125.00%				
Lower % Recovery Limits	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12500					
Duplicate Sample I.D	LCSD12500					
Sample Result (DPM/Sample, g, F):	100.7570					
1.96 Sigma Unc:	16.5420					
ple Duplicate Result (DPM/Sample, g, F):	109.6890					
Duplicate Sample 1.96 Sigma Unc.	17.5440					
Either results below MDC?	NO					
Relative Percent Difference	8.49%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment

Analyte:			
Sample Collection Date			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (DPM/Sample):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(DPM/Sample, g, F)			
MSD Aliquot (L, g, F):			
MSD Target Conc. (DPM/Sample, g, F)			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment

Analyte:			
Sample I.D.			
Sample MS I.D.			
Sample MSD I.D.			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

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Test: Low Energy Beta
Matrix: Smear
Batch ID: 12500

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Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

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Low Energy Beta CSU Derivation

CSU Analysis for Preparation

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Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

7/23/12

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 16:32
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 16:25	3072159052
2	15	7/20/2012 16:33	3072159053
3	23	7/20/2012 16:41	3072159054
4	31	7/20/2012 16:49	3072159055
5	39	7/20/2012 16:57	3072159056
6	47	7/20/2012 17:05	3072159057
7	55	7/20/2012 17:13	3072159058
8	63	7/20/2012 17:21	3072159059
9	71	7/20/2012 17:29	3072159060
10	79	7/20/2012 17:37	LCS12499
11	87	7/20/2012 17:45	LCSD12499
12	95	7/20/2012 17:53	459098
13	104	7/20/2012 18:02	3072159061
14	112	7/20/2012 18:10	3072159062
15	120	7/20/2012 18:18	3072159063
16	128	7/20/2012 18:26	3072159064
17	136	7/20/2012 18:34	3072159065
18	144	7/20/2012 18:42	3072159066
19	152	7/20/2012 18:50	3072159067
20	160	7/20/2012 18:58	3072159068
21	168	7/20/2012 19:06	3072159069
22	176	7/20/2012 19:14	3072159070
23	184	7/20/2012 19:22	3072159071
24	192	7/20/2012 19:30	3072159072
25	200	7/20/2012 19:38	3072159073
26	208	7/20/2012 19:46	3072159074
27	216	7/20/2012 19:54	3072159075
28	225	7/20/2012 20:03	3072159076
29	234	7/20/2012 20:12	3072159077
30	242	7/20/2012 20:20	3072159078
31	250	7/20/2012 20:28	3072159079
32	258	7/20/2012 20:36	3072159080
33	266	7/20/2012 20:44	LCS12500
34	274	7/20/2012 20:52	LCSD12500

7/23/12

7/22/12

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0	20.0	0	0.0	0.00
Region B:	2.0	160	0	0.0	0.00
Region C:	1.0	160	0	3.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
15	1	7.00	7	3.00	6.43	6.29	288.02	4
15	2	7.00	15	2.71	5.00	4.57	290.89	5
15	3	7.00	23	3.71	5.86	5.57	309.82	3
15	4	7.00	31	3.43	7.14	7.14	280.71	3
15	5	7.00	39	1.43	5.29	5.14	285.43	4
15	6	7.00	47	4.71	7.86	8.00	304.49	1
15	7	7.00	55	4.43	8.00	8.29	284.99	2
15	8	7.00	63	3.14	5.86	5.71	332.72	3
15	9	7.00	71	3.71	5.86	5.71	301.33	4
15	10	7.00	79	44.71	57.29	57.71	320.44	0
15	11	7.00	87	42.29	56.57	57.00	318.39	0
15	12	7.00	95	3.43	6.29	6.29	321.38	3
15	13	7.00	104	4.29	6.43	6.14	366.56	3
15	14	7.00	112	4.29	7.43	7.29	318.69	2
15	15	7.00	120	3.14	5.00	4.86	324.02	3
15	16	7.00	128	3.71	6.71	6.57	320.83	3
15	17	7.00	136	3.86	6.86	6.71	298.05	2
15	18	7.00	144	2.14	5.00	4.86	309.58	4
15	19	7.00	152	5.71	9.71	9.57	293.99	2
15	20	7.00	160	2.71	5.29	5.14	283.01	3
15	21	7.00	168	3.00	4.71	4.57	329.14	3
15	22	7.00	176	3.57	6.00	5.86	306.47	4
15	23	7.00	184	4.86	6.43	6.57	341.54	2
15	24	7.00	192	4.57	7.00	7.00	308.10	2
15	25	7.00	200	4.29	7.00	7.00	319.28	2
15	26	7.00	208	3.57	6.86	6.86	313.56	3
15	27	7.00	216	4.71	7.57	7.71	290.62	2
15	28	7.00	225	2.14	4.57	4.43	277.28	4
15	29	7.00	234	4.43	7.57	7.57	300.22	1
15	30	7.00	242	3.43	6.86	6.71	307.55	3
15	31	7.00	250	3.71	6.86	6.86	312.23	2
15	32	7.00	258	3.29	4.71	4.29	328.70	5
15	33	7.00	266	40.86	56.00	56.14	329.77	1
15	34	7.00	274	47.29	61.00	61.43	320.39	0

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
307215905S	12499	Swipe_H3C14	23	15	7/20/12 0900	7	NA	A
56								
57								
58								
59								
60								
LCS 12499								
LCSD 12499								
MB (459098)	12500							
307215906I			4					
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73			13					
74								
75								

Run comments: _____

Peer Review: _____

J:\QAQC\Master\Document Management\Radiological\Liquid Scintillation Runlog (R023-3 7Oct2010).XLS

Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072159076	12500	Swipe_43_C14	13	15	7/20/12 0900	7	NA	
77								
78								
79								
80								
LCS 12500								
LCSD 12500								
MB (459100)	12501		20	20				
3072159081								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92			14					
93								
94								
95								
96								

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

7/22/12

Quality Control Review

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Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

1 459100-BLANK for HBN 91074 [RADC/1250

Type BLANK **Matrix** Impact Plate **Collected** **% Moisture**
Client QCACCOUNT **WO** **Work ID**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12501 **Prep Date** 7/20/2012 21:00 **Dilution**
Method EPA 906.0M **HBN** 91074 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796267 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 21:00 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796267 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.66U ± 4.29 (9.46)	dpm/sa	1.66U ± 4.29 (9.46)		dpm/sa	

2 3072159081-SU-09-79

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12501 **Prep Date** 7/20/2012 21:08 **Dilution**
Method EPA 906.0M **HBN** 91074 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790547 **Instru** NONE **CC** OK *

Initial Volume	1 mL	Default	1 mL
Final Volume,	1 mL	Default	1 mL

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/20/2012 21:08 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790547 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.271U ± 4.34 (9.99)	dpm/sa	0.271U ± 4.34 (9.99)		dpm/sa		

3 3072159082-SU-09-80

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072159 **Work ID** Fort Monmouth 1207082 **Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

7/23/12

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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3 3072159082-SU-09-80

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:16	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790548		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:16	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790548		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.637U ± 4.30 (10.2)	dpm/sa	-0.637U ± 4.30 (10.2)		dpm/sa		

4 3072159083-SU-01-1

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:24	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790549		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:24	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790549		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.61J ± 4.81 (9.48)	dpm/sa	5.61J ± 4.81 (9.48)		dpm/sa		

5 3072159084-SU-01-2

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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5 3072159084-SU-01-2

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:32	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790550		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:32	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790550		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.0198U ± 4.10 (9.52)	dpm/sa	-0.0198U ± 4.10 (9.52)		dpm/sa		

6 3072159085-SU-01-3

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:40	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790551		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:40	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790551		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.871U ± 3.97 (9.50)	dpm/sa	-0.871U ± 3.97 (9.50)		dpm/sa		

7 3072159086-SU-01-4

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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7 3072159086-SU-01-4

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:48	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790552		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:48	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790552		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.90J ± 4.56 (9.40)	dpm/sa	3.90J ± 4.56 (9.40)		dpm/sa		

8 3072159087-SU-01-5

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 21:56	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790553		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 21:56	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790553		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.255U ± 4.08 (9.40)	dpm/sa	0.255U ± 4.08 (9.40)		dpm/sa		

9 3072159088-SU-01-5D

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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9 3072159088-SU-01-5D

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:04	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790554		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:04	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790554		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.95U ± 3.72 (9.25)	dpm/sa	-1.95U ± 3.72 (9.25)		dpm/sa		

10 3072159089-SU-01-6

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:12	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790555		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:12	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790555		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.35U ± 4.16 (9.25)	dpm/sa	1.35U ± 4.16 (9.25)		dpm/sa		

11 3072159090-SU-01-7

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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11 3072159090-SU-01-7

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:20	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790556		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:20	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790556		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.57J ± 4.48 (9.32)	dpm/sa	3.57J ± 4.48 (9.32)		dpm/sa		

12 3072159091-SU-01-8

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:28	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790557		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:28	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790557		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.91U ± 4.23 (9.25)	dpm/sa	1.91U ± 4.23 (9.25)		dpm/sa		

13 3072159092-SU-01-9

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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13 3072159092-SU-01-9

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:36	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790558		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:36	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790558		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-4.17U ± 3.42 (9.25)	dpm/sa	-4.17U ± 3.42 (9.25)		dpm/sa		

14 3072159093-SU-01-10

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:44	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790559		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 22:44	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790559		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.791U ± 4.09 (9.26)	dpm/sa	0.791U ± 4.09 (9.26)		dpm/sa		

15 3072159094-SU-01-11

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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15 3072159094-SU-01-11

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12501	**Prep Date**	7/20/2012 22:52	**Dilution**	
Method	EPA 906.0M	**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790560	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 22:52	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790560	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.35U ± 4.16 (9.26)	dpm/sa	1.35U ± 4.16 (9.26)		dpm/sa		

16 3072159095-SU-01-12

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:01	**Dilution**	
Method	EPA 906.0M	**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790561	**Instru**	NONE			**CC**	OK *

Initial Volume	1 mL Default	1 mL	
Final Volume,	1 mL Default	1 mL	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 23:01	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790561	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.814U ± 4.21 (9.53)	dpm/sa	0.814U ± 4.21 (9.53)		dpm/sa		

17 3072159096-SU-01-12D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**	

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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17 3072159096-SU-01-12D

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:09	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790562		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 23:09	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790562		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.22U ± 4.35 (9.43)	dpm/sa	2.22U ± 4.35 (9.43)		dpm/sa		

18 3072159097-SU-01-13

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:17	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790563		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 23:17	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790563		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.92U ± 4.25 (9.29)	dpm/sa	1.92U ± 4.25 (9.29)		dpm/sa		

19 3072159098-SU-01-14

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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19 3072159098-SU-01-14

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:25	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790564		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 23:25	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790564		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.40U ± 4.31 (9.58)	dpm/sa	1.40U ± 4.31 (9.58)		dpm/sa		

20 3072159099-SU-01-15

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:33	**Dilution**
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790565		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/20/2012 23:33	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790565		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-4.23U ± 3.47 (9.40)	dpm/sa	-4.23U ± 3.47 (9.40)		dpm/sa		

21 3072159100-SU-01-16

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072159	**Work ID**	Fort Monmouth 1207082	**Location**

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Quality Control Review

Batch	RADC/12501	**HBN**	91074
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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21 3072159100-SU-01-16

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12501	**Prep Date**	7/20/2012 23:41	**Dilution**	
Method	EPA 906.0M		**HBN**	91074	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790566		**Instru**	NONE			**CC**	OK *
Initial Volume	1 mL	Default	1 mL					
Final Volume,	1 mL	Default	1 mL					

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/20/2012 23:41	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790566	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.0193U ± 3.98 (9.26)	dpm/sa	-0.0193U ± 3.98 (9.26)		dpm/sa		

** Indicates QC failure. For example, blank contamination or recoveries out of range.

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Creation Date	06/28/2012 13:56		Assigned Analyst	RMK
Batch ID	12501		Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB	9060W	HBN	91074
Method	EPA 906.0M	EPA 906.0m		

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459100	BLANK	IP		QCACCOUNT	1.66U	4.29	9.46	7/20/12 21:00
3072159	3072159081	PS	WP	6/11/2012 0:01	RTI	0.271U	4.34	9.99	7/20/12 21:08
3072159	3072159082	PS	WP	6/11/2012 0:01	RTI	-0.637U	4.30	10.2	7/20/12 21:16
3072159	3072159083	PS	WP	6/11/2012 0:01	RTI	5.61J	4.81	9.48	7/20/12 21:24
3072159	3072159084	PS	WP	6/11/2012 0:01	RTI	-0.0198U	4.10	9.52	7/20/12 21:32
3072159	3072159085	PS	WP	6/11/2012 0:01	RTI	-0.871U	3.97	9.50	7/20/12 21:40
3072159	3072159086	PS	WP	6/11/2012 0:01	RTI	3.90J	4.56	9.40	7/20/12 21:48
3072159	3072159087	PS	WP	6/11/2012 0:01	RTI	0.255U	4.08	9.40	7/20/12 21:56
3072159	3072159088	PS	WP	6/11/2012 0:01	RTI	-1.95U	3.72	9.25	7/20/12 22:04
3072159	3072159089	PS	WP	6/11/2012 0:01	RTI	1.35U	4.16	9.25	7/20/12 22:12
3072159	3072159090	PS	WP	6/11/2012 0:01	RTI	3.57J	4.48	9.32	7/20/12 22:20
3072159	3072159091	PS	WP	6/11/2012 0:01	RTI	1.91U	4.23	9.25	7/20/12 22:28
3072159	3072159092	PS	WP	6/11/2012 0:01	RTI	-4.17U	3.42	9.25	7/20/12 22:36
3072159	3072159093	PS	WP	6/11/2012 0:01	RTI	0.791U	4.09	9.26	7/20/12 22:44
3072159	3072159094	PS	WP	6/11/2012 0:01	RTI	1.35U	4.16	9.26	7/20/12 22:52
3072159	3072159095	PS	WP	6/11/2012 0:01	RTI	0.814U	4.21	9.53	7/20/12 23:01
3072159	3072159096	PS	WP	6/11/2012 0:01	RTI	2.22U	4.35	9.43	7/20/12 23:09
3072159	3072159097	PS	WP	6/11/2012 0:01	RTI	1.92U	4.25	9.29	7/20/12 23:17
3072159	3072159098	PS	WP	6/11/2012 0:01	RTI	1.40U	4.31	9.58	7/20/12 23:25
3072159	3072159099	PS	WP	6/11/2012 0:01	RTI	-4.23U	3.47	9.40	7/20/12 23:33
3072159	3072159100	PS	WP	6/11/2012 0:01	RTI	-0.0193U	3.98	9.26	7/20/12 23:41

DM 7/22/12

7/23/12

LIMS Load
Printed 7/21/2012 at 8:59 PM

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK		
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	6.30
Batch ID	12501	**PrepSOP2**	n/a	**Bkg Duration**	30.0 min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG072012
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/20/2012 9:55
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459100	1.0	7/20/12 21:00	7.0	7/20/12 21:00	7.14	314.0	dpm/S	High, Evaluate
3072159081	1.0	6/11/12 0:01	7.0	7/20/12 21:08	6.43	341.3	dpm/S	High, Evaluate
3072159082	1.0	6/11/12 0:01	7.0	7/20/12 21:16	6.00	349.1	dpm/S	High, Evaluate
3072159083	1.0	6/11/12 0:01	7.0	7/20/12 21:24	9.14	310.6	dpm/S	Pass
3072159084	1.0	6/11/12 0:01	7.0	7/20/12 21:32	6.29	314.4	dpm/S	High, Evaluate
3072159085	1.0	6/11/12 0:01	7.0	7/20/12 21:40	5.86	312.8	dpm/S	Pass
3072159086	1.0	6/11/12 0:01	7.0	7/20/12 21:48	8.29	302.9	dpm/S	Pass
3072159087	1.0	6/11/12 0:01	7.0	7/20/12 21:56	6.43	302.8	dpm/S	Pass
3072159088	1.0	6/11/12 0:01	7.0	7/20/12 22:04	5.29	273.8	dpm/S	Pass
3072159089	1.0	6/11/12 0:01	7.0	7/20/12 22:12	7.00	272.3	dpm/S	Pass
3072159090	1.0	6/11/12 0:01	7.0	7/20/12 22:20	8.14	293.1	dpm/S	Pass
3072159091	1.0	6/11/12 0:01	7.0	7/20/12 22:28	7.29	270.7	dpm/S	Pass
3072159092	1.0	6/11/12 0:01	7.0	7/20/12 22:36	4.14	276.6	dpm/S	Pass
3072159093	1.0	6/11/12 0:01	7.0	7/20/12 22:44	6.71	278.1	dpm/S	Pass
3072159094	1.0	6/11/12 0:01	7.0	7/20/12 22:52	7.00	279.9	dpm/S	Pass
3072159095	1.0	6/11/12 0:01	7.0	7/20/12 23:01	6.71	314.9	dpm/S	High, Evaluate
3072159096	1.0	6/11/12 0:01	7.0	7/20/12 23:09	7.43	306.1	dpm/S	Pass
3072159097	1.0	6/11/12 0:01	7.0	7/20/12 23:17	7.29	288.4	dpm/S	Pass
3072159098	1.0	6/11/12 0:01	7.0	7/20/12 23:25	7.00	318.7	dpm/S	High, Evaluate
3072159099	1.0	6/11/12 0:01	7.0	7/20/12 23:33	4.14	302.8	dpm/S	Pass
3072159100	1.0	6/11/12 0:01	7.0	7/20/12 23:41	6.29	280.3	dpm/S	Pass
LCS12501	1.0	7/20/12 23:49	7.0	7/20/12 23:49	56.14	309.3	dpm/S	Pass
LCSD12501	1.0	7/20/12 23:57	7.0	7/20/12 23:57	59.57	315.0	dpm/S	High, Evaluate

7/22/12 7/23/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12501	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

Uncertainty Factors	
UE1	5.39%
UE2	10.60%
UE3	1.00%
UE4	0.00%

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459100	0.5073	0.0000	1.0000	1.656	4.285	4.290	9.459	3.427	1.009	4.285	1.00
3072159081	0.4830	0.1092	0.9939	0.271	4.337	4.337	9.995	3.621	1.066	4.337	1.00
3072159082	0.4740	0.1092	0.9939	-0.637	4.297	4.298	10.184	3.689	1.086	4.297	1.00
3072159083	0.5094	0.1092	0.9939	5.609	4.765	4.812	9.477	3.433	1.011	4.765	1.00
3072159084	0.5070	0.1092	0.9939	-0.020	4.096	4.096	9.523	3.450	1.016	4.096	1.00
3072159085	0.5081	0.1092	0.9939	-0.871	3.972	3.973	9.502	3.442	1.014	3.972	1.00
3072159086	0.5138	0.1093	0.9939	3.897	4.532	4.555	9.396	3.404	1.002	4.532	1.00
3072159087	0.5139	0.1093	0.9939	0.255	4.077	4.077	9.395	3.404	1.002	4.077	1.00
3072159088	0.5220	0.1093	0.9939	-1.947	3.712	3.720	9.249	3.351	0.987	3.712	1.00
3072159089	0.5221	0.1093	0.9939	1.349	4.155	4.158	9.248	3.350	0.987	4.155	1.00
3072159090	0.5180	0.1093	0.9939	3.574	4.460	4.481	9.320	3.376	0.994	4.460	1.00
3072159091	0.5221	0.1093	0.9939	1.908	4.225	4.231	9.247	3.350	0.986	4.225	1.00
3072159092	0.5218	0.1094	0.9939	-4.165	3.383	3.420	9.253	3.352	0.987	3.383	1.00
3072159093	0.5216	0.1094	0.9939	0.791	4.087	4.088	9.256	3.353	0.987	4.087	1.00
3072159094	0.5214	0.1094	0.9939	1.351	4.161	4.164	9.260	3.355	0.988	4.161	1.00
3072159095	0.5066	0.1094	0.9939	0.814	4.208	4.209	9.529	3.452	1.017	4.208	1.00
3072159096	0.5121	0.1094	0.9939	2.220	4.342	4.350	9.427	3.415	1.006	4.342	1.00
3072159097	0.5195	0.1094	0.9939	1.917	4.246	4.252	9.293	3.367	0.991	4.246	1.00
3072159098	0.5039	0.1094	0.9939	1.398	4.305	4.308	9.582	3.471	1.022	4.305	1.00
3072159099	0.5139	0.1095	0.9939	-4.229	3.436	3.472	9.395	3.404	1.002	3.436	1.00
3072159100	0.5213	0.1095	0.9939	-0.019	3.983	3.983	9.261	3.355	0.988	3.983	1.00
LCS12501	0.5102	0.0000	1.0000	97.679	11.020	16.036	9.404	3.407	1.003	11.020	1.00
LCSD12501	0.5065	0.0000	1.0000	105.166	11.426	16.967	9.473	3.432	1.011	11.426	1.00

7/22/12 7/23/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: RMK
Date: 7/21/2012 Method: EPA 906.0M
Worklist: 12501 SOP:
Matrix: Filter MB Sample ID: 459100

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	1.6560	4.2900	9.4590	3.42700		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 23:49	7/20/12 23:57				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.930	1184.930				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.493	118.493				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	97.679	105.166				
1.96 Sigma Unc:	16.036	16.967				
% Recovery:	82.43%	88.75%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12501					
Duplicate Sample I.D:	LCSD12501					
Sample Result (DPM/Sample, g, F):	97.6790					
1.96 Sigma Unc:	16.0360					
ple Duplicate Result (DPM/Sample, g, F):	105.1660					
Duplicate Sample 1.96 Sigma Unc:	16.9670					
Either results below MDC?	NO					
Relative Percent Difference:	7.38%					
Assessment:	Pass					
% RPD Limit:	25.00%					

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Sample Matrix Spike Control Assessment

Analyte:			
Sample Collection Date:			
Sample I.D.:			
Sample MS I.D.:			
Sample MSD I.D.:			
Spike I.D.:			
MS/MSD Decay Corrected Spike Conc. (DPM/Sample):			
Spike Volume Used in MS (mL):			
Spike Volume Used in MSD (mL):			
MS Aliquot (L, g, F):			
MS Target Conc.(DPM/Sample, g, F):			
MSD Aliquot (L, g, F):			
MSD Target Conc. (DPM/Sample, g, F):			
MS Spike uncertainty (calculated):			
MSD Spike uncertainty (calculated):			
Sample Result:			
Sample 1.96 Sigma Unc.:			
Sample Matrix Spike Result:			
Sample MS 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample MSD 1.96 Sigma Unc.:			
MS % Recovery:			
MSD % Recovery:			
MS Assessment:			
MSD Assessment:			
MS/MSD Upper % Recovery Limits:			
MS/MSD Lower % Recovery Limits:			

Matrix Spike/Matrix Spike Duplicate Sample Assessment

Analyte:			
Sample I.D.:			
Sample MS I.D.:			
Sample MSD I.D.:			
Sample Matrix Spike Result:			
Sample Matrix Spike 1.96 Sigma Unc.:			
Sample Matrix Spike Duplicate Result:			
Sample Matrix Spike Duplicate 1.96 Sigma Unc.:			
MS/MSD Relative Percent Difference:			
MS/ MSD RPD Assessment:			
% RPD Limit:			

Comments:

7/22/12 7/23/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12501

Calibration Information				
Instr. ID:	*System #2*	*System #3*		
Cal Type:	*LEB Quenched*	*LEB Quenched*		
Cal ID:	*81012-493*	*81012-493*		
Description:	*5 mL DI +15 mL Ultima LLT*	*5 mL DI +15 mL Ultima LLT*		
Window:	*1.0-160.0*	*1.0-160.0*		
Eff. Date:	*7/20/2012*	*7/19/2012*		
Exp. Date:	*7/20/2013*	*7/19/2013*		
Fit Type:	*Polynomial*	*Polynomial*		
polynomial = ax^5 + bx^4 + cx^3 + dx^2 + ex + f				
a	0	0		
b	0	0		
c	0	0		
d	-8.4166E-06	-7.7122E-06		
e	4.3584E-03	4.1665E-03		
f	-6.9579E-02	-4.0645E-02		

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

7/23/12

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

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Mass Aliquot

uncert (g)	mass (g)	rel unc
0.0003	2.000	0.02%

Decay/Ingrowth Correction

Precision of Sample Count Time	5 min
T1/2	12.43 years
Decay Correction Uncertainty	0.08%

			CSU (TPU) for Preparation	5.39%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Sample Dissolution	2.00%	1	2.00%	0.0004
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

			CSU (TPU) for Yield Correction	1.00%
Description	**relative**	**of Critical**	**Uncertainty**	**Uncertainty**
Absence of Yield Monitoring	1.00%	1	1.00%	0.0001

			CSU (TPU) for Analysis	10.60%
Description	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
SRM Uncertainty	3.50%	1	3.50%	0.0012
Source Reproducibility	5.00%	1	5.00%	0.0025
Curve Fitting Uncertainty	5.00%	1	5.00%	0.0025
Count reproducibility	5.00%	1	5.00%	0.0025
Decay/Ingrowth Correction	0.08%	1	0.08%	0.0000
Estimated Additional Uncertainty	5.00%	1	5.00%	0.0025

Total Uncertainty	**Maximum**	**of Critical**	**Uncertainty**	**Uncertainty**
UE1	5.39%	1	5.39%	0.0029
UE2	10.60%	1	10.60%	0.0112
UE3	1.00%	1	1.00%	0.0001
UE4	0.00%	1	0.00%	0.0000
				11.93%

7/23/12

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 21:07
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 21:00	459100
2	15	7/20/2012 21:08	3072159081
3	23	7/20/2012 21:16	3072159082
4	31	7/20/2012 21:24	3072159083
5	39	7/20/2012 21:32	3072159084
6	47	7/20/2012 21:40	3072159085
7	55	7/20/2012 21:48	3072159086
8	63	7/20/2012 21:56	3072159087
9	71	7/20/2012 22:04	3072159088
10	79	7/20/2012 22:12	3072159089
11	87	7/20/2012 22:20	3072159090
12	95	7/20/2012 22:28	3072159091
13	103	7/20/2012 22:36	3072159092
14	111	7/20/2012 22:44	3072159093
15	119	7/20/2012 22:52	3072159094
16	128	7/20/2012 23:01	3072159095
17	136	7/20/2012 23:09	3072159096
18	144	7/20/2012 23:17	3072159097
19	152	7/20/2012 23:25	3072159098
20	160	7/20/2012 23:33	3072159099
21	168	7/20/2012 23:41	3072159100
22	176	7/20/2012 23:49	LCS12501
23	184	7/20/2012 23:57	LCSD12501
24	192	7/21/2012 0:05	459101
25	200	7/21/2012 0:13	3072160001
26	208	7/21/2012 0:21	3072160002
27	216	7/21/2012 0:29	3072160003
28	224	7/21/2012 0:37	3072160004
29	232	7/21/2012 0:45	3072160005
30	240	7/21/2012 0:53	3072160006
31	248	7/21/2012 1:01	3072160007
32	256	7/21/2012 1:09	3072160008
33	264	7/21/2012 1:17	3072160009
34	272	7/21/2012 1:25	3072160010
35	280	7/21/2012 1:33	3072160011
36	288	7/21/2012 1:41	3072160012
37	296	7/21/2012 1:49	3072160013
38	304	7/21/2012 1:57	3072160014
39	312	7/21/2012 2:05	3072160015
40	320	7/21/2012 2:13	3072160016
41	328	7/21/2012 2:21	3072160017
42	336	7/21/2012 2:29	3072160018
43	344	7/21/2012 2:37	3072160019
44	352	7/21/2012 2:45	3072160020

7/22/12

7/23/12

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	0.0	0.00
Region C:	1.0 -	160	0	3.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

F#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
20	1	7.00	7	4.43	7.14	7.14	313.95	2
20	2	7.00	15	3.00	6.43	6.43	341.29	2
20	3	7.00	23	3.29	6.14	6.00	349.05	3
20	4	7.00	31	5.57	9.14	9.14	310.61	2
20	5	7.00	39	3.86	6.29	6.29	314.42	3
20	6	7.00	47	3.14	5.86	5.86	312.75	2
20	7	7.00	55	5.29	8.43	8.29	302.86	1
20	8	7.00	63	3.43	6.57	6.43	302.78	3
20	9	7.00	71	3.29	5.43	5.29	273.75	4
20	10	7.00	79	3.57	7.14	7.00	272.30	2
20	11	7.00	87	4.29	8.00	8.14	293.08	2
20	12	7.00	95	3.86	7.29	7.29	270.72	2
20	13	7.00	103	2.00	4.43	4.14	276.57	5
20	14	7.00	111	2.43	6.71	6.71	278.10	3
20	15	7.00	119	3.86	7.14	7.00	279.85	3
20	16	7.00	128	4.43	6.86	6.71	314.88	2
20	17	7.00	136	4.14	7.29	7.43	306.09	2
20	18	7.00	144	4.43	7.29	7.29	288.41	3
20	19	7.00	152	3.43	7.14	7.00	318.74	3
20	20	7.00	160	2.00	4.71	4.14	302.79	6
20	21	7.00	168	3.14	6.29	6.29	280.29	2
20	22	7.00	176	42.14	55.57	56.14	309.32	0
20	23	7.00	184	44.00	59.14	59.57	315.04	1
20	24	7.00	192	3.71	6.14	6.14	345.41	2
20	25	7.00	200	4.14	7.43	7.29	292.81	1
20	26	7.00	208	2.00	5.71	5.43	304.29	3
20	27	7.00	216	4.00	6.71	6.57	311.16	3
20	28	7.00	224	3.43	6.86	6.71	301.51	3
20	29	7.00	232	3.43	7.71	7.71	289.09	2
20	30	7.00	240	3.29	6.43	6.29	285.38	3
20	31	7.00	248	4.14	6.29	6.00	320.54	3
20	32	7.00	256	5.43	9.57	9.71	314.94	1
20	33	7.00	264	3.14	6.43	6.29	290.94	2
20	34	7.00	272	3.43	7.14	7.00	272.07	3
20	35	7.00	280	3.57	6.14	6.14	304.46	2
20	36	7.00	288	4.14	6.57	6.29	297.68	3
20	37	7.00	296	3.86	7.14	7.00	286.59	3
20	38	7.00	304	3.86	7.14	6.86	286.24	3
20	39	7.00	312	4.43	7.29	7.43	305.04	2

Protocol #:20 SWIPE_H3_C14 User :

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
20	40	7.00	320	3.57	6.00	5.86	302.21	3
20	41	7.00	328	2.29	5.14	5.00	285.07	3
20	42	7.00	336	3.86	6.71	6.71	297.98	2
20	43	7.00	344	3.29	6.14	6.29	281.73	2
20	44	7.00	352	4.43	7.57	7.43	305.73	2

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
307215907 6	12560	Swipe_43_C14	13	15	7/20/10 0900	7	NA	
77								
78								
79								
80								
LCS 12500								
LCSD 12500								
MB (459100)	12501		20	20				
307215907 81								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92			14					
93								
94								
95								
96								

Run comments: _____

Peer Review: _____

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072159097	12501	Swipe-H3_C14	14	20	7/20/12 0900	7	NA	JLK
98								
99								
100								
LCS 12501								
LCSD 12501								
MB (459101)	12502							
3072160001			40					
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13			9					
14								
15								
16								
17								

Run comments: _____

Peer Review: _____

Low Energy Beta Calibration Documentation

Low Energy Beta Smear Calibration Narrative
Applicable to Methods: Smear Counting
Date: 7/19/2012
Calibration Source Prep Analyst: JLK
Calibration Calculations by: JLK

Calibration Description Details:

Five (5.0) mL of DI water was added to each of ten glass liquid scintillation vials with reflective lids. Portions of Analytics SRM 81012-493 were added to each of the calibration vials in the masses documented in the table below. Fifteen (15) ml of Ultima Gold LLT liquid scintillation cocktail was added to each vial. The vials were capped and shaken gently to mix the contents. The caps were carefully removed, and varying volumes of nitromethane were added to the calibration vials in the quantities documented in the table. The calibration sources were capped and shaken to mix, wiped clean with methanol and DI water. A label was attached to the outside of each vial to be consistent with the sample vials.

The samples were counted on each of Pace's 2 liquid scintillation counters, and calculations were performed to determine the ratio of detector Ni-63 efficiency versus quench number (TSIE) for each detector system.

Cal Source ID	Mass (g) of Ni-63 Standard 81012-493	Volume of Nitromethane Added (uL)
Ni63-20120719-N1	0.1019	0
Ni63-20120719-N2	0.0995	10
Ni63-20120719-N3	0.0998	20
Ni63-20120719-N4	0.1040	30
Ni63-20120719-N5	0.1014	40
Ni63-20120719-N6	0.1015	50
Ni63-20120719-N7	0.2060	60
Ni63-20120719-N8	0.2034	70
Ni63-20120719-N9	0.2044	80
Ni63-20120719-N10	0.2036	90

7/20/12
7/20/12

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

81012-493

Ni-63 5 mL Liquid in Flame Sealed Vial

Customer: Pace Analytical Services, Inc.
P.O. No.: PI-12089, Item 18

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Ni-63	3.656E+04	3.456E+03	0.2	1.5	3.0	11/05/2009

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 4.99626 g 0.1M HCl solution with approximately 30 μg/g Ni carrier.

Source Prepared by: N. Kasate
N.E. Kasate, Radiochemist

QA Approved: D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 11-6-09

ACCREDITED SOURCE CALIBRATION LABORATORY — HEALTH PHYSICS SOCIETY — FOUNDED 1956

Nickel-63 Efficiency Quench Curve Calibration

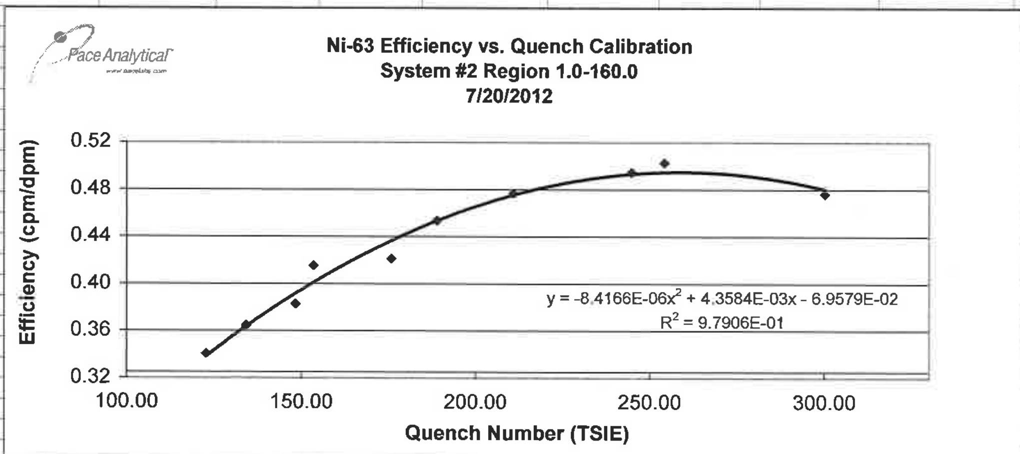
Pace Analytical™ www.pacelabs.com

Analyst:	JLK
Calibration Date:	7/20/2012
Ni-63 Standard:	81012-493
Standard Bq on Reference Date	3456
Standard Total Mass (g)	4.99626
System ID:	System #2
Background:	7.83

Detector System Settings

Count Mode:	Low Level
Background Subtract:	Off
Low CPM Threshold:	Off
Static Controller:	On
Region:	1.0-160.0

Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Decay Corrected Standard dpm/g	Standard Source dpm	Region 1-160 Ni-63 ROI Standard Source cpm	Source Ct. time (min)	Source Net Counts	TSIE	Region 1-160 Ni-63 Source Efficiency (cpm/dpm)	Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
Ni-63 20120719-N1	0.1019	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4228.94	2020.85	6.00	12078.12	300.10	0.4760	0.4804	0.92%	Yes
Ni-63 20120719-N2	0.0995	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4129.34	2082.61	6.00	12448.68	254.20	0.5024	0.4945	-1.59%	Yes
Ni-63 20120719-N3	0.0998	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4141.79	2055.91	6.00	12288.48	244.90	0.4945	0.4930	-0.30%	Yes
Ni-63 20120719-N4	0.1040	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4316.10	2065.34	6.00	12345.06	210.90	0.4767	0.4752	-0.31%	Yes
Ni-63 20120719-N5	0.1014	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4208.19	1915.89	6.00	11448.36	188.90	0.4534	0.4534	-0.01%	Yes
Ni-63 20120719-N6	0.1015	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4212.34	1781.94	7.00	12418.77	175.80	0.4212	0.4365	3.64%	Yes
Ni-63 20120719-N7	0.2060	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8549.19	3557.22	3.00	10648.17	153.50	0.4152	0.4011	-3.38%	Yes
Ni-63 20120719-N8	0.2034	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8441.29	3239.40	4.00	12926.28	148.30	0.3828	0.3917	2.31%	Yes
Ni-63 20120719-N9	0.2044	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8482.79	3100.91	4.00	12372.32	134.20	0.3646	0.3637	-0.24%	Yes
Ni-63 20120719-N10	0.2036	11/5/2009	7/20/2012	988.42	0.99995	41500.9	8449.59	2889.22	4.00	11525.56	122.70	0.3410	0.3385	-0.74%	Yes



C	-8.4166E-06
D	4.3584E-03
E	-6.9579E-02

7/20/12
7/20/12

Printed 7/20/2012 at 11:26 AM

Ni63 quench cal 20120719 SYS2
P:\QA Folders\Calibrations\Ni59 and Ni63 Cals\Ni63 quench cal 20120719 SYS2

Assay Definition-

Assay Description:
5 ml DI + FILTER +15 ml ULTIMA GOLD LLT Cocktail

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\20120720_0859.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\12482.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H-3_C-14_E.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 8.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	0.00
B	2.0	160.0	0.00
C	1.0	160.0	1.80

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

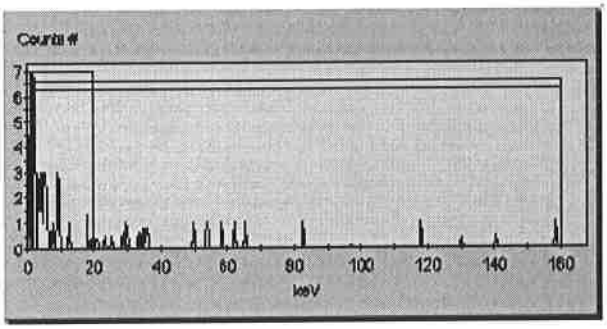
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM

14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM
3H E^2/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
14C E^2/B (4-156 keV): 554.79 Date Processed: 7/19/12 11:40:58 AM
3H Efficiency (0-18.6 keV): 62.31 Date Processed: 7/19/12 11:40:58 AM
14C Efficiency (0-156 keV): 95.37 Date Processed: 7/19/12 11:40:58 AM
IPA Background Date Processed: 7/19/12 11:40:58 AM
3H Background CPM (0-18.6 keV): 12.62 Date Processed: 7/19/12 11:40:58 AM
14C Background CPM (0-156 keV): 19.93 Date Processed: 7/19/12 11:40:58 AM
3H Calibration DPM: 278800
3H Reference Date: 12/5/07
14C Calibration DPM: 135100
===== IPA Errors and Warnings for Last Aquired Data Per Parameter ====
7/19/12 11:40:58 AM: WARNING: Questionable H3 Efficiency value - Please rerun quench curves
== End of IPA Errors and Warnings for Last Aquired Data Per Parameter ==

Cycle 1 Results

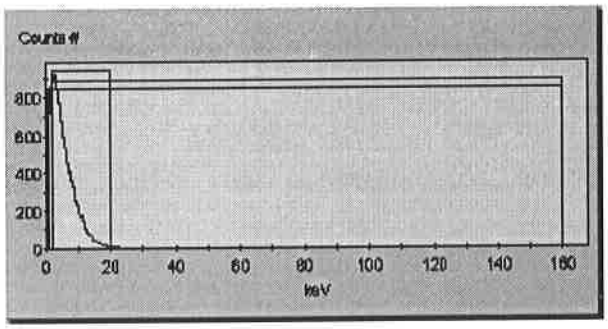
S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
			BKG 8	7/20/12	4.34	317.6	6.45	7.83	
1	5	8:59:56 AM	8						

SpectraView Block Data



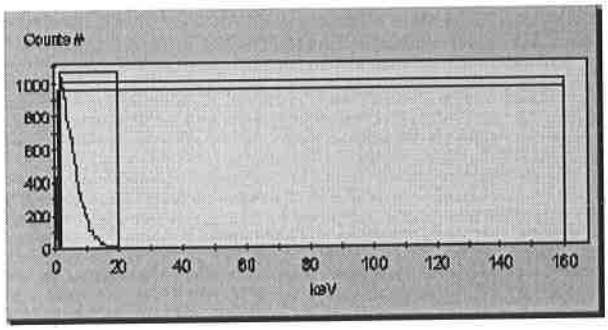
		NI63-20120719-N1	6	7/20/12	1763.93	300.1	1771.83	2020.85	
2	5	9:08:46 AM	0						

SpectraView Block Data



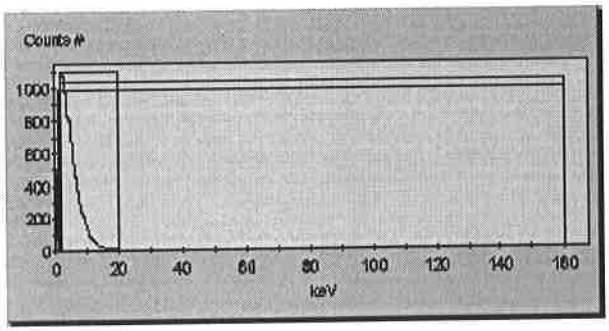
		NI63-20120179-N2	6	7/20/12	1813.72	254.2	1818.36	2082.61	
3	5	9:15:40 AM	0						

SpectraView Block Data



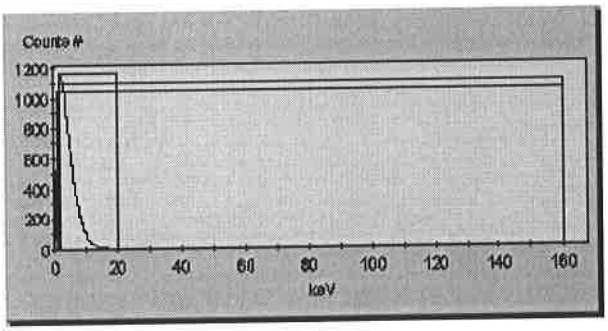
NI63-20120719-N3 6 7/20/12 1748.50 244.9 1754.08 2055.91
4 5 9:22:22 AM 0

SpectraView Block Data



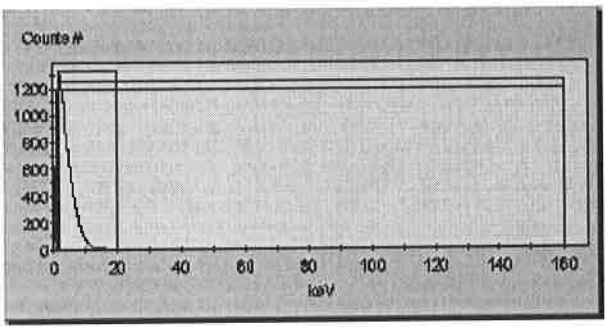
NI63-20120719-N4 6 7/20/12 1753.03 210.9 1756.32 2065.34
5 5 9:29:11 AM 0

SpectraView Block Data



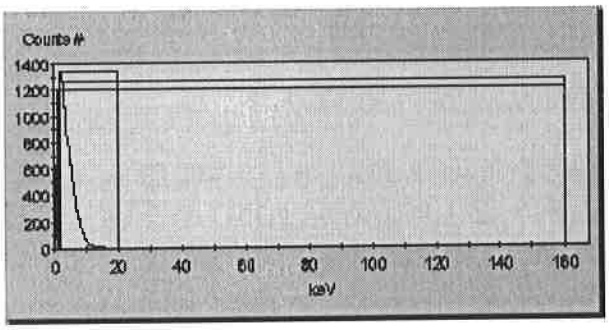
NI63-20120719-N5 6 7/20/12 1573.37 188.9 1575.74 1915.89
6 5 9:35:58 AM 0

SpectraView Block Data



NI63-20120719-N6 7 7/20/12 1456.33 175.8 1458.71 1781.94
7 5 9:43:13 AM 0

SpectraView Block Data



NI63-20120719-N7 3 7/20/12 2818.32 153.5 2821.87 3557.22
8 5 9:50:58 AM 0

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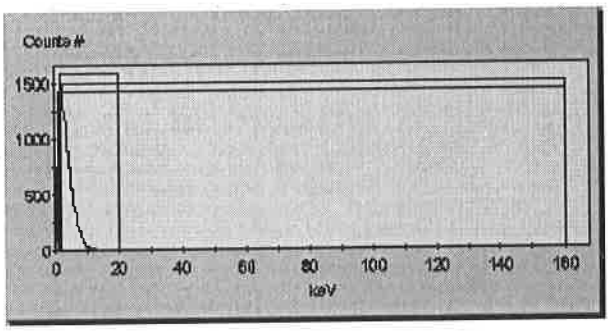

NI63-20120719-N8 4 7/20/12 2526.96 148.3 2529.45 3239.40
9 5 9:55:12 AM 0

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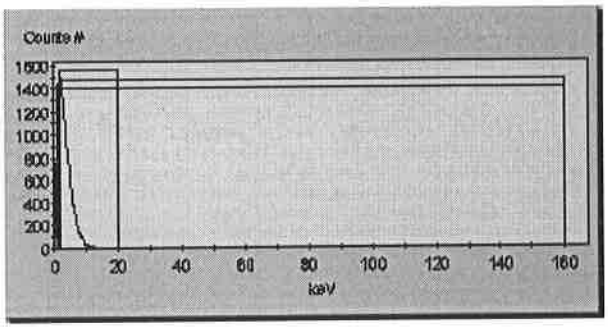
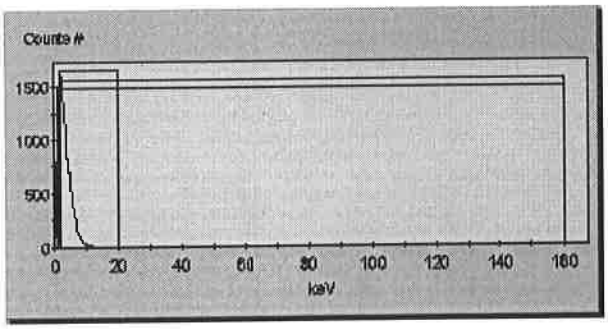


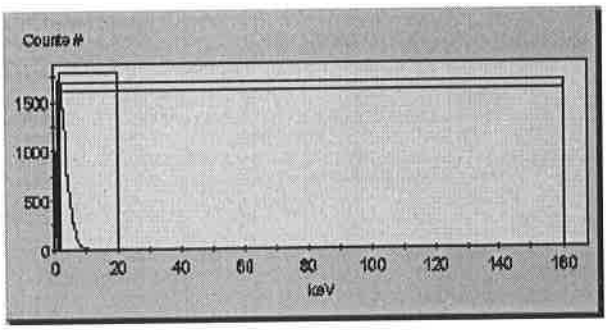
NI63-20120719-N9 4 7/20/12 2389.66 134.2 2392.64 3100.91
10 5 9:59:47 AM 0

SpectraView Block Data



NI63-20120719-N10 4 7/20/12 2122.40 122.7 2124.50 2889.22
11 5 10:04:33 AM 0

SpectraView Block Data



Pace Analytical

Pace Analytical Services, Inc.-Pittsurgh

Liquid Scintillation Counter Run Log System 2

Logbook ID: 8-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3KG	N Cal	Supe H3/C14	5	1	7/20/12 0845	8	7/20/12 0900	
N1 63 20120719 N1								
N2								
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
3072 158038		Supe H3/C14	12	8	7/20/12 0945	12	NA	
39								
40								
LCS								
LCSD								
BKG								

Run comments: _____

Peer Review: _____

Nickel-63 Efficiency Quench Curve Calibration

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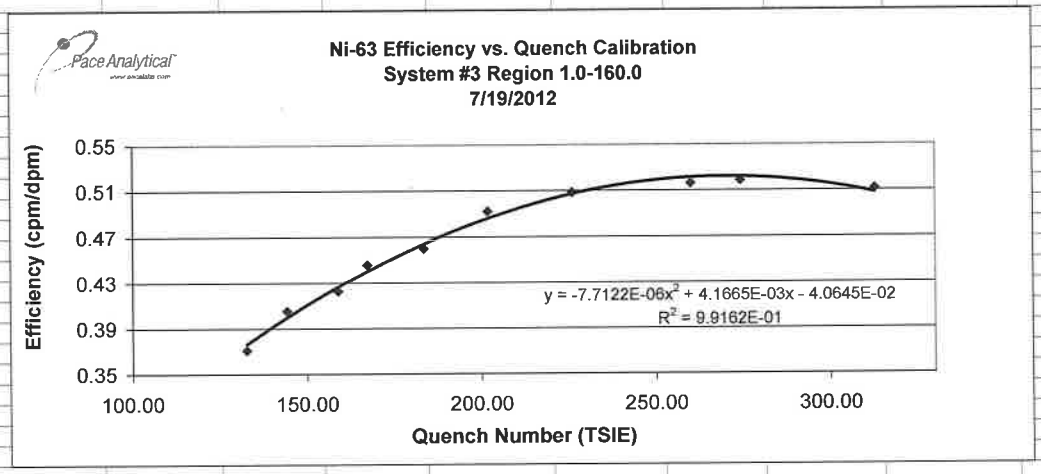
Analyst:	JLK	Detector System Settings	
Calibration Date:	7/19/2012	Count Mode:	Low Level
Ni-63 Standard:	81012-493	Background Subtract:	Off
Standard Bq on Reference Date	3456	Low Level Count Mode:	On
Standard Total Mass (g)	4.99626	Luminescence Correction:	On
System ID:	System #3	Region:	1.0-160.0
Background:	8.00		

Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Decay Corrected Standard dpm/g	Standard Source dpm	Region 1-160 Ni-63 ROI Standard Source cpm	Source Ct. time (min)	Source Net Counts	TSIE	Region 1-160 Ni-63 Source Efficiency (cpm/dpm)	Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
Ni-63 20120719-N1	0.1019	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4228.94	2170.96	4.58	9906.36	312.86	0.5115	0.5080	-0.68%	Yes
Ni-63 20120719-N2	0.0995	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4129.34	2150.00	4.64	9938.88	274.25	0.5187	0.5220	0.62%	Yes
Ni-63 20120719-N3	0.0998	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4141.79	2146.02	4.65	9941.79	260.02	0.5162	0.5213	0.99%	Yes
Ni-63 20120719-N4	0.1040	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4316.10	2202.43	4.52	9918.82	226.09	0.5084	0.5071	-0.25%	Yes
Ni-63 20120719-N5	0.1014	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4208.19	2079.17	4.80	9941.62	201.84	0.4922	0.4861	-1.23%	Yes
Ni-63 20120719-N6	0.1015	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4212.34	1946.38	5.11	9905.12	183.62	0.4602	0.4644	0.92%	Yes
Ni-63 20120719-N7	0.2060	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8549.19	3821.07	2.61	9952.11	167.31	0.4460	0.4406	-1.22%	Yes
Ni-63 20120719-N8	0.2034	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8441.29	3576.62	2.78	9920.76	158.90	0.4228	0.4267	0.93%	Yes
Ni-63 20120719-N9	0.2044	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8482.79	3445.83	2.88	9900.95	144.19	0.4053	0.3998	-1.35%	Yes
Ni-63 20120719-N10	0.2036	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8449.59	3141.96	3.17	9934.65	132.62	0.3709	0.3763	1.45%	Yes



C	-7.7122E-06
D	4.1665E-03
E	-4.0645E-02

7/7/2012
OK 7/30/12

Protocol #: 1 SWIPE_H3_C14 User :

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	2.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
1	1	7.00	7	4.14	7.86	8.00	325.58	1
1	2	4.58	13	1638.86	2147.60	2170.96	312.86	0
1	3	4.64	18	1581.68	2130.82	2150.00	274.25	0
1	4	4.65	24	1626.88	2127.31	2146.02	260.02	0
1	5	4.52	30	1663.50	2189.38	2202.43	226.09	0
1	6	4.80	35	1585.42	2070.00	2079.17	201.84	0
1	7	5.11	42	1494.52	1941.29	1946.38	183.62	0
1	8	2.61	45	2947.51	3815.33	3821.07	167.31	0
1	9	2.78	49	2737.77	3572.66	3576.62	158.90	0
1	10	2.88	53	2642.01	3442.01	3445.83	144.19	0
1	11	3.17	58	2460.25	3136.59	3141.96	132.62	0

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
N163 20120719 N2	N.63Cal	Simple H3C14	5	1	7/19/12 1330	7	n/a	
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
MB		Simple H3C14	27	45	7/20/12 0900			
30 72159041								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52			23					
53								
54								

Run comments: _____

Peer Review: _____

Standards

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

71157A-493

Ni-63 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ni-63
ACTIVITY (dps):	1.061 E4
HALF-LIFE:	100.1 years
CALIBRATION DATE:	April 5, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.0%

Impurities: γ-impurities <0.1%

5.08501 grams 0.1M HCl solution with 30 μg/g Ni carrier.

P O NUMBER PI-4864, Item 2

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: 7-22-05

Rcd 8-16-05

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Radioactive Standards Dilution Logbook

09-009 N:63 Spike Solution

Parent source: 09-008
Parent Conc: 12334.51 dpm/g
Ref date: 4/5/2005 12:00 EST

Explication: ND

$$\frac{25.26\,g \left(\frac{12334.51\ dpm}{g} \right)}{250.0\,ml} = 1246.3\ \frac{dpm}{ml}$$

diluted 25.26 g of 09-008 to 250.0 ml w/ 0.1 N HCl on 5/3/2009

0.1 N HCl DL09-0167

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Radioactive Standards Dilution Logbook

09-008 Ni-63 Spike "A" Solution

Parent Source: Analytics 71157A-493
Parent Cnc.: 10610 DPS (Bq)
Parent Ref date: 4/5/2005 12:00 EST
NO EXP ASSIGNED

5.0210 g	10610 DPS	60 dps/dpm = 12334.51 dpm/g
5.08501 g	50.9616 g	

diluted 5.0210 g of 71157A-493 to 50.9616 g w/ 0.1 N HCl on 5/3/2009

0.1 N HCl DL09-0167

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Ni-63
SRS 71157A-493 Qty 0.29 µCi QA
Date 04/05/05 12:00 EST Exp. XXXXXX
PO # PI-4864, Item 2
5.08501 g 0.1M HCl solution
CAUTION RADIOACTIVE MATERIAL