



RTI Laboratories, Inc.

Client Ref.: Fort Monmouth 1207079

Pace-Pittsburgh Project No. 3072161

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

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Case Narrative for Pace Analytical Job Number 3072161

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 3072161 with corresponding samples IDs of 3072161001 through 3072161100. 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 3072161

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



Date

July 31, 2012

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


RE: Project: Fort Monmouth 1207079
Pace Project No.: 3072161

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 Ferris

carin.ferris@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4 Greensburg, PA 15601
ACCLASS 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 1207079

Pace Project No.: 3072161

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072161001	2541-F9	Wipe	06/11/12 00:01	06/25/12 10:15
3072161002	2541-F10	Wipe	06/11/12 00:01	06/25/12 10:15
3072161003	2541-F11	Wipe	06/11/12 00:01	06/25/12 10:15
3072161004	2541-F12	Wipe	06/11/12 00:01	06/25/12 10:15
3072161005	2541-F13	Wipe	06/11/12 00:01	06/25/12 10:15
3072161006	2541-F13D	Wipe	06/11/12 00:01	06/25/12 10:15
3072161007	2541-F14	Wipe	06/11/12 00:01	06/25/12 10:15
3072161008	2541-F15	Wipe	06/11/12 00:01	06/25/12 10:15
3072161009	2541-F16	Wipe	06/11/12 00:01	06/25/12 10:15
3072161010	2541-F17	Wipe	06/11/12 00:01	06/25/12 10:15
3072161011	2541-F18	Wipe	06/11/12 00:01	06/25/12 10:15
3072161012	2541-F19	Wipe	06/11/12 00:01	06/25/12 10:15
3072161013	2541-F20	Wipe	06/11/12 00:01	06/25/12 10:15
3072161014	2541-F21	Wipe	06/11/12 00:01	06/25/12 10:15
3072161015	2541-F22	Wipe	06/11/12 00:01	06/25/12 10:15
3072161016	2541-F23	Wipe	06/11/12 00:01	06/25/12 10:15
3072161017	2541-F24	Wipe	06/11/12 00:01	06/25/12 10:15
3072161018	2541-F25	Wipe	06/11/12 00:01	06/25/12 10:15
3072161019	2541-F26	Wipe	06/11/12 00:01	06/25/12 10:15
3072161020	2541-F27	Wipe	06/11/12 00:01	06/25/12 10:15
3072161021	2541-F28	Wipe	06/11/12 00:01	06/25/12 10:15
3072161022	2541-F29	Wipe	06/11/12 00:01	06/25/12 10:15
3072161023	2541-F30	Wipe	06/11/12 00:01	06/25/12 10:15
3072161024	2541-W1	Wipe	06/11/12 00:01	06/25/12 10:15
3072161025	2541-W2	Wipe	06/11/12 00:01	06/25/12 10:15
3072161026	2541-W3	Wipe	06/11/12 00:01	06/25/12 10:15
3072161027	2541-W4	Wipe	06/11/12 00:01	06/25/12 10:15
3072161028	2541-W5	Wipe	06/11/12 00:01	06/25/12 10:15
3072161029	2541-W6	Wipe	06/11/12 00:01	06/25/12 10:15
3072161030	2541-W6D	Wipe	06/11/12 00:01	06/25/12 10:15
3072161031	2541-W7	Wipe	06/11/12 00:01	06/25/12 10:15
3072161032	2541-W8	Wipe	06/11/12 00:01	06/25/12 10:15
3072161033	2541-W9	Wipe	06/11/12 00:01	06/25/12 10:15
3072161034	2541-W10	Wipe	06/11/12 00:01	06/25/12 10:15
3072161035	2541-W11	Wipe	06/11/12 00:01	06/25/12 10:15
3072161036	2541-W12	Wipe	06/11/12 00:01	06/25/12 10:15
3072161037	2541-W13	Wipe	06/11/12 00:01	06/25/12 10:15

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SAMPLE SUMMARY

Project: Fort Monmouth 1207079

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072161038	2541-W14	Wipe	06/11/12 00:01	06/25/12 10:15
3072161039	2541-W15	Wipe	06/11/12 00:01	06/25/12 10:15
3072161040	2541-W16	Wipe	06/11/12 00:01	06/25/12 10:15
3072161041	2541-W17	Wipe	06/11/12 00:01	06/25/12 10:15
3072161042	2541-W18	Wipe	06/11/12 00:01	06/25/12 10:15
3072161043	2541-W19	Wipe	06/11/12 00:01	06/25/12 10:15
3072161044	2541-W20	Wipe	06/11/12 00:01	06/25/12 10:15
3072161045	2541-W20D	Wipe	06/11/12 00:01	06/25/12 10:15
3072161046	2541-W21	Wipe	06/11/12 00:01	06/25/12 10:15
3072161047	2541-W22	Wipe	06/11/12 00:01	06/25/12 10:15
3072161048	2541-W23	Wipe	06/11/12 00:01	06/25/12 10:15
3072161049	2541-W24	Wipe	06/11/12 00:01	06/25/12 10:15
3072161050	2541-W25	Wipe	06/11/12 00:01	06/25/12 10:15
3072161051	2541-W26	Wipe	06/11/12 00:01	06/25/12 10:15
3072161052	2541-W27	Wipe	06/11/12 00:01	06/25/12 10:15
3072161053	2541-W28	Wipe	06/11/12 00:01	06/25/12 10:15
3072161054	2541-W29	Wipe	06/11/12 00:01	06/25/12 10:15
3072161055	2541-W30	Wipe	06/11/12 00:01	06/25/12 10:15
3072161056	275-1	Wipe	06/05/12 00:01	06/25/12 10:15
3072161057	275-2	Wipe	06/05/12 00:01	06/25/12 10:15
3072161058	275-3	Wipe	06/05/12 00:01	06/25/12 10:15
3072161059	275-4	Wipe	06/05/12 00:01	06/25/12 10:15
3072161060	275-5	Wipe	06/05/12 00:01	06/25/12 10:15
3072161061	275-6	Wipe	06/05/12 00:01	06/25/12 10:15
3072161062	275-7	Wipe	06/05/12 00:01	06/25/12 10:15
3072161063	275-8	Wipe	06/05/12 00:01	06/25/12 10:15
3072161064	275-9	Wipe	06/05/12 00:01	06/25/12 10:15
3072161065	275-10	Wipe	06/05/12 00:01	06/25/12 10:15
3072161066	275-11	Wipe	06/05/12 00:01	06/25/12 10:15
3072161067	275-12	Wipe	06/05/12 00:01	06/25/12 10:15
3072161068	275-13	Wipe	06/05/12 00:01	06/25/12 10:15
3072161069	275-14	Wipe	06/05/12 00:01	06/25/12 10:15
3072161070	275-14D	Wipe	06/05/12 00:01	06/25/12 10:15
3072161071	275-15	Wipe	06/05/12 00:01	06/25/12 10:15
3072161072	275-16	Wipe	06/05/12 00:01	06/25/12 10:15
3072161073	275-17	Wipe	06/05/12 00:01	06/25/12 10:15
3072161074	275-18	Wipe	06/05/12 00:01	06/25/12 10:15

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072161075	275-19	Wipe	06/05/12 00:01	06/25/12 10:15
3072161076	275-19D	Wipe	06/05/12 00:01	06/25/12 10:15
3072161077	275-20	Wipe	06/05/12 00:01	06/25/12 10:15
3072161078	275-21	Wipe	06/05/12 00:01	06/25/12 10:15
3072161079	275-22	Wipe	06/05/12 00:01	06/25/12 10:15
3072161080	275-23	Wipe	06/05/12 00:01	06/25/12 10:15
3072161081	275-24	Wipe	06/05/12 00:01	06/25/12 10:15
3072161082	275-24D	Wipe	06/05/12 00:01	06/25/12 10:15
3072161083	275-25	Wipe	06/05/12 00:01	06/25/12 10:15
3072161084	275-26	Wipe	06/05/12 00:01	06/25/12 10:15
3072161085	275-27	Wipe	06/05/12 00:01	06/25/12 10:15
3072161086	275-28	Wipe	06/05/12 00:01	06/25/12 10:15
3072161087	275-29	Wipe	06/05/12 00:01	06/25/12 10:15
3072161088	275-30	Wipe	06/05/12 00:01	06/25/12 10:15
3072161089	275-C8	Wipe	06/05/12 00:01	06/25/12 10:15
3072161090	275-C13	Wipe	06/05/12 00:01	06/25/12 10:15
3072161091	275-C15	Wipe	06/05/12 00:01	06/25/12 10:15
3072161092	275-C17	Wipe	06/05/12 00:01	06/25/12 10:15
3072161093	292-1	Wipe	06/06/12 00:01	06/25/12 10:15
3072161094	292-2	Wipe	06/06/12 00:01	06/25/12 10:15
3072161095	292-3	Wipe	06/06/12 00:01	06/25/12 10:15
3072161096	292-4	Wipe	06/06/12 00:01	06/25/12 10:15
3072161097	292-5	Wipe	06/06/12 00:01	06/25/12 10:15
3072161098	292-6	Wipe	06/06/12 00:01	06/25/12 10:15
3072161099	292-6D	Wipe	06/06/12 00:01	06/25/12 10:15
3072161100	292-7	Wipe	06/06/12 00:01	06/25/12 10:15

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072161001	2541-F9	EPA 906.0M	MBT	1	PASI-PA
3072161002	2541-F10	EPA 906.0M	MBT	1	PASI-PA
3072161003	2541-F11	EPA 906.0M	MBT	1	PASI-PA
3072161004	2541-F12	EPA 906.0M	MBT	1	PASI-PA
3072161005	2541-F13	EPA 906.0M	MBT	1	PASI-PA
3072161006	2541-F13D	EPA 906.0M	MBT	1	PASI-PA
3072161007	2541-F14	EPA 906.0M	MBT	1	PASI-PA
3072161008	2541-F15	EPA 906.0M	MBT	1	PASI-PA
3072161009	2541-F16	EPA 906.0M	MBT	1	PASI-PA
3072161010	2541-F17	EPA 906.0M	MBT	1	PASI-PA
3072161011	2541-F18	EPA 906.0M	MBT	1	PASI-PA
3072161012	2541-F19	EPA 906.0M	MBT	1	PASI-PA
3072161013	2541-F20	EPA 906.0M	MBT	1	PASI-PA
3072161014	2541-F21	EPA 906.0M	MBT	1	PASI-PA
3072161015	2541-F22	EPA 906.0M	MBT	1	PASI-PA
3072161016	2541-F23	EPA 906.0M	MBT	1	PASI-PA
3072161017	2541-F24	EPA 906.0M	MBT	1	PASI-PA
3072161018	2541-F25	EPA 906.0M	MBT	1	PASI-PA
3072161019	2541-F26	EPA 906.0M	MBT	1	PASI-PA
3072161020	2541-F27	EPA 906.0M	MBT	1	PASI-PA
3072161021	2541-F28	EPA 906.0M	MBT	1	PASI-PA
3072161022	2541-F29	EPA 906.0M	MBT	1	PASI-PA
3072161023	2541-F30	EPA 906.0M	MBT	1	PASI-PA
3072161024	2541-W1	EPA 906.0M	MBT	1	PASI-PA
3072161025	2541-W2	EPA 906.0M	MBT	1	PASI-PA
3072161026	2541-W3	EPA 906.0M	MBT	1	PASI-PA
3072161027	2541-W4	EPA 906.0M	MBT	1	PASI-PA
3072161028	2541-W5	EPA 906.0M	MBT	1	PASI-PA
3072161029	2541-W6	EPA 906.0M	MBT	1	PASI-PA
3072161030	2541-W6D	EPA 906.0M	MBT	1	PASI-PA
3072161031	2541-W7	EPA 906.0M	MBT	1	PASI-PA
3072161032	2541-W8	EPA 906.0M	MBT	1	PASI-PA
3072161033	2541-W9	EPA 906.0M	MBT	1	PASI-PA
3072161034	2541-W10	EPA 906.0M	MBT	1	PASI-PA
3072161035	2541-W11	EPA 906.0M	MBT	1	PASI-PA
3072161036	2541-W12	EPA 906.0M	MBT	1	PASI-PA
3072161037	2541-W13	EPA 906.0M	MBT	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072161038	2541-W14	EPA 906.0M	MBT	1	PASI-PA
3072161039	2541-W15	EPA 906.0M	MBT	1	PASI-PA
3072161040	2541-W16	EPA 906.0M	MBT	1	PASI-PA
3072161041	2541-W17	EPA 906.0M	MBT	1	PASI-PA
3072161042	2541-W18	EPA 906.0M	MBT	1	PASI-PA
3072161043	2541-W19	EPA 906.0M	MBT	1	PASI-PA
3072161044	2541-W20	EPA 906.0M	MBT	1	PASI-PA
3072161045	2541-W20D	EPA 906.0M	MBT	1	PASI-PA
3072161046	2541-W21	EPA 906.0M	MBT	1	PASI-PA
3072161047	2541-W22	EPA 906.0M	MBT	1	PASI-PA
3072161048	2541-W23	EPA 906.0M	MBT	1	PASI-PA
3072161049	2541-W24	EPA 906.0M	MBT	1	PASI-PA
3072161050	2541-W25	EPA 906.0M	MBT	1	PASI-PA
3072161051	2541-W26	EPA 906.0M	MBT	1	PASI-PA
3072161052	2541-W27	EPA 906.0M	MBT	1	PASI-PA
3072161053	2541-W28	EPA 906.0M	MBT	1	PASI-PA
3072161054	2541-W29	EPA 906.0M	MBT	1	PASI-PA
3072161055	2541-W30	EPA 906.0M	MBT	1	PASI-PA
3072161056	275-1	EPA 906.0M	MBT	1	PASI-PA
3072161057	275-2	EPA 906.0M	MBT	1	PASI-PA
3072161058	275-3	EPA 906.0M	MBT	1	PASI-PA
3072161059	275-4	EPA 906.0M	MBT	1	PASI-PA
3072161060	275-5	EPA 906.0M	MBT	1	PASI-PA
3072161061	275-6	EPA 906.0M	MBT	1	PASI-PA
3072161062	275-7	EPA 906.0M	MBT	1	PASI-PA
3072161063	275-8	EPA 906.0M	MBT	1	PASI-PA
3072161064	275-9	EPA 906.0M	MBT	1	PASI-PA
3072161065	275-10	EPA 906.0M	MBT	1	PASI-PA
3072161066	275-11	EPA 906.0M	MBT	1	PASI-PA
3072161067	275-12	EPA 906.0M	MBT	1	PASI-PA
3072161068	275-13	EPA 906.0M	MBT	1	PASI-PA
3072161069	275-14	EPA 906.0M	MBT	1	PASI-PA
3072161070	275-14D	EPA 906.0M	MBT	1	PASI-PA
3072161071	275-15	EPA 906.0M	MBT	1	PASI-PA
3072161072	275-16	EPA 906.0M	MBT	1	PASI-PA
3072161073	275-17	EPA 906.0M	MBT	1	PASI-PA
3072161074	275-18	EPA 906.0M	MBT	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072161075	275-19	EPA 906.0M	MBT	1	PASI-PA
3072161076	275-19D	EPA 906.0M	MBT	1	PASI-PA
3072161077	275-20	EPA 906.0M	MBT	1	PASI-PA
3072161078	275-21	EPA 906.0M	MBT	1	PASI-PA
3072161079	275-22	EPA 906.0M	MBT	1	PASI-PA
3072161080	275-23	EPA 906.0M	MBT	1	PASI-PA
3072161081	275-24	EPA 906.0M	MBT	1	PASI-PA
3072161082	275-24D	EPA 906.0M	MBT	1	PASI-PA
3072161083	275-25	EPA 906.0M	MBT	1	PASI-PA
3072161084	275-26	EPA 906.0M	MBT	1	PASI-PA
3072161085	275-27	EPA 906.0M	MBT	1	PASI-PA
3072161086	275-28	EPA 906.0M	MBT	1	PASI-PA
3072161087	275-29	EPA 906.0M	MBT	1	PASI-PA
3072161088	275-30	EPA 906.0M	MBT	1	PASI-PA
3072161089	275-C8	EPA 906.0M	MBT	1	PASI-PA
3072161090	275-C13	EPA 906.0M	MBT	1	PASI-PA
3072161091	275-C15	EPA 906.0M	MBT	1	PASI-PA
3072161092	275-C17	EPA 906.0M	MBT	1	PASI-PA
3072161093	292-1	EPA 906.0M	MBT	1	PASI-PA
3072161094	292-2	EPA 906.0M	MBT	1	PASI-PA
3072161095	292-3	EPA 906.0M	MBT	1	PASI-PA
3072161096	292-4	EPA 906.0M	MBT	1	PASI-PA
3072161097	292-5	EPA 906.0M	MBT	1	PASI-PA
3072161098	292-6	EPA 906.0M	MBT	1	PASI-PA
3072161099	292-6D	EPA 906.0M	MBT	1	PASI-PA
3072161100	292-7	EPA 906.0M	MBT	1	PASI-PA

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Sample:	Lab ID:	Collected:	Received:	Matrix:		
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Sample: 2541-F9	Lab ID: 3072161001	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	3.70J ± 4.11 (7.97)	dpm/sample	07/21/12 10:02		
Sample: 2541-F10	Lab ID: 3072161002	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	-1.49U ± 3.69 (7.97)	dpm/sample	07/21/12 10:16		
Sample: 2541-F11	Lab ID: 3072161003	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	-0.838U ± 3.76 (8.00)	dpm/sample	07/21/12 10:30		
Sample: 2541-F12	Lab ID: 3072161004	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	0.610U ± 3.85 (7.97)	dpm/sample	07/21/12 10:43		
Sample: 2541-F13	Lab ID: 3072161005	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	-3.79U ± 3.53 (7.98)	dpm/sample	07/21/12 10:57		
Sample: 2541-F13D	Lab ID: 3072161006	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	-1.77U ± 3.67 (7.96)	dpm/sample	07/21/12 11:11		
Sample: 2541-F14	Lab ID: 3072161007	Collected: 06/11/12 00:01	Received: 06/25/12 10:15	Matrix: Wipe		
PWS:	Site ID:	Sample Type:				
LSC Low Energy Beta	EPA 906.0M	-0.328U ± 3.80 (8.02)	dpm/sample	07/21/12 11:25		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-F15		Lab ID: 3072161008	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	-2.37U ± 3.67 (8.06)	dpm/sample	07/21/12 11:39		

Sample: 2541-F16		Lab ID: 3072161009	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 ± 3.71 (7.98)	dpm/sample	07/21/12 11:53		

Sample: 2541-F17		Lab ID: 3072161010	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	-0.694U ± 3.76 (7.99)	dpm/sample	07/21/12 12:06		

Sample: 2541-F18		Lab ID: 3072161011	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	-3.40U ± 3.55 (7.96)	dpm/sample	07/21/12 12:20		

Sample: 2541-F19		Lab ID: 3072161012	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	-0.714U ± 3.76 (7.98)	dpm/sample	07/21/12 12:34		

Sample: 2541-F20		Lab ID: 3072161013	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 ± 3.79 (8.04)	dpm/sample	07/21/12 12:48		

Sample: 2541-F21		Lab ID: 3072161014	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	-2.89U ± 3.59 (7.97)	dpm/sample	07/21/12 13:02		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-F22		Lab ID: 3072161015	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	1.23U ± 3.92 (7.99)	dpm/sample	07/21/12 13:15		

Sample: 2541-F23		Lab ID: 3072161016	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	0.183U ± 3.82 (7.97)	dpm/sample	07/21/12 13:29		

Sample: 2541-F24		Lab ID: 3072161017	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	-0.142U ± 3.90 (8.31)	dpm/sample	07/21/12 17:18		

Sample: 2541-F25		Lab ID: 3072161018	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	-3.45U ± 3.68 (8.38)	dpm/sample	07/21/12 17:30		

Sample: 2541-F26		Lab ID: 3072161019	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	-0.695U ± 3.88 (8.35)	dpm/sample	07/21/12 17:43		

Sample: 2541-F27		Lab ID: 3072161020	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 ± 4.11 (8.37)	dpm/sample	07/21/12 17:56		

Sample: 2541-F28		Lab ID: 3072161021	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	0.503U ± 4.29 (9.77)	dpm/sample	07/30/12 15:17		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Sample: 2541-F29		Lab ID: 3072161022	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	-0.333U ± 4.23 (9.87)	dpm/sample	07/30/12 15:25		

Sample: 2541-F30		Lab ID: 3072161023	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	-1.44U ± 4.07 (9.83)	dpm/sample	07/30/12 15:33		

Sample: 2541-W1		Lab ID: 3072161024	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	-5.12U ± 3.64 (9.93)	dpm/sample	07/30/12 15:41		

Sample: 2541-W2		Lab ID: 3072161025	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	1.04U ± 4.35 (9.76)	dpm/sample	07/30/12 15:49		

Sample: 2541-W3		Lab ID: 3072161026	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	4.91J ± 4.83 (9.76)	dpm/sample	07/30/12 15:59		

Sample: 2541-W4		Lab ID: 3072161027	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	-1.19U ± 4.18 (10.0)	dpm/sample	07/30/12 16:08		

Sample: 2541-W5		Lab ID: 3072161028	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	-0.894U ± 4.13 (9.80)	dpm/sample	07/30/12 16:16		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-W6		Lab ID: 3072161029	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	1.61U ± 4.42 (9.77)	dpm/sample	07/30/12 16:24		

Sample: 2541-W6D		Lab ID: 3072161030	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	-1.43U ± 4.03 (9.75)	dpm/sample	07/30/12 16:32		

Sample: 2541-W7		Lab ID: 3072161031	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	-1.16U ± 4.07 (9.76)	dpm/sample	07/30/12 16:40		

Sample: 2541-W8		Lab ID: 3072161032	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	0.773U ± 4.31 (9.75)	dpm/sample	07/30/12 16:48		

Sample: 2541-W9		Lab ID: 3072161033	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	-2.26U ± 3.92 (9.74)	dpm/sample	07/30/12 16:56		

Sample: 2541-W10		Lab ID: 3072161034	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	-1.16U ± 4.07 (9.76)	dpm/sample	07/30/12 17:04		

Sample: 2541-W11		Lab ID: 3072161035	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	4.92J ± 4.84 (9.78)	dpm/sample	07/30/12 17:12		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-W12		Lab ID: 3072161036	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 ± 3.86 (9.76)	dpm/sample	07/30/12 17:20		

Sample: 2541-W13		Lab ID: 3072161037	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	-2.55U ± 3.89 (9.74)	dpm/sample	07/30/12 17:28		

Sample: 2541-W14		Lab ID: 3072161038	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	-1.43U ± 4.03 (9.74)	dpm/sample	07/30/12 17:37		

Sample: 2541-W15		Lab ID: 3072161039	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	2.70U ± 4.55 (9.74)	dpm/sample	07/30/12 17:45		

Sample: 2541-W16		Lab ID: 3072161040	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	2.14U ± 4.48 (9.74)	dpm/sample	07/30/12 17:53		

Sample: 2541-W17		Lab ID: 3072161041	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	5.53J ± 4.70 (9.23)	dpm/sample	07/21/12 21:53		

Sample: 2541-W18		Lab ID: 3072161042	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	-3.01U ± 3.57 (9.24)	dpm/sample	07/21/12 22:02		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-W19		Lab ID: 3072161043	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	2.52U ± 4.33 (9.29)	dpm/sample	07/21/12 22:10		

Sample: 2541-W20		Lab ID: 3072161044	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 ± 4.43 (9.26)	dpm/sample	07/21/12 22:18		

Sample: 2541-W20D		Lab ID: 3072161045	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	-1.09U ± 3.86 (9.31)	dpm/sample	07/21/12 22:26		

Sample: 2541-W21		Lab ID: 3072161046	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	-0.251U ± 3.95 (9.26)	dpm/sample	07/21/12 22:34		

Sample: 2541-W22		Lab ID: 3072161047	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 ± 4.49 (9.24)	dpm/sample	07/21/12 22:42		

Sample: 2541-W23		Lab ID: 3072161048	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 (9.23)	dpm/sample	07/21/12 22:50		

Sample: 2541-W24		Lab ID: 3072161049	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 ± 3.87 (9.23)	dpm/sample	07/21/12 22:58		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 2541-W25		Lab ID: 3072161050	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 ± 4.16 (9.31)	dpm/sample	07/21/12 23:06		

Sample: 2541-W26		Lab ID: 3072161051	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	3.34U ± 4.42 (9.24)	dpm/sample	07/21/12 23:14		

Sample: 2541-W27		Lab ID: 3072161052	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	-3.28U ± 3.53 (9.24)	dpm/sample	07/21/12 23:22		

Sample: 2541-W28		Lab ID: 3072161053	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	2.27U ± 4.33 (9.37)	dpm/sample	07/21/12 23:30		

Sample: 2541-W29		Lab ID: 3072161054	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	2.51U ± 4.30 (9.23)	dpm/sample	07/21/12 23:38		

Sample: 2541-W30		Lab ID: 3072161055	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 ± 4.24 (9.24)	dpm/sample	07/21/12 23:46		

Sample: 275-1		Lab ID: 3072161056	Collected: 06/05/12 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 ± 4.15 (9.29)	dpm/sample	07/21/12 23:54		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 275-2		Lab ID: 3072161057	Collected: 06/05/12 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	-0.251U ± 3.95 (9.25)	dpm/sample	07/22/12 00:02			

Sample: 275-3		Lab ID: 3072161058	Collected: 06/05/12 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	0.0386U ± 3.98 (9.24)	dpm/sample	07/22/12 00:10			

Sample: 275-4		Lab ID: 3072161059	Collected: 06/05/12 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	-1.89U ± 3.72 (9.25)	dpm/sample	07/22/12 00:18			

Sample: 275-5		Lab ID: 3072161060	Collected: 06/05/12 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 ± 3.79 (9.24)	dpm/sample	07/22/12 00:26			

Sample: 275-6		Lab ID: 3072161061	Collected: 06/05/12 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	0.867U ± 4.17 (9.43)	dpm/sample	07/22/12 00:58			

Sample: 275-7		Lab ID: 3072161062	Collected: 06/05/12 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	1.68U ± 4.21 (9.26)	dpm/sample	07/22/12 01:06			

Sample: 275-8		Lab ID: 3072161063	Collected: 06/05/12 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	0.579U ± 4.05 (9.24)	dpm/sample	07/22/12 01:14			

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Sample: 275-9		Lab ID: 3072161064	Collected: 06/05/12 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	3.62J ± 4.47 (9.27)	dpm/sample	07/22/12 01:22			

Sample: 275-10		Lab ID: 3072161065	Collected: 06/05/12 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	3.34U ± 4.41 (9.24)	dpm/sample	07/22/12 01:30			

Sample: 275-11		Lab ID: 3072161066	Collected: 06/05/12 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	07/22/12 01:38			

Sample: 275-12		Lab ID: 3072161067	Collected: 06/05/12 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	2.27U ± 4.33 (9.36)	dpm/sample	07/22/12 01:47			

Sample: 275-13		Lab ID: 3072161068	Collected: 06/05/12 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	0.850U ± 4.09 (9.25)	dpm/sample	07/22/12 01:55			

Sample: 275-14		Lab ID: 3072161069	Collected: 06/05/12 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 (9.24)	dpm/sample	07/22/12 02:03			

Sample: 275-14D		Lab ID: 3072161070	Collected: 06/05/12 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	3.61J ± 4.45 (9.24)	dpm/sample	07/22/12 02:11			

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Sample: 275-15		Lab ID: 3072161071	Collected: 06/05/12 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	4.46J ± 4.58 (9.27)	dpm/sample	07/22/12 02:19		

Sample: 275-16		Lab ID: 3072161072	Collected: 06/05/12 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	5.88J ± 4.78 (9.32)	dpm/sample	07/22/12 02:27		

Sample: 275-17		Lab ID: 3072161073	Collected: 06/05/12 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 ± 4.24 (9.24)	dpm/sample	07/22/12 02:36		

Sample: 275-18		Lab ID: 3072161074	Collected: 06/05/12 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	5.02J ± 4.65 (9.28)	dpm/sample	07/22/12 02:44		

Sample: 275-19		Lab ID: 3072161075	Collected: 06/05/12 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	-4.25U ± 3.53 (9.54)	dpm/sample	07/22/12 02:52		

Sample: 275-19D		Lab ID: 3072161076	Collected: 06/05/12 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	-2.45U ± 3.65 (9.24)	dpm/sample	07/22/12 03:00		

Sample: 275-20		Lab ID: 3072161077	Collected: 06/05/12 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	3.34U ± 4.42 (9.25)	dpm/sample	07/22/12 03:08		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 275-21		Lab ID: 3072161078	Collected: 06/05/12 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	4.47J ± 4.59 (9.31)	dpm/sample	07/22/12 03:16		

Sample: 275-22		Lab ID: 3072161079	Collected: 06/05/12 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	0.581U ± 4.07 (9.28)	dpm/sample	07/22/12 03:24		

Sample: 275-23		Lab ID: 3072161080	Collected: 06/05/12 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 ± 4.27 (9.31)	dpm/sample	07/22/12 03:32		

Sample: 275-24		Lab ID: 3072161081	Collected: 06/05/12 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	1.72U ± 4.30 (9.48)	dpm/sample	07/22/12 04:04		

Sample: 275-24D		Lab ID: 3072161082	Collected: 06/05/12 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	3.07U ± 4.38 (9.24)	dpm/sample	07/22/12 04:13		

Sample: 275-25		Lab ID: 3072161083	Collected: 06/05/12 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	-2.45U ± 3.65 (9.24)	dpm/sample	07/22/12 04:21		

Sample: 275-26		Lab ID: 3072161084	Collected: 06/05/12 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	5.00J ± 4.63 (9.24)	dpm/sample	07/22/12 04:29		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 275-27		Lab ID: 3072161085	Collected: 06/05/12 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	-2.45U ± 3.65 (9.25)	dpm/sample	07/22/12 04:37		

Sample: 275-28		Lab ID: 3072161086	Collected: 06/05/12 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	07/22/12 04:45		

Sample: 275-29		Lab ID: 3072161087	Collected: 06/05/12 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	2.78U ± 4.34 (9.24)	dpm/sample	07/22/12 04:53		

Sample: 275-30		Lab ID: 3072161088	Collected: 06/05/12 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	-3.56U ± 3.50 (9.25)	dpm/sample	07/22/12 05:01		

Sample: 275-C8		Lab ID: 3072161089	Collected: 06/05/12 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	-0.792U ± 3.87 (9.25)	dpm/sample	07/22/12 05:09		

Sample: 275-C13		Lab ID: 3072161090	Collected: 06/05/12 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 ± 4.05 (9.59)	dpm/sample	07/22/12 05:17		

Sample: 275-C15		Lab ID: 3072161091	Collected: 06/05/12 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	-2.18U ± 3.69 (9.25)	dpm/sample	07/22/12 05:25		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

Sample: 275-C17		Lab ID: 3072161092	Collected: 06/05/12 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	-2.49U ± 3.71 (9.40)	dpm/sample	07/22/12 05:33		

Sample: 292-1		Lab ID: 3072161093	Collected: 06/06/12 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	1.68U ± 4.20 (9.24)	dpm/sample	07/22/12 05:41		

Sample: 292-2		Lab ID: 3072161094	Collected: 06/06/12 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	0.849U ± 4.09 (9.24)	dpm/sample	07/22/12 05:49		

Sample: 292-3		Lab ID: 3072161095	Collected: 06/06/12 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	-1.65U ± 3.82 (9.40)	dpm/sample	07/22/12 05:57		

Sample: 292-4		Lab ID: 3072161096	Collected: 06/06/12 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	-1.63U ± 3.78 (9.29)	dpm/sample	07/22/12 06:05		

Sample: 292-5		Lab ID: 3072161097	Collected: 06/06/12 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 ± 4.28 (9.26)	dpm/sample	07/22/12 06:13		

Sample: 292-6		Lab ID: 3072161098	Collected: 06/06/12 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	2.79U ± 4.36 (9.28)	dpm/sample	07/22/12 06:21		

ANALYTICAL RESULTS

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

Sample: 292-6D	Lab ID: 3072161099	Collected: 06/06/12 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	0.886U ± 4.27 (9.64)	dpm/sample	07/22/12 06:29		

Sample: 292-7	Lab ID: 3072161100	Collected: 06/06/12 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	4.29J ± 4.66 (9.51)	dpm/sample	07/22/12 06:37		

QUALITY CONTROL DATA

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

QC Batch: RADC/12507 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072161001, 3072161002, 3072161003, 3072161004, 3072161005, 3072161006, 3072161007, 3072161008,
3072161009, 3072161010, 3072161011, 3072161012, 3072161013, 3072161014, 3072161015, 3072161016,
3072161017, 3072161018, 3072161019, 3072161020

METHOD BLANK: 459106 Matrix: Impact Plate
Associated Lab Samples: 3072161001, 3072161002, 3072161003, 3072161004, 3072161005, 3072161006, 3072161007, 3072161008,
3072161009, 3072161010, 3072161011, 3072161012, 3072161013, 3072161014, 3072161015, 3072161016,
3072161017, 3072161018, 3072161019, 3072161020

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	-3.37U ± 3.66 (8.18)	dpm/sample	07/21/12 09:48	

QUALITY CONTROL DATA

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

QC Batch: RADC/12508 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072161021, 3072161022, 3072161023, 3072161024, 3072161025, 3072161026, 3072161027, 3072161028,
3072161029, 3072161030, 3072161031, 3072161032, 3072161033, 3072161034, 3072161035, 3072161036,
3072161037, 3072161038, 3072161039, 3072161040

METHOD BLANK: 459107 Matrix: Impact Plate
Associated Lab Samples: 3072161021, 3072161022, 3072161023, 3072161024, 3072161025, 3072161026, 3072161027, 3072161028,
3072161029, 3072161030, 3072161031, 3072161032, 3072161033, 3072161034, 3072161035, 3072161036,
3072161037, 3072161038, 3072161039, 3072161040

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	-0.921U ± 4.25 (10.1)	dpm/sample	07/30/12 18:18	

QUALITY CONTROL DATA

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

QC Batch: RADC/12509 Analysis Method: EPA 906.0M
 QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
 Associated Lab Samples: 3072161041, 3072161042, 3072161043, 3072161044, 3072161045, 3072161046, 3072161047, 3072161048,
 3072161049, 3072161050, 3072161051, 3072161052, 3072161053, 3072161054, 3072161055, 3072161056,
 3072161057, 3072161058, 3072161059, 3072161060

METHOD BLANK: 459108 Matrix: Impact Plate
 Associated Lab Samples: 3072161041, 3072161042, 3072161043, 3072161044, 3072161045, 3072161046, 3072161047, 3072161048,
 3072161049, 3072161050, 3072161051, 3072161052, 3072161053, 3072161054, 3072161055, 3072161056,
 3072161057, 3072161058, 3072161059, 3072161060

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.44U ± 4.27 (9.48)	dpm/sample	07/21/12 21:45	

QUALITY CONTROL DATA

Project: Fort Monmouth 1207079

Pace Project No.: 3072161

QC Batch: RADC/12510

Analysis Method: EPA 906.0M

QC Batch Method: EPA 906.0M

Analysis Description: 906.0 LSC Low Energy Beta

Associated Lab Samples: 3072161061, 3072161062, 3072161063, 3072161064, 3072161065, 3072161066, 3072161067, 3072161068,
3072161069, 3072161070, 3072161071, 3072161072, 3072161073, 3072161074, 3072161075, 3072161076,
3072161077, 3072161078, 3072161079, 3072161080

METHOD BLANK: 459109

Matrix: Impact Plate

Associated Lab Samples: 3072161061, 3072161062, 3072161063, 3072161064, 3072161065, 3072161066, 3072161067, 3072161068,
3072161069, 3072161070, 3072161071, 3072161072, 3072161073, 3072161074, 3072161075, 3072161076,
3072161077, 3072161078, 3072161079, 3072161080

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.47U ± 4.34 (9.63)	dpm/sample	07/22/12 00:50	

QUALITY CONTROL DATA

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

QC Batch:	RADC/12511	Analysis Method:	EPA 906.0M
QC Batch Method:	EPA 906.0M	Analysis Description:	906.0 LSC Low Energy Beta
Associated Lab Samples:	3072161081, 3072161082, 3072161083, 3072161084, 3072161085, 3072161086, 3072161087, 3072161088, 3072161089, 3072161090, 3072161091, 3072161092, 3072161093, 3072161094, 3072161095, 3072161096, 3072161097, 3072161098, 3072161099, 3072161100		

METHOD BLANK:	459110	Matrix:	Impact Plate
Associated Lab Samples:	3072161081, 3072161082, 3072161083, 3072161084, 3072161085, 3072161086, 3072161087, 3072161088, 3072161089, 3072161090, 3072161091, 3072161092, 3072161093, 3072161094, 3072161095, 3072161096, 3072161097, 3072161098, 3072161099, 3072161100		

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	0.326U ± 4.24 (9.75)	dpm/sample	07/22/12 03:56	

QUALIFIERS

Project: Fort Monmouth 1207079
Pace Project No.: 3072161

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: 3072161

**Chain of Custody
And
Sample Receiving Conditions
Upon Receipt Form**



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:

Company: US Army Corps of Engineers, Address: 10 South Howard Street, Baltimore, MD, Email To: david.j.watters@usace.army.mil, Project Name: Fort Monmouth Rad Survey, Project Number: ASAP

Section B Required Project Information:

Report To: David Watters, Copy To: Alan Warminski, Purchase Order No.: , Project Name: Fort Monmouth Rad Survey, Project Number: ASAP

Section C Invoice Information:

Attention: , Address: , Pace Quote Reference: , Pace Project Manager: Carin Ferris, Pace Profile #: , Site Location: NJ, STATE: NJ

REGULATORY AGENCY: NPDES, UST, RCRA, DRINKING WATER, OTHER, NRC

Table with columns: ITEM #, Section D Required Client Information, Valid Matrix Codes, MATRIX CODE, SAMPLE TYPE, COLLECTED, COMPOSITE START, COMPOSITE END, DATE, TIME, Preservatives, Analysis Test, Requested Analysis Filtered (Y/N), Residual Chlorine (Y/N), Pace Project No./ Lab I.D.

Handwritten signature and date: 6/25/12



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: **29** of **38**

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: US Army Corps of Engineers		Report To: David Watters		Attention:	
Address: 10 South Howard Street Baltimore, MD		Copy To: Alan Warminski		REGULATORY AGENCY	
Email To: david.j.watters@usace.army.mil		Purchase Order No.:		<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/> NRC	
Phone: 443-263-0916 Fax: none		Project Name: Fort Monmouth Rad Survey		Site Location	
Requested Due Date/TAT: ASAP		Project Number:		STATE: NJ	
Valid Matrix Codes		Matrix Code (see valid codes to left)		Requested Analysis Filtered (Y/N)	
DRINKING WATER WATER WATER PRODUCT SOLID WPE AIR OTHER TISSUE		SAMPLE TYPE (G-GRAB C-COMP) DATE TIME DATE TIME COMPOSITE START COMPOSITE END/GRAB		Gross Low Energy Beta Analysis Analysis Test Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₈ Methanol Other	
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		SAMPLE TEMP AT COLLECTION # OF CONTAINERS		Residual Chlorine (Y/N)	

ITEM #	MATRIX CODE	SAMPLE TYPE (G-GRAB C-COMP)	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₈	Methanol	Other	Analysis Test	Gross Low Energy Beta Analysis	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	
616	2541-F23	G	NA	NA	06/11/12	NA	NA	1	X									X			016
617	2541-F24	G	NA	NA	06/11/12	NA	NA	1	X									X			017
618	2541-F25	G	NA	NA	06/11/12	NA	NA	1	X									X			018
619	2541-F26	G	NA	NA	06/11/12	NA	NA	1	X									X			019
620	2541-F27	G	NA	NA	06/11/12	NA	NA	1	X									X			020
621	2541-F28	G	NA	NA	06/11/12	NA	NA	1	X									X			021
622	2541-F29	G	NA	NA	06/11/12	NA	NA	1	X									X			022
623	2541-F30	G	NA	NA	06/11/12	NA	NA	1	X									X			023
624	2541-W1	G	NA	NA	06/11/12	NA	NA	1	X									X			024
625	2541-W2	G	NA	NA	06/11/12	NA	NA	1	X									X			025
626	2541-W3	G	NA	NA	06/11/12	NA	NA	1	X									X			026
627	2541-W4	G	NA	NA	06/11/12	NA	NA	1	X									X			027
628	2541-W5	G	NA	NA	06/11/12	NA	NA	1	X									X			028
629	2541-W6	G	NA	NA	06/11/12	NA	NA	1	X									X			029
630	2541-W6D	G	NA	NA	06/11/12	NA	NA	1	X									X			030
631	2541-W7	G	NA	NA	06/11/12	NA	NA	1	X									X			031
632	2541-W8	G	NA	NA	06/11/12	NA	NA	1	X									X			032
633	2541-W9	G	NA	NA	06/11/12	NA	NA	1	X									X			033
634	2541-W10	G	NA	NA	06/11/12	NA	NA	1	X									X			034
635	2541-W11	G	NA	NA	06/11/12	NA	NA	1	X									X			035
636	2541-W12	G	NA	NA	06/11/12	NA	NA	1	X									X			036
637	2541-W13	G	NA	NA	06/11/12	NA	NA	1	X									X			037

John G/25/12 1015



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A

Required Client Information:

Company: US Army Corps of Engineers
 Address: 10 South Howard Street, Baltimore, MD
 Email To: david.j.watters@usace.army.mil
 Phone: 443-263-0916
 Project Name: Fort Monmouth Rad Survey
 Project Number: ASAP

Section B

Required Project Information:

Report To: David Watters
 Copy To: Alan Warminski
 Purchase Order No.:
 Project Name: Fort Monmouth Rad Survey
 Project Number: ASAP

Section C

Invoice Information:

Attention:
 Address:
 Pace Quote Reference:
 Pace Project Manager: Carin Ferris
 Pace Profile #:
 Regulatory Agency:
 NPDES GROUND WATER DRINKING WATER NRC
 UST RCRA OTHER
 Site Location: NJ
 STATE: NJ

ITEM #	Section D Required Client Information	Valid Matrix Codes	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C-COMP)	COLLECTED		DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↓	Requested Analysis: Filtered (Y/N)	Residual Chlorine (Y/N)
					COMPOSITE START	COMPOSITE END/GRAB								
682	SAMPLE ID (A-Z, 0-9 / . / -) Sample IDs MUST BE UNIQUE	DRINKING WATER WASTE WATER PRODUCT SOLID OIL MATERIAL AIR OTHER TISSE	WP	G		06/05/12	NA	1	NA	X	H ₂ SO ₄ Unpreserved			
683			WP	G		06/05/12	NA	1	NA	X	HCl HNO ₃ NaOH Na ₂ S ₂ O ₃ Methanol Other			
684			WP	G		06/05/12	NA	1	NA	X				
685			WP	G		06/05/12	NA	1	NA	X				
686			WP	G		06/05/12	NA	1	NA	X				
687			WP	G		06/05/12	NA	1	NA	X				
688			WP	G		06/05/12	NA	1	NA	X				
689			WP	G		06/05/12	NA	1	NA	X				
690			WP	G		06/05/12	NA	1	NA	X				
691			WP	G		06/05/12	NA	1	NA	X				
692			WP	G		06/05/12	NA	1	NA	X				
693			WP	G		06/05/12	NA	1	NA	X				
694			WP	G		06/05/12	NA	1	NA	X				
695			WP	G		06/05/12	NA	1	NA	X				
696			WP	G		06/05/12	NA	1	NA	X				
697			WP	G		06/05/12	NA	1	NA	X				
698			WP	G		06/05/12	NA	1	NA	X				
699			WP	G		06/05/12	NA	1	NA	X				
700			WP	G		06/05/12	NA	1	NA	X				
701			WP	G		06/05/12	NA	1	NA	X				
702			WP	G		06/05/12	NA	1	NA	X				
703			WP	G		06/05/12	NA	1	NA	X				

3572161
Pace Project No. / Lab I.D.

Handwritten signature
6/25/12



Sample Condition Upon Receipt

Client Name: RTI Project # 3572161

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 825928653784

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

Optional
Proj. Due Date:
Proj. Name:

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 NO Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

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

Comments:

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

Project Number: 3972161

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 galL)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
100	WP																	←						
101	WP																							

Low Energy Beta Sample Analysis Data

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

1 459106-BLANK for HBN 91080 [RADC/1250]

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

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 09:48 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796277 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 09:48 Dilution
 Method EPA 906.0M Col ID Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796277 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL
Rad Chemistry	OK				
LSC Low Energy Beta	OK	-3.37U ± 3.66 (8.18)	dpm/sa -3.37U ± 3.66 (8.18)		dpm/sa

2 3072161001-2541-F9

Type PS Matrix Wipe Collected % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth
 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 10:02 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790689 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 10:02 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790689 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.70J ± 4.11 (7.97)	dpm/sa 3.70J ± 4.11 (7.97)		dpm/sa		

3 3072161002-2541-F10

Type PS Matrix Wipe Collected % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth
 1207079 Location

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

3 3072161002-2541-F10

Prep Information

Procedure 9060 I LEB **Batch** RADC/12507 **Prep Date** 7/21/2012 10:16 **Dilution**
Method EPA 906.0M **HBN** 91080 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790690 **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 10:16 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790690 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.49U ± 3.69 (7.97)	dpm/sa -1.49U ± 3.69 (7.97)		dpm/sa		

4 3072161003-2541-F11

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12507 **Prep Date** 7/21/2012 10:30 **Dilution**
Method EPA 906.0M **HBN** 91080 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790691 **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 10:30 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790691 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.838U ± 3.76 (8.00)	dpm/sa -0.838U ± 3.76 (8.00)		dpm/sa		

5 3072161004-2541-F12

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

5 3072161004-2541-F12

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 10:43 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790692 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 10:43 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790692 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.610U ± 3.85 (7.97)	dpm/sa 0.610U ± 3.85 (7.97)		dpm/sa		

6 3072161005-2541-F13

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 10:57 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790693 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 10:57 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790693 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.79U ± 3.53 (7.98)	dpm/sa -3.79U ± 3.53 (7.98)		dpm/sa		

7 3072161006-2541-F13D

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

7 3072161006-2541-F13D

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 11:11 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790694 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 11:11 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790694 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.77U ± 3.67 (7.96)	dpm/sa -1.77U ± 3.67 (7.96)		dpm/sa		

8 3072161007-2541-F14

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 11:25 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790695 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 11:25 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790695 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.328U ± 3.80 (8.02)	dpm/sa -0.328U ± 3.80 (8.02)		dpm/sa		

9 3072161008-2541-F15

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

9 3072161008-2541-F15

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 11:39 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790696 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 11:39 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790696 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.37U ± 3.67 (8.06)	dpm/sa -2.37U ± 3.67 (8.06)		dpm/sa		

10 3072161009-2541-F16

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 11:53 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790697 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 11:53 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790697 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.31U ± 3.71 (7.98)	dpm/sa -1.31U ± 3.71 (7.98)		dpm/sa		

11 3072161010-2541-F17

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

11 3072161010-2541-F17

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 12:06 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790698 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 12:06 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790698 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.694U ± 3.76 (7.99)	dpm/sa -0.694U ± 3.76 (7.99)		dpm/sa		

12 3072161011-2541-F18

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 12:20 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790699 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 12:20 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790699 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.40U ± 3.55 (7.96)	dpm/sa -3.40U ± 3.55 (7.96)		dpm/sa		

13 3072161012-2541-F19

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

13 3072161012-2541-F19

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 12:34 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790700 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 12:34 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790700 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.714U ± 3.76 (7.98)	dpm/sa -0.714U ± 3.76 (7.98)		dpm/sa		

14 3072161013-2541-F20

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 12:48 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790701 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 12:48 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790701 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.637U ± 3.79 (8.04)	dpm/sa -0.637U ± 3.79 (8.04)		dpm/sa		

15 3072161014-2541-F21

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

15 3072161014-2541-F21

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 13:02 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790702 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 13:02 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790702 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.89U ± 3.59 (7.97)	dpm/sa -2.89U ± 3.59 (7.97)		dpm/sa		

16 3072161015-2541-F22

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 13:15 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790703 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 13:15 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790703 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.23U ± 3.92 (7.99)	dpm/sa 1.23U ± 3.92 (7.99)		dpm/sa		

17 3072161016-2541-F23

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

17 3072161016-2541-F23

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 13:29 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790704 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 13:29 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790704 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.183U ± 3.82 (7.97)	dpm/sa 0.183U ± 3.82 (7.97)		dpm/sa		

18 3072161017-2541-F24

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 17:18 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790705 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 17:18 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790705 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.142U ± 3.90 (8.31)	dpm/sa -0.142U ± 3.90 (8.31)		dpm/sa		

19 3072161018-2541-F25

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12507 HBN 91080
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

19 3072161018-2541-F25

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 17:30 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790706 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 17:30 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790706 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.45U ± 3.68 (8.38)	dpm/sa -3.45U ± 3.68 (8.38)		dpm/sa		

20 3072161019-2541-F26

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12507 Prep Date 7/21/2012 17:43 Dilution
 Method EPA 906.0M HBN 91080 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790707 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 17:43 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790707 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.695U ± 3.88 (8.35)	dpm/sa -0.695U ± 3.88 (8.35)		dpm/sa		

21 3072161020-2541-F27

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12507 **HBN** 91080
Rule 9060 I LEB **Status** RE
Create Date 6/28/2012 **Analyst** MBT

21 3072161020-2541-F27

Prep Information

Procedure 9060 I LEB	Batch RADC/12507	Prep Date 7/21/2012 17:56	Dilution
Method EPA 906.0M	HBN 91080	Hold Date 12/8/2012 23:59	Analyst MBT
Schedule 2790708	Instru NONE		CC OK F
Initial Volume 1 mL Default	Final Volume, 1 mL Default		

Analytical Information

Procedure 9060 I LEB	Instru NONE	Run Date 7/21/2012 17:56	Dilution
Method EPA 906.0M	Col ID	Hold Date 12/8/2012 23:59	Analyst MBT
Schedule 2790708	File		CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.95U ± 4.11 (8.37)	dpm/sa 1.95U ± 4.11 (8.37)		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 13:58
 Batch ID 12507
 A-code 9060 ILEB 9060W
 Method EPA 906.0M EPA 906.0m

Assigned Analyst MBT
 Earliest Due Date 07/04/2012 07:12
 HBN 91080

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459106	BLANK	IP		QCACCOUNT	-3.37U	3.66	8.18	7/21/12 9:48
3072161	3072161001	PS	WP	6/11/2012 0:01	RTI	3.70J	4.11	7.97	7/21/12 10:02
3072161	3072161002	PS	WP	6/11/2012 0:01	RTI	-1.49U	3.69	7.97	7/21/12 10:16
3072161	3072161003	PS	WP	6/11/2012 0:01	RTI	-0.838U	3.76	8.00	7/21/12 10:30
3072161	3072161004	PS	WP	6/11/2012 0:01	RTI	0.610U	3.85	7.97	7/21/12 10:43
3072161	3072161005	PS	WP	6/11/2012 0:01	RTI	-3.79U	3.53	7.98	7/21/12 10:57
3072161	3072161006	PS	WP	6/11/2012 0:01	RTI	-1.77U	3.67	7.96	7/21/12 11:11
3072161	3072161007	PS	WP	6/11/2012 0:01	RTI	-0.328U	3.80	8.02	7/21/12 11:25
3072161	3072161008	PS	WP	6/11/2012 0:01	RTI	-2.37U	3.67	8.06	7/21/12 11:39
3072161	3072161009	PS	WP	6/11/2012 0:01	RTI	-1.31U	3.71	7.98	7/21/12 11:53
3072161	3072161010	PS	WP	6/11/2012 0:01	RTI	-0.694U	3.76	7.99	7/21/12 12:06
3072161	3072161011	PS	WP	6/11/2012 0:01	RTI	-3.40U	3.55	7.96	7/21/12 12:20
3072161	3072161012	PS	WP	6/11/2012 0:01	RTI	-0.714U	3.76	7.98	7/21/12 12:34
3072161	3072161013	PS	WP	6/11/2012 0:01	RTI	-0.637U	3.79	8.04	7/21/12 12:48
3072161	3072161014	PS	WP	6/11/2012 0:01	RTI	-2.89U	3.59	7.97	7/21/12 13:02
3072161	3072161015	PS	WP	6/11/2012 0:01	RTI	1.23U	3.92	7.99	7/21/12 13:15
3072161	3072161016	PS	WP	6/11/2012 0:01	RTI	0.183U	3.82	7.97	7/21/12 13:29
3072161	3072161017	PS	WP	6/11/2012 0:01	RTI	-0.142U	3.90	8.31	7/21/12 17:18
3072161	3072161018	PS	WP	6/11/2012 0:01	RTI	-3.45U	3.68	8.38	7/21/12 17:30
3072161	3072161019	PS	WP	6/11/2012 0:01	RTI	-0.695U	3.88	8.35	7/21/12 17:43
3072161	3072161020	PS	WP	6/11/2012 0:01	RTI	1.95U	4.11	8.37	7/21/12 17:56

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 7/27/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation



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

Test Code Low Energy Beta Analyst MBT
 Matrix Smear PrepSOP1 0
 Batch ID 12507 PrepSOP2 n/a
 Prep Start 7/16/2012 12:00 AnalSOP1 0
 Prep Finish 7/16/2012 AnalSOP2 n/a

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
459106	0.4784	0.0000	1.0000	-3.365	3.634	3.656	8.183	3.291	0.621	3.634	1.00
3072161001	0.4945	0.1107	0.9938	3.703	4.088	4.112	7.966	3.204	0.605	4.088	1.00
3072161002	0.4945	0.1107	0.9938	-1.485	3.687	3.691	7.967	3.204	0.605	3.687	1.00
3072161003	0.4923	0.1107	0.9938	-0.838	3.756	3.757	8.001	3.218	0.607	3.756	1.00
3072161004	0.4946	0.1107	0.9938	0.610	3.853	3.854	7.965	3.204	0.605	3.853	1.00
3072161005	0.4936	0.1108	0.9938	-3.792	3.501	3.530	7.981	3.210	0.606	3.501	1.00
3072161006	0.4946	0.1108	0.9938	-1.770	3.663	3.669	7.965	3.203	0.605	3.663	1.00
3072161007	0.4913	0.1108	0.9938	-0.328	3.804	3.805	8.017	3.225	0.609	3.804	1.00
3072161008	0.4887	0.1108	0.9938	-2.368	3.659	3.670	8.061	3.242	0.612	3.659	1.00
3072161009	0.4933	0.1109	0.9938	-1.305	3.710	3.714	7.985	3.212	0.606	3.710	1.00
3072161010	0.4931	0.1109	0.9938	-0.694	3.761	3.762	7.988	3.213	0.606	3.761	1.00
3072161011	0.4946	0.1109	0.9938	-3.397	3.526	3.550	7.964	3.203	0.604	3.526	1.00
3072161012	0.4934	0.1109	0.9938	-0.714	3.757	3.758	7.983	3.211	0.606	3.757	1.00
3072161013	0.4897	0.1110	0.9938	-0.637	3.793	3.793	8.044	3.235	0.611	3.793	1.00
3072161014	0.4945	0.1110	0.9938	-2.890	3.571	3.587	7.967	3.204	0.605	3.571	1.00
3072161015	0.4928	0.1110	0.9938	1.225	3.914	3.917	7.993	3.215	0.607	3.914	1.00
3072161016	0.4943	0.1111	0.9938	0.183	3.822	3.822	7.970	3.205	0.605	3.822	1.00
3072161017	0.4945	0.1115	0.9938	-0.142	3.903	3.903	8.310	3.296	0.647	3.903	1.00
3072161018	0.4901	0.1115	0.9938	-3.449	3.652	3.675	8.385	3.326	0.653	3.652	1.00
3072161019	0.4922	0.1115	0.9938	-0.695	3.876	3.876	8.349	3.312	0.650	3.876	1.00
3072161020	0.4909	0.1116	0.9938	1.947	4.102	4.109	8.370	3.320	0.652	4.102	1.00
LCS12507	0.4944	0.0000	1.0000	109.058	9.261	15.967	8.260	3.276	0.643	9.261	1.00
LCSD12507	0.4763	0.0000	1.0000	101.321	9.188	15.181	8.574	3.401	0.668	9.188	1.00

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: MBT
Date: 7/27/2012
Worklist: 12507
Matrix: Filter
Method: EPA 906.0M
SOP:
MB Sample ID: 459106



Method Blank Assessment	
Analyte	Activity
LSC Low Energy Beta	-3.3650
	1.96 Sig. Unc.
	3.6560
	MDC
	8.1830
	Critical Value
	3.29100
	Flag
	Assessment

Laboratory Control Sample Assessment						
Analyte:	LCS	LCSD	LCS	LCSD	LCS	LCSD
Count Date:	7/27/12 18:09	7/27/12 18:21				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (pCi/L):	1184.913	1184.913				
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):	109.058	101.321				
1.96 Sigma Unc.:	15.987	15.181				
% Recovery:	92.04%	85.51%				
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:	LCS Low Energy Beta					
Sample I.D.:	LCS12507					
Duplicate Sample I.D.:	LCS12507					
Sample Result (pCi/L, g, F):	109.0580					
1.96 Sigma Unc.:	15.9670					
Sample Duplicate Result (pCi/L, g, F):	101.3210					
Duplicate Sample 1.96 Sigma Unc.:	15.1810					
Either results below MDC?	NO					
Relative Percent Difference:	7.36%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

Comments:

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test: Low Energy Beta
 Matrix: Smear
 Batch ID: 12507



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	Sigma	1.96
PrepSOP2 n/a	Zero Factor	2.71
AnalSOP1		
AnalSOP2 n/a		



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%

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

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

Description	Maximum	of Critical	CSU (TPU) for Analysis	Uncertainty	10.60%
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# 3 - SWIPE_H-3_C-14_E.lsa

User: Default

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

#Vials/Sample: 1

Repeat Sample Count: 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

Colored Samples: n/a

Coincidence Time (nsec): 18

Luminescence Correction: n/a

Heterogeneity Monitor: n/a

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

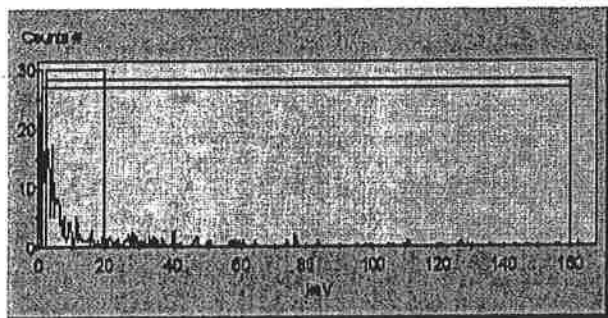
14C Chi Square: 18.58 Date Processed: 7/21/12 4:45:38 PM
 3H E^2/B (1-18.6 keV): 308.22 Date Processed: 7/21/12 4:45:38 PM
 14C E^2/B (4-156 keV): 562.59 Date Processed: 7/21/12 4:45:38 PM
 3H Efficiency (0-18.6 keV): 62.32 Date Processed: 7/21/12 4:45:38 PM
 14C Efficiency (0-156 keV): 95.60 Date Processed: 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	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	10	BKG 7/21/2012 4:46:13 PM	30	7/21/12	4.92	291.6	6.89	8.26	

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\20120721_0948.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): 13.00

Count Mode: Low Level

Assay Count Cycles: 1

#Vials/Sample: 1

Repeat Sample Count: 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

Colored Samples: n/a

Coincidence Time (nsec): 18

Luminescence Correction: n/a

Heterogeneity Monitor: n/a

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

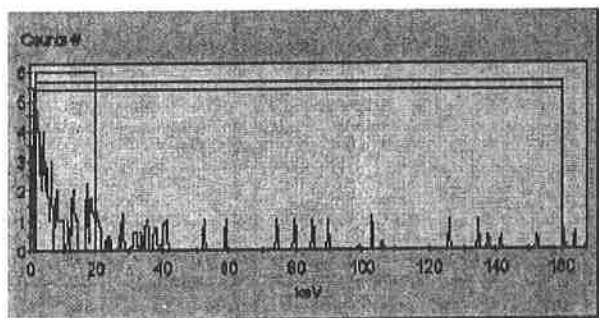
3H E²/B (1-18.6 keV): 311.34 Date Processed: 7/20/12 8:36:50 PM
 14C E²/B (4-156 keV): 556.50 Date Processed: 7/20/12 8:36:50 PM
 3H Efficiency (0-18.6 keV): 61.98 Date Processed: 7/20/12 8:36:50 PM
 14C Efficiency (0-156 keV): 94.97 Date Processed: 7/20/12 8:36:50 PM
 IPA Background Date Processed: 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

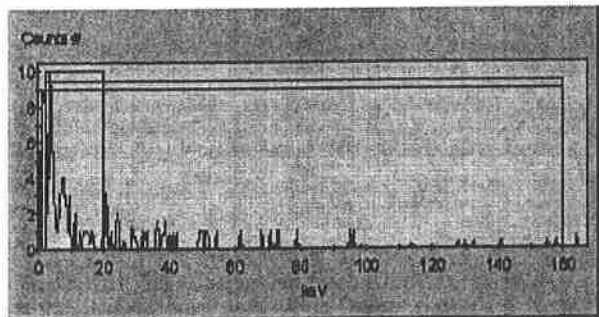
S#	PID	TIME	SMPL_ID	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	6	9:48:48 AM	MB	13	7/21/12	3.91	302.8	5.88	6.65	

SpectraView Block Data



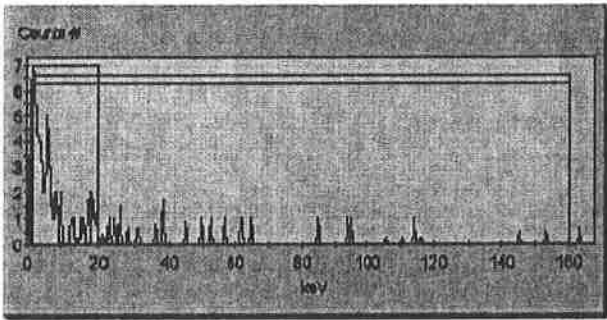
2	6	10:02:42 AM	3072	161-1	13	7/21/12	5.61	263.3	8.69	10.08
---	---	-------------	------	-------	----	---------	------	-------	------	-------

SpectraView Block Data



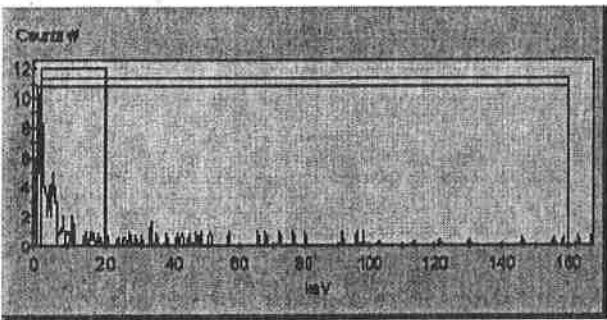
3	6	10:16:25 AM		161-2	13	7/21/12	4.91	254.3	6.61	7.53
---	---	-------------	--	-------	----	---------	------	-------	------	------

SpectraView Block Data



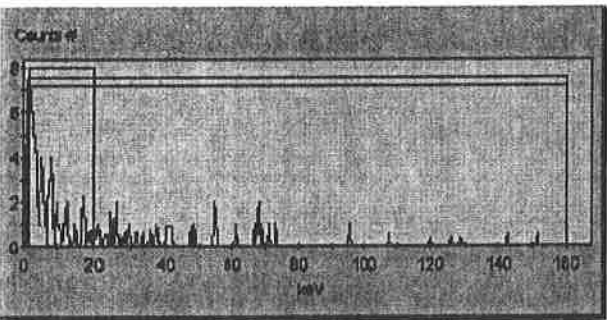
4 6 10:30:07 AM 161-3 13 7/21/12 4.64 275.5 6.77 7.85

SpectraView Block Data



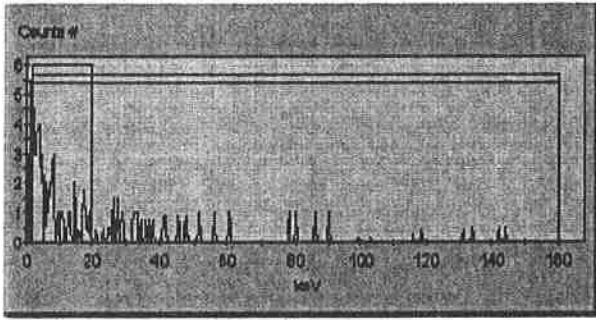
5 6 10:43:50 AM 161-4 13 7/21/12 4.83 255.5 7.48 8.56

SpectraView Block Data



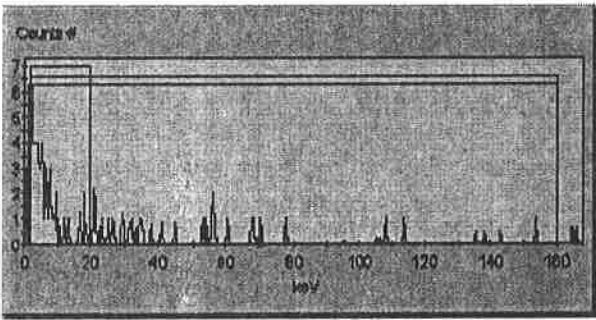
6 6 10:57:33 AM 161-5 13 7/21/12 3.65 247.6 5.63 6.40

SpectraView Block Data



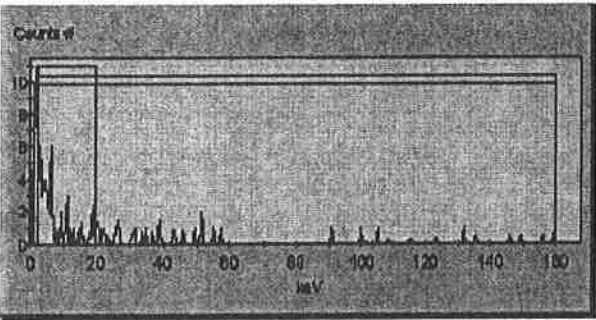
7 6 11:11:55 AM 161-6 13 7/21/12 4.11 256.4 6.70 7.39

SpectraView Block Data



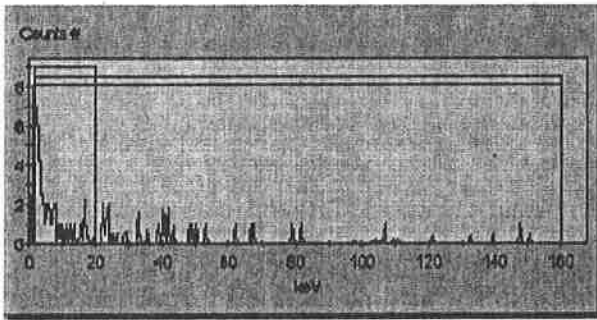
8 6 11:25:46 AM 161-7 13 7/21/12 4.34 239.1 6.71 8.10

SpectraView Block Data



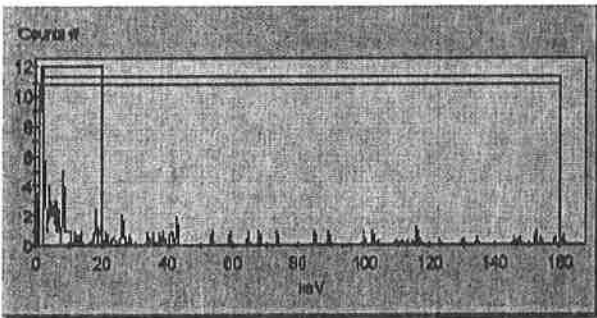
9 6 11:39:30 AM 161-8 13 7/21/12 3.70 232.3 6.18 7.11

SpectraView Block Data



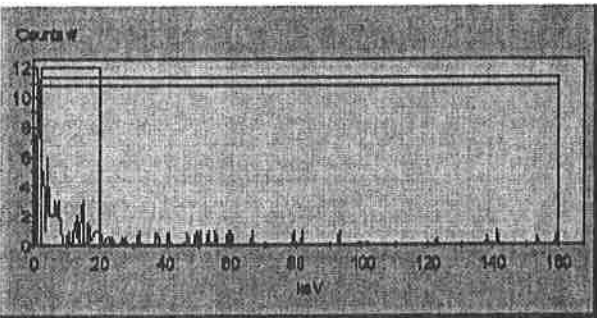
10 6 11:53:13 AM 161-9 13 7/21/12 3.84 271.4 6.15 7.62

SpectraView Block Data



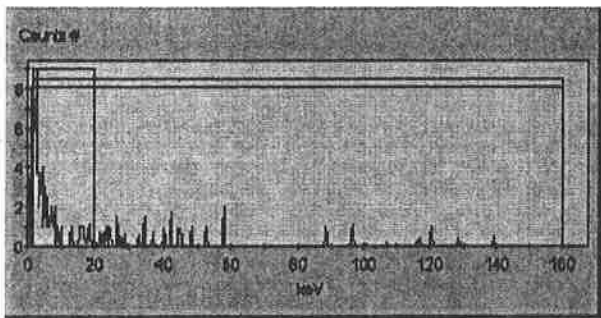
11 6 12:06:57 PM 161-10 13 7/21/12 4.39 245.5 6.15 7.92

SpectraView Block Data



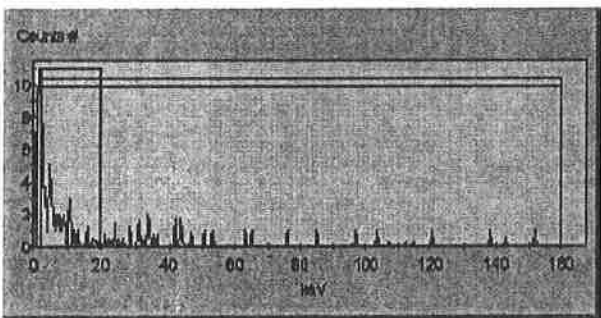
12 6 12:20:45 PM 161-11 13 7/21/12 3.81 257.8 5.59 6.59

SpectraView Block Data



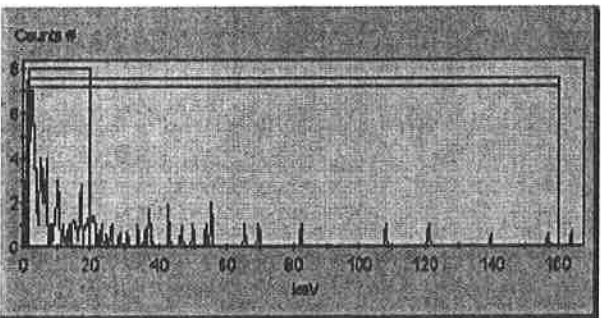
13 16 12:34:36 PM 161-12 4 13 7/21/12 4.31 270.9 6.68 7.91

SpectraView Block Data



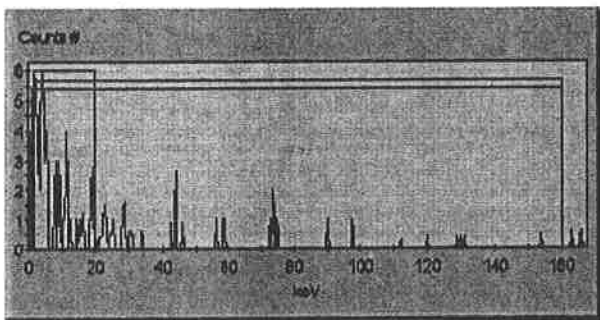
14 16 12:48:19 PM 161-13 3 13 7/21/12 4.85 234.7 6.88 7.95

SpectraView Block Data



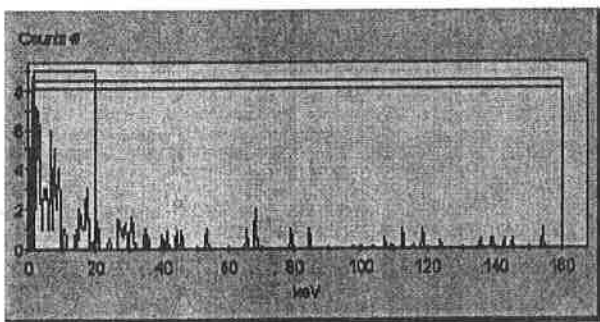
15 16 1:02:02 PM 161-14 3 13 7/21/12 4.43 263.5 6.45 6.84

SpectraView Block Data



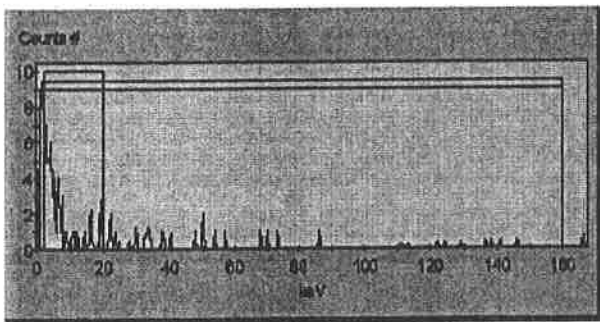
16 16 1:15:44 PM 161-15 13 7/21/12 5.27 244.2 7.55 8.86

SpectraView Block Data



17 16 1:29:27 PM 161-16 13 7/21/12 4.97 265.5 7.04 8.35

SpectraView Block Data



18 16 7:00:00 PM 161-17 7 12/31/69 5.41 262.2 7.79 8.65

SpectraView Block Data

NOT USED
On 7/31/12

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_H3_C14

Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H3_C14\20120721_1717.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

#Vials/Sample: 1

Repeat Sample Count: 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

Colored Samples: n/a

Coincidence Time (nsec): 18

Luminescence Correction: n/a

Heterogeneity Monitor: n/a

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

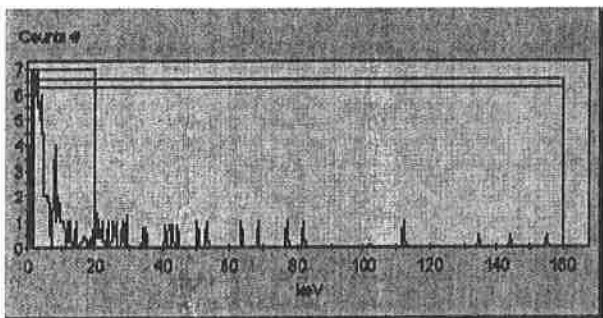
3H E²/B (1-18.6 keV): 308.22 Date Processed: 7/21/12 4:45:38 PM
 14C E²/B (4-156 keV): 562.59 Date Processed: 7/21/12 4:45:38 PM
 3H Efficiency (0-18.6 keV): 62.32 Date Processed: 7/21/12 4:45:38 PM
 14C Efficiency (0-156 keV): 95.60 Date Processed: 7/21/12 4:45:38 PM
 IPA Background Date Processed: 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 Acquired 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 Acquired Data Per Parameter ==

Cycle 1 Results

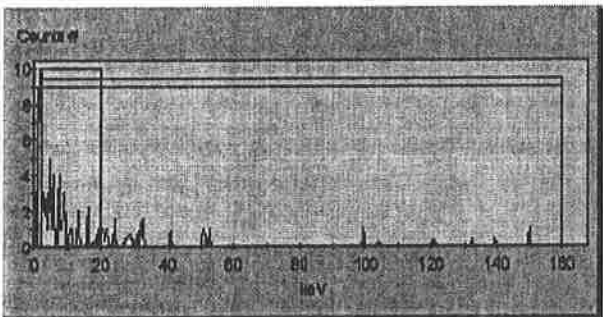
S#	PID	SMPL_ID	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
		TIME LUM							
		161-17	12	7/21/12	5.05	262.9	7.02	8.19	
1	16	5:18:12 PM	3						

SpectraView Block Data



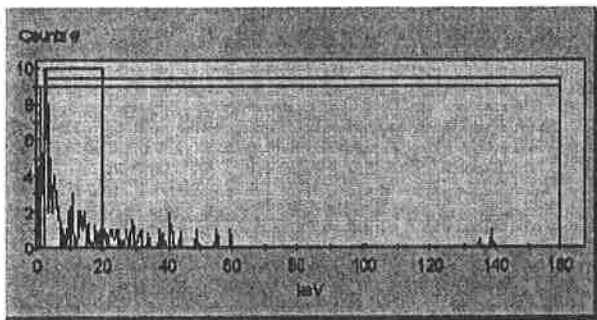
		161-18	12	7/21/12	3.61	235.6	5.33	6.58	
2	16	5:30:53 PM	5						

SpectraView Block Data



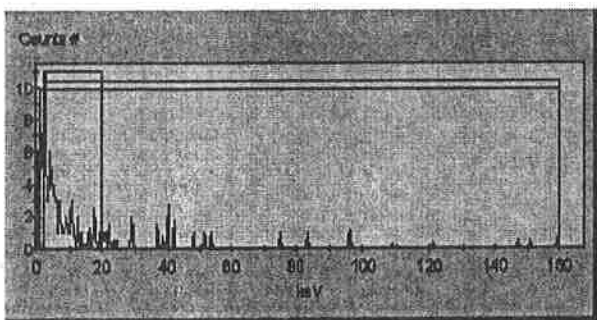
		161-19	12	7/21/12	5.00	241.7	7.08	7.92	
3	16	5:43:36 PM	4						

SpectraView Block Data



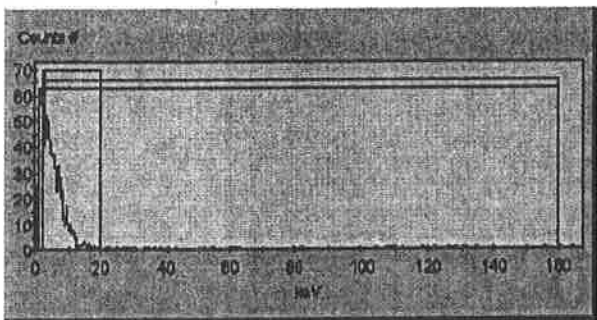
4 16 5:56:17 PM 161-20 3 12 7/21/12 6.08 237.9 7.96 9.21

SpectraView Block Data



5 16 6:09:01 PM LCS 1 12 7/21/12 51.49 253.6 53.84 62.18

SpectraView Block Data



6 16 6:21:54 PM LCSD 1 12 7/21/12 46.56 305.6 49.27 56.52

SpectraView Block Data



Pace Analytical Services, Inc.-Pittsburgh

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
12654 B1CG	12654	R2241684.154	6	2	7-20-12 14:31	120	N/A	KA
464994 MB	↓	↓	↓	↓	↓	↓	↓	↓
3078169001	↓	↓	↓	↓	↓	↓	↓	↓
1CS12654	↓	↓	↓	↓	↓	↓	↓	↓
UCSD 17654	↓	↓	↓	↓	↓	↓	↓	↓
MB 459106	12507	SuperH3C14	6	12	7/20/12 1500	13	N/A	KA
3079161001	↓	↓	↓	↓	↓	↓	↓	↓
2	↓	↓	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓	↓	↓
4	↓	↓	↓	↓	↓	↓	↓	↓
5	↓	↓	↓	↓	↓	↓	↓	↓
6	↓	↓	↓	↓	↓	↓	↓	↓
7	↓	↓	↓	↓	↓	↓	↓	↓
8	↓	↓	↓	↓	↓	↓	↓	↓
9	↓	↓	↓	↓	↓	↓	↓	↓
10	↓	↓	↓	↓	↓	↓	↓	↓
11	↓	↓	↓	↓	↓	↓	↓	↓
12	↓	↓	16	↓	↓	↓	↓	↓
13	↓	↓	↓	↓	↓	↓	↓	↓
14	↓	↓	↓	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓	↓	↓	↓
16	↓	↓	16	↓	↓	↓	↓	↓
17	↓	↓	↓	↓	↓	↓	↓	↓
18	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: OK/30/
Peer Review: OK/30/



Pace Analytical Services, Inc.-Pittsburgh
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
3072161019	NA 12507	SuperH344	16	12	7/20/12 1500	1312	N/A	ga
L 20						9/7/21/12		
US 12507								
USD ↓								
VUB								
3072161021			516					
22			12					
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								

Run comments:

Peer Review: *ga*

Low Energy Beta Sample Analysis Data

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

1 459107-BLANK for HBN 91081 [RADC/1250

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

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 18:18 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796278 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 7/30/2012 18:18 Dilution
 Method EPA 906.0M Col ID Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796278 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL
Rad Chemistry	OK				
LSC Low Energy Beta	OK	-0.921U ± 4.25 (10.1)	dpm/sa -0.921U ± 4.25 (10.1)		dpm/sa

2 3072161021-2541-F28

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 15:17 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790709 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 7/30/2012 15:17 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790709 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Req. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.503U ± 4.29 (9.77)	dpm/sa 0.503U ± 4.29 (9.77)		dpm/sa		

3 3072161022-2541-F29

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

3 3072161022-2541-F29

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 15:25 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790710 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 7/30/2012 15:25 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790710 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.333U ± 4.23 (9.87)	dpm/sa -0.333U ± 4.23 (9.87)		dpm/sa		

4 3072161023-2541-F30

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 15:33 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790711 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 7/30/2012 15:33 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790711 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.44U ± 4.07 (9.83)	dpm/sa -1.44U ± 4.07 (9.83)		dpm/sa		

5 3072161024-2541-W1

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

5 3072161024-2541-W1

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 15:41 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790712 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 7/30/2012 15:41 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790712 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-5.12U ± 3.64 (9.93)	dpm/sa -5.12U ± 3.64 (9.93)		dpm/sa		

6 3072161025-2541-W2

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 15:49 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790713 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 7/30/2012 15:49 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790713 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.04U ± 4.35 (9.76)	dpm/sa 1.04U ± 4.35 (9.76)		dpm/sa		

7 3072161026-2541-W3

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

7 3072161026-2541-W3

Prep Information

Procedure 9060 I LEB **Batch** RADC/12508 **Prep Date** 7/30/2012 15:59 **Dilution**
Method EPA 906.0M **HBN** 91081 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790714 **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** 7/30/2012 15:59 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790714 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	4.91J ± 4.83 (9.76)	dpm/sa 4.91J ± 4.83 (9.76)		dpm/sa		

8 3072161027-2541-W4

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12508 **Prep Date** 7/30/2012 16:08 **Dilution**
Method EPA 906.0M **HBN** 91081 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790715 **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** 7/30/2012 16:08 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790715 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.19U ± 4.18 (10.0)	dpm/sa -1.19U ± 4.18 (10.0)		dpm/sa		

9 3072161028-2541-W5

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

9 3072161028-2541-W5

Prep Information

Procedure 9060 I LEB **Batch** RADC/12508 **Prep Date** 7/30/2012 16:16 **Dilution**
Method EPA 906.0M **HBN** 91081 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790716 **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** 7/30/2012 16:16 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790716 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.894U ± 4.13 (9.80)	dpm/sa -0.894U ± 4.13 (9.80)		dpm/sa		

10 3072161029-2541-W6

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12508 **Prep Date** 7/30/2012 16:24 **Dilution**
Method EPA 906.0M **HBN** 91081 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790717 **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** 7/30/2012 16:24 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790717 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.61U ± 4.42 (9.77)	dpm/sa 1.61U ± 4.42 (9.77)		dpm/sa		

11 3072161030-2541-W6D

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

11 3072161030-2541-W6D

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 16:32 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790718 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 7/30/2012 16:32 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790718 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.43U ± 4.03 (9.75)	dpm/sa -1.43U ± 4.03 (9.75)		dpm/sa		

12 3072161031-2541-W7

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 16:40 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790719 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 7/30/2012 16:40 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790719 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.16U ± 4.07 (9.76)	dpm/sa -1.16U ± 4.07 (9.76)		dpm/sa		

13 3072161032-2541-W8

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

13 3072161032-2541-W8

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 16:48 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790720 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 7/30/2012 16:48 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790720 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.773U ± 4.31 (9.75)	dpm/sa 0.773U ± 4.31 (9.75)		dpm/sa		

14 3072161033-2541-W9

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 16:56 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790721 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 7/30/2012 16:56 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790721 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.26U ± 3.92 (9.74)	dpm/sa -2.26U ± 3.92 (9.74)		dpm/sa		

15 3072161034-2541-W10

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

15 3072161034-2541-W10

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:04 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790722 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 7/30/2012 17:04 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790722 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.16U ± 4.07 (9.76)	dpm/sa -1.16U ± 4.07 (9.76)		dpm/sa		

16 3072161035-2541-W11

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:12 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790723 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 7/30/2012 17:12 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790723 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	4.92J ± 4.84 (9.78)	dpm/sa 4.92J ± 4.84 (9.78)		dpm/sa		

17 3072161036-2541-W12

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

17 3072161036-2541-W12

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:20 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790724 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 7/30/2012 17:20 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790724 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.82U ± 3.86 (9.76)	dpm/sa -2.82U ± 3.86 (9.76)			dpm/sa	

18 3072161037-2541-W13

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:28 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790725 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 7/30/2012 17:28 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790725 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.55U ± 3.89 (9.74)	dpm/sa -2.55U ± 3.89 (9.74)			dpm/sa	

19 3072161038-2541-W14

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12508 HBN 91081
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

19 3072161038-2541-W14

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:37 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790726 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 7/30/2012 17:37 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790726 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.43U ± 4.03 (9.74)	dpm/sa -1.43U ± 4.03 (9.74)		dpm/sa		

20 3072161039-2541-W15

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12508 Prep Date 7/30/2012 17:45 Dilution
 Method EPA 906.0M HBN 91081 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790727 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 7/30/2012 17:45 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790727 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.70U ± 4.55 (9.74)	dpm/sa 2.70U ± 4.55 (9.74)		dpm/sa		

21 3072161040-2541-W16

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12508 **HBN** 91081
Rule 9060 I LEB **Status** RE
Create Date 6/28/2012 **Analyst** MBT

21 3072161040-2541-W16

Prep Information

Procedure 9060 I LEB	Batch RADC/12508	Prep Date 7/30/2012 17:53	Dilution
Method EPA 906.0M	HBN 91081	Hold Date 12/8/2012 23:59	Analyst MBT
Schedule 2790728	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 7/30/2012 17:53	Dilution
Method EPA 906.0M	Col ID	Hold Date 12/8/2012 23:59	Analyst MBT
Schedule 2790728	File		CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.14U ± 4.48 (9.74)	dpm/sa 2.14U ± 4.48 (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 13:59
 Batch ID 12508
 A-code 9060 I LEB 9060W
 Method EPA 906.0M EPA 906.0m

Assigned Analyst MBT
 Earliest Due Date 07/04/2012 07:12
 HBN
 91081

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459107	BLANK	IP		QCACCOUNT	-0.921U	4.25	10.1	7/30/12 18:18
3072161	3072161021	PS	WP	6/11/2012 0:01	RTI	0.503U	4.29	9.77	7/30/12 15:17
3072161	3072161022	PS	WP	6/11/2012 0:01	RTI	-0.333U	4.23	9.87	7/30/12 15:25
3072161	3072161023	PS	WP	6/11/2012 0:01	RTI	-1.44U	4.07	9.83	7/30/12 15:33
3072161	3072161024	PS	WP	6/11/2012 0:01	RTI	-5.12U	3.64	9.93	7/30/12 15:41
3072161	3072161025	PS	WP	6/11/2012 0:01	RTI	1.04U	4.35	9.76	7/30/12 15:49
3072161	3072161026	PS	WP	6/11/2012 0:01	RTI	4.91U	4.83	9.76	7/30/12 15:59
3072161	3072161027	PS	WP	6/11/2012 0:01	RTI	-1.19U	4.18	10.0	7/30/12 16:08
3072161	3072161028	PS	WP	6/11/2012 0:01	RTI	-0.894U	4.13	9.80	7/30/12 16:16
3072161	3072161029	PS	WP	6/11/2012 0:01	RTI	1.61U	4.42	9.77	7/30/12 16:24
3072161	3072161030	PS	WP	6/11/2012 0:01	RTI	-1.43U	4.03	9.75	7/30/12 16:32
3072161	3072161031	PS	WP	6/11/2012 0:01	RTI	-1.16U	4.07	9.76	7/30/12 16:40
3072161	3072161032	PS	WP	6/11/2012 0:01	RTI	0.773U	4.31	9.75	7/30/12 16:48
3072161	3072161033	PS	WP	6/11/2012 0:01	RTI	-2.26U	3.92	9.74	7/30/12 16:56
3072161	3072161034	PS	WP	6/11/2012 0:01	RTI	-1.16U	4.07	9.76	7/30/12 17:04
3072161	3072161035	PS	WP	6/11/2012 0:01	RTI	4.92J	4.84	9.78	7/30/12 17:12
3072161	3072161036	PS	WP	6/11/2012 0:01	RTI	-2.82U	3.86	9.76	7/30/12 17:20
3072161	3072161037	PS	WP	6/11/2012 0:01	RTI	-2.55U	3.89	9.74	7/30/12 17:28
3072161	3072161038	PS	WP	6/11/2012 0:01	RTI	-1.43U	4.03	9.74	7/30/12 17:37
3072161	3072161039	PS	WP	6/11/2012 0:01	RTI	2.70U	4.55	9.74	7/30/12 17:45
3072161	3072161040	PS	WP	6/11/2012 0:01	RTI	2.14U	4.48	9.74	7/30/12 17:53

MBT 7-31-12

07/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
Matrix Smear
Batch ID 12508
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 7.03
Bkg Duration 30.0 min
Bkg Ref BKG 7/30
Bkg Ct Date/Time: 7/30/2012 14:13
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
459107	1.0	7/30/12 18:18	7.0	7/30/12 18:18	6.57	324.0	dpm/S	High, Evaluate
3072161021	1.0	6/11/12 0:01	7.0	7/30/12 15:17	7.29	285.2	dpm/S	Pass
3072161022	1.0	6/11/12 0:01	7.0	7/30/12 15:25	6.86	300.4	dpm/S	Pass
3072161023	1.0	6/11/12 0:01	7.0	7/30/12 15:33	6.29	245.5	dpm/S	Pass
3072161024	1.0	6/11/12 0:01	7.0	7/30/12 15:41	4.43	306.4	dpm/S	Pass
3072161025	1.0	6/11/12 0:01	7.0	7/30/12 15:49	7.57	282.1	dpm/S	Pass
3072161026	1.0	6/11/12 0:01	7.0	7/30/12 15:59	9.57	257.6	dpm/S	Pass
3072161027	1.0	6/11/12 0:01	7.0	7/30/12 16:08	6.43	227.4	dpm/S	Pass
3072161028	1.0	6/11/12 0:01	7.0	7/30/12 16:16	6.57	249.1	dpm/S	Pass
3072161029	1.0	6/11/12 0:01	7.0	7/30/12 16:24	7.86	256.4	dpm/S	Pass
3072161030	1.0	6/11/12 0:01	7.0	7/30/12 16:32	6.29	277.0	dpm/S	Pass
3072161031	1.0	6/11/12 0:01	7.0	7/30/12 16:40	6.43	258.3	dpm/S	Pass
3072161032	1.0	6/11/12 0:01	7.0	7/30/12 16:48	7.43	278.8	dpm/S	Pass
3072161033	1.0	6/11/12 0:01	7.0	7/30/12 16:56	5.86	271.1	dpm/S	Pass
3072161034	1.0	6/11/12 0:01	7.0	7/30/12 17:04	6.43	257.3	dpm/S	Pass
3072161035	1.0	6/11/12 0:01	7.0	7/30/12 17:12	9.57	252.7	dpm/S	Pass
3072161036	1.0	6/11/12 0:01	7.0	7/30/12 17:20	5.57	282.9	dpm/S	Pass
3072161037	1.0	6/11/12 0:01	7.0	7/30/12 17:28	5.71	268.3	dpm/S	Pass
3072161038	1.0	6/11/12 0:01	7.0	7/30/12 17:37	6.29	269.0	dpm/S	Pass
3072161039	1.0	6/11/12 0:01	7.0	7/30/12 17:45	8.43	265.8	dpm/S	Pass
3072161040	1.0	6/11/12 0:01	7.0	7/30/12 17:53	8.14	274.6	dpm/S	Pass
LCS12508	1.0	7/30/12 18:02	7.0	7/30/12 18:02	53.00	321.6	dpm/S	High, Evaluate
LCSD12508	1.0	7/30/12 18:10	7.0	7/30/12 18:10	58.86	323.0	dpm/S	High, Evaluate

7/31/12
 MET-7-31-12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta Analyst MBT
 Matrix Smear PrepSOP1 0
 Batch ID 12508 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%



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
459107	0.4997	0.0000	1.0000	-0.921	4.248	4.250	10.101	3.675	1.024	4.248	1.00
3072161021	0.5203	0.1359	0.9925	0.503	4.287	4.287	9.774	3.556	0.991	4.287	1.00
3072161022	0.5150	0.1359	0.9925	-0.333	4.226	4.226	9.875	3.593	1.002	4.226	1.00
3072161023	0.5174	0.1359	0.9925	-1.441	4.063	4.066	9.829	3.576	0.997	4.063	1.00
3072161024	0.5120	0.1359	0.9924	-5.117	3.592	3.644	9.934	3.614	1.007	3.592	1.00
3072161025	0.5210	0.1360	0.9924	1.044	4.348	4.350	9.761	3.552	0.990	4.348	1.00
3072161026	0.5209	0.1360	0.9924	4.914	4.798	4.834	9.763	3.552	0.990	4.798	1.00
3072161027	0.5080	0.1360	0.9924	-1.190	4.174	4.177	10.011	3.642	1.015	4.174	1.00
3072161028	0.5187	0.1360	0.9924	-0.894	4.124	4.125	9.805	3.567	0.994	4.124	1.00
3072161029	0.5206	0.1360	0.9924	1.606	4.419	4.423	9.768	3.554	0.991	4.419	1.00
3072161030	0.5217	0.1360	0.9924	-1.429	4.029	4.033	9.747	3.547	0.989	4.029	1.00
3072161031	0.5210	0.1361	0.9924	-1.160	4.070	4.072	9.761	3.551	0.990	4.070	1.00
3072161032	0.5215	0.1361	0.9924	0.773	4.311	4.312	9.752	3.548	0.989	4.311	1.00
3072161033	0.5221	0.1361	0.9924	-2.258	3.916	3.925	9.741	3.544	0.988	3.916	1.00
3072161034	0.5208	0.1361	0.9924	-1.161	4.072	4.074	9.765	3.553	0.990	4.072	1.00
3072161035	0.5198	0.1361	0.9924	4.924	4.809	4.844	9.785	3.560	0.992	4.809	1.00
3072161036	0.5208	0.1361	0.9924	-2.825	3.848	3.863	9.764	3.553	0.990	3.848	1.00
3072161037	0.5221	0.1361	0.9924	-2.548	3.876	3.888	9.741	3.544	0.988	3.876	1.00
3072161038	0.5221	0.1362	0.9924	-1.428	4.026	4.030	9.741	3.544	0.988	4.026	1.00
3072161039	0.5219	0.1362	0.9924	2.703	4.538	4.550	9.743	3.545	0.988	4.538	1.00
3072161040	0.5219	0.1362	0.9924	2.143	4.473	4.480	9.744	3.545	0.988	4.473	1.00
LCS12508	0.5017	0.0000	1.0000	91.631	10.915	15.446	10.060	3.660	1.020	10.915	1.00
LCS12508	0.5006	0.0000	1.0000	103.546	11.512	16.883	10.083	3.669	1.023	11.512	1.00

MBT 7-31-12
 7/31/12

Quality Control Sample Performance Assessment

RCDU Upload



Analyst: RMK
Date: 7/31/2012
Worklist: 12508
Matrix: Filter

Method: EPA 906.0M
SOP:
MB Sample ID: 459107

Analyte	Method Blank Assessment			
	Activity	1.96 Sig Unc.	MDC	Assessment
LSC Low Energy Beta	-0.9210	4.2500	10.1010	3.87500

Analyte:	Laboratory Control Sample Assessment			
	LCS	LCSD	LCS	LCSD
Count Date:	7/30/12 18:02	7/30/12 18:10		
Spike I.D.:	09-009LEB	09-009LEB		
Spike Concentration (DPM/Sample):	1184.711	1184.711		
Volume Used (mL):	0.100	0.100		
Aliquot Volume (L, g, F):	1.000	1.000		
Target Conc. (DPM/Sample, g, F):	118.471	118.471		
1.96 Sigma Uncertainty (Calculated):	2.136	2.136		
Result (DPM/Sample, g, F):	91.631	103.546		
1.96 Sigma Unc:	15.446	16.883		
% Recovery:	77.34%	87.40%		
Assessment:	Pass	Pass		
Upper % Recovery Limits:	125.00%	125.00%		
Lower % Recovery Limits:	75.00%	75.00%		

LCS/LCSD Y or N?	Duplicate Sample Assessment			
	Y	N	Y	N
SC Low Energy Beta				
Analyte:	LCS12508			
Sample I.D.:	LCS12508			
Duplicate Sample I.D.:	LCSD12508			
Sample Result (DPM/Sample, g, F):	91.6310			
1.96 Sigma Unc:	15.4460			
Sample Duplicate Result (DPM/Sample, g, F):	103.5460			
Duplicate Sample 1.96 Sigma Unc:	16.8830			
Either results below MDC?	NO			
Relative Percent Difference:	12.21%			
Assessment:	Pass			
% RPD Limit:	25.00%			

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

Comments:

Handwritten: 7/31/12
WGT 7-31-12

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test: Low Energy Beta
 Matrix: Smear
 Batch ID: 12508



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	Sigma	1.96
PrepSOP2 n/a	Zero Factor	2.71
AnalSOP1		
AnalSOP2 n/a		

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%

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

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

Description	Maximum	of Critical	CSU (TPU) for Analysis	Uncertainty	Uncertainty	10.60%
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%

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			7/30/2012 14:21
		Sample Ct Duration (min)	7.0
		Calculated Count Start	
S#	ELTIME	Date/Time	Sample ID
1	63	7/30/2012 15:17	3072161021
2	71	7/30/2012 15:25	3072161022
3	79	7/30/2012 15:33	3072161023
4	87	7/30/2012 15:41	3072161024
5	95	7/30/2012 15:49	3072161025
6	105	7/30/2012 15:59	3072161026
7	114	7/30/2012 16:08	3072161027
8	122	7/30/2012 16:16	3072161028
9	130	7/30/2012 16:24	3072161029
10	138	7/30/2012 16:32	3072161030
11	146	7/30/2012 16:40	3072161031
12	154	7/30/2012 16:48	3072161032
13	162	7/30/2012 16:56	3072161033
14	170	7/30/2012 17:04	3072161034
15	178	7/30/2012 17:12	3072161035
16	186	7/30/2012 17:20	3072161036
17	194	7/30/2012 17:28	3072161037
18	203	7/30/2012 17:37	3072161038
19	211	7/30/2012 17:45	3072161039
20	219	7/30/2012 17:53	3072161040
21	228	7/30/2012 18:02	LCS12508
22	236	7/30/2012 18:10	LCSD12508
23	244	7/30/2012 18:18	459107

On 7/31/12

NBT 7-31-12

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	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
27	1	7.00	7	2.43	5.86	5.71	274.80	3
27	2	7.00	15	1.86	6.29	6.14	232.01	4
27	3	7.00	23	3.43	7.14	7.00	251.96	3
27	4	7.00	31	3.86	7.00	7.00	258.73	2
27	5	7.00	39	45.43	61.14	61.71	268.92	0
27	6	7.00	47	47.43	62.71	62.86	313.56	0
27	7	7.00	55	218.29	222.06	229.71	299.57	0
27	8	7.00	63	3.86	7.29	7.29	285.24	2
27	9	7.00	71	3.43	6.86	6.86	300.43	3
27	10	7.00	79	3.14	6.43	6.29	245.51	2
27	11	7.00	87	2.14	4.86	4.43	306.38	5
27	12	7.00	95	4.71	7.71	7.57	282.08	1
27	13	7.00	105	5.14	9.71	9.57	257.57	2
27	14	7.00	114	2.00	6.29	6.43	227.38	2
27	15	7.00	122	3.00	6.43	6.57	249.10	3
27	16	7.00	130	5.00	8.00	7.86	256.40	1
27	17	7.00	138	3.43	6.57	6.29	276.98	3
27	18	7.00	146	3.00	6.29	6.43	258.33	3
27	19	7.00	154	4.00	7.57	7.43	278.83	2
27	20	7.00	162	2.14	5.86	5.86	271.09	3
27	21	7.00	170	2.71	6.43	6.43	257.26	3
27	22	7.00	178	6.00	9.57	9.57	252.72	1
27	23	7.00	186	2.86	5.71	5.57	282.89	2
27	24	7.00	194	2.14	5.86	5.71	268.26	3
27	25	7.00	203	2.57	6.29	6.29	269.03	4
27	26	7.00	211	4.57	8.43	8.43	265.83	2
27	27	7.00	219	4.00	8.00	8.14	274.61	2
27	28	7.00	228	39.00	52.57	53.00	321.56	1
27	29	7.00	236	44.71	58.43	58.86	322.97	0
27	30	7.00	244	3.86	6.29	6.57	324.03	2

NOT
NEEDED
DL 7/31/12

Protocol #: 4

SWIPE_H3_C14

User :

Time: 30.00

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	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

F#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	3.83	7.13	7.03	295.93	2

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
B10 Background	N/A	N/A	3	4	7/22/12 10:30	30	MA	
3072155009			20	22		7		
W12502								
W12502								
MB 459005	12500							
613 MB 459107			5 (plate) 10 (HPLC)			7		
3072140817	07107		27					
18								
19								
20								
21	12508					7		
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
31								

Run comments:

Peer Review:

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
3092161034	N/A	N/A	7 (pre-run) 37	5 (trig)	7/27/12 10:30	7	N/A	G
35			37					
34			37					
37			37					
31			37					
40			37					
W2 12508								M
W2D11508								
W2B 459107								

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

1 459108-BLANK for HBN 91082 [RADC/1250

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

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 21:45 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796280 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 21:45 Dilution
 Method EPA 906.0M Col ID Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796280 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL
Rad Chemistry	OK				
LSC Low Energy Beta	OK	1.44U ± 4.27 (9.48)	dpm/sa 1.44U ± 4.27 (9.48)		dpm/sa

2 3072161041-2541-W17

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 21:53 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790729 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 21:53 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790729 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Req. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	5.53J ± 4.70 (9.23)	dpm/sa 5.53J ± 4.70 (9.23)		dpm/sa		

3 3072161042-2541-W18

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

3 3072161042-2541-W18

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:02 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790730 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 22:02 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790730 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.01U ± 3.57 (9.24)	dpm/sa -3.01U ± 3.57 (9.24)		dpm/sa		

4 3072161043-2541-W19

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:10 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790731 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 22:10 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790731 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.52U ± 4.33 (9.29)	dpm/sa 2.52U ± 4.33 (9.29)		dpm/sa		

5 3072161044-2541-W20

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

5 3072161044-2541-W20

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:18 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790732 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 22:18 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790732 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.35U ± 4.43 (9.26)	dpm/sa 3.35U ± 4.43 (9.26)		dpm/sa		

6 3072161045-2541-W20D

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:26 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790733 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 22:26 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790733 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.09U ± 3.86 (9.31)	dpm/sa -1.09U ± 3.86 (9.31)		dpm/sa		

7 3072161046-2541-W21

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

7 3072161046-2541-W21

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:34 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790734 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 22:34 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790734 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.251U ± 3.95 (9.26)	dpm/sa -0.251U ± 3.95 (9.26)		dpm/sa		

8 3072161047-2541-W22

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:42 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790735 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 22:42 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790735 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.90J ± 4.49 (9.24)	dpm/sa 3.90J ± 4.49 (9.24)		dpm/sa		

9 3072161048-2541-W23

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

9 3072161048-2541-W23

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:50 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790736 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 22:50 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790736 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.41U ± 4.16 (9.23)	dpm/sa 1.41U ± 4.16 (9.23)			dpm/sa	

10 3072161049-2541-W24

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 22:58 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790737 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 22:58 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790737 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.791U ± 3.87 (9.23)	dpm/sa -0.791U ± 3.87 (9.23)			dpm/sa	

11 3072161050-2541-W25

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

11 3072161050-2541-W25

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 23:06 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790738 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 23:06 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790738 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.15U ± 4.16 (9.31)	dpm/sa 1.15U ± 4.16 (9.31)		dpm/sa		

12 3072161051-2541-W26

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 23:14 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790739 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 23:14 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790739 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.34U ± 4.42 (9.24)	dpm/sa 3.34U ± 4.42 (9.24)		dpm/sa		

13 3072161052-2541-W27

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

13 3072161052-2541-W27

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/21/2012 23:22 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790740 **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 23:22 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790740 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.28U ± 3.53 (9.24)	dpm/sa -3.28U ± 3.53 (9.24)		dpm/sa		

14 3072161053-2541-W28

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/21/2012 23:30 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790741 **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 23:30 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** MBT
Schedule 2790741 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.27U ± 4.33 (9.37)	dpm/sa 2.27U ± 4.33 (9.37)		dpm/sa		

15 3072161054-2541-W29

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

15 3072161054-2541-W29

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 23:38 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790742 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 23:38 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790742 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.51U ± 4.30 (9.23)	dpm/sa 2.51U ± 4.30 (9.23)		dpm/sa		

16 3072161055-2541-W30

Type PS Matrix Wipe Collected 6/11/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12509 Prep Date 7/21/2012 23:46 Dilution
 Method EPA 906.0M HBN 91082 Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790743 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 23:46 Dilution
 Method EPA 906.0M Col ID Hold Date 12/8/2012 23:59 Analyst MBT
 Schedule 2790743 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.97U ± 4.24 (9.24)	dpm/sa 1.97U ± 4.24 (9.24)		dpm/sa		

17 3072161056-275-1

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

17 3072161056-275-1

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/21/2012 23:54 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790744 **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 23:54 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790744 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.15U ± 4.15 (9.29)	dpm/sa 1.15U ± 4.15 (9.29)		dpm/sa		

18 3072161057-275-2

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/22/2012 00:02 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790745 **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** 7/22/2012 00:02 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790745 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.251U ± 3.95 (9.25)	dpm/sa -0.251U ± 3.95 (9.25)		dpm/sa		

19 3072161058-275-3

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12509 HBN 91082
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

19 3072161058-275-3

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/22/2012 00:10 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790746 **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** 7/22/2012 00:10 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790746 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.0386U ± 3.98 (9.24)	dpm/sa 0.0386U ± 3.98 (9.24)		dpm/sa		

20 3072161059-275-4

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/22/2012 00:18 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790747 **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** 7/22/2012 00:18 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790747 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.89U ± 3.72 (9.25)	dpm/sa -1.89U ± 3.72 (9.25)		dpm/sa		

21 3072161060-275-5

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

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

Quality Control Review



Batch RADC/12509 **HBN** 91082
Rule 9060 I LEB **Status** RE
Create Date 6/28/2012 **Analyst** MBT

21 3072161060-275-5

Prep Information

Procedure 9060 I LEB **Batch** RADC/12509 **Prep Date** 7/22/2012 00:26 **Dilution**
Method EPA 906.0M **HBN** 91082 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790748 **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** 7/22/2012 00:26 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790748 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.35U ± 3.79 (9.24)	dpm/sa		-1.35U ± 3.79 (9.24)		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 13:59 Assigned Analyst MBT
 Batch ID 12509 Earliest Due Date 07/04/2012 07:12
 A-code 9060 I LEB 9060W HBN 91082
 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
	459108	BLANK	IP		QCACCOUNT	1.44U	4.27	9.48	7/21/12 21:45
3072161	3072161041	PS	WP	6/11/2012 0:01	RTI	5.53J	4.70	9.23	7/21/12 21:53
3072161	3072161042	PS	WP	6/11/2012 0:01	RTI	-3.01U	3.57	9.24	7/21/12 22:02
3072161	3072161043	PS	WP	6/11/2012 0:01	RTI	2.52U	4.33	9.29	7/21/12 22:10
3072161	3072161044	PS	WP	6/11/2012 0:01	RTI	3.35U	4.43	9.26	7/21/12 22:18
3072161	3072161045	PS	WP	6/11/2012 0:01	RTI	-1.09U	3.86	9.31	7/21/12 22:26
3072161	3072161046	PS	WP	6/11/2012 0:01	RTI	-0.251U	3.95	9.26	7/21/12 22:34
3072161	3072161047	PS	WP	6/11/2012 0:01	RTI	3.90J	4.49	9.24	7/21/12 22:42
3072161	3072161048	PS	WP	6/11/2012 0:01	RTI	1.41U	4.16	9.23	7/21/12 22:50
3072161	3072161049	PS	WP	6/11/2012 0:01	RTI	-0.791U	3.87	9.23	7/21/12 22:58
3072161	3072161050	PS	WP	6/11/2012 0:01	RTI	1.15U	4.16	9.31	7/21/12 23:06
3072161	3072161051	PS	WP	6/11/2012 0:01	RTI	3.34U	4.42	9.24	7/21/12 23:14
3072161	3072161052	PS	WP	6/11/2012 0:01	RTI	-3.28U	3.53	9.24	7/21/12 23:22
3072161	3072161053	PS	WP	6/11/2012 0:01	RTI	2.27U	4.33	9.37	7/21/12 23:30
3072161	3072161054	PS	WP	6/11/2012 0:01	RTI	2.51U	4.30	9.23	7/21/12 23:38
3072161	3072161055	PS	WP	6/11/2012 0:01	RTI	1.97U	4.24	9.24	7/21/12 23:46
3072161	3072161056	PS	WP	6/5/2012 0:01	RTI	1.15U	4.15	9.29	7/21/12 23:54
3072161	3072161057	PS	WP	6/5/2012 0:01	RTI	-0.251U	3.95	9.25	7/22/12 0:02
3072161	3072161058	PS	WP	6/5/2012 0:01	RTI	0.0386U	3.98	9.24	7/22/12 0:10
3072161	3072161059	PS	WP	6/5/2012 0:01	RTI	-1.89U	3.72	9.25	7/22/12 0:18
3072161	3072161060	PS	WP	6/5/2012 0:01	RTI	-1.35U	3.79	9.24	7/22/12 0:26

Mu 7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
 Matrix Smear
 Batch ID 12509
 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
459108	1.0	7/21/12 21:45	7.0	7/21/12 21:45	7.00	316.8	dpm/S	High, Evaluate
3072161041	1.0	6/11/12 0:01	7.0	7/21/12 21:53	9.14	264.5	dpm/S	Pass
3072161042	1.0	6/11/12 0:01	7.0	7/21/12 22:02	4.71	259.8	dpm/S	Pass
3072161043	1.0	6/11/12 0:01	7.0	7/21/12 22:10	7.57	291.6	dpm/S	Pass
3072161044	1.0	6/11/12 0:01	7.0	7/21/12 22:18	8.00	254.2	dpm/S	Pass
3072161045	1.0	6/11/12 0:01	7.0	7/21/12 22:26	5.71	293.8	dpm/S	Pass
3072161046	1.0	6/11/12 0:01	7.0	7/21/12 22:34	6.14	284.5	dpm/S	Pass
3072161047	1.0	6/11/12 0:01	7.0	7/21/12 22:42	8.29	278.3	dpm/S	Pass
3072161048	1.0	6/11/12 0:01	7.0	7/21/12 22:50	7.00	264.5	dpm/S	Pass
3072161049	1.0	6/11/12 0:01	7.0	7/21/12 22:58	5.86	275.8	dpm/S	Pass
3072161050	1.0	6/11/12 0:01	7.0	7/21/12 23:06	6.86	294.1	dpm/S	Pass
3072161051	1.0	6/11/12 0:01	7.0	7/21/12 23:14	8.00	280.0	dpm/S	Pass
3072161052	1.0	6/11/12 0:01	7.0	7/21/12 23:22	4.57	280.1	dpm/S	Pass
3072161053	1.0	6/11/12 0:01	7.0	7/21/12 23:30	7.43	301.7	dpm/S	Pass
3072161054	1.0	6/11/12 0:01	7.0	7/21/12 23:38	7.57	265.9	dpm/S	Pass
3072161055	1.0	6/11/12 0:01	7.0	7/21/12 23:46	7.29	259.2	dpm/S	Pass
3072161056	1.0	6/5/12 0:01	7.0	7/21/12 23:54	6.86	290.2	dpm/S	Pass
3072161057	1.0	6/5/12 0:01	7.0	7/22/12 0:02	6.14	279.7	dpm/S	Pass
3072161058	1.0	6/5/12 0:01	7.0	7/22/12 0:10	6.29	274.5	dpm/S	Pass
3072161059	1.0	6/5/12 0:01	7.0	7/22/12 0:18	5.29	278.9	dpm/S	Pass
3072161060	1.0	6/5/12 0:01	7.0	7/22/12 0:26	5.57	268.9	dpm/S	Pass
LCS12509	1.0	7/21/12 17:11	7.0	7/21/12 17:11	63.14	327.4	dpm/S	High, Evaluate
LCSD12509	1.0	7/21/12 17:19	7.0	7/21/12 17:19	56.57	332.6	dpm/S	High, Evaluate

9/27/12

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test: Low Energy Beta
 Matrix: Smear
 Batch ID: 12509



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	Sigma	1.96
PrepSOP2 n/a	Zero Factor	2.71
AnalSOP1		
AnalSOP2 n/a		

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
T _{1/2}	12.43 years
Decay Correction Uncertainty	0.08%

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

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

Description	Maximum	CSU (TPU) for Analysis 10.60%		
		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

<u>Total Uncertainty</u>	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

SWIFE_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

BKG 072112

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 21:52 ✓
Sample Ct Duration (min)			7.0 ✓
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7 ✓	7/21/2012 21:45	459108
2	15 ✓	7/21/2012 21:53	3072161041
3	24 ✓	7/21/2012 22:02	3072161042
4	32 ✓	7/21/2012 22:10	3072161043
5	40 ✓	7/21/2012 22:18	3072161044
6	48 ✓	7/21/2012 22:26	3072161045
7	56 ✓	7/21/2012 22:34	3072161046
8	64 ✓	7/21/2012 22:42	3072161047
9	72 ✓	7/21/2012 22:50	3072161048
10	80 ✓	7/21/2012 22:58	3072161049
11	88 ✓	7/21/2012 23:06	3072161050
12	96 ✓	7/21/2012 23:14	3072161051
13	104 ✓	7/21/2012 23:22	3072161052
14	112 ✓	7/21/2012 23:30	3072161053
15	120 ✓	7/21/2012 23:38	3072161054
16	128 ✓	7/21/2012 23:46	3072161055
17	136 ✓	7/21/2012 23:54	3072161056
18	144 ✓	7/22/2012 0:02	3072161057
19	152 ✓	7/22/2012 0:10	3072161058
20	160 ✓	7/22/2012 0:18	3072161059
21	168 ✓	7/22/2012 0:26	3072161060
22	176 ✓	7/22/2012 0:34	LCS12510
23	184 ✓	7/22/2012 0:42	LCSD12510
24	192 ✓	7/22/2012 0:50	459109
25	200 ✓	7/22/2012 0:58	3072161061
26	208 ✓	7/22/2012 1:06	3072161062
27	216 ✓	7/22/2012 1:14	3072161063
28	224 ✓	7/22/2012 1:22	3072161064
29	232 ✓	7/22/2012 1:30	3072161065
30	240 ✓	7/22/2012 1:38	3072161066
31	249 ✓	7/22/2012 1:47	3072161067
32	257 ✓	7/22/2012 1:55	3072161068
33	265 ✓	7/22/2012 2:03	3072161069
34	273 ✓	7/22/2012 2:11	3072161070
35	281 ✓	7/22/2012 2:19	3072161071
36	289 ✓	7/22/2012 2:27	3072161072
37	298 ✓	7/22/2012 2:36	3072161073
38	306 ✓	7/22/2012 2:44	3072161074
39	314 ✓	7/22/2012 2:52	3072161075

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7/31/12

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
28	1	7.00	7	3.00	7.00	7.00	316.83	2
28	2	7.00	15	4.71	9.00	9.14	264.52	2
28	3	7.00	24	2.00	5.00	4.71	259.83	4
28	4	7.00	32	4.57	7.14	7.57	291.58	2
28	5	7.00	40	3.43	8.00	8.00	254.17	1
28	6	7.00	48	3.00	5.71	5.71	293.75	3
28	7	7.00	56	3.43	6.29	6.14	284.50	2
28	8	7.00	64	5.14	8.29	8.29	278.29	2
28	9	7.00	72	4.43	7.14	7.00	264.53	2
28	10	7.00	80	2.86	6.00	5.86	275.84	3
28	11	7.00	88	4.29	7.14	6.86	294.12	4
28	12	7.00	96	5.00	8.00	8.00	280.02	2
28	13	7.00	104	2.71	4.71	4.57	280.13	3
28	14	7.00	112	4.71	7.57	7.43	301.66	2
28	15	7.00	120	3.29	7.57	7.57	265.93	2
28	16	7.00	128	3.14	7.43	7.29	259.23	2
28	17	7.00	136	3.57	6.86	6.86	290.17	2
28	18	7.00	144	4.00	6.29	6.14	279.71	2
28	19	7.00	152	3.29	6.43	6.29	274.47	3
28	20	7.00	160	2.14	5.57	5.29	278.85	4
28	21	7.00	168	3.00	5.57	5.57	268.92	3
28	22	7.00	176	47.29	64.43	64.71	319.29	0
28	23	7.00	184	44.86	58.14	58.43	325.72	0
28	24	7.00	192	4.14	7.43	7.00	326.99	3
28	25	7.00	200	3.00	6.71	6.71	232.93	2
28	26	7.00	208	4.43	7.14	7.14	283.52	2
28	27	7.00	216	3.00	6.57	6.57	267.85	3
28	28	7.00	224	4.43	8.00	8.14	253.61	1
28	29	7.00	232	4.00	7.86	8.00	271.95	0
28	30	7.00	240	3.43	7.29	7.00	277.69	2
28	31	7.00	249	4.14	7.57	7.43	299.93	2
28	32	7.00	257	3.43	6.71	6.71	278.75	2
28	33	7.00	265	3.57	7.00	6.86	277.07	2
28	34	7.00	273	4.57	8.14	8.14	274.24	2
28	35	7.00	281	4.00	8.43	8.57	286.61	2
28	36	7.00	289	5.71	9.14	9.29	294.78	1
28	37	7.00	298	3.43	7.29	7.29	277.01	2
28	38	7.00	306	5.00	8.86	8.86	288.18	1
28	39	7.00	314	2.29	4.43	4.14	316.73	5

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			7/22/2012 3:07 ✓
Sample Ct Duration (min)			7.0 ✓
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
40	322 ✓	7/22/2012 3:00	3072161076
41	330 ✓	7/22/2012 3:08	3072161077
42	338 ✓	7/22/2012 3:16	3072161078
43	346 ✓	7/22/2012 3:24	3072161079
44	354 ✓	7/22/2012 3:32	3072161080
45	362 ✓	7/22/2012 3:40	LCS12511
46	370 ✓	7/22/2012 3:48	LCSD12511
47	378 ✓	7/22/2012 3:56	459110
48	386 ✓	7/22/2012 4:04	3072161081
49	395 ✓	7/22/2012 4:13	3072161082
50	403 ✓	7/22/2012 4:21	3072161083
51	411 ✓	7/22/2012 4:29	3072161084
52	419 ✓	7/22/2012 4:37	3072161085
53	427 ✓	7/22/2012 4:45	3072161086
54	435 ✓	7/22/2012 4:53	3072161087
55	443 ✓	7/22/2012 5:01	3072161088
56	451 ✓	7/22/2012 5:09	3072161089
57	459 ✓	7/22/2012 5:17	3072161090
58	467 ✓	7/22/2012 5:25	3072161091
59	475 ✓	7/22/2012 5:33	3072161092
60	483 ✓	7/22/2012 5:41	3072161093
61	491 ✓	7/22/2012 5:49	3072161094
62	499 ✓	7/22/2012 5:57	3072161095
63	507 ✓	7/22/2012 6:05	3072161096
64	515 ✓	7/22/2012 6:13	3072161097
65	523 ✓	7/22/2012 6:21	3072161098
66	531 ✓	7/22/2012 6:29	3072161099
67	539 ✓	7/22/2012 6:37	3072161100

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7/31/12

Protocol #:28

SWIPE_H3_C14

User :

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tsIE	LUM
28	40	7.00	322	2.43	5.14	5.00	273.58	4
28	41	7.00	330	4.29	8.00	8.00	259.56	2
28	42	7.00	338	4.57	8.71	8.57	246.98	1
28	43	7.00	346	3.43	6.86	6.57	287.42	3
28	44	7.00	354	3.43	7.43	7.29	293.19	2
28	45	7.00	362	47.57	61.43	61.71	322.59	0
28	46	7.00	370	44.14	60.43	60.43	320.75	1
28	47	7.00	378	3.29	6.57	6.43	333.55	2
28	48	7.00	386	5.14	7.43	7.14	311.36	2
28	49	7.00	395	4.57	7.86	7.86	264.14	1
28	50	7.00	403	2.14	5.29	5.00	277.16	3
28	51	7.00	411	5.00	8.86	8.86	263.66	1
28	52	7.00	419	1.86	5.29	5.00	261.27	5
28	53	7.00	427	3.43	7.00	7.00	268.77	1
28	54	7.00	435	3.57	7.71	7.71	265.46	2
28	55	7.00	443	1.71	4.57	4.43	259.00	3
28	56	7.00	451	2.71	6.00	5.86	261.37	3
28	57	7.00	459	3.86	6.29	6.00	320.15	4
28	58	7.00	467	2.29	5.29	5.14	279.07	3
28	59	7.00	475	2.29	5.00	5.00	304.69	3
28	60	7.00	483	2.86	7.14	7.14	266.78	2
28	61	7.00	491	4.00	6.71	6.71	273.62	2
28	62	7.00	499	3.14	5.43	5.43	235.78	3
28	63	7.00	507	2.57	5.43	5.43	250.18	3
28	64	7.00	515	4.14	7.43	7.43	283.77	2
28	65	7.00	523	3.43	7.86	7.71	252.05	2
28	66	7.00	531	3.71	6.57	6.71	216.62	1
28	67	7.00	539	4.00	8.29	8.43	225.71	2

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 11:08
Sample Ct Duration (min)			7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7 ✓	7/21/2012 11:01	459104
2	15 ✓	7/21/2012 11:09	3072160061
3	23 ✓	7/21/2012 11:17	3072160062
4	31 ✓	7/21/2012 11:25	3072160063
5	39 ✓	7/21/2012 11:33	3072160064
6	47 ✓	7/21/2012 11:41	3072160065
7	55 ✓	7/21/2012 11:49	3072160066
8	63 ✓	7/21/2012 11:57	3072160067
9	71 ✓	7/21/2012 12:05	3072160068
10	79 ✓	7/21/2012 12:13	3072160069
11	87 ✓	7/21/2012 12:21	3072160070
12	95 ✓	7/21/2012 12:29	3072160071
13	104 ✓	7/21/2012 12:38	3072160072
14	112 ✓	7/21/2012 12:46	3072160073
15	120 ✓	7/21/2012 12:54	3072160074
16	128 ✓	7/21/2012 13:02	3072160075
17	136 ✓	7/21/2012 13:10	3072160076
18	144 ✓	7/21/2012 13:18	3072160077
19	152 ✓	7/21/2012 13:26	3072160078
20	160 ✓	7/21/2012 13:34	3072160079
21	168 ✓	7/21/2012 13:42	3072160080
22	176 ✓	7/21/2012 13:50	LCS12505
23	184 ✓	7/21/2012 13:58	LCSD12505
24	192 ✓	7/21/2012 14:06	459104/3072160081
25	200 ✓	7/21/2012 14:14	3072160081
26	208 ✓	7/21/2012 14:22	3072160082
27	216 ✓	7/21/2012 14:30	3072160083
28	224 ✓	7/21/2012 14:38	3072160084
29	232 ✓	7/21/2012 14:46	3072160085
30	240 ✓	7/21/2012 14:54	3072160086
31	248 ✓	7/21/2012 15:02	3072160087
32	256 ✓	7/21/2012 15:10	3072160088
33	264 ✓	7/21/2012 15:18	3072160089
34	272 ✓	7/21/2012 15:26	3072160090
35	280 ✓	7/21/2012 15:34	3072160091
36	288 ✓	7/21/2012 15:42	3072160092
37	296 ✓	7/21/2012 15:50	3072160093
38	304 ✓	7/21/2012 15:58	3072160094
39	312 ✓	7/21/2012 16:06	3072160095
40	320 ✓	7/21/2012 16:14	3072160096
41	328 ✓	7/21/2012 16:22	3072160097
42	336 ✓	7/21/2012 16:30	3072160098
43	345 ✓	7/21/2012 16:39	3072160099
44	353 ✓	7/21/2012 16:47	3072160100
45	361 ✓	7/21/2012 16:55	LCS12506
46	369 ✓	7/21/2012 17:03	LCSD12506
47	377 ✓	7/21/2012 17:11	LCS12509
48	385 ✓	7/21/2012 17:19	LCSD12509

02
7/31/12

Protocol #127

SWIPE_H3_C14

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 Indicators: 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
27	1	7.00	7	4.29	7.86	7.86	298.28	2
27	2	7.00	15	4.14	6.71	6.86	280.62	1
27	3	7.00	23	5.00	7.71	7.71	279.61	2
27	4	7.00	31	3.14	6.57	6.57	265.63	2
27	5	7.00	39	3.00	5.86	5.86	274.43	3
27	6	7.00	47	4.14	7.29	6.86	312.50	3
27	7	7.00	55	3.29	5.43	5.29	293.48	4
27	8	7.00	63	3.29	5.71	5.57	286.63	3
27	9	7.00	71	5.43	9.57	9.29	292.85	2
27	10	7.00	79	3.29	6.29	6.29	287.93	2
27	11	7.00	87	3.57	7.29	7.43	307.43	1
27	12	7.00	95	3.57	5.86	6.00	305.58	2
27	13	7.00	104	3.43	7.00	6.86	301.59	2
27	14	7.00	112	3.43	6.71	7.00	332.19	3
27	15	7.00	120	4.14	6.00	6.00	282.64	4
27	16	7.00	128	5.29	8.00	7.86	323.61	2
27	17	7.00	136	2.43	5.43	5.43	318.57	2
27	18	7.00	144	4.43	7.00	7.00	301.78	2
27	19	7.00	152	1.71	5.00	4.43	324.05	5
27	20	7.00	160	2.86	6.14	6.29	321.03	2
27	21	7.00	168	5.43	9.57	9.71	305.92	1
27	22	7.00	176	44.00	59.00	59.43	322.79	0
27	23	7.00	184	43.14	60.86	61.00	324.21	0
27	24	7.00	192	3.14	5.86	5.86	333.54	3
27	25	7.00	200	3.43	6.86	6.71	295.18	3
27	26	7.00	208	3.29	6.00	6.14	298.64	2
27	27	7.00	216	4.14	6.86	6.57	314.32	2
27	28	7.00	224	3.57	6.57	6.43	293.42	2
27	29	7.00	232	3.29	6.14	6.00	300.13	4
27	30	7.00	240	5.29	8.29	8.43	291.47	1
27	31	7.00	248	3.43	6.14	6.00	295.79	3
27	32	7.00	256	4.29	7.29	7.29	313.48	2
27	33	7.00	264	3.29	5.43	5.43	305.68	4
27	34	7.00	272	2.86	5.57	5.29	313.29	4
27	35	7.00	280	4.57	7.00	7.00	325.44	1
27	36	7.00	288	6.57	10.29	10.71	300.85	1
27	37	7.00	296	2.57	7.57	7.57	270.54	3
27	38	7.00	304	4.86	7.86	8.00	258.16	1
27	39	7.00	312	4.71	7.43	7.29	265.34	2

Protocol #:27

SWIFE_H3_C14

User :

PN	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tsIE	LUM
27	40	7.00	320	3.29	7.00	7.00	264.49	2
27	41	7.00	328	2.43	6.29	6.43	259.07	2
27	42	7.00	336	2.86	6.14	6.14	265.78	2
27	43	7.00	345	3.43	7.86	7.71	252.38	1
27	44	7.00	353	3.29	5.86	5.86	262.75	3
27	45	7.00	361	44.00	55.00	55.43	332.93	1
27	46	7.00	369	42.00	57.00	57.14	317.64	0
27	47	7.00	377	47.00	62.86	63.14	327.35	1
27	48	7.00	385	41.86	56.57	56.57	332.63	1

SYSTEM NORMALIZED

C14 IPA DATA PROCESSED

H3 IPA DATA PROCESSED

BKG IPA DATA PROCESSED

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
307216083	12506	Swipe_H3-c14	7	27	7/20/12 1608	7	MA	AL
84								
85								
86								
87								
88								
89								
90								
91								
92			15					
93								
94								
95								
96								
97								
98								
99								
100								
LES 12506								
LES D 12506								
LES 12509								
LES O 12509								
MB (459108)								
307216104			39	28	7/21/12 1430	7		AL

Run comments:

Peer Review:

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
3072161042	12509	Swpr-132c14	39	28	7/21/12 1430	7	NA	JLK
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
WS 12510	12510							
WSO 12510								
MS (45910A)								
3072161061								
4 62								

Run comments:

Peer Review:

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
3072160041	12504	Swpr-13-C14	7	26	7/20/12 1608	7	NA	R
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53			34					
54								
55								
56								
57								
58								
59								
60								
LCS 12504								
LCS *12504								
MB (459104)	12505		9	27				
3072160061								

Peer Review: _____

Run comments: * Samples LCS 12503 + LCS 12504 were counted as last two samples after. LCS 12504. Incidentally omitted from runlog. 7/21/12

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
3072160062	12505	SWAP-H3-C14	9	27	7/20/12 1608	7	NA	JA
63								
64								
65								
66								
67								
68								
69								
70								
71								
72			21					
73								
74								
75								
76								
77								
78								
79								
80								
LCS 12505								
LCS 12505								
MB (459105)	12506							
3072160081			7					
82								

Run comments:

Peer Review: _____

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
3072160083	12506	Swipe-43-cl4	7	27	7/20/12 1608	7	MS	AL
84								
85								
86								
87								
88								
89								
90								
91								
92			15					
93								
94								
95								
96								
97								
98								
99								
100								
LES 12506								
LES D 12506								
LES 12509	12509							
LES D 12509								
(MB (459108)								
3072161091			39	28	7/21/12 1430	7		AL

Run comments:

Peer Review: _____

Low Energy Beta Sample Analysis Data

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

1 459109-BLANK for HBN 91084 [RADC/1251

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

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 00:50 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796281 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 7/22/2012 00:50 Dilution
 Method EPA 906.0M Col ID Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796281 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL
Rad Chemistry	OK				
LSC Low Energy Beta	OK	1.47U ± 4.34 (9.63)	dpm/sa 1.47U ± 4.34 (9.63)		dpm/sa

2 3072161061-275-6

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 00:58 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790749 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 7/22/2012 00:58 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790749 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Req. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.867U ± 4.17 (9.43)	dpm/sa 0.867U ± 4.17 (9.43)		dpm/sa		

3 3072161062-275-7

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

3 3072161062-275-7

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:06 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790750 **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** 7/22/2012 01:06 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790750 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.68U ± 4.21 (9.26)	dpm/sa 1.68U ± 4.21 (9.26)		dpm/sa		

4 3072161063-275-8

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:14 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790751 **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** 7/22/2012 01:14 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790751 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.579U ± 4.05 (9.24)	dpm/sa 0.579U ± 4.05 (9.24)		dpm/sa		

5 3072161064-275-9

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

5 3072161064-275-9

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:22 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790752 **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** 7/22/2012 01:22 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790752 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.62J ± 4.47 (9.27)	dpm/sa 3.62J ± 4.47 (9.27)		dpm/sa		

6 3072161065-275-10

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:30 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790753 **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** 7/22/2012 01:30 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790753 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.34U ± 4.41 (9.24)	dpm/sa 3.34U ± 4.41 (9.24)		dpm/sa		

7 3072161066-275-11

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

7 3072161066-275-11

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:38 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790754 **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** 7/22/2012 01:38 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790754 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	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	

8 3072161067-275-12

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 01:47 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790755 **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** 7/22/2012 01:47 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790755 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.27U ± 4.33 (9.36)	dpm/sa 2.27U ± 4.33 (9.36)			dpm/sa	

9 3072161068-275-13

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

9 3072161068-275-13

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 01:55 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790756 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 7/22/2012 01:55 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790756 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.850U ± 4.09 (9.25)	dpm/sa 0.850U ± 4.09 (9.25)		dpm/sa		

10 3072161069-275-14

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 02:03 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790757 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 7/22/2012 02:03 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790757 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.14U ± 4.13 (9.24)	dpm/sa 1.14U ± 4.13 (9.24)		dpm/sa		

11 3072161070-275-14D

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

11 3072161070-275-14D

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 02:11 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790758 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 7/22/2012 02:11 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790758 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.61J ± 4.45 (9.24)	dpm/sa 3.61J ± 4.45 (9.24)		dpm/sa		

12 3072161071-275-15

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 02:19 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790759 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 7/22/2012 02:19 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790759 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	4.46J ± 4.58 (9.27)	dpm/sa 4.46J ± 4.58 (9.27)		dpm/sa		

13 3072161072-275-16

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

13 3072161072-275-16

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 02:27 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790760 **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** 7/22/2012 02:27 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790760 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	5.88J ± 4.78 (9.32)	dpm/sa 5.88J ± 4.78 (9.32)		dpm/sa		

14 3072161073-275-17

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12510 **Prep Date** 7/22/2012 02:36 **Dilution**
Method EPA 906.0M **HBN** 91084 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790761 **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** 7/22/2012 02:36 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790761 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.97U ± 4.24 (9.24)	dpm/sa 1.97U ± 4.24 (9.24)		dpm/sa		

15 3072161074-275-18

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth
 1207079 **Location**

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

15 3072161074-275-18

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 02:44 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790762 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 7/22/2012 02:44 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790762 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	5.02J ± 4.65 (9.28)	dpm/sa 5.02J ± 4.65 (9.28)			dpm/sa	

16 3072161075-275-19

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 02:52 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790763 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 7/22/2012 02:52 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790763 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-4.25U ± 3.53 (9.54)	dpm/sa -4.25U ± 3.53 (9.54)			dpm/sa	

17 3072161076-275-19D

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth 1207079 Location

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

17 3072161076-275-19D

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 03:00 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790764 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 7/22/2012 03:00 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790764 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.45U ± 3.65 (9.24)	dpm/sa -2.45U ± 3.65 (9.24)		dpm/sa		

18 3072161077-275-20

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 03:08 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790765 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 7/22/2012 03:08 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790765 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.34U ± 4.42 (9.25)	dpm/sa 3.34U ± 4.42 (9.25)		dpm/sa		

19 3072161078-275-21

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12510 HBN 91084
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

19 3072161078-275-21

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 03:16 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790766 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 7/22/2012 03:16 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790766 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	4.47J ± 4.59 (9.31)	dpm/sa 4.47J ± 4.59 (9.31)		dpm/sa		

20 3072161079-275-22

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12510 Prep Date 7/22/2012 03:24 Dilution
 Method EPA 906.0M HBN 91084 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790767 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 7/22/2012 03:24 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790767 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.581U ± 4.07 (9.28)	dpm/sa 0.581U ± 4.07 (9.28)		dpm/sa		

21 3072161080-275-23

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12510 **HBN** 91084
Rule 9060 I LEB **Status** RE
Create Date 6/28/2012 **Analyst** MBT

21 3072161080-275-23

Prep Information

Procedure 9060 I LEB	Batch RADC/12510	Prep Date 7/22/2012 03:32	Dilution
Method EPA 906.0M	HBN 91084	Hold Date 12/2/2012 23:59	Analyst MBT
Schedule 2790768	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 7/22/2012 03:32	Dilution
Method EPA 906.0M	Col ID	Hold Date 12/2/2012 23:59	Analyst MBT
Schedule 2790768	File		CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.98U ± 4.27 (9.31)	dpm/sa 1.98U ± 4.27 (9.31)		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 13:59
 Batch ID 12510
 A-code 9060 I LEB 9060W
 Method EPA 906.0M EPA 906.0m

Assigned Analyst MBT
 Earliest Due Date 07/04/2012 07:12
 HBN 91084

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459109	BLANK	IP		QCACCOUNT	1.47U	4.34	9.63	7/22/12 0:50
3072161	3072161061	PS	WP	6/5/2012 0:01	RTI	0.867U	4.17	9.43	7/22/12 0:58
3072161	3072161062	PS	WP	6/5/2012 0:01	RTI	1.68U	4.21	9.26	7/22/12 1:06
3072161	3072161063	PS	WP	6/5/2012 0:01	RTI	0.579U	4.05	9.24	7/22/12 1:14
3072161	3072161064	PS	WP	6/5/2012 0:01	RTI	3.62J	4.47	9.27	7/22/12 1:22
3072161	3072161065	PS	WP	6/5/2012 0:01	RTI	3.34U	4.41	9.24	7/22/12 1:30
3072161	3072161066	PS	WP	6/5/2012 0:01	RTI	1.41U	4.16	9.24	7/22/12 1:38
3072161	3072161067	PS	WP	6/5/2012 0:01	RTI	2.27U	4.33	9.36	7/22/12 1:47
3072161	3072161068	PS	WP	6/5/2012 0:01	RTI	0.850U	4.09	9.25	7/22/12 1:55
3072161	3072161069	PS	WP	6/5/2012 0:01	RTI	1.14U	4.13	9.24	7/22/12 2:03
3072161	3072161070	PS	WP	6/5/2012 0:01	RTI	3.61J	4.45	9.24	7/22/12 2:11
3072161	3072161071	PS	WP	6/5/2012 0:01	RTI	4.46J	4.58	9.27	7/22/12 2:19
3072161	3072161072	PS	WP	6/5/2012 0:01	RTI	5.88J	4.78	9.32	7/22/12 2:27
3072161	3072161073	PS	WP	6/5/2012 0:01	RTI	1.97U	4.24	9.24	7/22/12 2:36
3072161	3072161074	PS	WP	6/5/2012 0:01	RTI	5.02J	4.65	9.28	7/22/12 2:44
3072161	3072161075	PS	WP	6/5/2012 0:01	RTI	-4.25U	3.53	9.54	7/22/12 2:52
3072161	3072161076	PS	WP	6/5/2012 0:01	RTI	-2.45U	3.65	9.24	7/22/12 3:00
3072161	3072161077	PS	WP	6/5/2012 0:01	RTI	3.34U	4.42	9.25	7/22/12 3:08
3072161	3072161078	PS	WP	6/5/2012 0:01	RTI	4.47J	4.59	9.31	7/22/12 3:16
3072161	3072161079	PS	WP	6/5/2012 0:01	RTI	0.581U	4.07	9.28	7/22/12 3:24
3072161	3072161080	PS	WP	6/5/2012 0:01	RTI	1.98U	4.27	9.31	7/22/12 3:32

M7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
 Matrix Smear
 Batch ID 12510
 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
459109	1.0	7/22/12 0:50	7.0	7/22/12 0:50	7.00	327.0	dpm/S	High, Evaluate
3072161061	1.0	6/5/12 0:01	7.0	7/22/12 0:58	6.71	232.9	dpm/S	Pass
3072161062	1.0	6/5/12 0:01	7.0	7/22/12 1:06	7.14	283.5	dpm/S	Pass
3072161063	1.0	6/5/12 0:01	7.0	7/22/12 1:14	6.57	267.9	dpm/S	Pass
3072161064	1.0	6/5/12 0:01	7.0	7/22/12 1:22	8.14	253.6	dpm/S	Pass
3072161065	1.0	6/5/12 0:01	7.0	7/22/12 1:30	8.00	272.0	dpm/S	Pass
3072161066	1.0	6/5/12 0:01	7.0	7/22/12 1:38	7.00	277.7	dpm/S	Pass
3072161067	1.0	6/5/12 0:01	7.0	7/22/12 1:47	7.43	299.9	dpm/S	Pass
3072161068	1.0	6/5/12 0:01	7.0	7/22/12 1:55	6.71	278.8	dpm/S	Pass
3072161069	1.0	6/5/12 0:01	7.0	7/22/12 2:03	6.86	277.1	dpm/S	Pass
3072161070	1.0	6/5/12 0:01	7.0	7/22/12 2:11	8.14	274.2	dpm/S	Pass
3072161071	1.0	6/5/12 0:01	7.0	7/22/12 2:19	8.57	286.6	dpm/S	Pass
3072161072	1.0	6/5/12 0:01	7.0	7/22/12 2:27	9.29	294.8	dpm/S	Pass
3072161073	1.0	6/5/12 0:01	7.0	7/22/12 2:36	7.29	277.0	dpm/S	Pass
3072161074	1.0	6/5/12 0:01	7.0	7/22/12 2:44	8.86	288.2	dpm/S	Pass
3072161075	1.0	6/5/12 0:01	7.0	7/22/12 2:52	4.14	316.7	dpm/S	High, Evaluate
3072161076	1.0	6/5/12 0:01	7.0	7/22/12 3:00	5.00	273.6	dpm/S	Pass
3072161077	1.0	6/5/12 0:01	7.0	7/22/12 3:08	8.00	259.6	dpm/S	Pass
3072161078	1.0	6/5/12 0:01	7.0	7/22/12 3:16	8.57	247.0	dpm/S	Pass
3072161079	1.0	6/5/12 0:01	7.0	7/22/12 3:24	6.57	287.4	dpm/S	Pass
3072161080	1.0	6/5/12 0:01	7.0	7/22/12 3:32	7.29	293.2	dpm/S	Pass
LCS12510	1.0	7/22/12 0:34	7.0	7/22/12 0:34	64.71	319.3	dpm/S	High, Evaluate
LCS12510	1.0	7/22/12 0:42	7.0	7/22/12 0:42	58.43	325.7	dpm/S	High, Evaluate

M7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation



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

Test Code Low Energy Beta Analyst MBT
 Matrix Smear PrepSOP1 0
 Batch ID 12510 PrepSOP2 n/a
 Prep Start 7/16/2012 12:00 AnalSOP1 0
 Prep Finish 7/16/2012 AnalSOP2 n/a

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
459109	0.4972	0.0000	1.0000	1.468	4.335	4.338	9.631	3.488	1.030	4.335	1.00
3072161061	0.5114	0.1288	0.9928	0.867	4.171	4.172	9.430	3.415	1.008	4.171	1.00
3072161062	0.5207	0.1288	0.9928	1.683	4.203	4.208	9.261	3.355	0.990	4.203	1.00
3072161063	0.5221	0.1288	0.9928	0.579	4.051	4.051	9.238	3.346	0.988	4.051	1.00
3072161064	0.5200	0.1288	0.9928	3.622	4.447	4.468	9.274	3.359	0.992	4.447	1.00
3072161065	0.5221	0.1288	0.9928	3.338	4.397	4.415	9.237	3.346	0.988	4.397	1.00
3072161066	0.5216	0.1289	0.9928	1.409	4.161	4.165	9.245	3.349	0.988	4.161	1.00
3072161067	0.5152	0.1289	0.9928	2.268	4.319	4.327	9.360	3.390	1.001	4.319	1.00
3072161068	0.5215	0.1289	0.9928	0.850	4.090	4.092	9.247	3.349	0.989	4.090	1.00
3072161069	0.5217	0.1289	0.9928	1.139	4.126	4.128	9.244	3.348	0.988	4.126	1.00
3072161070	0.5220	0.1289	0.9928	3.608	4.430	4.451	9.239	3.347	0.988	4.430	1.00
3072161071	0.5200	0.1289	0.9928	4.455	4.545	4.576	9.274	3.359	0.992	4.545	1.00
3072161072	0.5174	0.1290	0.9928	5.879	4.729	4.781	9.321	3.376	0.996	4.729	1.00
3072161073	0.5217	0.1290	0.9928	1.969	4.231	4.238	9.243	3.348	0.988	4.231	1.00
3072161074	0.5196	0.1290	0.9928	5.021	4.614	4.653	9.282	3.362	0.992	4.614	1.00
3072161075	0.5053	0.1290	0.9928	-4.245	3.495	3.532	9.543	3.457	1.020	3.495	1.00
3072161076	0.5220	0.1290	0.9928	-2.451	3.634	3.646	9.239	3.346	0.988	3.634	1.00
3072161077	0.5212	0.1290	0.9928	3.343	4.404	4.422	9.252	3.351	0.989	4.404	1.00
3072161078	0.5180	0.1290	0.9928	4.473	4.563	4.594	9.311	3.372	0.995	4.563	1.00
3072161079	0.5198	0.1291	0.9928	0.581	4.069	4.069	9.278	3.361	0.992	4.069	1.00
3072161080	0.5180	0.1291	0.9928	1.983	4.262	4.268	9.310	3.372	0.995	4.262	1.00
LCS12510	0.5034	0.0000	1.0000	116.080	11.970	18.302	9.510	3.445	1.017	11.970	1.00
LCS12510	0.4983	0.0000	1.0000	104.686	11.507	16.979	9.610	3.481	1.027	11.507	1.00

Om13/12

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%

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

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

Description	Maximum	of Critical	CSU (TPU) for Analysis		10.60%
			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	

<u>Total Uncertainty</u>	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%

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test: Low Energy Beta
 Matrix: Smear
 Batch ID: 12510



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		Sigma	1.96
PrepSOP2	n/a	Zero Factor	2.71
AnalSOP1			
AnalSOP2	n/a		

Protocol #: 4

SWIPE_H3_C14

User :

Time: 30.00

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	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

BKG 072112

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 21:52 ✓
Sample Ct Duration (min)			7.0 ✓
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7 ✓	7/21/2012 21:45	459108
2	15 ✓	7/21/2012 21:53	3072161041
3	24 ✓	7/21/2012 22:02	3072161042
4	32 ✓	7/21/2012 22:10	3072161043
5	40 ✓	7/21/2012 22:18	3072161044
6	48 ✓	7/21/2012 22:26	3072161045
7	56 ✓	7/21/2012 22:34	3072161046
8	64 ✓	7/21/2012 22:42	3072161047
9	72 ✓	7/21/2012 22:50	3072161048
10	80 ✓	7/21/2012 22:58	3072161049
11	88 ✓	7/21/2012 23:06	3072161050
12	96 ✓	7/21/2012 23:14	3072161051
13	104 ✓	7/21/2012 23:22	3072161052
14	112 ✓	7/21/2012 23:30	3072161053
15	120 ✓	7/21/2012 23:38	3072161054
16	128 ✓	7/21/2012 23:46	3072161055
17	136 ✓	7/21/2012 23:54	3072161056
18	144 ✓	7/22/2012 0:02	3072161057
19	152 ✓	7/22/2012 0:10	3072161058
20	160 ✓	7/22/2012 0:18	3072161059
21	168 ✓	7/22/2012 0:26	3072161060
22	176 ✓	7/22/2012 0:34	LCS12510
23	184 ✓	7/22/2012 0:42	LCSD12510
24	192 ✓	7/22/2012 0:50	459109
25	200 ✓	7/22/2012 0:58	3072161061
26	208 ✓	7/22/2012 1:06	3072161062
27	216 ✓	7/22/2012 1:14	3072161063
28	224 ✓	7/22/2012 1:22	3072161064
29	232 ✓	7/22/2012 1:30	3072161065
30	240 ✓	7/22/2012 1:38	3072161066
31	249 ✓	7/22/2012 1:47	3072161067
32	257 ✓	7/22/2012 1:55	3072161068
33	265 ✓	7/22/2012 2:03	3072161069
34	273 ✓	7/22/2012 2:11	3072161070
35	281 ✓	7/22/2012 2:19	3072161071
36	289 ✓	7/22/2012 2:27	3072161072
37	298 ✓	7/22/2012 2:36	3072161073
38	306 ✓	7/22/2012 2:44	3072161074
39	314 ✓	7/22/2012 2:52	3072161075

Handwritten:
24
7/31/12

Protocol #:28

SWIFE_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	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
28	1	7.00	7	3.00	7.00	7.00	316.83	2
28	2	7.00	15	4.71	9.00	9.14	264.52	2
28	3	7.00	24	2.00	5.00	4.71	259.83	4
28	4	7.00	32	4.57	7.14	7.57	291.58	2
28	5	7.00	40	3.43	8.00	8.00	254.17	1
28	6	7.00	48	3.00	5.71	5.71	293.75	3
28	7	7.00	56	3.43	6.29	6.14	284.50	2
28	8	7.00	64	5.14	8.29	8.29	278.29	2
28	9	7.00	72	4.43	7.14	7.00	264.53	2
28	10	7.00	80	2.86	6.00	5.86	275.84	3
28	11	7.00	88	4.29	7.14	6.86	294.12	4
28	12	7.00	96	5.00	8.00	8.00	280.02	2
28	13	7.00	104	2.71	4.71	4.57	280.13	3
28	14	7.00	112	4.71	7.57	7.43	301.66	2
28	15	7.00	120	3.29	7.57	7.57	265.93	2
28	16	7.00	128	3.14	7.43	7.29	259.23	2
28	17	7.00	136	3.57	6.86	6.86	290.17	2
28	18	7.00	144	4.00	6.29	6.14	279.71	2
28	19	7.00	152	3.29	6.43	6.29	274.47	3
28	20	7.00	160	2.14	5.57	5.29	278.85	4
28	21	7.00	168	3.00	5.57	5.57	268.92	3
28	22	7.00	176	47.29	64.43	64.71	319.29	0
28	23	7.00	184	44.86	58.14	58.43	325.72	0
28	24	7.00	192	4.14	7.43	7.00	326.99	3
28	25	7.00	200	3.00	6.71	6.71	232.93	2
28	26	7.00	208	4.43	7.14	7.14	283.52	2
28	27	7.00	216	3.00	6.57	6.57	267.85	3
28	28	7.00	224	4.43	8.00	8.14	253.61	1
28	29	7.00	232	4.00	7.86	8.00	271.95	0
28	30	7.00	240	3.43	7.29	7.00	277.69	2
28	31	7.00	249	4.14	7.57	7.43	299.93	2
28	32	7.00	257	3.43	6.71	6.71	278.75	2
28	33	7.00	265	3.57	7.00	6.86	277.07	2
28	34	7.00	273	4.57	8.14	8.14	274.24	2
28	35	7.00	281	4.00	8.43	8.57	286.61	2
28	36	7.00	289	5.71	9.14	9.29	294.78	1
28	37	7.00	298	3.43	7.29	7.29	277.01	2
28	38	7.00	306	5.00	8.86	8.86	288.18	1
28	39	7.00	314	2.29	4.43	4.14	316.73	5

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			7/22/2012 3:07 ✓
		Sample Ct Duration (min)	7.0 ✓
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
40	322 ✓	7/22/2012 3:00	3072161076
41	330 ✓	7/22/2012 3:08	3072161077
42	338 ✓	7/22/2012 3:16	3072161078
43	346 ✓	7/22/2012 3:24	3072161079
44	354 ✓	7/22/2012 3:32	3072161080
45	362 ✓	7/22/2012 3:40	LCS12511
46	370 ✓	7/22/2012 3:48	LCSD12511
47	378 ✓	7/22/2012 3:56	459110
48	386 ✓	7/22/2012 4:04	3072161081
49	395 ✓	7/22/2012 4:13	3072161082
50	403 ✓	7/22/2012 4:21	3072161083
51	411 ✓	7/22/2012 4:29	3072161084
52	419 ✓	7/22/2012 4:37	3072161085
53	427 ✓	7/22/2012 4:45	3072161086
54	435 ✓	7/22/2012 4:53	3072161087
55	443 ✓	7/22/2012 5:01	3072161088
56	451 ✓	7/22/2012 5:09	3072161089
57	459 ✓	7/22/2012 5:17	3072161090
58	467 ✓	7/22/2012 5:25	3072161091
59	475 ✓	7/22/2012 5:33	3072161092
60	483 ✓	7/22/2012 5:41	3072161093
61	491 ✓	7/22/2012 5:49	3072161094
62	499 ✓	7/22/2012 5:57	3072161095
63	507 ✓	7/22/2012 6:05	3072161096
64	515 ✓	7/22/2012 6:13	3072161097
65	523 ✓	7/22/2012 6:21	3072161098
66	531 ✓	7/22/2012 6:29	3072161099
67	539 ✓	7/22/2012 6:37	3072161100

M
7/31/12

Protocol #:28

SWIPE_H3_C14

User :

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tsIE	LUM
28	40	7.00	322	2.43	5.14	5.00	273.58	4
28	41	7.00	330	4.29	8.00	8.00	259.56	2
28	42	7.00	338	4.57	8.71	8.57	246.98	1
28	43	7.00	346	3.43	6.86	6.57	287.42	3
28	44	7.00	354	3.43	7.43	7.29	293.19	2
28	45	7.00	362	47.57	61.43	61.71	322.59	0
28	46	7.00	370	44.14	60.43	60.43	320.75	1
28	47	7.00	378	3.29	6.57	6.43	333.55	2
28	48	7.00	386	5.14	7.43	7.14	311.36	2
28	49	7.00	395	4.57	7.86	7.86	264.14	1
28	50	7.00	403	2.14	5.29	5.00	277.16	3
28	51	7.00	411	5.00	8.86	8.86	263.66	1
28	52	7.00	419	1.86	5.29	5.00	261.27	5
28	53	7.00	427	3.43	7.00	7.00	268.77	1
28	54	7.00	435	3.57	7.71	7.71	265.46	2
28	55	7.00	443	1.71	4.57	4.43	259.00	3
28	56	7.00	451	2.71	6.00	5.86	261.37	3
28	57	7.00	459	3.86	6.29	6.00	320.15	4
28	58	7.00	467	2.29	5.29	5.14	279.07	3
28	59	7.00	475	2.29	5.00	5.00	304.69	3
28	60	7.00	483	2.86	7.14	7.14	266.78	2
28	61	7.00	491	4.00	6.71	6.71	273.62	2
28	62	7.00	499	3.14	5.43	5.43	235.78	3
28	63	7.00	507	2.57	5.43	5.43	250.18	3
28	64	7.00	515	4.14	7.43	7.43	283.77	2
28	65	7.00	523	3.43	7.86	7.71	252.05	2
28	66	7.00	531	3.71	6.57	6.71	216.62	1
28	67	7.00	539	4.00	8.29	8.43	225.71	2

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
3072161042	12509	Swip-H3014	39	28	7/21/12 1430	7	NA	JLK
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
WS 12510	12510							
WGD 12510								
WB (45910A)								
3072161061								
4 62								

Run comments:

Peer Review:

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
3072161063	12510	Swpr-H3214	34	28	7/21/12 1430	7	MA	JL1C
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
LS1								
LSDD	12511							
MB (459110)								
3072161081								
82			35					
83								

Run comments:

Peer Review:

Low Energy Beta Sample Analysis Data

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

1 459110-BLANK for HBN 91085 [RADC/1251

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

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 03:56 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796282 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 7/22/2012 03:56 Dilution
 Method EPA 906.0M Col ID Hold Date 12/25/2012 23:59 Analyst MBT
 Schedule 2796282 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL
Rad Chemistry	OK				
LSC Low Energy Beta	OK	0.326U ± 4.24 (9.75)	dpm/sa 0.326U ± 4.24 (9.75)		dpm/sa

2 3072161081-275-24

Type PS Matrix Wipe Collected % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth
 1207079 Location

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 04:04 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790769 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 7/22/2012 04:04 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790769 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.72U ± 4.30 (9.48)	dpm/sa 1.72U ± 4.30 (9.48)		dpm/sa		

3 3072161082-275-24D

Type PS Matrix Wipe Collected % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth
 1207079 Location

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

3 3072161082-275-24D

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 04:13 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790770 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 7/22/2012 04:13 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790770 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	3.07U ± 4.38 (9.24)	dpm/sa 3.07U ± 4.38 (9.24)		dpm/sa		

4 3072161083-275-25

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 04:21 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790771 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 7/22/2012 04:21 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790771 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.45U ± 3.65 (9.24)	dpm/sa -2.45U ± 3.65 (9.24)		dpm/sa		

5 3072161084-275-26

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

5 3072161084-275-26

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 04:29 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790772 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 7/22/2012 04:29 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790772 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	5.00J ± 4.63 (9.24)	dpm/sa 5.00J ± 4.63 (9.24)		dpm/sa		

6 3072161085-275-27

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 04:37 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790773 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 7/22/2012 04:37 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790773 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.45U ± 3.65 (9.25)	dpm/sa -2.45U ± 3.65 (9.25)		dpm/sa		

7 3072161086-275-28

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

7 3072161086-275-28

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 04:45 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790774 **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** 7/22/2012 04:45 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790774 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	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		

8 3072161087-275-29

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth **Location**
 1207079

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 04:53 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790775 **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** 7/22/2012 04:53 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790775 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.78U ± 4.34 (9.24)	dpm/sa 2.78U ± 4.34 (9.24)		dpm/sa		

9 3072161088-275-30

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth **Location**
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

9 3072161088-275-30

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 05:01 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790776 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 7/22/2012 05:01 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790776 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-3.56U ± 3.50 (9.25)	dpm/sa -3.56U ± 3.50 (9.25)		dpm/sa		

10 3072161089-275-C8

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 05:09 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790777 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 7/22/2012 05:09 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790777 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.792U ± 3.87 (9.25)	dpm/sa -0.792U ± 3.87 (9.25)		dpm/sa		

11 3072161090-275-C13

Type PS Matrix Wipe Collected 6/5/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

11 3072161090-275-C13

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 05:17 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790778 **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** 7/22/2012 05:17 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790778 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-0.541U ± 4.05 (9.59)	dpm/sa -0.541U ± 4.05 (9.59)		dpm/sa		

12 3072161091-275-C15

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 05:25 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790779 **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** 7/22/2012 05:25 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/2/2012 23:59 **Analyst** MBT
Schedule 2790779 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.18U ± 3.69 (9.25)	dpm/sa -2.18U ± 3.69 (9.25)		dpm/sa		

13 3072161092-275-C17

Type PS **Matrix** Wipe **Collected** 6/5/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

13 3072161092-275-C17

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 05:33 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790780 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 7/22/2012 05:33 Dilution
 Method EPA 906.0M Col ID Hold Date 12/2/2012 23:59 Analyst MBT
 Schedule 2790780 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-2.49U ± 3.71 (9.40)	dpm/sa -2.49U ± 3.71 (9.40)			dpm/sa	

14 3072161093-292-1

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 05:41 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790781 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 7/22/2012 05:41 Dilution
 Method EPA 906.0M Col ID Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790781 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.68U ± 4.20 (9.24)	dpm/sa 1.68U ± 4.20 (9.24)			dpm/sa	

15 3072161094-292-2

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

15 3072161094-292-2

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 05:49 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790782 **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** 7/22/2012 05:49 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790782 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.849U ± 4.09 (9.24)	dpm/sa 0.849U ± 4.09 (9.24)		dpm/sa		

16 3072161095-292-3

Type PS **Matrix** Wipe **Collected** 6/6/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 05:57 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790783 **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** 7/22/2012 05:57 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790783 **File** **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.65U ± 3.82 (9.40)	dpm/sa -1.65U ± 3.82 (9.40)		dpm/sa		

17 3072161096-292-4

Type PS **Matrix** Wipe **Collected** 6/6/2012 00:01 **% Moisture**
Client RTI **WO** 3072161 **Work ID** Fort Monmouth 1207079 **Location**

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

17 3072161096-292-4

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 06:05 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790784 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 7/22/2012 06:05 Dilution
 Method EPA 906.0M Col ID Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790784 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	-1.63U ± 3.78 (9.29)	dpm/sa -1.63U ± 3.78 (9.29)		dpm/sa		

18 3072161097-292-5

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 06:13 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790785 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 7/22/2012 06:13 Dilution
 Method EPA 906.0M Col ID Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790785 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.24U ± 4.28 (9.26)	dpm/sa 2.24U ± 4.28 (9.26)		dpm/sa		

19 3072161098-292-6

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

19 3072161098-292-6

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 06:21 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790786 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 7/22/2012 06:21 Dilution
 Method EPA 906.0M Col ID Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790786 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	2.79U ± 4.36 (9.28)	dpm/sa 2.79U ± 4.36 (9.28)			dpm/sa	

20 3072161099-292-6D

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

Prep Information

Procedure 9060 I LEB Batch RADC/12511 Prep Date 7/22/2012 06:29 Dilution
 Method EPA 906.0M HBN 91085 Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790787 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 7/22/2012 06:29 Dilution
 Method EPA 906.0M Col ID Hold Date 12/3/2012 23:59 Analyst MBT
 Schedule 2790787 File CC OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.886U ± 4.27 (9.64)	dpm/sa 0.886U ± 4.27 (9.64)			dpm/sa	

21 3072161100-292-7

Type PS Matrix Wipe Collected 6/6/2012 00:01 % Moisture
 Client RTI WO 3072161 Work ID Fort Monmouth Location
 1207079

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

Quality Control Review



Batch RADC/12511 HBN 91085
 Rule 9060 I LEB Status RE
 Create Date 6/28/2012 Analyst MBT

21 3072161100-292-7

Prep Information

Procedure 9060 I LEB **Batch** RADC/12511 **Prep Date** 7/22/2012 06:37 **Dilution**
Method EPA 906.0M **HBN** 91085 **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790788 **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** 7/22/2012 06:37 **Dilution**
Method EPA 906.0M **Col ID** NONE **Hold Date** 12/3/2012 23:59 **Analyst** MBT
Schedule 2790788 **File** NONE **CC** OK F

Analyte	CC	Posted Result	Result	MDL	RDL	Reg. Limits	
						Low	High
Rad Chemistry	OK						
LSC Low Energy Beta	OK	4.29J ± 4.66 (9.51)	dpm/sa 4.29J ± 4.66 (9.51)			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 14:00
 Batch ID 12511
 A-code 9060 I LEB 9060W
 Method EPA 906.0M EPA 906.0m

Assigned Analyst MBT
 Earliest Due Date 07/04/2012 07:12
 HBN
 91085

Project	Sample ID	Sample Type	Matrix	Collection Date/Time	Client ID	LEB Activity	LEB Unc.	LEB MDC	Analysis Date/Time
	459110	BLANK	IP		QCACCOUNT	0.326U	4.24	9.75	7/22/12 3:56
3072161	3072161081	PS	WP	6/5/2012 0:01	RTI	1.72U	4.30	9.48	7/22/12 4:04
3072161	3072161082	PS	WP	6/5/2012 0:01	RTI	3.07U	4.38	9.24	7/22/12 4:13
3072161	3072161083	PS	WP	6/5/2012 0:01	RTI	-2.45U	3.65	9.24	7/22/12 4:21
3072161	3072161084	PS	WP	6/5/2012 0:01	RTI	5.00J	4.63	9.24	7/22/12 4:29
3072161	3072161085	PS	WP	6/5/2012 0:01	RTI	-2.45U	3.65	9.25	7/22/12 4:37
3072161	3072161086	PS	WP	6/5/2012 0:01	RTI	1.41U	4.16	9.24	7/22/12 4:45
3072161	3072161087	PS	WP	6/5/2012 0:01	RTI	2.78U	4.34	9.24	7/22/12 4:53
3072161	3072161088	PS	WP	6/5/2012 0:01	RTI	-3.56U	3.50	9.25	7/22/12 5:01
3072161	3072161089	PS	WP	6/5/2012 0:01	RTI	-0.792U	3.87	9.25	7/22/12 5:09
3072161	3072161090	PS	WP	6/5/2012 0:01	RTI	-0.541U	4.05	9.59	7/22/12 5:17
3072161	3072161091	PS	WP	6/5/2012 0:01	RTI	-2.18U	3.69	9.25	7/22/12 5:25
3072161	3072161092	PS	WP	6/5/2012 0:01	RTI	-2.49U	3.71	9.40	7/22/12 5:33
3072161	3072161093	PS	WP	6/6/2012 0:01	RTI	1.68U	4.20	9.24	7/22/12 5:41
3072161	3072161094	PS	WP	6/6/2012 0:01	RTI	0.849U	4.09	9.24	7/22/12 5:49
3072161	3072161095	PS	WP	6/6/2012 0:01	RTI	-1.65U	3.82	9.40	7/22/12 5:57
3072161	3072161096	PS	WP	6/6/2012 0:01	RTI	-1.63U	3.78	9.29	7/22/12 6:05
3072161	3072161097	PS	WP	6/6/2012 0:01	RTI	2.24U	4.28	9.26	7/22/12 6:13
3072161	3072161098	PS	WP	6/6/2012 0:01	RTI	2.79U	4.36	9.28	7/22/12 6:21
3072161	3072161099	PS	WP	6/6/2012 0:01	RTI	0.886U	4.27	9.64	7/22/12 6:29
3072161	3072161100	PS	WP	6/6/2012 0:01	RTI	4.29J	4.66	9.51	7/22/12 6:37

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Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
 Matrix Smear
 Batch ID 12511
 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
459110	1.0	7/22/12 3:56	7.0	7/22/12 3:56	6.43	333.6	dpm/S	High, Evaluate
3072161081	1.0	6/5/12 0:01	7.0	7/22/12 4:04	7.14	311.4	dpm/S	Pass
3072161082	1.0	6/5/12 0:01	7.0	7/22/12 4:13	7.86	264.1	dpm/S	Pass
3072161083	1.0	6/5/12 0:01	7.0	7/22/12 4:21	5.00	277.2	dpm/S	Pass
3072161084	1.0	6/5/12 0:01	7.0	7/22/12 4:29	8.86	263.7	dpm/S	Pass
3072161085	1.0	6/5/12 0:01	7.0	7/22/12 4:37	5.00	261.3	dpm/S	Pass
3072161086	1.0	6/5/12 0:01	7.0	7/22/12 4:45	7.00	268.8	dpm/S	Pass
3072161087	1.0	6/5/12 0:01	7.0	7/22/12 4:53	7.71	265.5	dpm/S	Pass
3072161088	1.0	6/5/12 0:01	7.0	7/22/12 5:01	4.43	259.0	dpm/S	Pass
3072161089	1.0	6/5/12 0:01	7.0	7/22/12 5:09	5.86	261.4	dpm/S	Pass
3072161090	1.0	6/5/12 0:01	7.0	7/22/12 5:17	6.00	320.2	dpm/S	High, Evaluate
3072161091	1.0	6/5/12 0:01	7.0	7/22/12 5:25	5.14	279.1	dpm/S	Pass
3072161092	1.0	6/5/12 0:01	7.0	7/22/12 5:33	5.00	304.7	dpm/S	Pass
3072161093	1.0	6/6/12 0:01	7.0	7/22/12 5:41	7.14	266.8	dpm/S	Pass
3072161094	1.0	6/6/12 0:01	7.0	7/22/12 5:49	6.71	273.6	dpm/S	Pass
3072161095	1.0	6/6/12 0:01	7.0	7/22/12 5:57	5.43	235.8	dpm/S	Pass
3072161096	1.0	6/6/12 0:01	7.0	7/22/12 6:05	5.43	250.2	dpm/S	Pass
3072161097	1.0	6/6/12 0:01	7.0	7/22/12 6:13	7.43	283.8	dpm/S	Pass
3072161098	1.0	6/6/12 0:01	7.0	7/22/12 6:21	7.71	252.1	dpm/S	Pass
3072161099	1.0	6/6/12 0:01	7.0	7/22/12 6:29	6.71	216.6	dpm/S	Pass
3072161100	1.0	6/6/12 0:01	7.0	7/22/12 6:37	8.43	225.7	dpm/S	Pass
LCS12511	1.0	7/22/12 3:40	7.0	7/22/12 3:40	61.71	322.6	dpm/S	High, Evaluate
LCSD12511	1.0	7/22/12 3:48	7.0	7/22/12 3:48	60.43	320.8	dpm/S	High, Evaluate

MB 7/31/12

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
 Matrix Smear
 Batch ID 12511
 Prep Start 7/16/2012 12:00
 Prep Finish 7/16/2012

Analyst MBT
 PrepSOP1 0
 PrepSOP2 n/a
 AnalSOP1 0
 AnalSOP2 n/a

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



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
459110	0.4911	0.0000	1.0000	0.326	4.238	4.238	9.750	3.532	1.042	4.238	1.00
3072161081	0.5090	0.1291	0.9928	1.722	4.300	4.305	9.475	3.432	1.013	4.300	1.00
3072161082	0.5218	0.1292	0.9928	3.069	4.366	4.381	9.242	3.347	0.988	4.366	1.00
3072161083	0.5217	0.1292	0.9928	-2.452	3.636	3.648	9.244	3.348	0.988	3.636	1.00
3072161084	0.5218	0.1292	0.9928	5.000	4.595	4.633	9.243	3.348	0.988	4.595	1.00
3072161085	0.5215	0.1292	0.9928	-2.453	3.638	3.649	9.248	3.350	0.989	3.638	1.00
3072161086	0.5221	0.1292	0.9928	1.408	4.158	4.161	9.237	3.346	0.988	4.158	1.00
3072161087	0.5219	0.1292	0.9928	2.779	4.330	4.343	9.240	3.347	0.988	4.330	1.00
3072161088	0.5211	0.1292	0.9928	-3.556	3.476	3.502	9.254	3.352	0.989	3.476	1.00
3072161089	0.5215	0.1293	0.9928	-0.792	3.872	3.873	9.248	3.350	0.989	3.872	1.00
3072161090	0.5028	0.1293	0.9928	-0.541	4.054	4.055	9.592	3.474	1.025	4.054	1.00
3072161091	0.5215	0.1293	0.9928	-2.183	3.677	3.686	9.248	3.350	0.989	3.677	1.00
3072161092	0.5129	0.1293	0.9928	-2.494	3.699	3.711	9.403	3.406	1.005	3.699	1.00
3072161093	0.5220	0.1266	0.9930	1.678	4.192	4.197	9.237	3.346	0.988	4.192	1.00
3072161094	0.5220	0.1266	0.9930	0.849	4.086	4.087	9.237	3.346	0.988	4.086	1.00
3072161095	0.5130	0.1266	0.9930	-1.649	3.818	3.823	9.400	3.405	1.005	3.818	1.00
3072161096	0.5190	0.1266	0.9930	-1.630	3.774	3.779	9.290	3.365	0.993	3.774	1.00
3072161097	0.5207	0.1266	0.9930	2.244	4.273	4.282	9.261	3.354	0.990	4.273	1.00
3072161098	0.5196	0.1267	0.9930	0.886	4.349	4.362	9.281	3.361	0.992	4.349	1.00
3072161099	0.5000	0.1267	0.9930	2.791	4.266	4.267	9.644	3.493	1.031	4.266	1.00
3072161100	0.5069	0.1267	0.9930	4.292	4.630	4.658	9.513	3.446	1.017	4.630	1.00
LCS12511	0.5009	0.0000	1.0000	110.689	11.756	17.678	9.560	3.463	1.022	11.756	1.00
LCSD12511	0.5023	0.0000	1.0000	107.819	11.602	17.320	9.532	3.452	1.019	11.602	1.00

06/13/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: MBT
Date: 7/27/2012
Worklist: 12511
Matrix: Filler

Method: EPA 906.0M
SOP:
MB Sample ID: 459110



Method Blank Assessment		Sample Matrix Spike Control Assessment	
Analyte	Activity	1.96 Sig Unc.	Assessment
LSC Low Energy Beta	0.3260	4.2390	3.53200
MDC		9.7500	
Flag			
<p>Analyte: _____</p> <p>Sample Collection Date: _____</p> <p>Sample I.D.: _____</p> <p>Sample MS I.D.: _____</p> <p>Sample MSD I.D.: _____</p> <p>Spike I.D.: _____</p> <p>MS/MSD Decay Corrected Spike Conc. (pCi/L): _____</p> <p>Spike Volume Used in MS (mL): _____</p> <p>Spike Volume Used in MSD (mL): _____</p> <p>MS Aliquot (L, g, F): _____</p> <p>MS Target Conc. (pCi/L, g, F): _____</p> <p>MSD Aliquot (L, g, F): _____</p> <p>MSD Target Conc. (pCi/L, g, F): _____</p> <p>MS Spike uncertainty (calculated): _____</p> <p>MSD Spike uncertainty (calculated): _____</p> <p>Sample Result: _____</p> <p>Sample 1.96 Sigma Unc.: _____</p> <p>Sample Matrix Spike Result: _____</p> <p>Sample MS 1.96 Sigma Unc.: _____</p> <p>Sample Matrix Spike Duplicate Result: _____</p> <p>Sample MSD 1.96 Sigma Unc.: _____</p> <p>MS % Recovery: _____</p> <p>MSD % Recovery: _____</p> <p>MS Assessment: _____</p> <p>MS/MSD Upper % Recovery Limits: _____</p> <p>MS/MSD Lower % Recovery Limits: _____</p> <p>Matrix Spike/Matrix Spike Duplicate Sample Assessment</p>			

Method Blank Assessment				Laboratory Control Sample Assessment			
Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment	
LSC Low Energy Beta	0.3260	4.2390	9.7500	3.53200			
<p>Analyte: LSC Low Energy Beta</p> <p>Count Date: 7/22/12 3:48</p> <p>Spike I.D.: 09-009LEB</p> <p>Spike Concentration (pCi/L): 1184.904</p> <p>Volume Used (mL): 0.100</p> <p>Aliquot Volume (L, g, F): 1.000</p> <p>Target Conc. (pCi/L, g, F): 118.490</p> <p>1.96 Sigma Uncertainty (Calculated): 2.137</p> <p>Result (pCi/L, g, F): 110.689</p> <p>1.96 Sigma Unc.: 17.678</p> <p>% Recovery: 93.42%</p> <p>Assessment: Pass</p> <p>Upper % Recovery Limits: 125.00%</p> <p>Lower % Recovery Limits: 75.00%</p> <p>Duplicate Sample Assessment</p>							
<p>LCS/LCSD Y or N?: Y</p> <p>Analyte: LSC Low Energy Beta</p> <p>Sample I.D.: LCS12511</p> <p>Duplicate Sample I.D.: LCS12511</p> <p>Sample Result (pCi/L, g, F): 110.6990</p> <p>1.96 Sigma Unc.: 17.6780</p> <p>Sample Duplicate Result (pCi/L, g, F): 107.6190</p> <p>Duplicate Sample 1.96 Sigma Unc.: 17.3200</p> <p>Either results below MDC? NO</p> <p>Relative Percent Difference: 2.63%</p> <p>Assessment: Pass</p> <p>% RPD Limit: 25.00%</p>							

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

Comments:

m/3/12

Pace Analytical Services
 Low Energy Beta Emitters by Liquid Scintillation

Test: Low Energy Beta
 Matrix: Smear
 Batch ID: 12511



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		Sigma	1.96
PrepSOP2	n/a	Zero Factor	2.71
AnalSOP1			
AnalSOP2	n/a		

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%

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

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

Description	Maximum	CSU (TPU) for Analysis			10.60%
		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	

<u>Total Uncertainty</u>	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	25%	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

BKG 072112

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			7/22/2012 3:07 ✓
		Sample Ct Duration (min)	7.0 ✓
		Calculated Count Start	
S#	ELTIME	Date/Time	Sample ID
40	322 ✓	7/22/2012 3:00	3072161076
41	330 ✓	7/22/2012 3:08	3072161077
42	338 ✓	7/22/2012 3:16	3072161078
43	346 ✓	7/22/2012 3:24	3072161079
44	354 ✓	7/22/2012 3:32	3072161080
45	362 ✓	7/22/2012 3:40	LCS12511
46	370 ✓	7/22/2012 3:48	LCSD12511
47	378 ✓	7/22/2012 3:56	459110
48	386 ✓	7/22/2012 4:04	3072161081
49	395 ✓	7/22/2012 4:13	3072161082
50	403 ✓	7/22/2012 4:21	3072161083
51	411 ✓	7/22/2012 4:29	3072161084
52	419 ✓	7/22/2012 4:37	3072161085
53	427 ✓	7/22/2012 4:45	3072161086
54	435 ✓	7/22/2012 4:53	3072161087
55	443 ✓	7/22/2012 5:01	3072161088
56	451 ✓	7/22/2012 5:09	3072161089
57	459 ✓	7/22/2012 5:17	3072161090
58	467 ✓	7/22/2012 5:25	3072161091
59	475 ✓	7/22/2012 5:33	3072161092
60	483 ✓	7/22/2012 5:41	3072161093
61	491 ✓	7/22/2012 5:49	3072161094
62	499 ✓	7/22/2012 5:57	3072161095
63	507 ✓	7/22/2012 6:05	3072161096
64	515 ✓	7/22/2012 6:13	3072161097
65	523 ✓	7/22/2012 6:21	3072161098
66	531 ✓	7/22/2012 6:29	3072161099
67	539 ✓	7/22/2012 6:37	3072161100

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tsIE	LUM
28	40	7.00	322	2.43	5.14	5.00	273.58	4
28	41	7.00	330	4.29	8.00	8.00	259.56	2
28	42	7.00	338	4.57	8.71	8.57	246.98	1
28	43	7.00	346	3.43	6.86	6.57	287.42	3
28	44	7.00	354	3.43	7.43	7.29	293.19	2
28	45	7.00	362	47.57	61.43	61.71	322.59	0
28	46	7.00	370	44.14	60.43	60.43	320.75	1
28	47	7.00	378	3.29	6.57	6.43	333.55	2
28	48	7.00	386	5.14	7.43	7.14	311.36	2
28	49	7.00	395	4.57	7.86	7.86	264.14	1
28	50	7.00	403	2.14	5.29	5.00	277.16	3
28	51	7.00	411	5.00	8.86	8.86	263.66	1
28	52	7.00	419	1.86	5.29	5.00	261.27	5
28	53	7.00	427	3.43	7.00	7.00	268.77	1
28	54	7.00	435	3.57	7.71	7.71	265.46	2
28	55	7.00	443	1.71	4.57	4.43	259.00	3
28	56	7.00	451	2.71	6.00	5.86	261.37	3
28	57	7.00	459	3.86	6.29	6.00	320.15	4
28	58	7.00	467	2.29	5.29	5.14	279.07	3
28	59	7.00	475	2.29	5.00	5.00	304.69	3
28	60	7.00	483	2.86	7.14	7.14	266.78	2
28	61	7.00	491	4.00	6.71	6.71	273.62	2
28	62	7.00	499	3.14	5.43	5.43	235.78	3
28	63	7.00	507	2.57	5.43	5.43	250.18	3
28	64	7.00	515	4.14	7.43	7.43	283.77	2
28	65	7.00	523	3.43	7.86	7.71	252.05	2
28	66	7.00	531	3.71	6.57	6.71	216.62	1
28	67	7.00	539	4.00	8.29	8.43	225.71	2

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
3072161063	12510	Supp-H3C14	34	28	7/21/12 1430	7	MA	JL1C
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
LS1								
LSDD	12511							
1MB (459110)								
3072161081								
82			35					
83								

Run comments:

Peer Review: _____

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
85	12511	Sample-13.004	35	28	7/21/12 1430	7	Nil	A
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								
MB (451097)	12499	Sample-43.004	10	27	7/21/12 1430	7	Nil	A
3072159041								
042								
043								
044								

Run comments: * Batch re-count 12499

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 Analytix 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

JLK
07/19/12



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* , %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
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 μ g/g Ni carrier.

Source Prepared by: N.E. Kasate
N.E. Kasate, Radiochemist

QA Approved: D.M. Montgomery
D. M. Montgomery, QA Manager

Date: 11-6-09



Nickel-63 Efficiency Quench Curve Calibration



Detector System Settings

Count Mode: Low Level
 Background Subtract: Off
 Low CPM Threshold: Off
 Static Controller: On
 Region: 1.0-160.0

Analyst: J.L.K.
 Calibration Date: 7/20/2012

Ni-63 Standard: 81012-493

Standard Bq on Reference Date: 3456

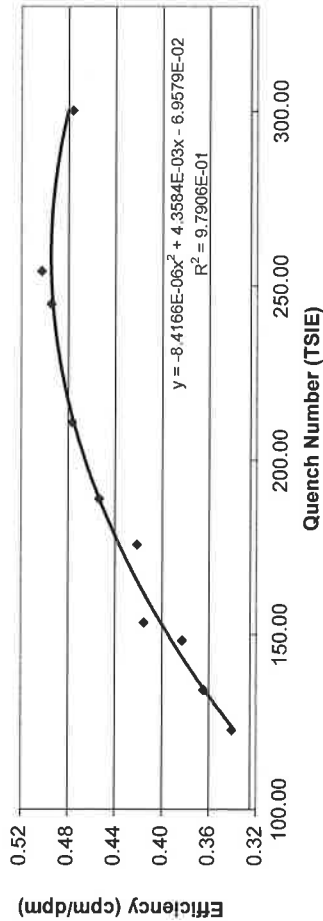
Standard Total Mass (g): 4.99826

System ID: System #2

Background: 7.83

Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Standard Corrected dpm/g	Region 1-160 Ni-63 ROI		Region 1-160 Ni-63		Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
							Standard Source dpm	Source Net Counts	Source Ct. time (min)	Source Efficiency (cpm/dpm)			
Ni-63 20120719-N1	0.1019	11/5/2009	7/20/2012	988.38	0.99995	41500.9	2020.85	12078.12	0.4760	300.10	0.4804	0.92%	Yes
Ni-63 20120719-N2	0.0995	11/5/2009	7/20/2012	988.38	0.99995	41500.9	2082.61	12448.68	0.5024	254.20	0.4945	-1.59%	Yes
Ni-63 20120719-N3	0.0998	11/5/2009	7/20/2012	988.38	0.99995	41500.9	2055.91	12288.48	0.4945	244.90	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	12345.06	0.4767	210.90	0.4752	-0.31%	Yes
Ni-63 20120719-N5	0.1014	11/5/2009	7/20/2012	988.38	0.99995	41500.9	1915.89	11448.36	0.4534	188.90	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	12418.77	0.4212	175.80	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	10648.17	0.4152	153.50	0.4011	-3.38%	Yes
Ni-63 20120719-N8	0.2034	11/5/2009	7/20/2012	988.38	0.99995	41500.9	3239.40	12976.28	0.3828	148.30	0.3917	2.31%	Yes
Ni-63 20120719-N9	0.2044	11/5/2009	7/20/2012	988.38	0.99995	41500.9	3100.91	12372.32	0.3646	134.20	0.3637	-0.24%	Yes
Ni-63 20120719-N10	0.2036	11/5/2009	7/20/2012	988.42	0.99995	41500.9	2889.22	11525.56	0.3410	122.70	0.3385	-0.74%	Yes

Ni-63 Efficiency vs. Quench Calibration
 System #2 Region 1.0-160.0
 7/20/2012



Jul 20 2012
One Zbach

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

#Vials/Sample: 1

Repeat Sample Count: 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

Colored Samples: n/a

Coincidence Time (nsec): 18

Luminescence Correction: n/a

Heterogeneity Monitor: n/a

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

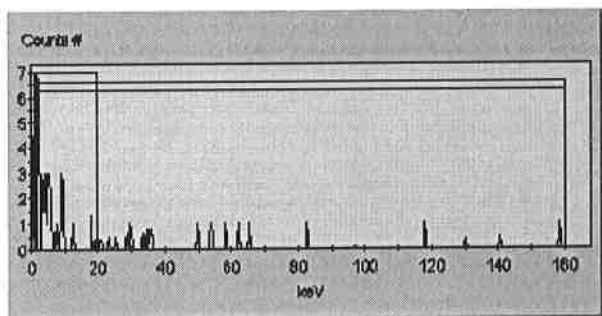
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM

14C Chi Square: 10.90 Date Processed: 7/19/12 11:40:58 AM
 3H E²/B (1-18.6 keV): 303.70 Date Processed: 7/19/12 11:40:58 AM
 14C E²/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

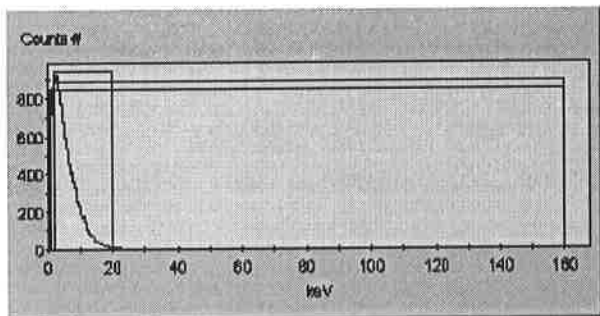
S#	PID	SMPL ID	C.T.	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
1	5	8:59:56 AM	8	7/20/12	4.34	317.6	6.45	7.83	

SpectraView Block Data



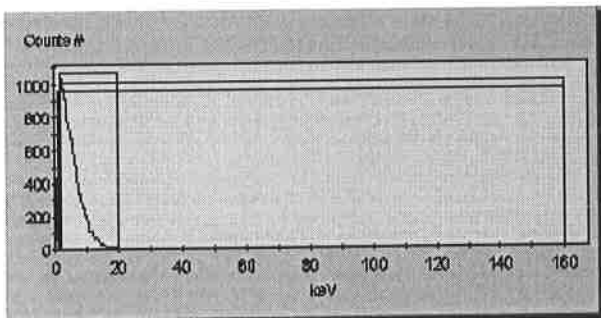
2	5	NI63-20120719-N1	6	7/20/12	1763.93	300.1	1771.83	2020.85	
		9:08:46 AM	0						

SpectraView Block Data



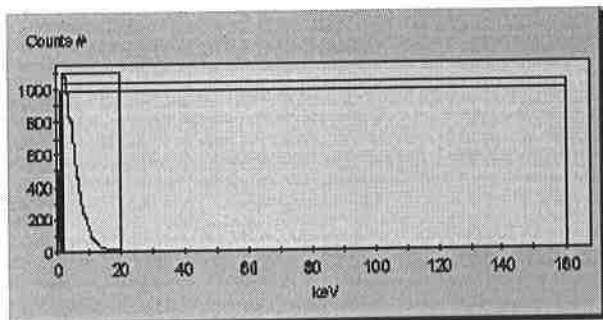
3	5	NI63-20120179-N2	6	7/20/12	1813.72	254.2	1818.36	2082.61	
		9:15:40 AM	0						

SpectraView Block Data



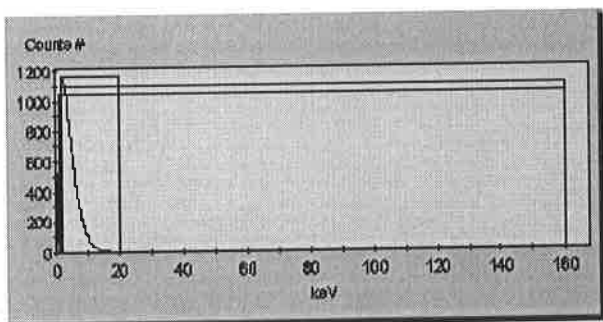
4 5 NI63-20120719-N3 6 7/20/12 1748.50 244.9 1754.08 2055.91
 9:22:22 AM 0

SpectraView Block Data



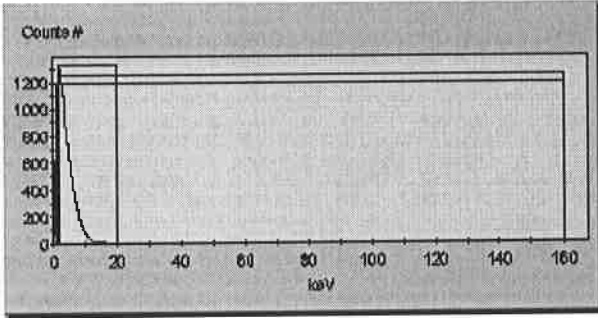
5 5 NI63-20120719-N4 6 7/20/12 1753.03 210.9 1756.32 2065.34
 9:29:11 AM 0

SpectraView Block Data



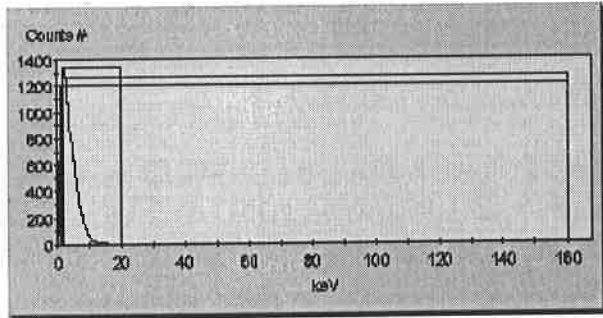
6 5 NI63-20120719-N5 6 7/20/12 1573.37 188.9 1575.74 1915.89
 9:35:58 AM 0

SpectraView Block Data



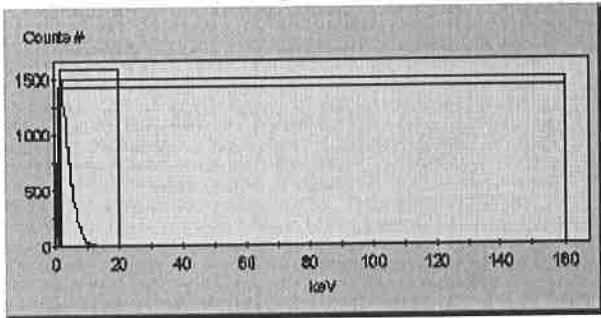
		NI63-20120719-N6	7	7/20/12	1456.33	175.8	1458.71	1781.94
7	5	9:43:13 AM	0					

SpectraView Block Data



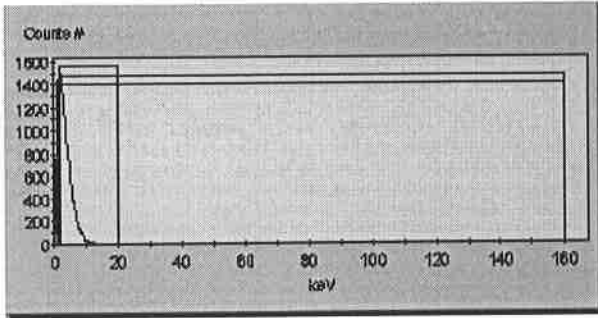
		NI63-20120719-N7	3	7/20/12	2818.32	153.5	2821.87	3557.22
8	5	9:50:58 AM	0					

SpectraView Block Data



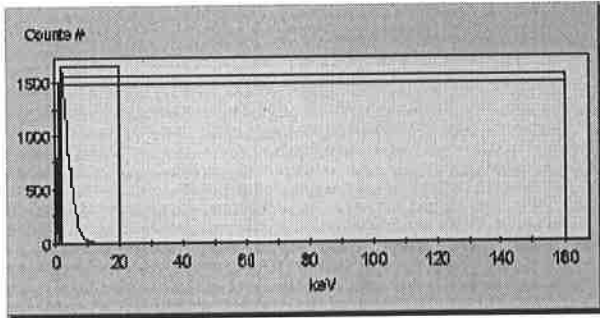
		NI63-20120719-N8	4	7/20/12	2526.96	148.3	2529.45	3239.40
9	5	9:55:12 AM	0					

SpectraView Block Data



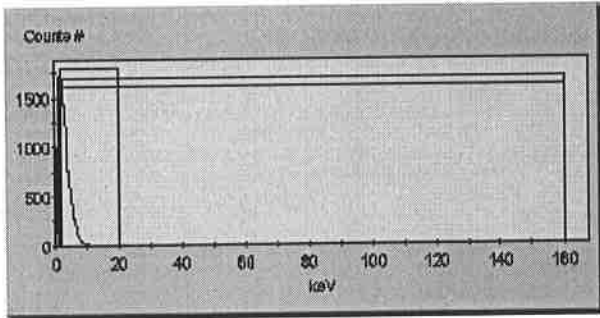
10 NI63-20120719-N9 4 7/20/12 2389.66 134.2 2392.64 3100.91
 5 9:59:47 AM 0

SpectraView Block Data



11 NI63-20120719-N10 4 7/20/12 2122.40 122.7 2124.50 2889.22
 5 10:04:33 AM 0

SpectraView Block Data





Pace Analytical Services, Inc.-Pittsburgh
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
3K6	N Cal	Supp H3/C14	5	1	7/26/12 0545	8	7/26/12 0900	Q
N1								
N2								
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
3072 154038		Supp H3/C14	12	8	7/26/12 0945	12	NA	Q
39								
40								
LLS								
LLSD								
TRK								

Run comments:

Peer Review:

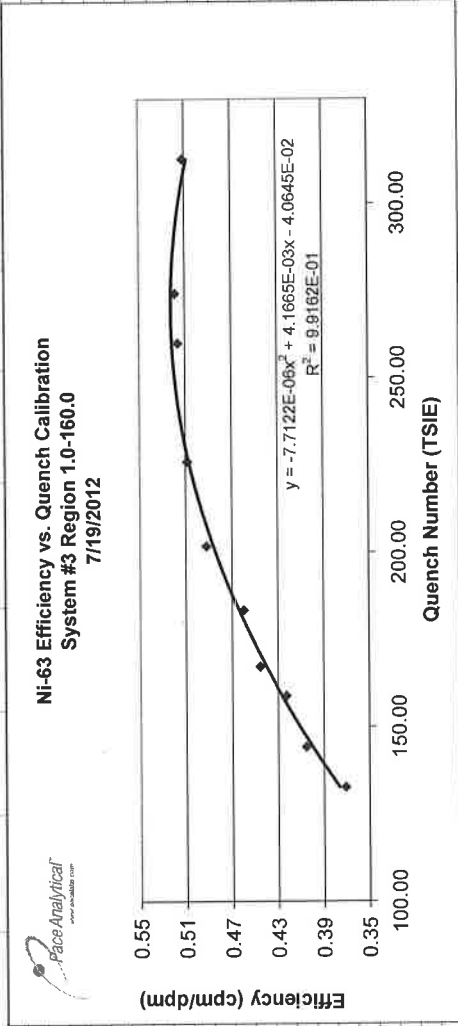
Nickel-63 Efficiency Quench Curve Calibration



Analyst: JLK
Calibration Date: 7/19/2012
Ni-63 Standard: 81012-493
Standard Bq on Reference Date: 3456
Standard Total Mass (g): 4.99626
System ID: System #3
Background: 8.00

Detector System Settings
Count Mode: Low Level
Background Subtract: Off
Low Level Count Mode: On
Luminescence Correction: On
Region: 1.0-160.0

Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Decay dpm/g	Corrected Standard Source dpm	Region 1-160 Ni-63 ROI		Source Ct. time (min)	Source Net Counts	TSIE	Source Efficiency (cpm/dpm)	Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
								Standard Source cpm	Source							
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	



Jul 7/20/12
One 7/20/12

Protocol #: 1

SWIPE_H3_C14

User :

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	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

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
N16320120719 N2	N.6302	Sample H3C14	5	1	7/19/12 - 1330	7	WA	R
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
M13		Sample H3C14	27	45	7/20/12 0900			R
3072159041								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52			23					
53								
54								

Run comments: _____
Peer Review: _____

Standards

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 μ g/g Ni carrier.

P O NUMBER PI-4864, Item 2

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

W. M. J. 7-22-05



Radioactive Standards Dilution Logbook

09-009 Ni63 Spike Solution

Parent source: 09-008

Parent Conc: 12334.51 dpm/g

Ref date: 4/5/2005 12:00 EST

Expiration: ND

$$\frac{25.26 \text{ g}}{250.0 \text{ ml}} \left(\frac{12334.51 \text{ dpm}}{\text{g}} \right) = 1246.3 \frac{\text{dpm}}{\text{ml}}$$

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



Radioactive Standards Dilution Logbook

09-008 N.63 Spike "A" Solution

Parent Source. Analytical 71157A-493
Parent Conc. 10610 DPS (Bq)
Parent Ref date 4/5/2005 12:00 EST
NO EXP ASSIGNED

$$\frac{5.0210 \text{ g}}{5.08501 \text{ g}} \times \frac{10610 \text{ DPS}}{50.9616 \text{ g}} \times \frac{60 \text{ dps}}{\text{dpm}} = 12334.51 \frac{\text{dpm}}{8}$$

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 $\mu\text{Ci QA}$ *LM*

Date 04/05/05 12:00 EST Exp. XXXXXX

PO # PI-4864, Item 2

5.08501 g 0.1M HCl solution



CAUTION RADIOACTIVE MATERIAL