RTI Laboratories, Inc.

Client Ref.: Fort Monmouth 1207077

Pace-Pittsburgh Project No. 3072157

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

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

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Case Narrative for Pace Analytical Job Number 3072157

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 3072157 with corresponding samples IDs of 3072157001 through 3072157100. 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 3072157

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

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

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

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

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

General Comments

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

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

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

Radiochemistry Manager or Designate

8/1/12
Date

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

July 25, 2012

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

RE: Project: Fort Monmouth 1207077
Pace Project No.: 3072157

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

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

Sincerely,

Carin A. Ferris

Carin Ferris

carin.ferris@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Pennsylvania Certification IDs

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

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SAMPLE SUMMARY

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072157001	SU-10-3	Wipe	06/11/12 00:01	06/25/12 10:15
3072157002	SU-10-4	Wipe	06/11/12 00:01	06/25/12 10:15
3072157003	SU-10-5	Wipe	06/11/12 00:01	06/25/12 10:15
3072157004	SU-10-6	Wipe	06/11/12 00:01	06/25/12 10:15
3072157005	SU-10-7	Wipe	06/11/12 00:01	06/25/12 10:15
3072157006	SU-10-8	Wipe	06/11/12 00:01	06/25/12 10:15
3072157007	SU-10-9	Wipe	06/11/12 00:01	06/25/12 10:15
3072157008	SU-10-10	Wipe	06/11/12 00:01	06/25/12 10:15
3072157009	SU-10-11	Wipe	06/11/12 00:01	06/25/12 10:15
3072157010	SU-10-12	Wipe	06/11/12 00:01	06/25/12 10:15
3072157011	SU-10-12D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157012	SU-10-13	Wipe	06/11/12 00:01	06/25/12 10:15
3072157013	SU-10-14	Wipe	06/11/12 00:01	06/25/12 10:15
3072157014	SU-10-15	Wipe	06/11/12 00:01	06/25/12 10:15
3072157015	SU-10-16	Wipe	06/11/12 00:01	06/25/12 10:15
3072157016	SU-10-17	Wipe	06/11/12 00:01	06/25/12 10:15
3072157017	SU-10-18	Wipe	06/11/12 00:01	06/25/12 10:15
3072157018	SU-10-19	Wipe	06/11/12 00:01	06/25/12 10:15
3072157019	SU-10-20	Wipe	06/11/12 00:01	06/25/12 10:15
3072157020	SU-10-21	Wipe	06/11/12 00:01	06/25/12 10:15
3072157021	SU-10-22	Wipe	06/11/12 00:01	06/25/12 10:15
3072157022	SU-10-23	Wipe	06/11/12 00:01	06/25/12 10:15
3072157023	SU-10-24	Wipe	06/11/12 00:01	06/25/12 10:15
3072157024	SU-11-1	Wipe	06/11/12 00:01	06/25/12 10:15
3072157025	SU-11-2	Wipe	06/11/12 00:01	06/25/12 10:15
3072157026	SU-11-3	Wipe	06/11/12 00:01	06/25/12 10:15
3072157027	SU-11-4	Wipe	06/11/12 00:01	06/25/12 10:15
3072157028	SU-11-5	Wipe	06/11/12 00:01	06/25/12 10:15
3072157029	SU-11-5D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157030	SU-11-6	Wipe	06/11/12 00:01	06/25/12 10:15
3072157031	SU-11-7	Wipe	06/11/12 00:01	06/25/12 10:15
3072157032	SU-11-8	Wipe	06/11/12 00:01	06/25/12 10:15
3072157033	SU-11-9	Wipe	06/11/12 00:01	06/25/12 10:15
3072157034	SU-11-10	Wipe	06/11/12 00:01	06/25/12 10:15
3072157035	SU-11-11	Wipe	06/11/12 00:01	06/25/12 10:15
3072157036	SU-11-12	Wipe	06/11/12 00:01	06/25/12 10:15
3072157037	SU-11-13	Wipe	06/11/12 00:01	06/25/12 10:15

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SAMPLE SUMMARY

Project: Fort Monmouth 1207077
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Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072157038	SU-11-14	Wipe	06/11/12 00:01	06/25/12 10:15
3072157039	SU-11-15	Wipe	06/11/12 00:01	06/25/12 10:15
3072157040	SU-11-16	Wipe	06/11/12 00:01	06/25/12 10:15
3072157041	SU-11-17	Wipe	06/11/12 00:01	06/25/12 10:15
3072157042	SU-11-18	Wipe	06/11/12 00:01	06/25/12 10:15
3072157043	SU-11-19	Wipe	06/11/12 00:01	06/25/12 10:15
3072157044	SU-11-20	Wipe	06/11/12 00:01	06/25/12 10:15
3072157045	SU-11-21	Wipe	06/11/12 00:01	06/25/12 10:15
3072157046	SU-11-22	Wipe	06/11/12 00:01	06/25/12 10:15
3072157047	SU-11-22D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157048	SU-11-23	Wipe	06/11/12 00:01	06/25/12 10:15
3072157049	SU-11-24	Wipe	06/11/12 00:01	06/25/12 10:15
3072157050	SU-11-25	Wipe	06/11/12 00:01	06/25/12 10:15
3072157051	SU-11-26	Wipe	06/11/12 00:01	06/25/12 10:15
3072157052	SU-11-27	Wipe	06/11/12 00:01	06/25/12 10:15
3072157053	SU-11-28	Wipe	06/11/12 00:01	06/25/12 10:15
3072157054	SU-11-29	Wipe	06/11/12 00:01	06/25/12 10:15
3072157055	SU-11-30	Wipe	06/11/12 00:01	06/25/12 10:15
3072157056	SU-11-31	Wipe	06/11/12 00:01	06/25/12 10:15
3072157057	SU-11-32	Wipe	06/11/12 00:01	06/25/12 10:15
3072157058	SU-11-33	Wipe	06/11/12 00:01	06/25/12 10:15
3072157059	SU-11-33D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157060	SU-11-34	Wipe	06/11/12 00:01	06/25/12 10:15
3072157061	SU-11-35	Wipe	06/11/12 00:01	06/25/12 10:15
3072157062	SU-11-36	Wipe	06/11/12 00:01	06/25/12 10:15
3072157063	SU-11-37	Wipe	06/11/12 00:01	06/25/12 10:15
3072157064	SU-11-38	Wipe	06/11/12 00:01	06/25/12 10:15
3072157065	SU-11-39	Wipe	06/11/12 00:01	06/25/12 10:15
3072157066	SU-11-40	Wipe	06/11/12 00:01	06/25/12 10:15
3072157067	SU-11-41	Wipe	06/11/12 00:01	06/25/12 10:15
3072157068	SU-11-42	Wipe	06/11/12 00:01	06/25/12 10:15
3072157069	SU-14-1	Wipe	06/11/12 00:01	06/25/12 10:15
3072157070	SU-14-2	Wipe	06/11/12 00:01	06/25/12 10:15
3072157071	SU-14-3	Wipe	06/11/12 00:01	06/25/12 10:15
3072157072	SU-14-4	Wipe	06/11/12 00:01	06/25/12 10:15
3072157073	SU-14-5	Wipe	06/11/12 00:01	06/25/12 10:15
3072157074	SU-14-6	Wipe	06/11/12 00:01	06/25/12 10:15

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Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3072157075	SU-14-7	Wipe	06/11/12 00:01	06/25/12 10:15
3072157076	SU-14-8	Wipe	06/11/12 00:01	06/25/12 10:15
3072157077	SU-14-9	Wipe	06/11/12 00:01	06/25/12 10:15
3072157078	SU-14-9D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157079	SU-14-10	Wipe	06/11/12 00:01	06/25/12 10:15
3072157080	SU-14-11	Wipe	06/11/12 00:01	06/25/12 10:15
3072157081	SU-14-12	Wipe	06/11/12 00:01	06/25/12 10:15
3072157082	SU-14-13	Wipe	06/11/12 00:01	06/25/12 10:15
3072157083	SU-14-14	Wipe	06/11/12 00:01	06/25/12 10:15
3072157084	SU-14-15	Wipe	06/11/12 00:01	06/25/12 10:15
3072157085	SU-14-16	Wipe	06/11/12 00:01	06/25/12 10:15
3072157086	SU-14-17	Wipe	06/11/12 00:01	06/25/12 10:15
3072157087	SU-14-17D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157088	SU-14-18	Wipe	06/11/12 00:01	06/25/12 10:15
3072157089	SU-14-19	Wipe	06/11/12 00:01	06/25/12 10:15
3072157090	SU-14-20	Wipe	06/11/12 00:01	06/25/12 10:15
3072157091	SU-14-21	Wipe	06/11/12 00:01	06/25/12 10:15
3072157092	SU-14-22	Wipe	06/11/12 00:01	06/25/12 10:15
3072157093	SU-14-23	Wipe	06/11/12 00:01	06/25/12 10:15
3072157094	SU-14-23D	Wipe	06/11/12 00:01	06/25/12 10:15
3072157095	SU-14-24	Wipe	06/11/12 00:01	06/25/12 10:15
3072157096	SU-14-25	Wipe	06/11/12 00:01	06/25/12 10:15
3072157097	SU-14-26	Wipe	06/11/12 00:01	06/25/12 10:15
3072157098	SU-14-27	Wipe	06/11/12 00:01	06/25/12 10:15
3072157099	SU-04-1	Wipe	06/11/12 00:01	06/25/12 10:15
3072157100	SU-04-2	Wipe	06/11/12 00:01	06/25/12 10:15

Pace Analytical Services, Inc.
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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072157001	SU-10-3	EPA 906.0M	RMK	1	PASI-PA
3072157002	SU-10-4	EPA 906.0M	RMK	1	PASI-PA
3072157003	SU-10-5	EPA 906.0M	RMK	1	PASI-PA
3072157004	SU-10-6	EPA 906.0M	RMK	1	PASI-PA
3072157005	SU-10-7	EPA 906.0M	RMK	1	PASI-PA
3072157006	SU-10-8	EPA 906.0M	RMK	1	PASI-PA
3072157007	SU-10-9	EPA 906.0M	RMK	1	PASI-PA
3072157008	SU-10-10	EPA 906.0M	RMK	1	PASI-PA
3072157009	SU-10-11	EPA 906.0M	RMK	1	PASI-PA
3072157010	SU-10-12	EPA 906.0M	RMK	1	PASI-PA
3072157011	SU-10-12D	EPA 906.0M	RMK	1	PASI-PA
3072157012	SU-10-13	EPA 906.0M	RMK	1	PASI-PA
3072157013	SU-10-14	EPA 906.0M	RMK	1	PASI-PA
3072157014	SU-10-15	EPA 906.0M	RMK	1	PASI-PA
3072157015	SU-10-16	EPA 906.0M	RMK	1	PASI-PA
3072157016	SU-10-17	EPA 906.0M	RMK	1	PASI-PA
3072157017	SU-10-18	EPA 906.0M	RMK	1	PASI-PA
3072157018	SU-10-19	EPA 906.0M	RMK	1	PASI-PA
3072157019	SU-10-20	EPA 906.0M	RMK	1	PASI-PA
3072157020	SU-10-21	EPA 906.0M	RMK	1	PASI-PA
3072157021	SU-10-22	EPA 906.0M	RMK	1	PASI-PA
3072157022	SU-10-23	EPA 906.0M	RMK	1	PASI-PA
3072157023	SU-10-24	EPA 906.0M	RMK	1	PASI-PA
3072157024	SU-11-1	EPA 906.0M	RMK	1	PASI-PA
3072157025	SU-11-2	EPA 906.0M	RMK	1	PASI-PA
3072157026	SU-11-3	EPA 906.0M	RMK	1	PASI-PA
3072157027	SU-11-4	EPA 906.0M	RMK	1	PASI-PA
3072157028	SU-11-5	EPA 906.0M	RMK	1	PASI-PA
3072157029	SU-11-5D	EPA 906.0M	RMK	1	PASI-PA
3072157030	SU-11-6	EPA 906.0M	RMK	1	PASI-PA
3072157031	SU-11-7	EPA 906.0M	RMK	1	PASI-PA
3072157032	SU-11-8	EPA 906.0M	RMK	1	PASI-PA
3072157033	SU-11-9	EPA 906.0M	RMK	1	PASI-PA
3072157034	SU-11-10	EPA 906.0M	RMK	1	PASI-PA
3072157035	SU-11-11	EPA 906.0M	RMK	1	PASI-PA
3072157036	SU-11-12	EPA 906.0M	RMK	1	PASI-PA
3072157037	SU-11-13	EPA 906.0M	RMK	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072157038	SU-11-14	EPA 906.0M	RMK	1	PASI-PA
3072157039	SU-11-15	EPA 906.0M	RMK	1	PASI-PA
3072157040	SU-11-16	EPA 906.0M	RMK	1	PASI-PA
3072157041	SU-11-17	EPA 906.0M	RMK	1	PASI-PA
3072157042	SU-11-18	EPA 906.0M	RMK	1	PASI-PA
3072157043	SU-11-19	EPA 906.0M	RMK	1	PASI-PA
3072157044	SU-11-20	EPA 906.0M	RMK	1	PASI-PA
3072157045	SU-11-21	EPA 906.0M	RMK	1	PASI-PA
3072157046	SU-11-22	EPA 906.0M	RMK	1	PASI-PA
3072157047	SU-11-22D	EPA 906.0M	RMK	1	PASI-PA
3072157048	SU-11-23	EPA 906.0M	RMK	1	PASI-PA
3072157049	SU-11-24	EPA 906.0M	RMK	1	PASI-PA
3072157050	SU-11-25	EPA 906.0M	RMK	1	PASI-PA
3072157051	SU-11-26	EPA 906.0M	RMK	1	PASI-PA
3072157052	SU-11-27	EPA 906.0M	RMK	1	PASI-PA
3072157053	SU-11-28	EPA 906.0M	RMK	1	PASI-PA
3072157054	SU-11-29	EPA 906.0M	RMK	1	PASI-PA
3072157055	SU-11-30	EPA 906.0M	RMK	1	PASI-PA
3072157056	SU-11-31	EPA 906.0M	RMK	1	PASI-PA
3072157057	SU-11-32	EPA 906.0M	RMK	1	PASI-PA
3072157058	SU-11-33	EPA 906.0M	RMK	1	PASI-PA
3072157059	SU-11-33D	EPA 906.0M	RMK	1	PASI-PA
3072157060	SU-11-34	EPA 906.0M	RMK	1	PASI-PA
3072157061	SU-11-35	EPA 906.0M	RMK	1	PASI-PA
3072157062	SU-11-36	EPA 906.0M	RMK	1	PASI-PA
3072157063	SU-11-37	EPA 906.0M	RMK	1	PASI-PA
3072157064	SU-11-38	EPA 906.0M	RMK	1	PASI-PA
3072157065	SU-11-39	EPA 906.0M	RMK	1	PASI-PA
3072157066	SU-11-40	EPA 906.0M	RMK	1	PASI-PA
3072157067	SU-11-41	EPA 906.0M	RMK	1	PASI-PA
3072157068	SU-11-42	EPA 906.0M	RMK	1	PASI-PA
3072157069	SU-14-1	EPA 906.0M	RMK	1	PASI-PA
3072157070	SU-14-2	EPA 906.0M	RMK	1	PASI-PA
3072157071	SU-14-3	EPA 906.0M	RMK	1	PASI-PA
3072157072	SU-14-4	EPA 906.0M	RMK	1	PASI-PA
3072157073	SU-14-5	EPA 906.0M	RMK	1	PASI-PA
3072157074	SU-14-6	EPA 906.0M	RMK	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3072157075	SU-14-7	EPA 906.0M	RMK	1	PASI-PA
3072157076	SU-14-8	EPA 906.0M	RMK	1	PASI-PA
3072157077	SU-14-9	EPA 906.0M	RMK	1	PASI-PA
3072157078	SU-14-9D	EPA 906.0M	RMK	1	PASI-PA
3072157079	SU-14-10	EPA 906.0M	RMK	1	PASI-PA
3072157080	SU-14-11	EPA 906.0M	RMK	1	PASI-PA
3072157081	SU-14-12	EPA 906.0M	RMK	1	PASI-PA
3072157082	SU-14-13	EPA 906.0M	RMK	1	PASI-PA
3072157083	SU-14-14	EPA 906.0M	RMK	1	PASI-PA
3072157084	SU-14-15	EPA 906.0M	RMK	1	PASI-PA
3072157085	SU-14-16	EPA 906.0M	RMK	1	PASI-PA
3072157086	SU-14-17	EPA 906.0M	RMK	1	PASI-PA
3072157087	SU-14-17D	EPA 906.0M	RMK	1	PASI-PA
3072157088	SU-14-18	EPA 906.0M	RMK	1	PASI-PA
3072157089	SU-14-19	EPA 906.0M	RMK	1	PASI-PA
3072157090	SU-14-20	EPA 906.0M	RMK	1	PASI-PA
3072157091	SU-14-21	EPA 906.0M	RMK	1	PASI-PA
3072157092	SU-14-22	EPA 906.0M	RMK	1	PASI-PA
3072157093	SU-14-23	EPA 906.0M	RMK	1	PASI-PA
3072157094	SU-14-23D	EPA 906.0M	RMK	1	PASI-PA
3072157095	SU-14-24	EPA 906.0M	RMK	1	PASI-PA
3072157096	SU-14-25	EPA 906.0M	RMK	1	PASI-PA
3072157097	SU-14-26	EPA 906.0M	RMK	1	PASI-PA
3072157098	SU-14-27	EPA 906.0M	RMK	1	PASI-PA
3072157099	SU-04-1	EPA 906.0M	RMK	1	PASI-PA
3072157100	SU-04-2	EPA 906.0M	RMK	1	PASI-PA

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-10-3 **Lab ID: 3072157001** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**2.07U ± 3.52 (7.28)**	dpm/sample	07/18/12 03:02		

Sample: SU-10-4 **Lab ID: 3072157002** 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	**1.29U ± 3.42 (7.24)**	dpm/sample	07/18/12 03:13		

Sample: SU-10-5 **Lab ID: 3072157003** 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	**1.68U ± 3.47 (7.27)**	dpm/sample	07/18/12 03:24		

Sample: SU-10-6 **Lab ID: 3072157004** 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	**4.57J ± 3.79 (7.25)**	dpm/sample	07/18/12 03:35		

Sample: SU-10-7 **Lab ID: 3072157005** 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	**3.80J ± 3.71 (7.26)**	dpm/sample	07/18/12 03:46		

Sample: SU-10-8 **Lab ID: 3072157006** 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	**5.34J ± 3.88 (7.25)**	dpm/sample	07/18/12 03:57		

Sample: SU-10-9 **Lab ID: 3072157007** 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	**0.328U ± 3.32 (7.26)**	dpm/sample	07/18/12 04:08		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-10-10 **Lab ID: 3072157008** 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	**1.68U ± 3.47 (7.26)**	dpm/sample	07/18/12 04:19		

Sample: SU-10-11 **Lab ID: 3072157009** 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	**-0.0578U ± 3.27 (7.25)**	dpm/sample	07/18/12 04:30		

Sample: SU-10-12 **Lab ID: 3072157010** 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 ± 3.53 (7.25)**	dpm/sample	07/18/12 04:41		

Sample: SU-10-12D **Lab ID: 3072157011** 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	**2.84J ± 3.60 (7.25)**	dpm/sample	07/18/12 04:52		

Sample: SU-10-13 **Lab ID: 3072157012** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**6.51J ± 4.02 (7.26)**	dpm/sample	07/18/12 05:03		

Sample: SU-10-14 **Lab ID: 3072157013** 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	**1.48U ± 3.44 (7.24)**	dpm/sample	07/18/12 05:15		

Sample: SU-10-15 **Lab ID: 3072157014** 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 ± 3.12 (7.26)**	dpm/sample	07/18/12 05:26		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-10-16 **Lab ID: 3072157015** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**6.55J ± 4.05 (7.31)**	dpm/sample	07/18/12 05:37		

Sample: SU-10-17 **Lab ID: 3072157016** 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	**2.45U ± 3.55 (7.25)**	dpm/sample	07/18/12 05:48		

Sample: SU-10-18 **Lab ID: 3072157017** 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	**0.907U ± 3.38 (7.25)**	dpm/sample	07/18/12 05:59		

Sample: SU-10-19 **Lab ID: 3072157018** 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	**2.65U ± 3.58 (7.26)**	dpm/sample	07/18/12 06:10		

Sample: SU-10-20 **Lab ID: 3072157019** 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	**2.65U ± 3.58 (7.26)**	dpm/sample	07/18/12 06:21		

Sample: SU-10-21 **Lab ID: 3072157020** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**2.25U ± 3.53 (7.24)**	dpm/sample	07/18/12 06:32		

Sample: SU-10-22 **Lab ID: 3072157021** 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 ± 3.53 (7.25)**	dpm/sample	07/18/12 07:17		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
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Sample: SU-10-23 **Lab ID: 3072157022** 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	**0.328U ± 3.31 (7.24)**	dpm/sample	07/18/12 07:28		

Sample: SU-10-24 **Lab ID: 3072157023** 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	**0.135U ± 3.30 (7.26)**	dpm/sample	07/18/12 07:39		

Sample: SU-11-1 **Lab ID: 3072157024** 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	**3.04J ± 3.64 (7.29)**	dpm/sample	07/18/12 07:50		

Sample: SU-11-2 **Lab ID: 3072157025** 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	**3.22J ± 3.64 (7.25)**	dpm/sample	07/18/12 08:01		

Sample: SU-11-3 **Lab ID: 3072157026** 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	**0.139U ± 3.39 (7.47)**	dpm/sample	07/18/12 08:12		

Sample: SU-11-4 **Lab ID: 3072157027** 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	**1.88U ± 3.51 (7.31)**	dpm/sample	07/18/12 08:23		

Sample: SU-11-5 **Lab ID: 3072157028** 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	**1.68U ± 3.46 (7.25)**	dpm/sample	07/18/12 08:34		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-5D **Lab ID: 3072157029** 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	**0.720U ± 3.39 (7.32)**	dpm/sample	07/18/12 08:45		

Sample: SU-11-6 **Lab ID: 3072157030** 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	**0.520U ± 3.33 (7.25)**	dpm/sample	07/18/12 08:56		

Sample: SU-11-7 **Lab ID: 3072157031** 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	**3.23J ± 3.65 (7.27)**	dpm/sample	07/18/12 09:54		

Sample: SU-11-8 **Lab ID: 3072157032** 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	**4.95J ± 3.84 (7.25)**	dpm/sample	07/18/12 10:05		

Sample: SU-11-9 **Lab ID: 3072157033** 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	**2.64U ± 3.57 (7.24)**	dpm/sample	07/18/12 10:16		

Sample: SU-11-10 **Lab ID: 3072157034** 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	**2.45U ± 3.55 (7.25)**	dpm/sample	07/18/12 10:27		

Sample: SU-11-11 **Lab ID: 3072157035** 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	**3.83J ± 3.73 (7.30)**	dpm/sample	07/18/12 10:38		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-12 **Lab ID: 3072157036** 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	**1.68U ± 3.47 (7.26)**	dpm/sample	07/18/12 10:49		

Sample: SU-11-13 **Lab ID: 3072157037** 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	**2.83J ± 3.59 (7.25)**	dpm/sample	07/18/12 11:00		

Sample: SU-11-14 **Lab ID: 3072157038** 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	**1.10U ± 3.40 (7.25)**	dpm/sample	07/18/12 11:11		

Sample: SU-11-15 **Lab ID: 3072157039** 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	**0.713U ± 3.35 (7.25)**	dpm/sample	07/18/12 11:22		

Sample: SU-11-16 **Lab ID: 3072157040** 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	**-1.02U ± 3.16 (7.24)**	dpm/sample	07/18/12 11:33		

Sample: SU-11-17 **Lab ID: 3072157041** 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 ± 3.04 (6.57)**	dpm/sample	07/18/12 16:25		

Sample: SU-11-18 **Lab ID: 3072157042** 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	**3.93J ± 3.47 (6.57)**	dpm/sample	07/18/12 16:38		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-19 **Lab ID: 3072157043** 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	**-0.591U ± 3.07 (6.72)**	dpm/sample	07/18/12 16:51		

Sample: SU-11-20 **Lab ID: 3072157044** 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	**2.16U ± 3.29 (6.58)**	dpm/sample	07/18/12 17:04		

Sample: SU-11-21 **Lab ID: 3072157045** 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	**-0.0963U ± 3.05 (6.57)**	dpm/sample	07/18/12 17:17		

Sample: SU-11-22 **Lab ID: 3072157046** 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 ± 3.04 (6.59)**	dpm/sample	07/18/12 17:30		

Sample: SU-11-22D **Lab ID: 3072157047** 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	**2.79J ± 3.35 (6.57)**	dpm/sample	07/18/12 17:43		

Sample: SU-11-23 **Lab ID: 3072157048** 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	**2.00U ± 3.26 (6.57)**	dpm/sample	07/18/12 17:56		

Sample: SU-11-24 **Lab ID: 3072157049** 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	**2.00U ± 3.27 (6.57)**	dpm/sample	07/18/12 18:09		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-25 **Lab ID: 3072157050** 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	**5.59J ± 3.67 (6.64)**	dpm/sample	07/18/12 18:23		

Sample: SU-11-26 **Lab ID: 3072157051** 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	**-0.253U ± 3.06 (6.64)**	dpm/sample	07/18/12 18:36		

Sample: SU-11-27 **Lab ID: 3072157052** 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	**2.99J ± 3.39 (6.62)**	dpm/sample	07/18/12 18:49		

Sample: SU-11-28 **Lab ID: 3072157053** 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	**0.562U ± 3.13 (6.61)**	dpm/sample	07/18/12 19:02		

Sample: SU-11-29 **Lab ID: 3072157054** 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	**1.20U ± 3.20 (6.60)**	dpm/sample	07/18/12 19:15		

Sample: SU-11-30 **Lab ID: 3072157055** 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	**3.33J ± 3.45 (6.68)**	dpm/sample	07/18/12 19:28		

Sample: SU-11-31 **Lab ID: 3072157056** 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	**-0.887U ± 2.97 (6.58)**	dpm/sample	07/18/12 19:41		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-32 **Lab ID: 3072157057** 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	**1.20U ± 3.19 (6.58)**	dpm/sample	07/18/12 19:54		

Sample: SU-11-33 **Lab ID: 3072157058** 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	**0.872U ± 3.17 (6.61)**	dpm/sample	07/18/12 20:07		

Sample: SU-11-33D **Lab ID: 3072157059** 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	**2.64U ± 3.52 (6.97)**	dpm/sample	07/18/12 20:20		

Sample: SU-11-34 **Lab ID: 3072157060** 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	**1.83U ± 3.25 (6.57)**	dpm/sample	07/18/12 20:33		

Sample: SU-11-35 **Lab ID: 3072157061** 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 ± 3.04 (6.58)**	dpm/sample	07/18/12 21:26		

Sample: SU-11-36 **Lab ID: 3072157062** 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	**3.45J ± 3.42 (6.57)**	dpm/sample	07/18/12 21:39		

Sample: SU-11-37 **Lab ID: 3072157063** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**-1.06U ± 2.96 (6.57)**	dpm/sample	07/18/12 21:52		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-11-38 **Lab ID: 3072157064** 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	**3.12J ± 3.38 (6.57)**	dpm/sample	07/18/12 22:05		

Sample: SU-11-39 **Lab ID: 3072157065** 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	**2.00U ± 3.27 (6.58)**	dpm/sample	07/18/12 22:18		

Sample: SU-11-40 **Lab ID: 3072157066** 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	**4.08J ± 3.60 (6.83)**	dpm/sample	07/18/12 22:31		

Sample: SU-11-41 **Lab ID: 3072157067** 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	**0.232U ± 3.10 (6.60)**	dpm/sample	07/18/12 22:44		

Sample: SU-11-42 **Lab ID: 3072157068** 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	**4.07J ± 3.88 (7.43)**	dpm/sample	07/18/12 22:57		

Sample: SU-14-1 **Lab ID: 3072157069** 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	**2.97J ± 3.36 (6.57)**	dpm/sample	07/18/12 23:11		

Sample: SU-14-2 **Lab ID: 3072157070** 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	**1.37U ± 3.25 (6.69)**	dpm/sample	07/18/12 23:24		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-14-3 **Lab ID: 3072157071** 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	**5.05J ± 3.58 (6.57)**	dpm/sample	07/18/12 23:37		

Sample: SU-14-4 **Lab ID: 3072157072** 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	**2.33U ± 3.32 (6.63)**	dpm/sample	07/18/12 23:50		

Sample: SU-14-5 **Lab ID: 3072157073** 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	**5.74J ± 3.69 (6.64)**	dpm/sample	07/19/12 00:03		

Sample: SU-14-6 **Lab ID: 3072157074** 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	**2.79J ± 3.35 (6.57)**	dpm/sample	07/19/12 00:16		

Sample: SU-14-7 **Lab ID: 3072157075** 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	**-0.0973U ± 3.08 (6.64)**	dpm/sample	07/19/12 00:29		

Sample: SU-14-8 **Lab ID: 3072157076** 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	**4.72J ± 3.55 (6.57)**	dpm/sample	07/19/12 00:42		

Sample: SU-14-9 **Lab ID: 3072157077** 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	**5.68J ± 3.65 (6.57)**	dpm/sample	07/19/12 00:55		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-14-9D **Lab ID: 3072157078** 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	**3.76J ± 3.45 (6.58)**	dpm/sample	07/19/12 01:08		

Sample: SU-14-10 **Lab ID: 3072157079** 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 ± 3.58 (6.59)**	dpm/sample	07/19/12 01:21		

Sample: SU-14-11 **Lab ID: 3072157080** 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	**4.72J ± 3.55 (6.57)**	dpm/sample	07/19/12 01:34		

Sample: SU-14-12 **Lab ID: 3072157081** 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	**3.76J ± 3.45 (6.57)**	dpm/sample	07/19/12 09:10		

Sample: SU-14-13 **Lab ID: 3072157082** 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	**4.72J ± 3.55 (6.57)**	dpm/sample	07/19/12 09:23		

Sample: SU-14-14 **Lab ID: 3072157083** 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	**4.41J ± 3.52 (6.57)**	dpm/sample	07/19/12 09:36		

Sample: SU-14-15 **Lab ID: 3072157084** 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	**5.38J ± 3.62 (6.58)**	dpm/sample	07/19/12 09:49		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-14-16 **Lab ID: 3072157085** 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	**0.867U ± 3.15 (6.57)**	dpm/sample	07/19/12 10:02		

Sample: SU-14-17 **Lab ID: 3072157086** 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	**4.41J ± 3.52 (6.57)**	dpm/sample	07/19/12 10:15		

Sample: SU-14-17D **Lab ID: 3072157087** 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	**4.58J ± 3.55 (6.60)**	dpm/sample	07/19/12 10:28		

Sample: SU-14-18 **Lab ID: 3072157088** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**0.561U ± 3.13 (6.59)**	dpm/sample	07/19/12 10:42		

Sample: SU-14-19 **Lab ID: 3072157089** 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	**5.60J ± 3.68 (6.65)**	dpm/sample	07/19/12 10:55		

Sample: SU-14-20 **Lab ID: 3072157090** 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	**3.48J ± 3.44 (6.62)**	dpm/sample	07/19/12 11:08		

Sample: SU-14-21 **Lab ID: 3072157091** 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	**2.16U ± 3.28 (6.58)**	dpm/sample	07/19/12 11:21		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-14-22 **Lab ID: 3072157092** 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	**1.05U ± 3.19 (6.62)**	dpm/sample	07/19/12 11:34		

Sample: SU-14-23 **Lab ID: 3072157093** Collected: 06/11/12 00:01 Received: 06/25/12 10:15 Matrix: Wipe
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
LSC Low Energy Beta	EPA 906.0M	**1.84U ± 3.26 (6.60)**	dpm/sample	07/19/12 11:47		

Sample: SU-14-23D **Lab ID: 3072157094** 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	**-0.733U ± 2.99 (6.58)**	dpm/sample	07/19/12 12:00		

Sample: SU-14-24 **Lab ID: 3072157095** 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	**2.49U ± 3.32 (6.59)**	dpm/sample	07/19/12 12:13		

Sample: SU-14-25 **Lab ID: 3072157096** 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	**0.394U ± 3.17 (6.72)**	dpm/sample	07/19/12 12:26		

Sample: SU-14-26 **Lab ID: 3072157097** 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 ± 3.17 (6.57)**	dpm/sample	07/19/12 12:39		

Sample: SU-14-27 **Lab ID: 3072157098** 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	**4.45J ± 3.55 (6.63)**	dpm/sample	07/19/12 12:52		

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ANALYTICAL RESULTS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

Sample: SU-04-1 **Lab ID: 3072157099** 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	**2.65J ± 3.34 (6.59)**	dpm/sample	07/19/12 13:05		

Sample: SU-04-2 **Lab ID: 3072157100** 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 ± 3.35 (6.65)**	dpm/sample	07/19/12 13:18		

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

QC Batch: RADC/12486 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072157001, 3072157002, 3072157003, 3072157004, 3072157005, 3072157006, 3072157007, 3072157008, 3072157009, 3072157010, 3072157011, 3072157012, 3072157013, 3072157014, 3072157015, 3072157016, 3072157017, 3072157018, 3072157019, 3072157020

METHOD BLANK: 459073 Matrix: Impact Plate
Associated Lab Samples: 3072157001, 3072157002, 3072157003, 3072157004, 3072157005, 3072157006, 3072157007, 3072157008, 3072157009, 3072157010, 3072157011, 3072157012, 3072157013, 3072157014, 3072157015, 3072157016, 3072157017, 3072157018, 3072157019, 3072157020

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.94U ± 3.62 (7.53)	dpm/sample	07/18/12 07:05	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

QC Batch: RADC/12487 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072157021, 3072157022, 3072157023, 3072157024, 3072157025, 3072157026, 3072157027, 3072157028, 3072157029, 3072157030, 3072157031, 3072157032, 3072157033, 3072157034, 3072157035, 3072157036, 3072157037, 3072157038, 3072157039, 3072157040

METHOD BLANK: 459074 Matrix: Impact Plate
Associated Lab Samples: 3072157021, 3072157022, 3072157023, 3072157024, 3072157025, 3072157026, 3072157027, 3072157028, 3072157029, 3072157030, 3072157031, 3072157032, 3072157033, 3072157034, 3072157035, 3072157036, 3072157037, 3072157038, 3072157039, 3072157040

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	0.327U ± 3.31 (7.24)	dpm/sample	07/18/12 12:07	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

QC Batch: RADC/12488 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072157041, 3072157042, 3072157043, 3072157044, 3072157045, 3072157046, 3072157047, 3072157048, 3072157049, 3072157050, 3072157051, 3072157052, 3072157053, 3072157054, 3072157055, 3072157056, 3072157057, 3072157058, 3072157059, 3072157060

METHOD BLANK: 459079 Matrix: Impact Plate
Associated Lab Samples: 3072157041, 3072157042, 3072157043, 3072157044, 3072157045, 3072157046, 3072157047, 3072157048, 3072157049, 3072157050, 3072157051, 3072157052, 3072157053, 3072157054, 3072157055, 3072157056, 3072157057, 3072157058, 3072157059, 3072157060

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	0.0814U ± 3.24 (6.94)	dpm/sample	07/18/12 21:12	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

QC Batch: RADC/12489 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072157061, 3072157062, 3072157063, 3072157064, 3072157065, 3072157066, 3072157067, 3072157068, 3072157069, 3072157070, 3072157071, 3072157072, 3072157073, 3072157074, 3072157075, 3072157076, 3072157077, 3072157078, 3072157079, 3072157080

METHOD BLANK: 459080 Matrix: Impact Plate
Associated Lab Samples: 3072157061, 3072157062, 3072157063, 3072157064, 3072157065, 3072157066, 3072157067, 3072157068, 3072157069, 3072157070, 3072157071, 3072157072, 3072157073, 3072157074, 3072157075, 3072157076, 3072157077, 3072157078, 3072157079, 3072157080

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.75U ± 3.38 (6.87)	dpm/sample	07/19/12 02:14	

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

QUALITY CONTROL DATA

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

QC Batch: RADC/12490 Analysis Method: EPA 906.0M
QC Batch Method: EPA 906.0M Analysis Description: 906.0 LSC Low Energy Beta
Associated Lab Samples: 3072157081, 3072157082, 3072157083, 3072157084, 3072157085, 3072157086, 3072157087, 3072157088, 3072157089, 3072157090, 3072157091, 3072157092, 3072157093, 3072157094, 3072157095, 3072157096, 3072157097, 3072157098, 3072157099, 3072157100

METHOD BLANK: 459082 Matrix: Impact Plate
Associated Lab Samples: 3072157081, 3072157082, 3072157083, 3072157084, 3072157085, 3072157086, 3072157087, 3072157088, 3072157089, 3072157090, 3072157091, 3072157092, 3072157093, 3072157094, 3072157095, 3072157096, 3072157097, 3072157098, 3072157099, 3072157100

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
LSC Low Energy Beta	1.24U ± 3.29 (6.80)	dpm/sample	07/19/12 13:57	

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

QUALIFIERS

Project: Fort Monmouth 1207077
Pace Project No.: 3072157

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: 3072157

Chain of Custody
And
Sample Receiving Conditions Upon Receipt Form

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CHAIN-OF-CUSTODY / Analytical Request Document

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Project Number:	

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

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER NRC

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(A-Z, 0-9 / ,-)
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OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

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198	SU-13-40	WP	G	NA	NA	06/11/12		NA	1	X								X		
199	SU-10-1	WP	G	NA	NA	06/11/12		NA	1	X								X		
200	SU-10-2	WP	G	NA	NA	06/11/12		NA	1	X								X		
201	SU-10-3	WP	G	NA	NA	06/11/12		NA	1	X								X		001
202	SU-10-4	WP	G	NA	NA	06/11/12		NA	1	X								X		002
203	SU-10-5	WP	G	NA	NA	06/11/12		NA	1	X								X		003
204	SU-10-6	WP	G	NA	NA	06/11/12		NA	1	X								X		004
205	SU-10-7	WP	G	NA	NA	06/11/12		NA	1	X								X		005
206	SU-10-8	WP	G	NA	NA	06/11/12		NA	1	X								X		006
207	SU-10-9	WP	G	NA	NA	06/11/12		NA	1	X								X		007
208	SU-10-10	WP	G	NA	NA	06/11/12		NA	1	X								X		008
209	SU-10-11	WP	G	NA	NA	06/11/12		NA	1	X								X		009
210	SU-10-12	WP	G	NA	NA	06/11/12		NA	1	X								X		010
211	SU-10-12D	WP	G	NA	NA	06/11/12		NA	1	X								X		011
212	SU-10-13	WP	G	NA	NA	06/11/12		NA	1	X								X		012
213	SU-10-14	WP	G	NA	NA	06/11/12		NA	1	X								X		013
214	SU-10-15	WP	G	NA	NA	06/11/12		NA	1	X								X		014
215	SU-10-16	WP	G	NA	NA	06/11/12		NA	1	X								X		015
216	SU-10-17	WP	G	NA	NA	06/11/12		NA	1	X								X		016
217	SU-10-18	WP	G	NA	NA	06/11/12		NA	1	X								X		017
218	SU-10-19	WP	G	NA	NA	06/11/12		NA	1	X								X		018
219	SU-10-20	WP	G	NA	NA	06/11/12		NA	1	X								X		019

Pace 6/25/12 1015

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Project Number:	

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

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER NRC

Site Location STATE: NJ

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(A-Z, 0-9 / ,-)
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SOIL/SOLID	SL
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WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

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																		Requested Analysis Filtered (Y/N)	N		
220	SU-10-21	WP	G	NA	NA	06/11/12		NA	1	X									X		020
221	SU-10-22	WP	G	NA	NA	06/11/12		NA	1	X									X		021
222	SU-10-23	WP	G	NA	NA	06/11/12		NA	1	X									X		022
223	SU-10-24	WP	G	NA	NA	06/11/12		NA	1	X									X		023
224	SU-11-1	WP	G	NA	NA	06/11/12		NA	1	X									X		024
225	SU-11-2	WP	G	NA	NA	06/11/12		NA	1	X									X		025
226	SU-11-3	WP	G	NA	NA	06/11/12		NA	1	X									X		026
227	SU-11-4	WP	G	NA	NA	06/11/12		NA	1	X									X		027
228	SU-11-5	WP	G	NA	NA	06/11/12		NA	1	X									X		028
229	SU-11-5D	WP	G	NA	NA	06/11/12		NA	1	X									X		029
230	SU-11-6	WP	G	NA	NA	06/11/12		NA	1	X									X		030
231	SU-11-7	WP	G	NA	NA	06/11/12		NA	1	X									X		031
232	SU-11-8	WP	G	NA	NA	06/11/12		NA	1	X									X		032
233	SU-11-9	WP	G	NA	NA	06/11/12		NA	1	X									X		033
234	SU-11-10	WP	G	NA	NA	06/11/12		NA	1	X									X		034
235	SU-11-11	WP	G	NA	NA	06/11/12		NA	1	X									X		035
236	SU-11-12	WP	G	NA	NA	06/11/12		NA	1	X									X		036
237	SU-11-13	WP	G	NA	NA	06/11/12		NA	1	X									X		037
238	SU-11-14	WP	G	NA	NA	06/11/12		NA	1	X									X		038
239	SU-11-15	WP	G	NA	NA	06/11/12		NA	1	X									X		039
240	SU-11-16	WP	G	NA	NA	06/11/12		NA	1	X									X		040
241	SU-11-17	WP	G	NA	NA	06/11/12		NA	1	X									X		041

6/25/12 1015

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

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
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																		N			
242	SU-11-18	WP	G	NA	NA	06/11/12		NA	1	X								X			042
243	SU-11-19	WP	G	NA	NA	06/11/12		NA	1	X								X			043
244	SU-11-20	WP	G	NA	NA	06/11/12		NA	1	X								X			044
245	SU-11-21	WP	G	NA	NA	06/11/12		NA	1	X								X			045
246	SU-11-22	WP	G	NA	NA	06/11/12		NA	1	X								X			046
247	SU-11-22D	WP	G	NA	NA	06/11/12		NA	1	X								X			047
248	SU-11-23	WP	G	NA	NA	06/11/12		NA	1	X								X			048
249	SU-11-24	WP	G	NA	NA	06/11/12		NA	1	X								X			049
250	SU-11-25	WP	G	NA	NA	06/11/12		NA	1	X								X			050
251	SU-11-26	WP	G	NA	NA	06/11/12		NA	1	X								X			051
252	SU-11-27	WP	G	NA	NA	06/11/12		NA	1	X								X			052
253	SU-11-28	WP	G	NA	NA	06/11/12		NA	1	X								X			053
254	SU-11-29	WP	G	NA	NA	06/11/12		NA	1	X								X			054
255	SU-11-30	WP	G	NA	NA	06/11/12		NA	1	X								X			055
256	SU-11-31	WP	G	NA	NA	06/11/12		NA	1	X								X			056
257	SU-11-32	WP	G	NA	NA	06/11/12		NA	1	X								X			057
258	SU-11-33	WP	G	NA	NA	06/11/12		NA	1	X								X			058
259	SU-11-33D	WP	G	NA	NA	06/11/12		NA	1	X								X			059
260	SU-11-34	WP	G	NA	NA	06/11/12		NA	1	X								X			060
261	SU-11-35	WP	G	NA	NA	06/11/12		NA	1	X								X			061
262	SU-11-36	WP	G	NA	NA	06/11/12		NA	1	X								X			062
263	SU-11-37	WP	G	NA	NA	06/11/12		NA	1	X								X			063

Mark Pace 6/25/12 1015

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264	SU-11-38	WP	G	NA	NA	06/11/12		NA	1	X								X			064
265	SU-11-39	WP	G	NA	NA	06/11/12		NA	1	X								X			065
266	SU-11-40	WP	G	NA	NA	06/11/12		NA	1	X								X			066
267	SU-11-41	WP	G	NA	NA	06/11/12		NA	1	X								X			067
268	SU-11-42	WP	G	NA	NA	06/11/12		NA	1	X								X			068
269	SU-14-1	WP	G	NA	NA	06/11/12		NA	1	X								X			069
270	SU-14-2	WP	G	NA	NA	06/11/12		NA	1	X								X			070
271	SU-14-3	WP	G	NA	NA	06/11/12		NA	1	X								X			071
272	SU-14-4	WP	G	NA	NA	06/11/12		NA	1	X								X			072
273	SU-14-5	WP	G	NA	NA	06/11/12		NA	1	X								X			073
274	SU-14-6	WP	G	NA	NA	06/11/12		NA	1	X								X			074
275	SU-14-7	WP	G	NA	NA	06/11/12		NA	1	X								X			075
276	SU-14-8	WP	G	NA	NA	06/11/12		NA	1	X								X			076
277	SU-14-9	WP	G	NA	NA	06/11/12		NA	1	X								X			077
278	SU-14-9D	WP	G	NA	NA	06/11/12		NA	1	X								X			078
279	SU-14-10	WP	G	NA	NA	06/11/12		NA	1	X								X			079
280	SU-14-11	WP	G	NA	NA	06/11/12		NA	1	X								X			080
281	SU-14-12	WP	G	NA	NA	06/11/12		NA	1	X								X			081
282	SU-14-13	WP	G	NA	NA	06/11/12		NA	1	X								X			082
283	SU-14-14	WP	G	NA	NA	06/11/12		NA	1	X								X			083
284	SU-14-15	WP	G	NA	NA	06/11/12		NA	1	X								X			084
285	SU-14-16	WP	G	NA	NA	06/11/12		NA	1	X								X			085

6/25/12 1115

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																		Y/N	N		3072157
286	SU-14-17	WP	G	NA	NA	06/11/12		NA	1	X									X		086
287	SU-14-17D	WP	G	NA	NA	06/11/12		NA	1	X									X		087
288	SU-14-18	WP	G	NA	NA	06/11/12		NA	1	X									X		088
289	SU-14-19	WP	G	NA	NA	06/11/12		NA	1	X									X		089
290	SU-14-20	WP	G	NA	NA	06/11/12		NA	1	X									X		090
291	SU-14-21	WP	G	NA	NA	06/11/12		NA	1	X									X		091
292	SU-14-22	WP	G	NA	NA	06/11/12		NA	1	X									X		092
293	SU-14-23	WP	G	NA	NA	06/11/12		NA	1	X									X		093
294	SU-14-23D	WP	G	NA	NA	06/11/12		NA	1	X									X		094
295	SU-14-24	WP	G	NA	NA	06/11/12		NA	1	X									X		095
296	SU-14-25	WP	G	NA	NA	06/11/12		NA	1	X									X		096
297	SU-14-26	WP	G	NA	NA	06/11/12		NA	1	X									X		097
298	SU-14-27	WP	G	NA	NA	06/11/12		NA	1	X									X		098
299	SU-04-1	WP	G	NA	NA	06/11/12		NA	1	X									X		099
300	SU-04-2	WP	G	NA	NA	06/11/12		NA	1	X									X		100
301	SU-04-2D	WP	G	NA	NA	06/11/12		NA	1	X									X		
302	SU-04-3	WP	G	NA	NA	06/11/12		NA	1	X									X		
303	SU-04-4	WP	G	NA	NA	06/11/12		NA	1	X									X		
304	SU-04-5	WP	G	NA	NA	06/11/12		NA	1	X									X		
305	SU-04-6	WP	G	NA	NA	06/11/12		NA	1	X									X		
306	SU-04-7	WP	G	NA	NA	06/11/12		NA	1	X									X		
307	SU-04-8	WP	G	NA	NA	06/11/12		NA	1	X									X		

6/25/12 1015

Sample Condition Upon Receipt

Pace Analytical

Client Name: RTI Project # 3572182

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

Optional
Proj. Due Date:
Proj. Name:

Tracking #: 879285653784

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

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

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

Cooler Temperature NA Biological Tissue is Frozen: Yes No

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

Temp should be above freezing to 6°C

Comments:

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

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

Pace Analytical

Project Number: 3022157

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 (1 vial)	Radchem Nalgene (125 / 250 / 500 / 1L)	Radchem Nalgene (1/2 gal. / 1 gal.L)	Cubitainer (500 ml / 4L)	Ziploc	Other	Other
001 -	WP																	—						
100	↓																	↓						

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

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1 459073-BLANK for HBN 91057 [RADC/1248

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

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 07:05
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/25/2012 23:59
Schedule	2796179	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 07:05
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/25/2012 23:59
Schedule	2796179	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.94U ± 3.62 (7.53)	dpm/sa	1.94U ± 3.62 (7.53)			dpm/sa

2 3072157001-SU-10-3

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 03:02
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59
Schedule	2790239	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 03:02
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790239	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.07U ± 3.52 (7.28)	dpm/sa	2.07U ± 3.52 (7.28)		dpm/sa		

3 3072157002-SU-10-4

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

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

7/23/12

Quality Control Review

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Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

3 3072157002-SU-10-4

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 03:13	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790240	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 03:13	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790240	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.29U ± 3.42 (7.24)	dpm/sa	1.29U ± 3.42 (7.24)		dpm/sa		

4 3072157003-SU-10-5

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 03:24	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790241	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 03:24	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790241	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.68U ± 3.47 (7.27)	dpm/sa	1.68U ± 3.47 (7.27)		dpm/sa		

5 3072157004-SU-10-6

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

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Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

5 3072157004-SU-10-6

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 03:35	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790242	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 03:35	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790242	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.57J ± 3.79 (7.25)	dpm/sa	4.57J ± 3.79 (7.25)		dpm/sa		

6 3072157005-SU-10-7

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 03:46	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790243	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 03:46	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790243	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.80J ± 3.71 (7.26)	dpm/sa	3.80J ± 3.71 (7.26)		dpm/sa		

7 3072157006-SU-10-8

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

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Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

7 3072157006-SU-10-8

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790244

Batch RADC/12486
HBN 91057
Instru NONE

Prep Date 7/18/2012 03:57
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790244

Instru NONE
Col ID
File

Run Date 7/18/2012 03:57
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.34J ± 3.88 (7.25)	dpm/sa	5.34J ± 3.88 (7.25)		dpm/sa		

8 3072157007-SU-10-9

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790245

Batch RADC/12486
HBN 91057
Instru NONE

Prep Date 7/18/2012 04:08
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790245

Instru NONE
Col ID
File

Run Date 7/18/2012 04:08
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.328U ± 3.32 (7.26)	dpm/sa	0.328U ± 3.32 (7.26)		dpm/sa		

9 3072157008-SU-10-10

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

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Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

9 3072157008-SU-10-10

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 04:19	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790246	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 04:19	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790246	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.68U ± 3.47 (7.26)	dpm/sa	1.68U ± 3.47 (7.26)		dpm/sa		

10 3072157009-SU-10-11

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 04:30	**Dilution**	
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790247	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 04:30	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790247	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.0578U ± 3.27 (7.25)	dpm/sa	-0.0578U ± 3.27 (7.25)		dpm/sa		

11 3072157010-SU-10-12

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch RADC/12486 HBN 91057
Rule 9060 I LEB Status WP
Create Date 6/28/2012 Analyst RMK

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11 3072157010-SU-10-12

Prep Information

Procedure 9060 I LEB **Batch** RADC/12486 **Prep Date** 7/18/2012 04:41 **Dilution**
Method EPA 906.0M **HBN** 91057 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790248 **Instru** NONE **CC** OK *

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/18/2012 04:41 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790248 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.26U ± 3.53 (7.25)	dpm/sa	2.26U ± 3.53 (7.25)		dpm/sa		

12 3072157011-SU-10-12D

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12486 **Prep Date** 7/18/2012 04:52 **Dilution**
Method EPA 906.0M **HBN** 91057 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790249 **Instru** NONE **CC** OK *

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/18/2012 04:52 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790249 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.84J ± 3.60 (7.25)	dpm/sa	2.84J ± 3.60 (7.25)		dpm/sa		

13 3072157012-SU-10-13

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

Batch RADC/12486 HBN 91057
Rule 9060 I LEB Status WP
Create Date 6/28/2012 Analyst RMK

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13 3072157012-SU-10-13

Prep Information

Procedure 9060 I LEB **Batch** RADC/12486 **Prep Date** 7/18/2012 05:03 **Dilution**
Method EPA 906.0M **HBN** 91057 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790250 **Instru** NONE **CC** OK *

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/18/2012 05:03 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790250 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	6.51J ± 4.02 (7.26)	dpm/sa	6.51J ± 4.02 (7.26)		dpm/sa		

14 3072157013-SU-10-14

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12486 **Prep Date** 7/18/2012 05:15 **Dilution**
Method EPA 906.0M **HBN** 91057 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790251 **Instru** NONE **CC** OK *

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/18/2012 05:15 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790251 **File** **CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.48U ± 3.44 (7.24)	dpm/sa	1.48U ± 3.44 (7.24)		dpm/sa		

15 3072157014-SU-10-15

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

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Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

15 3072157014-SU-10-15

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 05:26	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790252		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 05:26	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790252		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.41U ± 3.12 (7.26)	dpm/sa	-1.41U ± 3.12 (7.26)		dpm/sa		

16 3072157015-SU-10-16

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 05:37	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790253		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 05:37	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790253		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	6.55J ± 4.05 (7.31)	dpm/sa	6.55J ± 4.05 (7.31)		dpm/sa		

17 3072157016-SU-10-17

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

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17 3072157016-SU-10-17

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 05:48	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790254		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 05:48	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790254		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.45U ± 3.55 (7.25)	dpm/sa	2.45U ± 3.55 (7.25)		dpm/sa		

18 3072157017-SU-10-18

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 05:59	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790255		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 05:59	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790255		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.907U ± 3.38 (7.25)	dpm/sa	0.907U ± 3.38 (7.25)		dpm/sa		

19 3072157018-SU-10-19

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12486	HBN	91057
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

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19 3072157018-SU-10-19

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 06:10	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790256		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 06:10	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790256		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.65U ± 3.58 (7.26)	dpm/sa	2.65U ± 3.58 (7.26)		dpm/sa		

20 3072157019-SU-10-20

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12486	**Prep Date**	7/18/2012 06:21	**Dilution**
Method	EPA 906.0M		**HBN**	91057	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790257		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 06:21	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790257		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.65U ± 3.58 (7.26)	dpm/sa	2.65U ± 3.58 (7.26)		dpm/sa		

21 3072157020-SU-10-21

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12486	**HBN**	91057
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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21 3072157020-SU-10-21

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12486	**Prep Date**	7/18/2012 06:32
Method	EPA 906.0M	**HBN**	91057	**Hold Date**	12/8/2012 23:59
Schedule	2790258	**Instru**	NONE		

Initial Volume	1 mL	Default	1 mL	**Dilution**		
Final Volume,	1 mL	Default	1 mL	**Analyst**	RMK	
				CC	OK *	

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 06:32	**Dilution**
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790258	**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	2.25U ± 3.53 (7.24)	dpm/sa	2.25U ± 3.53 (7.24)			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 13:48		Assigned Analyst	RMK
Batch ID	12486		Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB	9060W	HBN	91057
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
	459073	BLANK	IP		QCACCOUNT	1.94U	3.62	7.53	7/18/12 7:05
3072157	3072157001	PS	WP	6/11/2012 0:01	RTI	2.07U	3.52	7.28	7/18/12 3:02
3072157	3072157002	PS	WP	6/11/2012 0:01	RTI	1.29U	3.42	7.24	7/18/12 3:13
3072157	3072157003	PS	WP	6/11/2012 0:01	RTI	1.68U	3.47	7.27	7/18/12 3:24
3072157	3072157004	PS	WP	6/11/2012 0:01	RTI	4.57J	3.79	7.25	7/18/12 3:35
3072157	3072157005	PS	WP	6/11/2012 0:01	RTI	3.80J	3.71	7.26	7/18/12 3:46
3072157	3072157006	PS	WP	6/11/2012 0:01	RTI	5.34J	3.88	7.25	7/18/12 3:57
3072157	3072157007	PS	WP	6/11/2012 0:01	RTI	0.328U	3.32	7.26	7/18/12 4:08
3072157	3072157008	PS	WP	6/11/2012 0:01	RTI	1.68U	3.47	7.26	7/18/12 4:19
3072157	3072157009	PS	WP	6/11/2012 0:01	RTI	-0.0578U	3.27	7.25	7/18/12 4:30
3072157	3072157010	PS	WP	6/11/2012 0:01	RTI	2.26U	3.53	7.25	7/18/12 4:41
3072157	3072157011	PS	WP	6/11/2012 0:01	RTI	2.84J	3.60	7.25	7/18/12 4:52
3072157	3072157012	PS	WP	6/11/2012 0:01	RTI	6.51J	4.02	7.26	7/18/12 5:03
3072157	3072157013	PS	WP	6/11/2012 0:01	RTI	1.48U	3.44	7.24	7/18/12 5:15
3072157	3072157014	PS	WP	6/11/2012 0:01	RTI	-1.41U	3.12	7.26	7/18/12 5:26
3072157	3072157015	PS	WP	6/11/2012 0:01	RTI	6.55J	4.05	7.31	7/18/12 5:37
3072157	3072157016	PS	WP	6/11/2012 0:01	RTI	2.45U	3.55	7.25	7/18/12 5:48
3072157	3072157017	PS	WP	6/11/2012 0:01	RTI	0.907U	3.38	7.25	7/18/12 5:59
3072157	3072157018	PS	WP	6/11/2012 0:01	RTI	2.65U	3.58	7.26	7/18/12 6:10
3072157	3072157019	PS	WP	6/11/2012 0:01	RTI	2.65U	3.58	7.26	7/18/12 6:21
3072157	3072157020	PS	WP	6/11/2012 0:01	RTI	2.25U	3.53	7.24	7/18/12 6:32

7/27/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK			
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	5.63	
Batch ID	12486	**PrepSOP2**	n/a	**Bkg Duration**	30.0	min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG071812	
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/18/2012 2:31	
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3	

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459073	1.0	7/18/12 7:05	10.0	7/18/12 7:05	6.60	324.1	dpm/S	High, Evaluate
3072157001	1.0	6/11/12 0:01	10.0	7/18/12 3:02	6.70	250.6	dpm/S	Pass
3072157002	1.0	6/11/12 0:01	10.0	7/18/12 3:13	6.30	270.8	dpm/S	Pass
3072157003	1.0	6/11/12 0:01	10.0	7/18/12 3:24	6.50	285.1	dpm/S	Pass
3072157004	1.0	6/11/12 0:01	10.0	7/18/12 3:35	8.00	262.5	dpm/S	Pass
3072157005	1.0	6/11/12 0:01	10.0	7/18/12 3:46	7.60	256.9	dpm/S	Pass
3072157006	1.0	6/11/12 0:01	10.0	7/18/12 3:57	8.40	264.9	dpm/S	Pass
3072157007	1.0	6/11/12 0:01	10.0	7/18/12 4:08	5.80	256.7	dpm/S	Pass
3072157008	1.0	6/11/12 0:01	10.0	7/18/12 4:19	6.50	256.7	dpm/S	Pass
3072157009	1.0	6/11/12 0:01	10.0	7/18/12 4:30	5.60	265.2	dpm/S	Pass
3072157010	1.0	6/11/12 0:01	10.0	7/18/12 4:41	6.80	280.2	dpm/S	Pass
3072157011	1.0	6/11/12 0:01	10.0	7/18/12 4:52	7.10	279.3	dpm/S	Pass
3072157012	1.0	6/11/12 0:01	10.0	7/18/12 5:03	9.00	282.2	dpm/S	Pass
3072157013	1.0	6/11/12 0:01	10.0	7/18/12 5:15	6.40	268.4	dpm/S	Pass
3072157014	1.0	6/11/12 0:01	10.0	7/18/12 5:26	4.90	259.3	dpm/S	Pass
3072157015	1.0	6/11/12 0:01	10.0	7/18/12 5:37	9.00	294.2	dpm/S	Pass
3072157016	1.0	6/11/12 0:01	10.0	7/18/12 5:48	6.90	263.8	dpm/S	Pass
3072157017	1.0	6/11/12 0:01	10.0	7/18/12 5:59	6.10	259.8	dpm/S	Pass
3072157018	1.0	6/11/12 0:01	10.0	7/18/12 6:10	7.00	284.4	dpm/S	Pass
3072157019	1.0	6/11/12 0:01	10.0	7/18/12 6:21	7.00	256.9	dpm/S	Pass
3072157020	1.0	6/11/12 0:01	10.0	7/18/12 6:32	6.80	267.2	dpm/S	Pass

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12486	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459073	0.4996	0.0000	1.0000	1.942	3.612	3.619	7.526	2.862	0.746	3.612	1.00
3072157001	0.5192	0.1016	0.9943	2.073	3.516	3.525	7.284	2.769	0.722	3.516	1.00
3072157002	0.5221	0.1017	0.9943	1.291	3.414	3.417	7.243	2.754	0.718	3.414	1.00
3072157003	0.5204	0.1017	0.9943	1.681	3.467	3.473	7.267	2.763	0.720	3.467	1.00
3072157004	0.5216	0.1017	0.9943	4.569	3.755	3.795	7.249	2.756	0.718	3.755	1.00
3072157005	0.5207	0.1017	0.9943	3.805	3.685	3.713	7.262	2.761	0.720	3.685	1.00
3072157006	0.5219	0.1017	0.9943	5.338	3.829	3.881	7.246	2.755	0.718	3.829	1.00
3072157007	0.5207	0.1018	0.9943	0.328	3.317	3.317	7.262	2.761	0.720	3.317	1.00
3072157008	0.5207	0.1018	0.9943	1.680	3.465	3.471	7.262	2.761	0.720	3.465	1.00
3072157009	0.5219	0.1018	0.9943	-0.058	3.266	3.266	7.245	2.755	0.718	3.266	1.00
3072157010	0.5213	0.1018	0.9943	2.257	3.522	3.532	7.254	2.758	0.719	3.522	1.00
3072157011	0.5214	0.1019	0.9943	2.835	3.582	3.597	7.252	2.757	0.719	3.582	1.00
3072157012	0.5210	0.1019	0.9943	6.506	3.946	4.022	7.259	2.760	0.719	3.946	1.00
3072157013	0.5221	0.1019	0.9943	1.483	3.435	3.440	7.243	2.754	0.718	3.435	1.00
3072157014	0.5212	0.1019	0.9943	-1.409	3.113	3.118	7.256	2.759	0.719	3.113	1.00
3072157015	0.5176	0.1019	0.9943	6.548	3.972	4.048	7.306	2.778	0.724	3.972	1.00
3072157016	0.5218	0.1020	0.9943	2.448	3.539	3.551	7.247	2.755	0.718	3.539	1.00
3072157017	0.5213	0.1020	0.9943	0.907	3.377	3.379	7.254	2.758	0.719	3.377	1.00
3072157018	0.5205	0.1020	0.9943	2.647	3.568	3.582	7.265	2.762	0.720	3.568	1.00
3072157019	0.5207	0.1020	0.9943	2.646	3.566	3.580	7.262	2.761	0.720	3.566	1.00
3072157020	0.5220	0.1020	0.9943	2.254	3.517	3.528	7.244	2.754	0.718	3.517	1.00

7/17/2012

Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/31/2012	**Method:**	EPA 906.0M
Worklist:	12486	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459073

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	1.9420	3.6190	7.5260	2.86200		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 13:35	7/20/12 13:43				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.940	1184.939				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	106.957	112.973				
1.96 Sigma Unc:	17.053	17.923				
% Recovery:	90.26%	95.34%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12486					
Duplicate Sample I.D.	LCSD12486					
Sample Result (DPM/Sample, g, F):	106.9570					
1.96 Sigma Unc:	17.0530					
ple Duplicate Result (DPM/Sample, g, F):	112.9730					
Duplicate Sample 1.96 Sigma Unc.	17.9230					
Either results below MDC?	NO					
Relative Percent Difference:	5.47%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

Sample Matrix Spike Control Assessment

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

Matrix Spike/Matrix Spike Duplicate Sample Assessment

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

Comments:

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07/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12486

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Protocol #: 2 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
2	1	30.00	30	2.53	5.83	5.63	292.82	4

BKG071812

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			7/18/2012 3:12
		Sample Ct Duration (min)	10.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	10	7/18/2012 3:02	3072157001
2	21	7/18/2012 3:13	3072157002
3	32	7/18/2012 3:24	3072157003
4	43	7/18/2012 3:35	3072157004
5	54	7/18/2012 3:46	3072157005
6	65	7/18/2012 3:57	3072157006
7	76	7/18/2012 4:08	3072157007
8	87	7/18/2012 4:19	3072157008
9	98	7/18/2012 4:30	3072157009
10	109	7/18/2012 4:41	3072157010
11	120	7/18/2012 4:52	3072157011
12	131	7/18/2012 5:03	3072157012
13	143	7/18/2012 5:15	3072157013
14	154	7/18/2012 5:26	3072157014
15	165	7/18/2012 5:37	3072157015
16	176	7/18/2012 5:48	3072157016
17	187	7/18/2012 5:59	3072157017
18	198	7/18/2012 6:10	3072157018
19	209	7/18/2012 6:21	3072157019
20	220	7/18/2012 6:32	3072157020
21	231	7/18/2012 6:43	LCS
22	242	7/18/2012 6:54	LCSD
23	253	7/18/2012 7:05	459073

7/31/12

Protocol #:11 SWIPE_H3_C14 User :

Time: 10.00
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 Instruaent 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
11	1	10.00	10	2.80	6.70	6.70	250.61	2
11	2	10.00	21	3.40	6.20	6.30	270.75	2
11	3	10.00	32	3.30	6.60	6.50	285.14	3
11	4	10.00	43	4.60	8.00	8.00	262.48	2
11	5	10.00	54	4.40	7.50	7.60	256.91	1
11	6	10.00	65	4.10	8.50	8.40	264.94	3
11	7	10.00	76	3.40	5.80	5.80	256.67	3
11	8	10.00	87	3.40	6.60	6.50	256.66	2
11	9	10.00	98	3.00	5.60	5.60	265.21	4
11	10	10.00	109	3.80	6.70	6.80	280.23	1
11	11	10.00	120	4.00	7.10	7.10	279.27	2
11	12	10.00	131	5.10	9.00	9.00	282.19	1
11	13	10.00	143	3.10	6.50	6.40	268.39	3
11	14	10.00	154	1.80	5.00	4.90	259.30	3
11	15	10.00	165	5.00	9.00	9.00	294.20	2
11	16	10.00	176	4.10	6.80	6.90	263.77	2
11	17	10.00	187	2.80	6.20	6.10	259.80	3
11	18	10.00	198	4.00	7.00	7.00	284.38	3
11	19	10.00	209	3.90	7.00	7.00	256.87	3
11	20	10.00	220	3.50	7.00	6.80	267.24	3
11	21	10.00	231	609.30	613.90	634.40	294.39	0
11	22	10.00	242	625.20	630.50	654.90	304.20	0
11	23	10.00	253	3.30	6.80	6.60	324.14	3

Pace Analytical

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
3072155088	12480	Swipe_H3_C14	6	12	~~12~~ 7/17/12 2110	10	NA	RMK
089								
090								
091								
092								
093								
095								
096								
097								
098								
099								
LCS	NA		2					
LCSD 7/17/12								
MB (459063)	12479							
BKG071812	NA		34	2	7/17/12 2110	30	NA	RMK
3072157001	12486		31	11		10		
002								
003								
004								
005								
006								
007								
008								
009								

Run comments: _____

Peer Review: _____

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
307215701O	12486	Swipe-H3_C14	31	11	7/17/12 2110	10	NA	RMK
011								
012			↓					
013			18					
014								
015								
016								
017								
018								
019								
020								
LCS	NA							
LCSD	~~7/17/12~~ 12486							
MB (459073)	~~12486~~							
307215702I	12487		5	8	7/17/12 2130	10	NA	RMK
022								
023								
024								
025								
026								
027								
028								
029								
030								

Run comments: _____

Peer Review: _____

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

Bkg CPM 6.30
Bkg Duration 30.0 min
Bkg Ref bkg 07/20/2012
Bkg Ct Date/Time: 7/20/2012 10:25
Instrument ID: System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459058	1.0	1/0/00 0:00	7.0				dpm/S	Low, Reprep
LCS12476	1.0	7/20/12 12:03	7.0	7/20/12 12:03	62.57	313.2	dpm/S	High, Evaluate
LCSD12476	1.0	7/20/12 12:11	7.0	7/20/12 12:11	61.29	313.4	dpm/S	High, Evaluate
LCS12477	1.0	7/20/12 12:19	7.0	7/20/12 12:19	56.14	271.5	dpm/S	Pass
LCSD12477	1.0	7/20/12 12:27	7.0	7/20/12 12:27	58.86	319.0	dpm/S	High, Evaluate
LCS12478	1.0	7/20/12 12:35	7.0	7/20/12 12:35	58.43	328.2	dpm/S	High, Evaluate
LCSD12478	1.0	7/20/12 12:43	7.0	7/20/12 12:43	59.43	318.4	dpm/S	High, Evaluate
LCS12479	1.0	7/20/12 12:51	7.0	7/20/12 12:51	58.86	331.5	dpm/S	High, Evaluate
LCSD12479	1.0	7/20/12 12:59	7.0	7/20/12 12:59	57.86	329.1	dpm/S	High, Evaluate
LCS12480	1.0	7/20/12 13:19	7.0	7/20/12 13:19	57.14	312.1	dpm/S	Pass
LCSD12480	1.0	7/20/12 13:27	7.0	7/20/12 13:27	63.86	315.7	dpm/S	High, Evaluate
LCS12486	1.0	7/20/12 13:35	7.0	7/20/12 13:35	62.14	269.0	dpm/S	Pass
LCSD12486	1.0	7/20/12 13:43	7.0	7/20/12 13:43	63.29	317.9	dpm/S	High, Evaluate
LCS12487	1.0	7/20/12 13:51	7.0	7/20/12 13:51	60.90	329.4	dpm/S	High, Evaluate
LCSD12487	1.0	7/20/12 13:59	7.0	7/20/12 13:59	57.43	320.2	dpm/S	High, Evaluate
LCS12488	1.0	7/20/12 14:07	7.0	7/20/12 14:07	56.14	330.7	dpm/S	High, Evaluate
LCSD12488	1.0	7/20/12 14:15	7.0	7/20/12 14:15	60.43	330.5	dpm/S	High, Evaluate

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0406	0.0000	1.0000	155.001	-22.098	22.369	-118.059	-42.770	-12.594	-12.594	1.00
LCS12476	0.5078	0.0000	1.0000	110.816	11.675	17.635	9.450	3.423	1.008	11.675	1.00
LCSD12476	0.5076	0.0000	1.0000	108.328	11.561	17.338	9.453	3.425	1.008	11.561	1.00
LCS12477	0.5221	0.0000	1.0000	95.465	10.770	15.673	9.191	3.330	0.981	10.770	1.00
LCSD12477	0.5036	0.0000	1.0000	104.361	11.425	16.896	9.528	3.452	1.016	11.425	1.00
LCS12478	0.4961	0.0000	1.0000	105.080	11.557	17.048	9.673	3.504	1.032	11.557	1.00
LCSD12478	0.5041	0.0000	1.0000	105.391	11.468	17.015	9.519	3.448	1.015	11.468	1.00
LCS12479	0.4930	0.0000	1.0000	106.606	11.671	17.259	9.733	3.526	1.038	11.671	1.00
LCSD12479	0.4953	0.0000	1.0000	104.102	11.521	16.938	9.688	3.510	1.034	11.521	1.00
LCS12480	0.5085	0.0000	1.0000	99.974	11.153	16.327	9.436	3.418	1.007	11.153	1.00
LCSD12480	0.5061	0.0000	1.0000	113.736	11.831	18.000	9.482	3.435	1.011	11.831	1.00
LCS12486	0.5221	0.0000	1.0000	106.957	11.317	17.053	9.191	3.330	0.980	11.317	1.00
LCSD12486	0.5045	0.0000	1.0000	112.973	11.818	17.923	9.512	3.446	1.015	11.818	1.00
LCS12487	0.4950	0.0000	1.0000	110.294	11.818	17.684	9.693	3.512	1.034	11.818	1.00
LCSD12487	0.5028	0.0000	1.0000	101.694	11.308	16.583	9.544	3.458	1.018	11.308	1.00
LCS12488	0.4938	0.0000	1.0000	100.924	11.386	16.569	9.717	3.520	1.037	11.386	1.00
LCSD12488	0.4939	0.0000	1.0000	109.588	11.800	17.609	9.715	3.519	1.036	11.800	1.00

7/31/12

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

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 13:26
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 13:19	LCS12480
2	15	7/20/2012 13:27	LCSD12480
3	23	7/20/2012 13:35	LCS12486
4	31	7/20/2012 13:43	LCSD12486
5	39	7/20/2012 13:51	LCS12487
6	47	7/20/2012 13:59	LCSD12487
7	55	7/20/2012 14:07	LCS12488
8	63	7/20/2012 14:15	LCSD12488

7/31/12

Protocol #: 7 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	0.0	0.00
Region C:	1.0 -	160	0	6.0	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
7	1	7.00	7	41.29	56.71	57.14	312.05	1
7	2	7.00	15	49.00	63.57	63.86	315.68	1
7	3	7.00	23	46.86	61.86	62.14	268.99	1
7	4	7.00	31	44.86	63.14	63.29	317.94	1
7	5	7.00	39	44.43	59.86	60.29	329.35	0
7	6	7.00	47	42.29	56.71	57.43	320.16	0
7	7	7.00	55	41.14	55.86	56.14	330.65	0
7	8	7.00	63	44.71	59.86	60.43	330.54	0

Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Comments: 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
3072116000 18			9	20	7/20/12 0900	7		JL
19			↓	↓	↓	↓		↓
20			↓	↓	↓	↓		↓
LCS			↓	↓	↓	↓		↓
LCSD			↓	↓	↓	↓		↓
LCS 12476	12476	Swipe_H3_C14	18	7	7/20/12 0950	7	N/A	RMK
LCSD 12476	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12477	12477	↓	↓	↓	↓	↓	↓	↓
LCSD 12477	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12478	12478	↓	↓	↓	↓	↓	↓	↓
LCSD 12478	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12479	12479	↓	↓	↓	↓	↓	↓	↓
LCSD 12479	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12480	12480	↓	6	↓	↓	↓	↓	↓
LCSD 12480	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12486	12486	↓	↓	↓	↓	↓	↓	↓
LCSD 12486	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12487	12487	↓	↓	↓	↓	↓	↓	↓
LCSD 12487	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12488	12488	↓	↓	↓	↓	↓	↓	↓
LCSD 12488	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

Quality Control Review

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Batch	RADC/12487	HBN	91058
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

1 459074-BLANK for HBN 91058 [RADC/1248

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

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 12:07
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/25/2012 23:59
Schedule	2796180	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 12:07
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/25/2012 23:59
Schedule	2796180	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.327U ± 3.31 (7.24)	dpm/sa	0.327U ± 3.31 (7.24)			dpm/sa

2 3072157021-SU-10-22

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 07:17
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790259	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 07:17
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790259	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.26U ± 3.53 (7.25)	dpm/sa	2.26U ± 3.53 (7.25)			dpm/sa	

3 3072157022-SU-10-23

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

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Batch	RADC/12487	HBN	91058
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

3 3072157022-SU-10-23

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 07:28	**Dilution**	
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790260	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 07:28	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790260	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.328U ± 3.31 (7.24)	dpm/sa	0.328U ± 3.31 (7.24)		dpm/sa		

4 3072157023-SU-10-24

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 07:39	**Dilution**	
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790261	**Instru**	NONE			**CC**	OK *

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 07:39	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790261	**File**				**CC**	OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.135U ± 3.30 (7.26)	dpm/sa	0.135U ± 3.30 (7.26)		dpm/sa		

5 3072157024-SU-11-1

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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5 3072157024-SU-11-1

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 07:50	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790262		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 07:50	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790262		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.04J ± 3.64 (7.29)	dpm/sa	3.04J ± 3.64 (7.29)		dpm/sa		

6 3072157025-SU-11-2

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:01	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790263		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 08:01	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790263		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.22J ± 3.64 (7.25)	dpm/sa	3.22J ± 3.64 (7.25)		dpm/sa		

7 3072157026-SU-11-3

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

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Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

7 3072157026-SU-11-3

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:12
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790264	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 08:12
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790264	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.139U ± 3.39 (7.47)	dpm/sa	0.139U ± 3.39 (7.47)		dpm/sa		

8 3072157027-SU-11-4

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:23
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790265	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK *

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 08:23
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790265	**File**			

Dilution
Analyst RMK
CC OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.88U ± 3.51 (7.31)	dpm/sa	1.88U ± 3.51 (7.31)		dpm/sa		

9 3072157028-SU-11-5

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

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Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

9 3072157028-SU-11-5

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:34
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790266	**Instru**	NONE		

Dilution					
Analyst	RMK				
CC	OK *				

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 08:34
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790266	**File**			

							Reg. Limits	
Analyte	**CC**	**Posted Result**		**Result**	**MDL**	**RDL**	**Low**	**High**
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.68U ± 3.46 (7.25)	dpm/sa	1.68U ± 3.46 (7.25)		dpm/sa		

10 3072157029-SU-11-5D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:45
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790267	**Instru**	NONE		

Dilution					
Analyst	RMK				
CC	OK *				

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 08:45
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790267	**File**			

							Reg. Limits	
Analyte	**CC**	**Posted Result**		**Result**	**MDL**	**RDL**	**Low**	**High**
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.720U ± 3.39 (7.32)	dpm/sa	0.720U ± 3.39 (7.32)		dpm/sa		

11 3072157030-SU-11-6

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

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Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

11 3072157030-SU-11-6

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 08:56	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790268		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 08:56	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790268		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.520U ± 3.33 (7.25)	dpm/sa	0.520U ± 3.33 (7.25)		dpm/sa		

12 3072157031-SU-11-7

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 09:54	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790269		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 09:54	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790269		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.23J ± 3.65 (7.27)	dpm/sa	3.23J ± 3.65 (7.27)		dpm/sa		

13 3072157032-SU-11-8

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12487	HBN	91058
Rule	9060 I LEB	Status	WP
Create Date	6/28/2012	Analyst	RMK

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13 3072157032-SU-11-8

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 10:05	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790270		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 10:05	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790270		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.95J ± 3.84 (7.25)	dpm/sa	4.95J ± 3.84 (7.25)		dpm/sa		

14 3072157033-SU-11-9

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 10:16	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790271		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 10:16	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790271		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.64U ± 3.57 (7.24)	dpm/sa	2.64U ± 3.57 (7.24)		dpm/sa		

15 3072157034-SU-11-10

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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15 3072157034-SU-11-10

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 10:27	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790272		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 10:27	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790272		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.45U ± 3.55 (7.25)	dpm/sa	2.45U ± 3.55 (7.25)		dpm/sa		

16 3072157035-SU-11-11

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 10:38	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790273		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 10:38	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790273		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.83J ± 3.73 (7.30)	dpm/sa	3.83J ± 3.73 (7.30)		dpm/sa		

17 3072157036-SU-11-12

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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17 3072157036-SU-11-12

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 10:49	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790274		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 10:49	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790274		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.68U ± 3.47 (7.26)	dpm/sa	1.68U ± 3.47 (7.26)		dpm/sa		

18 3072157037-SU-11-13

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 11:00	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790275		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 11:00	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790275		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.83J ± 3.59 (7.25)	dpm/sa	2.83J ± 3.59 (7.25)		dpm/sa		

19 3072157038-SU-11-14

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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19 3072157038-SU-11-14

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 11:11	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790276		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 11:11	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790276		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.10U ± 3.40 (7.25)	dpm/sa	1.10U ± 3.40 (7.25)		dpm/sa		

20 3072157039-SU-11-15

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12487	**Prep Date**	7/18/2012 11:22	**Dilution**
Method	EPA 906.0M		**HBN**	91058	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790277		**Instru**	NONE			**CC** OK *
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/18/2012 11:22	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790277		**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.713U ± 3.35 (7.25)	dpm/sa	0.713U ± 3.35 (7.25)		dpm/sa		

21 3072157040-SU-11-16

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12487	**HBN**	91058
Rule	9060 I LEB	**Status**	WP
Create Date	6/28/2012	**Analyst**	RMK

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21 3072157040-SU-11-16

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12487	**Prep Date**	7/18/2012 11:33
Method	EPA 906.0M	**HBN**	91058	**Hold Date**	12/8/2012 23:59
Schedule	2790278	**Instru**	NONE		

Dilution						
Analyst	RMK					
CC	OK *					

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/18/2012 11:33	**Dilution**
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790278	**File**				**CC** OK *

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.02U ± 3.16 (7.24)	dpm/sa	-1.02U ± 3.16 (7.24)		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 13:49		Assigned Analyst	RMK
Batch ID	12487		Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB	9060W	HBN	91058
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
	459074	BLANK	IP		QCACCOUNT	0.327U	3.31	7.24	7/18/12 12:07
3072157	3072157021	PS	WP	6/11/2012 0:01	RTI	2.26U	3.53	7.25	7/18/12 7:17
3072157	3072157022	PS	WP	6/11/2012 0:01	RTI	0.328U	3.31	7.24	7/18/12 7:28
3072157	3072157023	PS	WP	6/11/2012 0:01	RTI	0.135U	3.30	7.26	7/18/12 7:39
3072157	3072157024	PS	WP	6/11/2012 0:01	RTI	3.04J	3.64	7.29	7/18/12 7:50
3072157	3072157025	PS	WP	6/11/2012 0:01	RTI	3.22J	3.64	7.25	7/18/12 8:01
3072157	3072157026	PS	WP	6/11/2012 0:01	RTI	0.139U	3.39	7.47	7/18/12 8:12
3072157	3072157027	PS	WP	6/11/2012 0:01	RTI	1.88U	3.51	7.31	7/18/12 8:23
3072157	3072157028	PS	WP	6/11/2012 0:01	RTI	1.68U	3.46	7.25	7/18/12 8:34
3072157	3072157029	PS	WP	6/11/2012 0:01	RTI	0.720U	3.39	7.32	7/18/12 8:45
3072157	3072157030	PS	WP	6/11/2012 0:01	RTI	0.520U	3.33	7.25	7/18/12 8:56
3072157	3072157031	PS	WP	6/11/2012 0:01	RTI	3.23J	3.65	7.27	7/18/12 9:54
3072157	3072157032	PS	WP	6/11/2012 0:01	RTI	4.95J	3.84	7.25	7/18/12 10:05
3072157	3072157033	PS	WP	6/11/2012 0:01	RTI	2.64U	3.57	7.24	7/18/12 10:16
3072157	3072157034	PS	WP	6/11/2012 0:01	RTI	2.45U	3.55	7.25	7/18/12 10:27
3072157	3072157035	PS	WP	6/11/2012 0:01	RTI	3.83J	3.73	7.30	7/18/12 10:38
3072157	3072157036	PS	WP	6/11/2012 0:01	RTI	1.68U	3.47	7.26	7/18/12 10:49
3072157	3072157037	PS	WP	6/11/2012 0:01	RTI	2.83J	3.59	7.25	7/18/12 11:00
3072157	3072157038	PS	WP	6/11/2012 0:01	RTI	1.10U	3.40	7.25	7/18/12 11:11
3072157	3072157039	PS	WP	6/11/2012 0:01	RTI	0.713U	3.35	7.25	7/18/12 11:22
3072157	3072157040	PS	WP	6/11/2012 0:01	RTI	-1.02U	3.16	7.24	7/18/12 11:33

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK			
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	5.63	
Batch ID	12487	**PrepSOP2**	n/a	**Bkg Duration**	30.0	min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG071812	
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/18/2012 2:31	
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3	

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459074	1.0	7/18/12 12:07	10.0	7/18/12 12:07	5.80	288.3	dpm/S	Pass
3072157021	1.0	6/11/12 0:01	10.0	7/18/12 7:17	6.80	263.8	dpm/S	Pass
3072157022	1.0	6/11/12 0:01	10.0	7/18/12 7:28	5.80	267.0	dpm/S	Pass
3072157023	1.0	6/11/12 0:01	10.0	7/18/12 7:39	5.70	256.7	dpm/S	Pass
3072157024	1.0	6/11/12 0:01	10.0	7/18/12 7:50	7.20	248.8	dpm/S	Pass
3072157025	1.0	6/11/12 0:01	10.0	7/18/12 8:01	7.30	277.2	dpm/S	Pass
3072157026	1.0	6/11/12 0:01	10.0	7/18/12 8:12	5.70	315.7	dpm/S	High, Evaluate
3072157027	1.0	6/11/12 0:01	10.0	7/18/12 8:23	6.60	246.1	dpm/S	Pass
3072157028	1.0	6/11/12 0:01	10.0	7/18/12 8:34	6.50	264.9	dpm/S	Pass
3072157029	1.0	6/11/12 0:01	10.0	7/18/12 8:45	6.00	296.1	dpm/S	Pass
3072157030	1.0	6/11/12 0:01	10.0	7/18/12 8:56	5.90	276.8	dpm/S	Pass
3072157031	1.0	6/11/12 0:01	10.0	7/18/12 9:54	7.30	255.6	dpm/S	Pass
3072157032	1.0	6/11/12 0:01	10.0	7/18/12 10:05	8.20	263.3	dpm/S	Pass
3072157033	1.0	6/11/12 0:01	10.0	7/18/12 10:16	7.00	273.0	dpm/S	Pass
3072157034	1.0	6/11/12 0:01	10.0	7/18/12 10:27	6.90	276.8	dpm/S	Pass
3072157035	1.0	6/11/12 0:01	10.0	7/18/12 10:38	7.60	293.5	dpm/S	Pass
3072157036	1.0	6/11/12 0:01	10.0	7/18/12 10:49	6.50	283.2	dpm/S	Pass
3072157037	1.0	6/11/12 0:01	10.0	7/18/12 11:00	7.10	274.2	dpm/S	Pass
3072157038	1.0	6/11/12 0:01	10.0	7/18/12 11:11	6.20	278.8	dpm/S	Pass
3072157039	1.0	6/11/12 0:01	10.0	7/18/12 11:22	6.00	263.9	dpm/S	Pass
3072157040	1.0	6/11/12 0:01	10.0	7/18/12 11:33	5.10	269.9	dpm/S	Pass

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12487	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459074	0.5195	0.0000	1.0000	0.327	3.305	3.306	7.237	2.752	0.717	3.305	1.00
3072157021	0.5218	0.1021	0.9943	2.255	3.519	3.529	7.247	2.755	0.718	3.519	1.00
3072157022	0.5220	0.1022	0.9943	0.328	3.309	3.309	7.244	2.754	0.718	3.309	1.00
3072157023	0.5207	0.1022	0.9943	0.135	3.295	3.295	7.262	2.761	0.720	3.295	1.00
3072157024	0.5186	0.1022	0.9943	3.045	3.621	3.640	7.292	2.772	0.723	3.621	1.00
3072157025	0.5217	0.1022	0.9943	3.219	3.620	3.640	7.248	2.756	0.718	3.620	1.00
3072157026	0.5061	0.1022	0.9943	0.139	3.391	3.391	7.473	2.841	0.740	3.391	1.00
3072157027	0.5176	0.1023	0.9943	1.885	3.506	3.513	7.306	2.778	0.724	3.506	1.00
3072157028	0.5219	0.1023	0.9943	1.677	3.457	3.463	7.246	2.755	0.718	3.457	1.00
3072157029	0.5169	0.1023	0.9943	0.720	3.385	3.386	7.316	2.782	0.725	3.385	1.00
3072157030	0.5217	0.1023	0.9943	0.520	3.332	3.332	7.248	2.756	0.718	3.332	1.00
3072157031	0.5205	0.1024	0.9943	3.227	3.628	3.648	7.266	2.762	0.720	3.628	1.00
3072157032	0.5217	0.1024	0.9943	4.954	3.793	3.838	7.248	2.756	0.718	3.793	1.00
3072157033	0.5220	0.1025	0.9943	2.639	3.558	3.572	7.244	2.754	0.718	3.558	1.00
3072157034	0.5218	0.1025	0.9943	2.448	3.539	3.551	7.248	2.756	0.718	3.539	1.00
3072157035	0.5179	0.1025	0.9943	3.826	3.705	3.733	7.302	2.776	0.724	3.705	1.00
3072157036	0.5208	0.1025	0.9943	1.680	3.464	3.470	7.261	2.761	0.720	3.464	1.00
3072157037	0.5220	0.1026	0.9943	2.832	3.578	3.594	7.245	2.755	0.718	3.578	1.00
3072157038	0.5215	0.1026	0.9943	1.099	3.397	3.400	7.251	2.757	0.719	3.397	1.00
3072157039	0.5218	0.1026	0.9943	0.713	3.353	3.354	7.247	2.755	0.718	3.353	1.00
3072157040	0.5221	0.1026	0.9943	-1.021	3.154	3.156	7.243	2.754	0.718	3.154	1.00

7/31/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: RMK
Date: 7/21/2012 Method: EPA 906.0M
Worklist: 12487 SOP:
Matrix: Filter MB Sample ID: 459074

Method Blank Assessment						
Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	0.3270	3.3060	7.2370	2.75200		

Laboratory Control Sample Assessment						
	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 13:51	7/20/12 13:59				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.939	1184.939				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	110.294	101.694				
1.96 Sigma Unc:	17.684	16.583				
% Recovery:	93.08%	85.82%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment						
LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12487					
Duplicate Sample I.D.	LCSD12487					
Sample Result (DPM/Sample, g, F):	110.2940					
1.96 Sigma Unc:	17.6840					
ple Duplicate Result (DPM/Sample, g, F):	101.6940					
Duplicate Sample 1.96 Sigma Unc.	16.5830					
Either results below MDC?	NO					
Relative Percent Difference:	8.11%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

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

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

Comments:

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12487

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Protocol #: 2 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
2	1	30.00	30	2.53	5.83	5.63	292.82	4

BKG071812

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			7/18/2012 7:27
		Sample Ct Duration (min)	10.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	10	7/18/2012 7:17	3072157021
2	21	7/18/2012 7:28	3072157022
3	32	7/18/2012 7:39	3072157023
4	43	7/18/2012 7:50	3072157024
5	54	7/18/2012 8:01	3072157025
6	65	7/18/2012 8:12	3072157026
7	76	7/18/2012 8:23	3072157027
8	87	7/18/2012 8:34	3072157028
9	98	7/18/2012 8:45	3072157029
10	109	7/18/2012 8:56	3072157030

7/31/12

Protocol #: 8 SWIPE_H3_C14 User :

Time: 10.00
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: Coupt
Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
8	1	10.00	10	4.20	6.90	6.80	263.79	2
8	2	10.00	21	2.70	6.00	5.80	266.97	3
8	3	10.00	32	2.40	5.80	5.70	256.73	3
8	4	10.00	43	3.00	7.40	7.20	248.79	2
8	5	10.00	54	3.70	7.30	7.30	277.24	3
8	6	10.00	65	3.30	5.90	5.70	315.73	4
8	7	10.00	76	3.40	6.50	6.60	246.06	2
8	8	10.00	87	2.90	6.60	6.50	264.92	3
8	9	10.00	98	3.00	6.20	6.00	296.12	3
8	10	10.00	109	3.30	5.90	5.90	276.80	4

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			7/18/2012 10:04
		Sample Ct Duration (min)	10.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	10	7/18/2012 9:54	3072157031
2	21	7/18/2012 10:05	3072157032
3	32	7/18/2012 10:16	3072157033
4	43	7/18/2012 10:27	3072157034
5	54	7/18/2012 10:38	3072157035
6	65	7/18/2012 10:49	3072157036
7	76	7/18/2012 11:00	3072157037
8	87	7/18/2012 11:11	3072157038
9	98	7/18/2012 11:22	3072157039
10	109	7/18/2012 11:33	3072157040
11	120	7/18/2012 11:44	LCS
12	131	7/18/2012 11:55	LCSD
13	143	7/18/2012 12:07	459074

Ok
7/31/12

Time: 10.00
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
8	1	10.00	10	3.40	7.20	7.30	255.64	2
8	2	10.00	21	4.20	8.30	8.20	263.26	2
8	3	10.00	32	4.20	7.00	7.00	272.95	2
8	4	10.00	43	4.00	6.90	6.90	276.76	2
8	5	10.00	54	4.40	7.60	7.60	293.51	2
8	6	10.00	65	3.70	6.30	6.50	283.17	3
8	7	10.00	76	3.40	7.10	7.10	274.23	3
8	8	10.00	87	3.40	6.20	6.20	278.82	2
8	9	10.00	98	3.10	6.10	6.00	263.85	2
8	10	10.00	109	2.40	5.20	5.10	269.89	3
8	11	10.00	120	615.10	619.70	640.30	306.87	0
8	12	10.00	131	625.10	631.10	651.10	293.67	0
8	13	10.00	143	1.60	6.00	5.80	288.33	4

Pace Analytical

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
307215701O	12486	Swipe-H3_C14	31	11	7/17/12 2110	10	NA	RMK
O11								
O12								
O13			18					
O14								
O15								
O16								
O17								
O18								
O19								
O20								
LCS	NA							
LCSD	~~7/17/12~~							
MB (459073)	~~12486~~							
307215702I	12487		5	8	7/17/12 2130	10	NA	RMK
O22								
O23								
O24								
O25								
O26								
O27								
O28								
O29								
O30								

Run comments: _____

Peer Review: _____

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072157031	12487	Swipe-H3C14	9	8	7/17/12 2130	10	NA	RMK
032			7/18/12					
033			9	8				
034								
035								
036								
037								
038								
039								
040								
LCS	NA							
LCSD	NA 12487							
MB (459074)	~~459074~~ 7/18/12		17 7/18/12					
BKG	Cal C-14	Swipe C14-H3	1	25	7/18/12 0900	3	NA	
CM-20120718-N1								
N2								
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								

Run comments: _____

Peer Review: _____

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

Bkg CPM 6.30
Bkg Duration 30.0 min
Bkg Ref bkg 07/20/2012
Bkg Ct Date/Time: 7/20/2012 10:25
Instrument ID: System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459058	1.0	1/0/00 0:00	7.0				dpm/S	Low, Reprep
LCS12476	1.0	7/20/12 12:03	7.0	7/20/12 12:03	62.57	313.2	dpm/S	High, Evaluate
LCSD12476	1.0	7/20/12 12:11	7.0	7/20/12 12:11	61.29	313.4	dpm/S	High, Evaluate
LCS12477	1.0	7/20/12 12:19	7.0	7/20/12 12:19	56.14	271.5	dpm/S	Pass
LCSD12477	1.0	7/20/12 12:27	7.0	7/20/12 12:27	58.86	319.0	dpm/S	High, Evaluate
LCS12478	1.0	7/20/12 12:35	7.0	7/20/12 12:35	58.43	328.2	dpm/S	High, Evaluate
LCSD12478	1.0	7/20/12 12:43	7.0	7/20/12 12:43	59.43	318.4	dpm/S	High, Evaluate
LCS12479	1.0	7/20/12 12:51	7.0	7/20/12 12:51	58.86	331.5	dpm/S	High, Evaluate
LCSD12479	1.0	7/20/12 12:59	7.0	7/20/12 12:59	57.86	329.1	dpm/S	High, Evaluate
LCS12480	1.0	7/20/12 13:19	7.0	7/20/12 13:19	57.14	312.1	dpm/S	Pass
LCSD12480	1.0	7/20/12 13:27	7.0	7/20/12 13:27	63.86	315.7	dpm/S	High, Evaluate
LCS12486	1.0	7/20/12 13:35	7.0	7/20/12 13:35	62.14	269.0	dpm/S	Pass
LCSD12486	1.0	7/20/12 13:43	7.0	7/20/12 13:43	63.29	317.9	dpm/S	High, Evaluate
LCS12487	1.0	7/20/12 13:51	7.0	7/20/12 13:51	60.90	329.4	dpm/S	High, Evaluate
LCSD12487	1.0	7/20/12 13:59	7.0	7/20/12 13:59	57.43	320.2	dpm/S	High, Evaluate
LCS12488	1.0	7/20/12 14:07	7.0	7/20/12 14:07	56.14	330.7	dpm/S	High, Evaluate
LCSD12488	1.0	7/20/12 14:15	7.0	7/20/12 14:15	60.43	330.5	dpm/S	High, Evaluate

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0406	0.0000	1.0000	155.001	-22.098	22.369	-118.059	-42.770	-12.594	-12.594	1.00
LCS12476	0.5078	0.0000	1.0000	110.816	11.675	17.635	9.450	3.423	1.008	11.675	1.00
LCSD12476	0.5076	0.0000	1.0000	108.328	11.561	17.338	9.453	3.425	1.008	11.561	1.00
LCS12477	0.5221	0.0000	1.0000	95.465	10.770	15.673	9.191	3.330	0.981	10.770	1.00
LCSD12477	0.5036	0.0000	1.0000	104.361	11.425	16.896	9.528	3.452	1.016	11.425	1.00
LCS12478	0.4961	0.0000	1.0000	105.080	11.557	17.048	9.673	3.504	1.032	11.557	1.00
LCSD12478	0.5041	0.0000	1.0000	105.391	11.468	17.015	9.519	3.448	1.015	11.468	1.00
LCS12479	0.4930	0.0000	1.0000	106.606	11.671	17.259	9.733	3.526	1.038	11.671	1.00
LCSD12479	0.4953	0.0000	1.0000	104.102	11.521	16.938	9.688	3.510	1.034	11.521	1.00
LCS12480	0.5085	0.0000	1.0000	99.974	11.153	16.327	9.436	3.418	1.007	11.153	1.00
LCSD12480	0.5061	0.0000	1.0000	113.736	11.831	18.000	9.482	3.435	1.011	11.831	1.00
LCS12486	0.5221	0.0000	1.0000	106.957	11.317	17.053	9.191	3.330	0.980	11.317	1.00
LCSD12486	0.5045	0.0000	1.0000	112.973	11.818	17.923	9.512	3.446	1.015	11.818	1.00
LCS12487	0.4950	0.0000	1.0000	110.294	11.818	17.684	9.693	3.512	1.034	11.818	1.00
LCSD12487	0.5028	0.0000	1.0000	101.694	11.308	16.583	9.544	3.458	1.018	11.308	1.00
LCS12488	0.4938	0.0000	1.0000	100.924	11.386	16.569	9.717	3.520	1.037	11.386	1.00
LCSD12488	0.4939	0.0000	1.0000	109.588	11.800	17.609	9.715	3.519	1.036	11.800	1.00

7/31/12

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

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 13:26
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 13:19	LCS12480
2	15	7/20/2012 13:27	LCSD12480
3	23	7/20/2012 13:35	LCS12486
4	31	7/20/2012 13:43	LCSD12486
5	39	7/20/2012 13:51	LCS12487
6	47	7/20/2012 13:59	LCSD12487
7	55	7/20/2012 14:07	LCS12488
8	63	7/20/2012 14:15	LCSD12488

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	6.0	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
7	1	7.00	7	41.29	56.71	57.14	312.05	1
7	2	7.00	15	49.00	63.57	63.86	315.68	1
7	3	7.00	23	46.86	61.86	62.14	268.99	1
7	4	7.00	31	44.86	63.14	63.29	317.94	1
7	5	7.00	39	44.43	59.86	60.29	329.35	0
7	6	7.00	47	42.29	56.71	57.43	320.16	0
7	7	7.00	55	41.14	55.86	56.14	330.65	0
7	8	7.00	63	44.71	59.86	60.43	330.54	0

Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

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
3072116000 18			9	20	7/20/12 0900	7		RMK
19			↓	↓	↓	↓		↓
↓ 20								
LCS								
LCSD			↓	↓	↓	↓		
LCS 12476	12476	Swipe_H3_C14	18	7	7/20/12 0950	7	N/A	
LCSD 12476	↓							
LCS 12477	12477							
LCSD 12477	↓							
LCS 12478	12478							
LCSD 12478	↓							
LCS 12479	12479							
LCSD 12479	↓		↓					
LCS 12480	12480		6					
LCSD 12480	↓							
LCS 12486	12486							
LCSD 12486	↓							
LCS 12487	12487							
LCSD 12487	↓							
LCS 12488	12488							
LCSD 12488	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12488	**HBN**	91060
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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1 459079-BLANK for HBN 91060 [RADC/1248

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

Prep Information

Procedure 9060 I LEB **Batch** RADC/12488 **Prep Date** 7/18/2012 21:12 **Dilution**
Method EPA 906.0M **HBN** 91060 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796185 **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** 7/18/2012 21:12 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796185 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	0.0814U ± 3.24 (6.94)	dpm/sa	0.0814U ± 3.24 (6.94)		dpm/sa	

2 3072157041-SU-11-17

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12488 **Prep Date** 7/18/2012 16:25 **Dilution**
Method EPA 906.0M **HBN** 91060 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790279 **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** 7/18/2012 16:25 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790279 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.251U ± 3.04 (6.57)	dpm/sa	-0.251U ± 3.04 (6.57)		dpm/sa		

3 3072157042-SU-11-18

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

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Batch	RADC/12488	HBN	91060
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

3 3072157042-SU-11-18

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790280

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 16:38
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790280

Instru NONE
Col ID
File

Run Date 7/18/2012 16:38
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.93J ± 3.47 (6.57)	dpm/sa	3.93J ± 3.47 (6.57)		dpm/sa		

4 3072157043-SU-11-19

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790281

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 16:51
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790281

Instru NONE
Col ID
File

Run Date 7/18/2012 16:51
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.591U ± 3.07 (6.72)	dpm/sa	-0.591U ± 3.07 (6.72)		dpm/sa		

5 3072157044-SU-11-20

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12488	**HBN**	91060
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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5 3072157044-SU-11-20

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790282

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 17:04
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790282

Instru NONE
Col ID
File

Run Date 7/18/2012 17:04
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.16U ± 3.29 (6.58)	dpm/sa	2.16U ± 3.29 (6.58)		dpm/sa		

6 3072157045-SU-11-21

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790283

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 17:17
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790283

Instru NONE
Col ID
File

Run Date 7/18/2012 17:17
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.0963U ± 3.05 (6.57)	dpm/sa	-0.0963U ± 3.05 (6.57)		dpm/sa		

7 3072157046-SU-11-22

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

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Batch	RADC/12488	HBN	91060
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

7 3072157046-SU-11-22

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 17:30	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790284	**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**	7/18/2012 17:30	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790284	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.251U ± 3.04 (6.59)	dpm/sa	-0.251U ± 3.04 (6.59)		dpm/sa		

8 3072157047-SU-11-22D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 17:43	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790285	**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**	7/18/2012 17:43	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790285	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.79J ± 3.35 (6.57)	dpm/sa	2.79J ± 3.35 (6.57)		dpm/sa		

9 3072157048-SU-11-23

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12488	**HBN**	91060
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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9 3072157048-SU-11-23

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790286

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 17:56
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790286

Instru NONE
Col ID
File

Run Date 7/18/2012 17:56
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.00U ± 3.26 (6.57)	dpm/sa	2.00U ± 3.26 (6.57)		dpm/sa		

10 3072157049-SU-11-24

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790287

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 18:09
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790287

Instru NONE
Col ID
File

Run Date 7/18/2012 18:09
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.00U ± 3.27 (6.57)	dpm/sa	2.00U ± 3.27 (6.57)		dpm/sa		

11 3072157050-SU-11-25

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch RADC/12488 HBN 91060
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst RMK

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11 3072157050-SU-11-25

Prep Information

Procedure 9060 I LEB **Batch** RADC/12488 **Prep Date** 7/18/2012 18:23 **Dilution**
Method EPA 906.0M **HBN** 91060 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790288 **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** 7/18/2012 18:23 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790288 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Req. Limits Low	Req. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	5.59J ± 3.67 (6.64)	dpm/sa	5.59J ± 3.67 (6.64)			dpm/sa		

12 3072157051-SU-11-26

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12488 **Prep Date** 7/18/2012 18:36 **Dilution**
Method EPA 906.0M **HBN** 91060 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790289 **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** 7/18/2012 18:36 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790289 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Req. Limits Low	Req. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-0.253U ± 3.06 (6.64)	dpm/sa	-0.253U ± 3.06 (6.64)			dpm/sa		

13 3072157052-SU-11-27

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

Batch	RADC/12488	HBN	91060
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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13 3072157052-SU-11-27

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 18:49	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790290	**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**	7/18/2012 18:49	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790290	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.99J ± 3.39 (6.62)	dpm/sa	2.99J ± 3.39 (6.62)		dpm/sa		

14 3072157053-SU-11-28

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 19:02	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790291	**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**	7/18/2012 19:02	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790291	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.562U ± 3.13 (6.61)	dpm/sa	0.562U ± 3.13 (6.61)		dpm/sa		

15 3072157054-SU-11-29

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch RADC/12488 HBN 91060
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst RMK

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15 3072157054-SU-11-29

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790292

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 19:15
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790292

Instru NONE
Col ID
File

Run Date 7/18/2012 19:15
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.20U ± 3.20 (6.60)	dpm/sa	1.20U ± 3.20 (6.60)		dpm/sa		

16 3072157055-SU-11-30

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790293

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 19:28
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790293

Instru NONE
Col ID
File

Run Date 7/18/2012 19:28
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.33J ± 3.45 (6.68)	dpm/sa	3.33J ± 3.45 (6.68)		dpm/sa		

17 3072157056-SU-11-31

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12488	HBN	91060
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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17 3072157056-SU-11-31

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790294

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 19:41
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790294

Instru NONE
Col ID
File

Run Date 7/18/2012 19:41
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.887U ± 2.97 (6.58)	dpm/sa	-0.887U ± 2.97 (6.58)		dpm/sa		

18 3072157057-SU-11-32

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790295

Batch RADC/12488
HBN 91060
Instru NONE

Prep Date 7/18/2012 19:54
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790295

Instru NONE
Col ID
File

Run Date 7/18/2012 19:54
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.20U ± 3.19 (6.58)	dpm/sa	1.20U ± 3.19 (6.58)		dpm/sa		

19 3072157058-SU-11-33

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12488	HBN	91060
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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19 3072157058-SU-11-33

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 20:07	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790296	**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**	7/18/2012 20:07	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790296	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.872U ± 3.17 (6.61)	dpm/sa	0.872U ± 3.17 (6.61)		dpm/sa		

20 3072157059-SU-11-33D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 20:20	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790297	**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**	7/18/2012 20:20	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790297	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.64U ± 3.52 (6.97)	dpm/sa	2.64U ± 3.52 (6.97)		dpm/sa		

21 3072157060-SU-11-34

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12488	**HBN**	91060
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

21 3072157060-SU-11-34

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12488	**Prep Date**	7/18/2012 20:33	**Dilution**	
Method	EPA 906.0M	**HBN**	91060	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790298	**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**	7/18/2012 20:33	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790298	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	1.83U ± 3.25 (6.57)	dpm/sa	1.83U ± 3.25 (6.57)			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 13:49	Assigned Analyst	RMK
Batch ID	12488	Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB 9060W	HBN	91060
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
	459079	BLANK	IP		QCACCOUNT	0.0814U	3.24	6.94	7/18/12 21:12
3072157	3072157041	PS	WP	6/11/2012 0:01	RTI	-0.251U	3.04	6.57	7/18/12 16:25
3072157	3072157042	PS	WP	6/11/2012 0:01	RTI	3.93J	3.47	6.57	7/18/12 16:38
3072157	3072157043	PS	WP	6/11/2012 0:01	RTI	-0.591U	3.07	6.72	7/18/12 16:51
3072157	3072157044	PS	WP	6/11/2012 0:01	RTI	2.16U	3.29	6.58	7/18/12 17:04
3072157	3072157045	PS	WP	6/11/2012 0:01	RTI	-0.0963U	3.05	6.57	7/18/12 17:17
3072157	3072157046	PS	WP	6/11/2012 0:01	RTI	-0.251U	3.04	6.59	7/18/12 17:30
3072157	3072157047	PS	WP	6/11/2012 0:01	RTI	2.79J	3.35	6.57	7/18/12 17:43
3072157	3072157048	PS	WP	6/11/2012 0:01	RTI	2.00U	3.26	6.57	7/18/12 17:56
3072157	3072157049	PS	WP	6/11/2012 0:01	RTI	2.00U	3.27	6.57	7/18/12 18:09
3072157	3072157050	PS	WP	6/11/2012 0:01	RTI	5.59J	3.67	6.64	7/18/12 18:23
3072157	3072157051	PS	WP	6/11/2012 0:01	RTI	-0.253U	3.06	6.64	7/18/12 18:36
3072157	3072157052	PS	WP	6/11/2012 0:01	RTI	2.99J	3.39	6.62	7/18/12 18:49
3072157	3072157053	PS	WP	6/11/2012 0:01	RTI	0.562U	3.13	6.61	7/18/12 19:02
3072157	3072157054	PS	WP	6/11/2012 0:01	RTI	1.20U	3.20	6.60	7/18/12 19:15
3072157	3072157055	PS	WP	6/11/2012 0:01	RTI	3.33J	3.45	6.68	7/18/12 19:28
3072157	3072157056	PS	WP	6/11/2012 0:01	RTI	-0.887U	2.97	6.58	7/18/12 19:41
3072157	3072157057	PS	WP	6/11/2012 0:01	RTI	1.20U	3.19	6.58	7/18/12 19:54
3072157	3072157058	PS	WP	6/11/2012 0:01	RTI	0.872U	3.17	6.61	7/18/12 20:07
3072157	3072157059	PS	WP	6/11/2012 0:01	RTI	2.64U	3.52	6.97	7/18/12 20:20
3072157	3072157060	PS	WP	6/11/2012 0:01	RTI	1.83U	3.25	6.57	7/18/12 20:33

7/24/12

LIMS Load
Printed 7/24/2012 at 12:57 PM

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK			
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	5.63	
Batch ID	12488	**PrepSOP2**	n/a	**Bkg Duration**	30.0	min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG071812	
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/18/2012 2:31	
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3	

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459079	1.0	7/18/12 21:12	12.0	7/18/12 21:12	5.67	333.3	dpm/S	High, Evaluate
3072157041	1.0	6/11/12 0:01	12.0	7/18/12 16:25	5.50	264.2	dpm/S	Pass
3072157042	1.0	6/11/12 0:01	12.0	7/18/12 16:38	7.67	269.0	dpm/S	Pass
3072157043	1.0	6/11/12 0:01	12.0	7/18/12 16:51	5.33	309.3	dpm/S	Pass
3072157044	1.0	6/11/12 0:01	12.0	7/18/12 17:04	6.75	258.8	dpm/S	Pass
3072157045	1.0	6/11/12 0:01	12.0	7/18/12 17:17	5.58	270.8	dpm/S	Pass
3072157046	1.0	6/11/12 0:01	12.0	7/18/12 17:30	5.50	284.3	dpm/S	Pass
3072157047	1.0	6/11/12 0:01	12.0	7/18/12 17:43	7.08	267.2	dpm/S	Pass
3072157048	1.0	6/11/12 0:01	12.0	7/18/12 17:56	6.67	269.9	dpm/S	Pass
3072157049	1.0	6/11/12 0:01	12.0	7/18/12 18:09	6.67	274.6	dpm/S	Pass
3072157050	1.0	6/11/12 0:01	12.0	7/18/12 18:23	8.50	296.8	dpm/S	Pass
3072157051	1.0	6/11/12 0:01	12.0	7/18/12 18:36	5.50	295.8	dpm/S	Pass
3072157052	1.0	6/11/12 0:01	12.0	7/18/12 18:49	7.17	291.6	dpm/S	Pass
3072157053	1.0	6/11/12 0:01	12.0	7/18/12 19:02	5.92	289.2	dpm/S	Pass
3072157054	1.0	6/11/12 0:01	12.0	7/18/12 19:15	6.25	288.0	dpm/S	Pass
3072157055	1.0	6/11/12 0:01	12.0	7/18/12 19:28	7.33	303.0	dpm/S	Pass
3072157056	1.0	6/11/12 0:01	12.0	7/18/12 19:41	5.17	278.9	dpm/S	Pass
3072157057	1.0	6/11/12 0:01	12.0	7/18/12 19:54	6.25	260.7	dpm/S	Pass
3072157058	1.0	6/11/12 0:01	12.0	7/18/12 20:07	6.08	289.6	dpm/S	Pass
3072157059	1.0	6/11/12 0:01	12.0	7/18/12 20:20	6.92	332.7	dpm/S	High, Evaluate
3072157060	1.0	6/11/12 0:01	12.0	7/18/12 20:33	6.58	265.1	dpm/S	Pass

LEB Data Input
Printed 7/24/2012 at 12:57 PM

7/24/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12488	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459079	0.4913	0.0000	1.0000	0.081	3.241	3.241	6.942	2.722	0.647	3.241	1.00
3072157041	0.5218	0.1032	0.9943	-0.251	3.036	3.036	6.574	2.577	0.613	3.036	1.00
3072157042	0.5221	0.1032	0.9943	3.930	3.433	3.465	6.571	2.576	0.613	3.433	1.00
3072157043	0.5103	0.1032	0.9943	-0.591	3.071	3.072	6.723	2.636	0.627	3.071	1.00
3072157044	0.5211	0.1032	0.9943	2.162	3.276	3.287	6.583	2.581	0.614	3.276	1.00
3072157045	0.5221	0.1033	0.9943	-0.096	3.050	3.050	6.571	2.576	0.613	3.050	1.00
3072157046	0.5205	0.1033	0.9943	-0.251	3.044	3.044	6.590	2.584	0.615	3.044	1.00
3072157047	0.5220	0.1033	0.9943	2.794	3.330	3.347	6.572	2.576	0.613	3.330	1.00
3072157048	0.5221	0.1033	0.9943	2.004	3.256	3.265	6.571	2.576	0.613	3.256	1.00
3072157049	0.5219	0.1034	0.9943	2.004	3.257	3.265	6.573	2.577	0.613	3.257	1.00
3072157050	0.5166	0.1034	0.9943	5.588	3.612	3.673	6.641	2.604	0.619	3.612	1.00
3072157051	0.5170	0.1034	0.9943	-0.253	3.065	3.065	6.636	2.602	0.619	3.065	1.00
3072157052	0.5185	0.1034	0.9942	2.987	3.369	3.387	6.616	2.594	0.617	3.369	1.00
3072157053	0.5193	0.1035	0.9942	0.562	3.133	3.133	6.606	2.590	0.616	3.133	1.00
3072157054	0.5196	0.1035	0.9942	1.200	3.193	3.197	6.602	2.588	0.616	3.193	1.00
3072157055	0.5138	0.1035	0.9942	3.328	3.429	3.452	6.677	2.618	0.623	3.429	1.00
3072157056	0.5215	0.1035	0.9942	-0.887	2.973	2.975	6.578	2.579	0.614	2.973	1.00
3072157057	0.5214	0.1036	0.9942	1.196	3.182	3.186	6.580	2.580	0.614	3.182	1.00
3072157058	0.5192	0.1036	0.9942	0.872	3.164	3.166	6.608	2.591	0.616	3.164	1.00
3072157059	0.4919	0.1036	0.9942	2.638	3.504	3.518	6.974	2.734	0.650	3.504	1.00
3072157060	0.5219	0.1036	0.9942	1.831	3.241	3.248	6.573	2.577	0.613	3.241	1.00

7/24/12

Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/31/2012	**Method:**	EPA 906.0M
Worklist:	12488	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459079

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	0.0810	3.2410	6.9420	2.72200		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 14:07	7/20/12 14:15				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.939	1184.939				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	100.924	109.588				
1.96 Sigma Unc:	16.569	17.609				
% Recovery:	85.17%	92.48%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12488					
Duplicate Sample I.D.	LCSD12488					
Sample Result (DPM/Sample, g, F):	100.9240					
1.96 Sigma Unc:	16.5690					
ple Duplicate Result (DPM/Sample, g, F):	109.5880					
Duplicate Sample 1.96 Sigma Unc.	17.6090					
Either results below MDC?	NO					
Relative Percent Difference:	8.23%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

Sample Matrix Spike Control Assessment

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

Matrix Spike/Matrix Spike Duplicate Sample Assessment

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

Comments:

7/31/12

Protocol #: 2 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
2	1	30.00	30	2.53	5.83	5.63	292.82	4

BKG071812

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			7/18/2012 16:37
		Sample Ct Duration (min)	12.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	12	7/18/2012 16:25	3072157041
2	25	7/18/2012 16:38	3072157042
3	38	7/18/2012 16:51	3072157043
4	51	7/18/2012 17:04	3072157044
5	64	7/18/2012 17:17	3072157045
6	77	7/18/2012 17:30	3072157046
7	90	7/18/2012 17:43	3072157047
8	103	7/18/2012 17:56	3072157048
9	116	7/18/2012 18:09	3072157049
10	130	7/18/2012 18:23	3072157050
11	143	7/18/2012 18:36	3072157051
12	156	7/18/2012 18:49	3072157052
13	169	7/18/2012 19:02	3072157053
14	182	7/18/2012 19:15	3072157054
15	195	7/18/2012 19:28	3072157055
16	208	7/18/2012 19:41	3072157056
17	221	7/18/2012 19:54	3072157057
18	234	7/18/2012 20:07	3072157058
19	247	7/18/2012 20:20	3072157059
20	260	7/18/2012 20:33	3072157060
21	273	7/18/2012 20:46	LCS
22	286	7/18/2012 20:59	LCSD
23	299	7/18/2012 21:12	459079

7/24/12

Protocol #:12 SWIPE_H3_C14 User :

Time: 12.00
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
12	1	12.00	12	1.92	5.58	5.50	264.20	3
12	2	12.00	25	4.00	7.58	7.67	268.97	1
12	3	12.00	38	2.67	5.50	5.33	309.30	4
12	4	12.00	51	3.42	6.83	6.75	258.83	2
12	5	12.00	64	2.17	5.67	5.58	270.81	3
12	6	12.00	77	2.83	5.58	5.50	284.31	4
12	7	12.00	90	3.83	7.17	7.08	267.20	3
12	8	12.00	103	3.58	6.75	6.67	269.89	3
12	9	12.00	116	3.67	6.75	6.67	274.57	3
12	10	12.00	130	5.00	8.50	8.50	296.84	2
12	11	12.00	143	3.00	5.83	5.50	295.84	4
12	12	12.00	156	4.08	7.42	7.17	291.58	3
12	13	12.00	169	3.17	5.92	5.92	289.15	2
12	14	12.00	182	3.83	6.25	6.25	288.04	2
12	15	12.00	195	4.42	7.33	7.33	302.95	2
12	16	12.00	208	2.58	5.17	5.17	278.92	3
12	17	12.00	221	3.33	6.42	6.25	260.69	3
12	18	12.00	234	3.42	6.17	6.08	289.64	2
12	19	12.00	247	4.58	7.17	6.92	332.66	3
12	20	12.00	260	3.17	6.67	6.58	265.13	2
12	21	12.00	273	671.58	678.08	703.75	322.25	0
12	22	12.00	286	670.92	675.42	700.08	322.56	0
12	23	12.00	299	3.33	6.08	5.67	333.26	4

7/24/12

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072155060	12478	Swipe-H3C14	20	19	7/17/12 2130	10	NA	RMK
066	12479							
086	12480							
094								
100								
MB (459065)	12480							
3072157041	12488		6	12	7/18/12 1210	12	NA	RMK
042								
043								
044								
045								
046								
047								
048								
049								
050								
051								
052								
053			2					
054								
055								
056								
057								
058								

Run comments: _____

Peer Review: _____

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072157059	12488	Sw.pe-113.c14	2	12	7/18/12 1210	12	NA	RMK
060	↓	↓	↓	↓	↓	↓	↓	↓
LCS	NA							
LCSD	↓							
MB (459079)	12488		↓	↓		↓		
3072157061	12489		6	2		12	NA	RMK
062	↓	↓	↓	↓	↓	↓	↓	↓
063								
064								
065								
066								
067								
068								
069								
070								
071								
072								
073			15					
074			↓					
075								
076								
077								
078								
079	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

Bkg CPM 6.30
Bkg Duration 30.0 min
Bkg Ref bkg 07/20/2012
Bkg Ct Date/Time: 7/20/2012 10:25
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
459058	1.0	1/0/00 0:00	7.0				dpm/S	Low, Reprep
LCS12476	1.0	7/20/12 12:03	7.0	7/20/12 12:03	62.57	313.2	dpm/S	High, Evaluate
LCSD12476	1.0	7/20/12 12:11	7.0	7/20/12 12:11	61.29	313.4	dpm/S	High, Evaluate
LCS12477	1.0	7/20/12 12:19	7.0	7/20/12 12:19	56.14	271.5	dpm/S	Pass
LCSD12477	1.0	7/20/12 12:27	7.0	7/20/12 12:27	58.86	319.0	dpm/S	High, Evaluate
LCS12478	1.0	7/20/12 12:35	7.0	7/20/12 12:35	58.43	328.2	dpm/S	High, Evaluate
LCSD12478	1.0	7/20/12 12:43	7.0	7/20/12 12:43	59.43	318.4	dpm/S	High, Evaluate
LCS12479	1.0	7/20/12 12:51	7.0	7/20/12 12:51	58.86	331.5	dpm/S	High, Evaluate
LCSD12479	1.0	7/20/12 12:59	7.0	7/20/12 12:59	57.86	329.1	dpm/S	High, Evaluate
LCS12480	1.0	7/20/12 13:19	7.0	7/20/12 13:19	57.14	312.1	dpm/S	Pass
LCSD12480	1.0	7/20/12 13:27	7.0	7/20/12 13:27	63.86	315.7	dpm/S	High, Evaluate
LCS12486	1.0	7/20/12 13:35	7.0	7/20/12 13:35	62.14	269.0	dpm/S	Pass
LCSD12486	1.0	7/20/12 13:43	7.0	7/20/12 13:43	63.29	317.9	dpm/S	High, Evaluate
LCS12487	1.0	7/20/12 13:51	7.0	7/20/12 13:51	60.90	329.4	dpm/S	High, Evaluate
LCSD12487	1.0	7/20/12 13:59	7.0	7/20/12 13:59	57.43	320.2	dpm/S	High, Evaluate
LCS12488	1.0	7/20/12 14:07	7.0	7/20/12 14:07	56.14	330.7	dpm/S	High, Evaluate
LCSD12488	1.0	7/20/12 14:15	7.0	7/20/12 14:15	60.43	330.5	dpm/S	High, Evaluate

LEB Data Input
Printed 7/22/2012 at 10:06 AM

7/31/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0406	0.0000	1.0000	155.001	-22.098	22.369	-118.059	-42.770	-12.594	-12.594	1.00
LCS12476	0.5078	0.0000	1.0000	110.816	11.675	17.635	9.450	3.423	1.008	11.675	1.00
LCSD12476	0.5076	0.0000	1.0000	108.328	11.561	17.338	9.453	3.425	1.008	11.561	1.00
LCS12477	0.5221	0.0000	1.0000	95.465	10.770	15.673	9.191	3.330	0.981	10.770	1.00
LCSD12477	0.5036	0.0000	1.0000	104.361	11.425	16.896	9.528	3.452	1.016	11.425	1.00
LCS12478	0.4961	0.0000	1.0000	105.080	11.557	17.048	9.673	3.504	1.032	11.557	1.00
LCSD12478	0.5041	0.0000	1.0000	105.391	11.468	17.015	9.519	3.448	1.015	11.468	1.00
LCS12479	0.4930	0.0000	1.0000	106.606	11.671	17.259	9.733	3.526	1.038	11.671	1.00
LCSD12479	0.4953	0.0000	1.0000	104.102	11.521	16.938	9.688	3.510	1.034	11.521	1.00
LCS12480	0.5085	0.0000	1.0000	99.974	11.153	16.327	9.436	3.418	1.007	11.153	1.00
LCSD12480	0.5061	0.0000	1.0000	113.736	11.831	18.000	9.482	3.435	1.011	11.831	1.00
LCS12486	0.5221	0.0000	1.0000	106.957	11.317	17.053	9.191	3.330	0.980	11.317	1.00
LCSD12486	0.5045	0.0000	1.0000	112.973	11.818	17.923	9.512	3.446	1.015	11.818	1.00
LCS12487	0.4950	0.0000	1.0000	110.294	11.818	17.684	9.693	3.512	1.034	11.818	1.00
LCSD12487	0.5028	0.0000	1.0000	101.694	11.308	16.583	9.544	3.458	1.018	11.308	1.00
LCS12488	0.4938	0.0000	1.0000	100.924	11.386	16.569	9.717	3.520	1.037	11.386	1.00
LCSD12488	0.4939	0.0000	1.0000	109.588	11.800	17.609	9.715	3.519	1.036	11.800	1.00

7/13/12

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

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 13:26
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	7	7/20/2012 13:19	LCS12480
2	15	7/20/2012 13:27	LCSD12480
3	23	7/20/2012 13:35	LCS12486
4	31	7/20/2012 13:43	LCSD12486
5	39	7/20/2012 13:51	LCS12487
6	47	7/20/2012 13:59	LCSD12487
7	55	7/20/2012 14:07	LCS12488
8	63	7/20/2012 14:15	LCSD12488

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	6.0	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
7	1	7.00	7	41.29	56.71	57.14	312.05	1
7	2	7.00	15	49.00	63.57	63.86	315.68	1
7	3	7.00	23	46.86	61.86	62.14	268.99	1
7	4	7.00	31	44.86	63.14	63.29	317.94	1
7	5	7.00	39	44.43	59.86	60.29	329.35	0
7	6	7.00	47	42.29	56.71	57.43	320.16	0
7	7	7.00	55	41.14	55.86	56.14	330.65	0
7	8	7.00	63	44.71	59.86	60.43	330.54	0

Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

REMEMBER: 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
3072116000 18			9	20	7/20/12 0900	7		RMK
↓ 19			↓	↓	↓	↓		↓
↓ 20			↓	↓	↓	↓		↓
LCS			↓	↓	↓	↓		↓
LCSD			↓	↓	↓	↓		↓
LCS 12476	12476	Swipe_H3_C14	18	7	7/20/12 0950	7	N/A	RMK
LCSD 12476	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12477	12477	↓	↓	↓	↓	↓	↓	↓
LCSD 12477	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12478	12478	↓	↓	↓	↓	↓	↓	↓
LCSD 12478	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12479	12479	↓	↓	↓	↓	↓	↓	↓
LCSD 12479	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12480	12480	↓	6	↓	↓	↓	↓	↓
LCSD 12480	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12486	12486	↓	↓	↓	↓	↓	↓	↓
LCSD 12486	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12487	12487	↓	↓	↓	↓	↓	↓	↓
LCSD 12487	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12488	12488	↓	↓	↓	↓	↓	↓	↓
LCSD 12488	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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1 459080-BLANK for HBN 91061 [RADC/1248

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

Prep Information

Procedure 9060 I LEB **Batch** RADC/12489 **Prep Date** 7/19/2012 02:14 **Dilution**
Method EPA 906.0M **HBN** 91061 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796187 **Instru** NONE **CC** OK F

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 02:14 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796187 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.75U ± 3.38 (6.87)	dpm/sa	1.75U ± 3.38 (6.87)			dpm/sa

2 3072157061-SU-11-35

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12489 **Prep Date** 7/18/2012 21:26 **Dilution**
Method EPA 906.0M **HBN** 91061 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790299 **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** 7/18/2012 21:26 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790299 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	-0.251U ± 3.04 (6.58)	dpm/sa	-0.251U ± 3.04 (6.58)					dpm/sa

3 3072157062-SU-11-36

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

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Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

3 3072157062-SU-11-36

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 21:39
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59
Schedule	2790300	**Instru**	NONE		

Dilution			
Analyst	RMK		
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**	7/18/2012 21:39
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790300	**File**			

Dilution								
Analyst	RMK							
CC	OK F							

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.45J ± 3.42 (6.57)	dpm/sa	3.45J ± 3.42 (6.57)		dpm/sa		

4 3072157063-SU-11-37

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 21:52
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59
Schedule	2790301	**Instru**	NONE		

Dilution			
Analyst	RMK		
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**	7/18/2012 21:52
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790301	**File**			

Dilution								
Analyst	RMK							
CC	OK F							

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-1.06U ± 2.96 (6.57)	dpm/sa	-1.06U ± 2.96 (6.57)		dpm/sa		

5 3072157064-SU-11-38

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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5 3072157064-SU-11-38

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 22:05	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790302	**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**	7/18/2012 22:05	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790302	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.12J ± 3.38 (6.57)	dpm/sa	3.12J ± 3.38 (6.57)		dpm/sa		

6 3072157065-SU-11-39

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 22:18	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790303	**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**	7/18/2012 22:18	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790303	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.00U ± 3.27 (6.58)	dpm/sa	2.00U ± 3.27 (6.58)		dpm/sa		

7 3072157066-SU-11-40

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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7 3072157066-SU-11-40

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12489	**Prep Date**	7/18/2012 22:31	**Dilution**
Method	EPA 906.0M		**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790304		**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**	7/18/2012 22:31	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790304		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.08J ± 3.60 (6.83)	dpm/sa	4.08J ± 3.60 (6.83)		dpm/sa		

8 3072157067-SU-11-41

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12489	**Prep Date**	7/18/2012 22:44	**Dilution**
Method	EPA 906.0M		**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790305		**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**	7/18/2012 22:44	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790305		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.232U ± 3.10 (6.60)	dpm/sa	0.232U ± 3.10 (6.60)		dpm/sa		

9 3072157068-SU-11-42

Type	PS		**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI		**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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9 3072157068-SU-11-42

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 22:57	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790306	**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**	7/18/2012 22:57	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790306	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.07J ± 3.88 (7.43)	dpm/sa	4.07J ± 3.88 (7.43)		dpm/sa		

10 3072157069-SU-14-1

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 23:11	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790307	**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**	7/18/2012 23:11	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790307	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.97J ± 3.36 (6.57)	dpm/sa	2.97J ± 3.36 (6.57)		dpm/sa		

11 3072157070-SU-14-2

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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11 3072157070-SU-14-2

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 23:24	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790308	**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**	7/18/2012 23:24	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790308	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.37U ± 3.25 (6.69)	dpm/sa	1.37U ± 3.25 (6.69)		dpm/sa		

12 3072157071-SU-14-3

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 23:37	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790309	**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**	7/18/2012 23:37	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790309	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.05J ± 3.58 (6.57)	dpm/sa	5.05J ± 3.58 (6.57)		dpm/sa		

13 3072157072-SU-14-4

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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13 3072157072-SU-14-4

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/18/2012 23:50	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790310	**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**	7/18/2012 23:50	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790310	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.33U ± 3.32 (6.63)	dpm/sa	2.33U ± 3.32 (6.63)		dpm/sa		

14 3072157073-SU-14-5

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/19/2012 00:03	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790311	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 00:03	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790311	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.74J ± 3.69 (6.64)	dpm/sa	5.74J ± 3.69 (6.64)		dpm/sa		

15 3072157074-SU-14-6

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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15 3072157074-SU-14-6

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/19/2012 00:16	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790312	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 00:16	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790312	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.79J ± 3.35 (6.57)	dpm/sa	2.79J ± 3.35 (6.57)		dpm/sa		

16 3072157075-SU-14-7

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/19/2012 00:29	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790313	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 00:29	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790313	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.0973U ± 3.08 (6.64)	dpm/sa	-0.0973U ± 3.08 (6.64)		dpm/sa		

17 3072157076-SU-14-8

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

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Batch	RADC/12489	HBN	91061
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

17 3072157076-SU-14-8

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790314

Batch RADC/12489
HBN 91061
Instru NONE

Prep Date 7/19/2012 00:42
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790314

Instru NONE
Col ID
File

Run Date 7/19/2012 00:42
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.72J ± 3.55 (6.57)	dpm/sa	4.72J ± 3.55 (6.57)		dpm/sa		

18 3072157077-SU-14-9

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790315

Batch RADC/12489
HBN 91061
Instru NONE

Prep Date 7/19/2012 00:55
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790315

Instru NONE
Col ID
File

Run Date 7/19/2012 00:55
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.68J ± 3.65 (6.57)	dpm/sa	5.68J ± 3.65 (6.57)		dpm/sa		

19 3072157078-SU-14-9D

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch RADC/12489 HBN 91061
Rule 9060 I LEB Status RE
Create Date 6/28/2012 Analyst RMK

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19 3072157078-SU-14-9D

Prep Information

Procedure 9060 I LEB **Batch** RADC/12489 **Prep Date** 7/19/2012 01:08 **Dilution**
Method EPA 906.0M **HBN** 91061 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790316 **Instru** NONE **CC** OK F

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 01:08 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790316 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.76J ± 3.45 (6.58)	dpm/sa	3.76J ± 3.45 (6.58)		dpm/sa		

20 3072157079-SU-14-10

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12489 **Prep Date** 7/19/2012 01:21 **Dilution**
Method EPA 906.0M **HBN** 91061 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790317 **Instru** NONE **CC** OK F

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 01:21 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790317 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.91J ± 3.58 (6.59)	dpm/sa	4.91J ± 3.58 (6.59)		dpm/sa		

21 3072157080-SU-14-11

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

Batch	RADC/12489	**HBN**	91061
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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21 3072157080-SU-14-11

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12489	**Prep Date**	7/19/2012 01:34	**Dilution**	
Method	EPA 906.0M	**HBN**	91061	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790318	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 01:34	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790318	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	4.72J ± 3.55 (6.57)	dpm/sa	4.72J ± 3.55 (6.57)			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 13:50		Assigned Analyst	RMK	
Batch ID	12489		Earliest Due Date	07/04/2012 07:12	
A-code	9060 I LEB	9060W	HBN	91061	
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
	459080	BLANK	IP		QCACCOUNT	1.75U	3.38	6.87	7/19/12 2:14
3072157	3072157061	PS	WP	6/11/2012 0:01	RTI	-0.251U	3.04	6.58	7/18/12 21:26
3072157	3072157062	PS	WP	6/11/2012 0:01	RTI	3.45J	3.42	6.57	7/18/12 21:39
3072157	3072157063	PS	WP	6/11/2012 0:01	RTI	-1.06U	2.96	6.57	7/18/12 21:52
3072157	3072157064	PS	WP	6/11/2012 0:01	RTI	3.12J	3.38	6.57	7/18/12 22:05
3072157	3072157065	PS	WP	6/11/2012 0:01	RTI	2.00U	3.27	6.58	7/18/12 22:18
3072157	3072157066	PS	WP	6/11/2012 0:01	RTI	4.08J	3.60	6.83	7/18/12 22:31
3072157	3072157067	PS	WP	6/11/2012 0:01	RTI	0.232U	3.10	6.60	7/18/12 22:44
3072157	3072157068	PS	WP	6/11/2012 0:01	RTI	4.07J	3.88	7.43	7/18/12 22:57
3072157	3072157069	PS	WP	6/11/2012 0:01	RTI	2.97J	3.36	6.57	7/18/12 23:11
3072157	3072157070	PS	WP	6/11/2012 0:01	RTI	1.37U	3.25	6.69	7/18/12 23:24
3072157	3072157071	PS	WP	6/11/2012 0:01	RTI	5.05J	3.58	6.57	7/18/12 23:37
3072157	3072157072	PS	WP	6/11/2012 0:01	RTI	2.33U	3.32	6.63	7/18/12 23:50
3072157	3072157073	PS	WP	6/11/2012 0:01	RTI	5.74J	3.69	6.64	7/19/12 0:03
3072157	3072157074	PS	WP	6/11/2012 0:01	RTI	2.79J	3.35	6.57	7/19/12 0:16
3072157	3072157075	PS	WP	6/11/2012 0:01	RTI	-0.0973U	3.08	6.64	7/19/12 0:29
3072157	3072157076	PS	WP	6/11/2012 0:01	RTI	4.72J	3.55	6.57	7/19/12 0:42
3072157	3072157077	PS	WP	6/11/2012 0:01	RTI	5.68J	3.65	6.57	7/19/12 0:55
3072157	3072157078	PS	WP	6/11/2012 0:01	RTI	3.76J	3.45	6.58	7/19/12 1:08
3072157	3072157079	PS	WP	6/11/2012 0:01	RTI	4.91J	3.58	6.59	7/19/12 1:21
3072157	3072157080	PS	WP	6/11/2012 0:01	RTI	4.72J	3.55	6.57	7/19/12 1:34

LIMS Load
Printed 7/24/2012 at 11:24 AM

7/24/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK			
Matrix	Smear	**PrepSOP1**		**Bkg CPM**	5.63	
Batch ID	12489	**PrepSOP2**	n/a	**Bkg Duration**	30.0	min
Prep Start	7/16/2012 12:00	**AnalSOP1**		**Bkg Ref**	BKG071812	
Prep Finish	7/16/2012	**AnalSOP2**	n/a	**Bkg Ct Date/Time:**	7/18/2012 2:31	
Act. Rpt Units	dpm	**Aliq. Rpt Units**	Sample	**Instrument ID:**	System #3	

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459080	1.0	7/19/12 2:14	12.0	7/19/12 2:14	6.50	327.5	dpm/S	High, Evaluate
3072157061	1.0	6/11/12 0:01	12.0	7/18/12 21:26	5.50	258.8	dpm/S	Pass
3072157062	1.0	6/11/12 0:01	12.0	7/18/12 21:39	7.42	273.5	dpm/S	Pass
3072157063	1.0	6/11/12 0:01	12.0	7/18/12 21:52	5.08	275.4	dpm/S	Pass
3072157064	1.0	6/11/12 0:01	12.0	7/18/12 22:05	7.25	274.4	dpm/S	Pass
3072157065	1.0	6/11/12 0:01	12.0	7/18/12 22:18	6.67	277.1	dpm/S	Pass
3072157066	1.0	6/11/12 0:01	12.0	7/18/12 22:31	7.67	320.6	dpm/S	High, Evaluate
3072157067	1.0	6/11/12 0:01	12.0	7/18/12 22:44	5.75	287.9	dpm/S	Pass
3072157068	1.0	6/11/12 0:01	12.0	7/18/12 22:57	7.50	358.4	dpm/S	High, Evaluate
3072157069	1.0	6/11/12 0:01	12.0	7/18/12 23:11	7.17	270.2	dpm/S	Pass
3072157070	1.0	6/11/12 0:01	12.0	7/18/12 23:24	6.33	235.7	dpm/S	Pass
3072157071	1.0	6/11/12 0:01	12.0	7/18/12 23:37	8.25	268.2	dpm/S	Pass
3072157072	1.0	6/11/12 0:01	12.0	7/18/12 23:50	6.83	246.4	dpm/S	Pass
3072157073	1.0	6/11/12 0:01	12.0	7/19/12 0:03	8.58	244.0	dpm/S	Pass
3072157074	1.0	6/11/12 0:01	12.0	7/19/12 0:16	7.08	271.4	dpm/S	Pass
3072157075	1.0	6/11/12 0:01	12.0	7/19/12 0:29	5.58	244.3	dpm/S	Pass
3072157076	1.0	6/11/12 0:01	12.0	7/19/12 0:42	8.08	268.8	dpm/S	Pass
3072157077	1.0	6/11/12 0:01	12.0	7/19/12 0:55	8.58	269.2	dpm/S	Pass
3072157078	1.0	6/11/12 0:01	12.0	7/19/12 1:08	7.58	260.3	dpm/S	Pass
3072157079	1.0	6/11/12 0:01	12.0	7/19/12 1:21	8.17	255.6	dpm/S	Pass
3072157080	1.0	6/11/12 0:01	12.0	7/19/12 1:34	8.08	271.5	dpm/S	Pass

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12489	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459080	0.4967	0.0000	1.0000	1.752	3.370	3.377	6.867	2.692	0.641	3.370	1.00
3072157061	0.5211	0.1037	0.9942	-0.251	3.041	3.041	6.584	2.581	0.614	3.041	1.00
3072157062	0.5220	0.1038	0.9942	3.449	3.390	3.415	6.572	2.577	0.613	3.390	1.00
3072157063	0.5219	0.1038	0.9942	-1.060	2.953	2.955	6.574	2.577	0.613	2.953	1.00
3072157064	0.5220	0.1038	0.9942	3.122	3.361	3.381	6.573	2.577	0.613	3.361	1.00
3072157065	0.5217	0.1038	0.9942	2.005	3.258	3.267	6.576	2.578	0.613	3.258	1.00
3072157066	0.5024	0.1039	0.9942	4.084	3.568	3.601	6.828	2.677	0.637	3.568	1.00
3072157067	0.5197	0.1039	0.9942	0.232	3.098	3.098	6.602	2.588	0.616	3.098	1.00
3072157068	0.4620	0.1039	0.9942	4.072	3.847	3.878	7.427	2.912	0.693	3.847	1.00
3072157069	0.5221	0.1039	0.9942	2.967	3.346	3.365	6.571	2.576	0.613	3.346	1.00
3072157070	0.5129	0.1040	0.9942	1.373	3.250	3.254	6.688	2.622	0.624	3.250	1.00
3072157071	0.5221	0.1040	0.9942	5.048	3.533	3.584	6.571	2.576	0.613	3.533	1.00
3072157072	0.5178	0.1040	0.9942	2.331	3.312	3.324	6.626	2.598	0.618	3.312	1.00
3072157073	0.5168	0.1040	0.9942	5.741	3.624	3.688	6.638	2.602	0.619	3.624	1.00
3072157074	0.5221	0.1041	0.9942	2.794	3.330	3.347	6.571	2.576	0.613	3.330	1.00
3072157075	0.5169	0.1041	0.9942	-0.097	3.081	3.081	6.637	2.602	0.619	3.081	1.00
3072157076	0.5221	0.1041	0.9942	4.720	3.504	3.549	6.571	2.576	0.613	3.504	1.00
3072157077	0.5221	0.1041	0.9942	5.683	3.588	3.651	6.571	2.576	0.613	3.588	1.00
3072157078	0.5213	0.1042	0.9942	3.762	3.423	3.452	6.581	2.580	0.614	3.423	1.00
3072157079	0.5205	0.1042	0.9942	4.909	3.530	3.578	6.592	2.584	0.615	3.530	1.00
3072157080	0.5221	0.1042	0.9942	4.720	3.504	3.549	6.571	2.576	0.613	3.504	1.00

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Quality Control Sample Performance Assessment

RCDU Upload

Analyst:	RMK		
Date:	7/31/2012	**Method:**	EPA 906.0M
Worklist:	12489	**SOP:**	
Matrix:	Filter	**MB Sample ID:**	459080

Method Blank Assessment

Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	1.7520	3.3770	6.8670	2.69200		

Laboratory Control Sample Assessment

	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 14:48	7/20/12 14:56				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (DPM/Sample):	1184.938	1184.938				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (DPM/Sample, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (DPM/Sample, g, F):	107.723	117.548				
1.96 Sigma Unc:	17.368	18.474				
% Recovery:	90.91%	99.20%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment

LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12489					
Duplicate Sample I.D.	LCSD12489					
Sample Result (DPM/Sample, g, F):	107.7230					
1.96 Sigma Unc:	17.3680					
ıple Duplicate Result (DPM/Sample, g, F):	117.5480					
Duplicate Sample 1.96 Sigma Unc.	18.4740					
Either results below MDC?	NO					
Relative Percent Difference:	8.72%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

Sample Matrix Spike Control Assessment

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

Matrix Spike/Matrix Spike Duplicate Sample Assessment

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

Comments:

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12489

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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

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

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

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

Protocol #: 2 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
2	1	30.00	30	2.53	5.83	5.63	292.82	4

BKG071812

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			7/18/2012 21:38
		Sample Ct Duration (min)	12.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	12	7/18/2012 21:26	3072157061
2	25	7/18/2012 21:39	3072157062
3	38	7/18/2012 21:52	3072157063
4	51	7/18/2012 22:05	3072157064
5	64	7/18/2012 22:18	3072157065
6	77	7/18/2012 22:31	3072157066
7	90	7/18/2012 22:44	3072157067
8	103	7/18/2012 22:57	3072157068
9	117	7/18/2012 23:11	3072157069
10	130	7/18/2012 23:24	3072157070
11	143	7/18/2012 23:37	3072157071
12	156	7/18/2012 23:50	3072157072
13	169	7/19/2012 0:03	3072157073
14	182	7/19/2012 0:16	3072157074
15	195	7/19/2012 0:29	3072157075
16	208	7/19/2012 0:42	3072157076
17	221	7/19/2012 0:55	3072157077
18	234	7/19/2012 1:08	3072157078
19	247	7/19/2012 1:21	3072157079
20	260	7/19/2012 1:34	3072157080
21	273	7/19/2012 1:47	LCS
22	287	7/19/2012 2:01	LCSD
23	300	7/19/2012 2:14	459080

7/20/12

Protocol #: 2 SWIPE_H3_C14 User :

Time: 12.00
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
2	1	12.00	12	2.33	5.58	5.50	258.78	4
2	2	12.00	25	4.75	7.33	7.42	273.49	2
2	3	12.00	38	3.25	5.17	5.08	275.42	3
2	4	12.00	51	4.75	7.25	7.25	274.39	2
2	5	12.00	64	3.50	6.75	6.67	277.08	3
2	6	12.00	77	4.17	7.75	7.67	320.60	2
2	7	12.00	90	2.83	6.08	5.75	287.85	4
2	8	12.00	103	5.08	7.42	7.50	358.43	2
2	9	12.00	117	3.58	7.17	7.17	270.19	2
2	10	12.00	130	2.67	6.42	6.33	235.68	3
2	11	12.00	143	4.08	8.25	8.25	268.17	3
2	12	12.00	156	3.83	6.83	6.83	246.41	3
2	13	12.00	169	4.50	8.50	8.58	244.00	2
2	14	12.00	182	3.83	7.17	7.08	271.39	2
2	15	12.00	195	2.42	5.75	5.58	244.30	4
2	16	12.00	208	3.75	8.08	8.08	268.77	2
2	17	12.00	221	5.42	8.58	8.58	269.24	2
2	18	12.00	234	4.83	7.67	7.58	260.30	3
2	19	12.00	247	4.33	8.17	8.17	255.55	2
2	20	12.00	260	5.00	7.92	8.08	271.51	1
2	21	12.00	273	667.58	672.92	698.08	324.52	0
2	22	12.00	287	687.33	693.00	718.17	317.74	0
2	23	12.00	300	3.33	6.42	6.50	327.52	3

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072157059	12488	Sw.pe-H3.C14	2	12	7/18/12 1210	12	NA	RMK
060								
LCS	NA							
LCSD								
MB (459079)	12488							
3072157061	12489		6	2		12	NA	RMK
062								
063								
064								
065								
066								
067								
068								
069								
070								
071								
072								
073			15					
074								
075								
076								
077								
078								
079								

Run comments: _____

Peer Review: _____

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072157080	12489	Swipe H3 C14	15	2	7/18/12 1210	12	NA	RMK
LCS	NA							
LCSD	↓							
MB (459080)	12489							
3072157081	12490		34	1	7/18/12 1710	12	NA	JLK
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92			↓					
93			4					
94								
95								
96								
97								
98								
99								
100								

Run comments: _____

Peer Review: _____

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

Bkg CPM 6.30
Bkg Duration 30.0 min
Bkg Ref bkg 07/20/2012
Bkg Ct Date/Time: 7/20/2012 10:25
Instrument ID: System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459058	1.0	1/0/00 0:00	7.0				dpm/S	Low, Reprep
LCS12489	1.0	7/20/12 14:48	7.0	7/20/12 14:48	59.71	328.5	dpm/S	High, Evaluate
LCSD12489	1.0	7/20/12 14:56	7.0	7/20/12 14:56	65.57	318.3	dpm/S	High, Evaluate
LCS12490	1.0	7/20/12 15:04	7.0	7/20/12 15:04	57.43	329.3	dpm/S	High, Evaluate
LCSD12490	1.0	7/20/12 15:12	7.0	7/20/12 15:12	59.14	327.2	dpm/S	High, Evaluate
LCS12491	1.0	7/20/12 15:20	7.0	7/20/12 15:20	55.43	309.2	dpm/S	Pass
LCSD12491	1.0	7/20/12 15:28	7.0	7/20/12 15:28	58.00	317.4	dpm/S	High, Evaluate
LCS12492	1.0	7/20/12 15:36	7.0	7/20/12 15:36	58.43	268.8	dpm/S	Pass
LCSD12492	1.0	7/20/12 15:44	7.0	7/20/12 15:44	59.86	320.7	dpm/S	High, Evaluate
LCS12493	1.0	7/20/12 15:52	7.0	7/20/12 15:52	56.29	311.8	dpm/S	Pass
LCSD12493	1.0	7/20/12 16:00	7.0	7/20/12 16:00	61.71	319.8	dpm/S	High, Evaluate
LCS12494	1.0	7/20/12 16:08	7.0	7/20/12 16:08	59.14	314.9	dpm/S	High, Evaluate
LCSD12494	1.0	7/20/12 16:16	7.0	7/20/12 16:16	58.57	328.3	dpm/S	High, Evaluate

7/24/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0406	0.0000	1.0000	155.001	-22.098	22.369	-118.059	-42.770	-12.594	-12.594	1.00
LCS12489	0.4958	0.0000	1.0000	107.723	11.687	17.368	9.678	3.506	1.032	11.687	1.00
LCSD12489	0.5042	0.0000	1.0000	117.548	12.030	18.474	9.517	3.448	1.015	12.030	1.00
LCS12490	0.4951	0.0000	1.0000	103.270	11.483	16.840	9.692	3.511	1.034	11.483	1.00
LCSD12490	0.4970	0.0000	1.0000	106.321	11.605	17.190	9.655	3.498	1.030	11.605	1.00
LCS12491	0.5103	0.0000	1.0000	96.271	10.950	15.866	9.403	3.406	1.003	10.950	1.00
LCSD12491	0.5048	0.0000	1.0000	102.409	11.316	16.651	9.505	3.443	1.014	11.316	1.00
LCS12492	0.5221	0.0000	1.0000	99.851	10.982	16.200	9.191	3.330	0.981	10.982	1.00
LCSD12492	0.5023	0.0000	1.0000	106.619	11.549	17.178	9.552	3.461	1.019	11.549	1.00
LCS12493	0.5087	0.0000	1.0000	98.267	11.067	16.120	9.433	3.417	1.006	11.067	1.00
LCSD12493	0.5030	0.0000	1.0000	110.151	11.706	17.596	9.539	3.456	1.018	11.706	1.00
LCS12494	0.5066	0.0000	1.0000	104.297	11.384	16.862	9.471	3.431	1.010	11.384	1.00
LCSD12494	0.4960	0.0000	1.0000	105.383	11.573	17.086	9.674	3.505	1.032	11.573	1.00

7/24/12

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

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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%

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPME	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 14:55
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
2	7	7/20/2012 14:48	LCS12489
3	15	7/20/2012 14:56	LCSD12489
4	23	7/20/2012 15:04	LCS12490
5	31	7/20/2012 15:12	LCSD12490
6	39	7/20/2012 15:20	LCS12491
7	47	7/20/2012 15:28	LCSD12491
8	55	7/20/2012 15:36	LCS12492
9	63	7/20/2012 15:44	LCSD12492
10	71	7/20/2012 15:52	LCS12493
11	79	7/20/2012 16:00	LCSD12493
12	87	7/20/2012 16:08	LCS12494
13	95	7/20/2012 16:16	LCSD12494

Protocol #: 7 SWIPE_H3_C14 User :

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	0.0	0.00
Region C:	1.0 -	160	0	6.0	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	MISSING	TUBE(S)						
7	2	7.00	7	46.29	59.71	59.71	328.50	1
7	3	7.00	15	47.29	64.86	65.57	318.26	0
7	4	7.00	23	41.86	56.71	57.43	329.27	0
7	5	7.00	31	41.00	58.71	59.14	327.18	1
7	6	7.00	39	39.29	55.00	55.43	309.17	1
7	7	7.00	47	41.29	57.43	58.00	317.42	0
7	8	7.00	55	39.71	58.43	58.43	268.79	1
7	9	7.00	63	42.57	59.43	59.86	320.72	1
7	10	7.00	71	41.86	56.00	56.29	311.77	0
7	11	7.00	79	45.43	61.14	61.71	319.83	0
7	12	7.00	87	43.71	59.00	59.14	314.90	0
7	13	7.00	95	44.43	58.00	58.57	328.29	1

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
307211600 18	12502	Swipe_H3_C14	9	20	7/20/12 0900	7	MA	RMK
19	↓	↓	↓	↓	↓	↓	↓	↓
20	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12502	↓	↓	↓	↓	↓	↓	↓	↓
LCSD 12502	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12476	12476	Swipe_H3_C14	18	7	7/20/12 0950	7	MA	RMK
LCSD 12476	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12477	12477	↓	↓	↓	↓	↓	↓	↓
LCSD 12477	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12478	12478	↓	↓	↓	↓	↓	↓	↓
LCSD 12478	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12479	12479	↓	↓	↓	↓	↓	↓	↓
LCSD 12479	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12480	12480	↓	6	↓	↓	↓	↓	↓
LCSD 12480	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12486	12486	↓	↓	↓	↓	↓	↓	↓
LCSD 12486	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12487	12487	↓	↓	↓	↓	↓	↓	↓
LCSD 12487	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12488	12488	↓	↓	↓	↓	↓	↓	↓
LCSD 12488	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12489	12489	Swipe_H3C14	11	7	7/20/12 1130	7	MA	RMK
LCSD 12489	↓	↓	↓	↓	↓	↓	↓	↓
LCS 12490	12490	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Liquid Scintillation Runlog (R023-3 7Oct2010).XLS

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
LCSD 12490	12490	Swipe-H3_C14	11	7	7/20/12 1130	7	NA	RMK
LCS 12491	12491	↓	↓	↓	↓	↓	↓	↓
LCSD 12491	↓							
LCS 12492	12492							
LCSD 12492	↓							
LCS 12493	12493							
LCSD 12493	↓							
LCS 12494	12494							
LCSD 12494	↓							

7/24/12

Run comments: _____

Peer Review: _____

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

Low Energy Beta Sample Analysis Data

Quality Control Review

Batch	RADC/12490	**HBN**	91062
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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1 459082-BLANK for HBN 91062 [RADC/1249

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

Prep Information

Procedure 9060 I LEB **Batch** RADC/12490 **Prep Date** 7/19/2012 13:57 **Dilution**
Method EPA 906.0M **HBN** 91062 **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796192 **Instru** NONE **CC** OK F

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 13:57 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/25/2012 23:59 **Analyst** RMK
Schedule 2796192 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	
Rad Chemistry	OK						
LSC Low Energy Beta	OK	1.24U ± 3.29 (6.80)	dpm/sa	1.24U ± 3.29 (6.80)			dpm/sa

2 3072157081-SU-14-12

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

Prep Information

Procedure 9060 I LEB **Batch** RADC/12490 **Prep Date** 7/19/2012 09:10 **Dilution**
Method EPA 906.0M **HBN** 91062 **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790319 **Instru** NONE **CC** OK F

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

Analytical Information

Procedure 9060 I LEB **Instru** NONE **Run Date** 7/19/2012 09:10 **Dilution**
Method EPA 906.0M **Col ID** **Hold Date** 12/8/2012 23:59 **Analyst** RMK
Schedule 2790319 **File** **CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High	
Rad Chemistry	OK								
LSC Low Energy Beta	OK	3.76J ± 3.45 (6.57)	dpm/sa	3.76J ± 3.45 (6.57)					dpm/sa

3 3072157082-SU-14-13

Type PS **Matrix** Wipe **Collected** 6/11/2012 00:01 **% Moisture**
Client RTI **WO** 3072157 **Work ID** Fort Monmouth 1207077 **Location**

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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3 3072157082-SU-14-13

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 09:23	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790320	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 09:23	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790320	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.72J ± 3.55 (6.57)	dpm/sa	4.72J ± 3.55 (6.57)		dpm/sa		

4 3072157083-SU-14-14

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 09:36	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790321	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 09:36	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790321	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.41J ± 3.52 (6.57)	dpm/sa	4.41J ± 3.52 (6.57)		dpm/sa		

5 3072157084-SU-14-15

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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5 3072157084-SU-14-15

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 09:49	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790322	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 09:49	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790322	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	5.38J ± 3.62 (6.58)	dpm/sa	5.38J ± 3.62 (6.58)		dpm/sa		

6 3072157085-SU-14-16

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 10:02	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790323	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 10:02	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790323	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.867U ± 3.15 (6.57)	dpm/sa	0.867U ± 3.15 (6.57)		dpm/sa		

7 3072157086-SU-14-17

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12490	**HBN**	91062
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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7 3072157086-SU-14-17

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12490	**Prep Date**	7/19/2012 10:15	**Dilution**
Method	EPA 906.0M		**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790324		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 10:15	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790324		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.41J ± 3.52 (6.57)	dpm/sa	4.41J ± 3.52 (6.57)		dpm/sa		

8 3072157087-SU-14-17D

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

Prep Information

Procedure	9060 I LEB		**Batch**	RADC/12490	**Prep Date**	7/19/2012 10:28	**Dilution**
Method	EPA 906.0M		**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790325		**Instru**	NONE			**CC** OK F
Initial Volume	1 mL	Default	1 mL				
Final Volume,	1 mL	Default	1 mL				

Analytical Information

Procedure	9060 I LEB		**Instru**	NONE	**Run Date**	7/19/2012 10:28	**Dilution**
Method	EPA 906.0M		**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst** RMK
Schedule	2790325		**File**				**CC** OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.58J ± 3.55 (6.60)	dpm/sa	4.58J ± 3.55 (6.60)		dpm/sa		

9 3072157088-SU-14-18

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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9 3072157088-SU-14-18

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 10:42
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59
Schedule	2790326	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK F

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 10:42
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790326	**File**			

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	0.561U ± 3.13 (6.59)	dpm/sa	0.561U ± 3.13 (6.59)			dpm/sa		

10 3072157089-SU-14-19

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 10:55
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59
Schedule	2790327	**Instru**	NONE		

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

Dilution
Analyst RMK
CC OK F

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 10:55
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59
Schedule	2790327	**File**			

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	5.60J ± 3.68 (6.65)	dpm/sa	5.60J ± 3.68 (6.65)			dpm/sa		

11 3072157090-SU-14-20

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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11 3072157090-SU-14-20

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790328

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 11:08
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790328

Instru NONE
Col ID
File

Run Date 7/19/2012 11:08
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	3.48J ± 3.44 (6.62)	dpm/sa	3.48J ± 3.44 (6.62)		dpm/sa		

12 3072157091-SU-14-21

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790329

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 11:21
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790329

Instru NONE
Col ID
File

Run Date 7/19/2012 11:21
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.16U ± 3.28 (6.58)	dpm/sa	2.16U ± 3.28 (6.58)		dpm/sa		

13 3072157092-SU-14-22

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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13 3072157092-SU-14-22

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790330

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 11:34
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790330

Instru NONE
Col ID
File

Run Date 7/19/2012 11:34
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.05U ± 3.19 (6.62)	dpm/sa	1.05U ± 3.19 (6.62)		dpm/sa		

14 3072157093-SU-14-23

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790331

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 11:47
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790331

Instru NONE
Col ID
File

Run Date 7/19/2012 11:47
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.84U ± 3.26 (6.60)	dpm/sa	1.84U ± 3.26 (6.60)		dpm/sa		

15 3072157094-SU-14-23D

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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15 3072157094-SU-14-23D

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790332

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 12:00
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790332

Instru NONE
Col ID
File

Run Date 7/19/2012 12:00
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	-0.733U ± 2.99 (6.58)	dpm/sa	-0.733U ± 2.99 (6.58)		dpm/sa		

16 3072157095-SU-14-24

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790333

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 12:13
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790333

Instru NONE
Col ID
File

Run Date 7/19/2012 12:13
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Req. Limits Low	Req. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.49U ± 3.32 (6.59)	dpm/sa	2.49U ± 3.32 (6.59)		dpm/sa		

17 3072157096-SU-14-25

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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17 3072157096-SU-14-25

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 12:26	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790334	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 12:26	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790334	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	0.394U ± 3.17 (6.72)	dpm/sa	0.394U ± 3.17 (6.72)		dpm/sa		

18 3072157097-SU-14-26

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 12:39	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790335	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 12:39	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790335	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	1.04U ± 3.17 (6.57)	dpm/sa	1.04U ± 3.17 (6.57)		dpm/sa		

19 3072157098-SU-14-27

Type	PS	**Matrix**	Wipe	**Collected**	6/11/2012 00:01	**% Moisture**	
Client	RTI	**WO**	3072157	**Work ID**	Fort Monmouth 1207077	**Location**	

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

Quality Control Review

Batch	RADC/12490	HBN	91062
Rule	9060 I LEB	Status	RE
Create Date	6/28/2012	Analyst	RMK

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19 3072157098-SU-14-27

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790336

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 12:52
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790336

Instru NONE
Col ID
File

Run Date 7/19/2012 12:52
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	4.45J ± 3.55 (6.63)	dpm/sa	4.45J ± 3.55 (6.63)		dpm/sa		

20 3072157099-SU-04-1

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

Prep Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790337

Batch RADC/12490
HBN 91062
Instru NONE

Prep Date 7/19/2012 13:05
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

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

Analytical Information

Procedure 9060 I LEB
Method EPA 906.0M
Schedule 2790337

Instru NONE
Col ID
File

Run Date 7/19/2012 13:05
Hold Date 12/8/2012 23:59

Dilution
Analyst RMK
CC OK F

Analyte	CC	Posted Result		Result	MDL	RDL	Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK							
LSC Low Energy Beta	OK	2.65J ± 3.34 (6.59)	dpm/sa	2.65J ± 3.34 (6.59)		dpm/sa		

21 3072157100-SU-04-2

Type PS
Client RTI

Matrix Wipe
WO 3072157

Collected 6/11/2012 00:01
Work ID Fort Monmouth 1207077

% Moisture
Location

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

Quality Control Review

Batch	RADC/12490	**HBN**	91062
Rule	9060 I LEB	**Status**	RE
Create Date	6/28/2012	**Analyst**	RMK

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21 3072157100-SU-04-2

Prep Information

Procedure	9060 I LEB	**Batch**	RADC/12490	**Prep Date**	7/19/2012 13:18	**Dilution**	
Method	EPA 906.0M	**HBN**	91062	**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790338	**Instru**	NONE			**CC**	OK F

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

Analytical Information

Procedure	9060 I LEB	**Instru**	NONE	**Run Date**	7/19/2012 13:18	**Dilution**	
Method	EPA 906.0M	**Col ID**		**Hold Date**	12/8/2012 23:59	**Analyst**	RMK
Schedule	2790338	**File**				**CC**	OK F

Analyte	CC	Posted Result		Result	MDL	RDL		Reg. Limits Low	Reg. Limits High
Rad Chemistry	OK								
LSC Low Energy Beta	OK	2.51U ± 3.35 (6.65)	dpm/sa	2.51U ± 3.35 (6.65)			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 13:50		Assigned Analyst	RMK
Batch ID	12490		Earliest Due Date	07/04/2012 07:12
A-code	9060 I LEB	9060W	HBN	91062
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
	459082	BLANK	IP		QCACCOUNT	1.24U	3.29	6.80	7/19/12 13:57
3072157	3072157081	PS	WP	6/11/2012 0:01	RTI	3.76J	3.45	6.57	7/19/12 9:10
3072157	3072157082	PS	WP	6/11/2012 0:01	RTI	4.72J	3.55	6.57	7/19/12 9:23
3072157	3072157083	PS	WP	6/11/2012 0:01	RTI	4.41J	3.52	6.57	7/19/12 9:36
3072157	3072157084	PS	WP	6/11/2012 0:01	RTI	5.38J	3.62	6.58	7/19/12 9:49
3072157	3072157085	PS	WP	6/11/2012 0:01	RTI	0.867U	3.15	6.57	7/19/12 10:02
3072157	3072157086	PS	WP	6/11/2012 0:01	RTI	4.41J	3.52	6.57	7/19/12 10:15
3072157	3072157087	PS	WP	6/11/2012 0:01	RTI	4.58J	3.55	6.60	7/19/12 10:28
3072157	3072157088	PS	WP	6/11/2012 0:01	RTI	0.561U	3.13	6.59	7/19/12 10:42
3072157	3072157089	PS	WP	6/11/2012 0:01	RTI	5.60J	3.68	6.65	7/19/12 10:55
3072157	3072157090	PS	WP	6/11/2012 0:01	RTI	3.48J	3.44	6.62	7/19/12 11:08
3072157	3072157091	PS	WP	6/11/2012 0:01	RTI	2.16U	3.28	6.58	7/19/12 11:21
3072157	3072157092	PS	WP	6/11/2012 0:01	RTI	1.05U	3.19	6.62	7/19/12 11:34
3072157	3072157093	PS	WP	6/11/2012 0:01	RTI	1.84U	3.26	6.60	7/19/12 11:47
3072157	3072157094	PS	WP	6/11/2012 0:01	RTI	-0.733U	2.99	6.58	7/19/12 12:00
3072157	3072157095	PS	WP	6/11/2012 0:01	RTI	2.49U	3.32	6.59	7/19/12 12:13
3072157	3072157096	PS	WP	6/11/2012 0:01	RTI	0.394U	3.17	6.72	7/19/12 12:26
3072157	3072157097	PS	WP	6/11/2012 0:01	RTI	1.04U	3.17	6.57	7/19/12 12:39
3072157	3072157098	PS	WP	6/11/2012 0:01	RTI	4.45J	3.55	6.63	7/19/12 12:52
3072157	3072157099	PS	WP	6/11/2012 0:01	RTI	2.65J	3.34	6.59	7/19/12 13:05
3072157	3072157100	PS	WP	6/11/2012 0:01	RTI	2.51U	3.35	6.65	7/19/12 13:18

LIMS Load
Printed 7/31/2012 at 1:34 PM

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code Low Energy Beta
Matrix Smear
Batch ID 12490
Prep Start 7/16/2012 12:00
Prep Finish 7/16/2012
Act. Rpt Units dpm

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

Bkg CPM 5.63
Bkg Duration 30.0 min
Bkg Ref BKG071812
Bkg Ct Date/Time: 7/18/2012 2:31
Instrument ID: System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459082	1.0	7/19/12 13:57	12.0	7/19/12 13:57	6.25	321.2	dpm/S	High, Evaluate
3072157081	1.0	6/11/12 0:01	12.0	7/19/12 9:10	7.58	270.8	dpm/S	Pass
3072157082	1.0	6/11/12 0:01	12.0	7/19/12 9:23	8.08	270.6	dpm/S	Pass
3072157083	1.0	6/11/12 0:01	12.0	7/19/12 9:36	7.92	266.2	dpm/S	Pass
3072157084	1.0	6/11/12 0:01	12.0	7/19/12 9:49	8.42	262.6	dpm/S	Pass
3072157085	1.0	6/11/12 0:01	12.0	7/19/12 10:02	6.08	272.9	dpm/S	Pass
3072157086	1.0	6/11/12 0:01	12.0	7/19/12 10:15	7.92	270.9	dpm/S	Pass
3072157087	1.0	6/11/12 0:01	12.0	7/19/12 10:28	8.00	253.7	dpm/S	Pass
3072157088	1.0	6/11/12 0:01	12.0	7/19/12 10:42	5.92	285.2	dpm/S	Pass
3072157089	1.0	6/11/12 0:01	12.0	7/19/12 10:55	8.50	299.2	dpm/S	Pass
3072157090	1.0	6/11/12 0:01	12.0	7/19/12 11:08	7.42	293.0	dpm/S	Pass
3072157091	1.0	6/11/12 0:01	12.0	7/19/12 11:21	6.75	276.6	dpm/S	Pass
3072157092	1.0	6/11/12 0:01	12.0	7/19/12 11:34	6.17	291.9	dpm/S	Pass
3072157093	1.0	6/11/12 0:01	12.0	7/19/12 11:47	6.58	288.4	dpm/S	Pass
3072157094	1.0	6/11/12 0:01	12.0	7/19/12 12:00	5.25	280.5	dpm/S	Pass
3072157095	1.0	6/11/12 0:01	12.0	7/19/12 12:13	6.92	283.3	dpm/S	Pass
3072157096	1.0	6/11/12 0:01	12.0	7/19/12 12:26	5.83	309.2	dpm/S	Pass
3072157097	1.0	6/11/12 0:01	12.0	7/19/12 12:39	6.17	274.2	dpm/S	Pass
3072157098	1.0	6/11/12 0:01	12.0	7/19/12 12:52	7.92	293.8	dpm/S	Pass
3072157099	1.0	6/11/12 0:01	12.0	7/19/12 13:05	7.00	284.2	dpm/S	Pass
3072157100	1.0	6/11/12 0:01	12.0	7/19/12 13:18	6.92	297.6	dpm/S	Pass

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

Test Code	Low Energy Beta	**Analyst**	RMK
Matrix	Smear	**PrepSOP1**	0
Batch ID	12490	**PrepSOP2**	n/a
Prep Start	7/16/2012 12:00	**AnalSOP1**	0
Prep Finish	7/16/2012	**AnalSOP2**	n/a

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459082	0.5019	0.0000	1.0000	1.235	3.287	3.290	6.795	2.664	0.634	3.287	1.00
3072157081	0.5221	0.1051	0.9942	3.757	3.418	3.447	6.572	2.576	0.613	3.418	1.00
3072157082	0.5221	0.1051	0.9942	4.720	3.504	3.549	6.572	2.576	0.613	3.504	1.00
3072157083	0.5220	0.1051	0.9942	4.413	3.477	3.517	6.573	2.577	0.613	3.477	1.00
3072157084	0.5217	0.1052	0.9942	5.380	3.564	3.621	6.577	2.579	0.613	3.564	1.00
3072157085	0.5220	0.1052	0.9942	0.867	3.147	3.149	6.572	2.577	0.613	3.147	1.00
3072157086	0.5221	0.1052	0.9942	4.412	3.477	3.516	6.572	2.576	0.613	3.477	1.00
3072157087	0.5200	0.1052	0.9942	4.585	3.504	3.547	6.598	2.587	0.615	3.504	1.00
3072157088	0.5203	0.1053	0.9941	0.561	3.127	3.128	6.594	2.585	0.615	3.127	1.00
3072157089	0.5156	0.1053	0.9941	5.599	3.620	3.681	6.655	2.609	0.621	3.620	1.00
3072157090	0.5181	0.1053	0.9941	3.476	3.417	3.442	6.623	2.596	0.618	3.417	1.00
3072157091	0.5218	0.1053	0.9941	2.159	3.273	3.283	6.576	2.578	0.613	3.273	1.00
3072157092	0.5184	0.1054	0.9941	1.048	3.186	3.188	6.618	2.595	0.617	3.186	1.00
3072157093	0.5195	0.1054	0.9941	1.839	3.256	3.263	6.604	2.589	0.616	3.256	1.00
3072157094	0.5213	0.1054	0.9941	-0.733	2.991	2.992	6.582	2.580	0.614	2.991	1.00
3072157095	0.5208	0.1054	0.9941	2.492	3.310	3.323	6.588	2.583	0.615	3.310	1.00
3072157096	0.5103	0.1055	0.9941	0.394	3.170	3.171	6.723	2.636	0.627	3.170	1.00
3072157097	0.5220	0.1055	0.9941	1.041	3.164	3.167	6.573	2.577	0.613	3.164	1.00
3072157098	0.5178	0.1055	0.9941	4.449	3.506	3.546	6.627	2.598	0.618	3.506	1.00
3072157099	0.5206	0.1055	0.9941	2.647	3.326	3.341	6.591	2.584	0.615	3.326	1.00
3072157100	0.5163	0.1056	0.9941	2.513	3.339	3.352	6.646	2.606	0.620	3.339	1.00

Quality Control Sample Performance Assessment

RCDU Upload

Analyst: MBT
Date: 7/24/2012 **Method:** EPA 906.0M
Worklist: 12490 **SOP:**
Matrix: Filter **MB Sample ID:** 459082

Method Blank Assessment						
Analyte	Activity	1.96 Sig Unc.	MDC	Critical Value	Flag	Assessment
LSC Low Energy Beta	1.2350	3.2900	6.7950	2.66400		

Laboratory Control Sample Assessment						
	LCS	LCSD	LCS	LCSD	LCS	LCSD
Analyte:	LSC Low Energy Beta					
Count Date:	7/20/12 15:04	7/20/12 15:12				
Spike I.D.:	09-009LEB	09-009LEB				
Spike Concentration (pCi/L):	1184.938	1184.938				
Volume Used (mL):	0.100	0.100				
Aliquot Volume (L, g, F):	1.000	1.000				
Target Conc. (pCi/L, g, F):	118.494	118.494				
1.96 Sigma Uncertainty (Calculated):	2.137	2.137				
Result (pCi/L, g, F):	103.270	106.321				
1.96 Sigma Unc:	16.840	17.190				
% Recovery:	87.15%	89.73%				
Assessment:	Pass	Pass				
Upper % Recovery Limits:	125.00%	125.00%				
Lower % Recovery Limits:	75.00%	75.00%				

Duplicate Sample Assessment						
LCS/LCSD Y or N?:	Y					
Analyte:	SC Low Energy Beta					
Sample I.D.:	LCS12490					
Duplicate Sample I.D.	LCSD12490					
Sample Result (pCi/L, g, F):	103.2700					
1.96 Sigma Unc:	16.8400					
Sample Duplicate Result (pCi/L, g, F):	106.3210					
Duplicate Sample 1.96 Sigma Unc.	17.1900					
Either results below MDC?	NO					
Relative Percent Difference:	2.91%					
Assessment:	Pass					
% RPD Limit:	25.00%					

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

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

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

Comments:

7/31/12

Test: Low Energy Beta
Matrix: Smear
Batch ID: 12490

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Protocol #: 2 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2SX	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
2	1	30.00	30	2.53	5.83	5.63	292.82	4

BKG071812

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			7/19/2012 9:22
		Sample Ct Duration (min)	12.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
1	12	7/19/2012 9:10	3072157081
2	25	7/19/2012 9:23	3072157082
3	38	7/19/2012 9:36	3072157083
4	51	7/19/2012 9:49	3072157084
5	64	7/19/2012 10:02	3072157085
6	77	7/19/2012 10:15	3072157086
7	90	7/19/2012 10:28	3072157087
8	104	7/19/2012 10:42	3072157088
9	117	7/19/2012 10:55	3072157089
10	130	7/19/2012 11:08	3072157090
11	143	7/19/2012 11:21	3072157091
12	156	7/19/2012 11:34	3072157092
13	169	7/19/2012 11:47	3072157093
14	182	7/19/2012 12:00	3072157094
15	195	7/19/2012 12:13	3072157095
16	208	7/19/2012 12:26	3072157096
17	221	7/19/2012 12:39	3072157097
18	234	7/19/2012 12:52	3072157098
19	247	7/19/2012 13:05	3072157099
20	260	7/19/2012 13:18	3072157100
21	273	7/19/2012 13:31	LCS
22	286	7/19/2012 13:44	LCSD
23	299	7/19/2012 13:57	459082

7/24/12

Protocol #:11 SWIPE_H3_C14 User :

Time: 12.00
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
11	1	12.00	12	4.33	7.67	7.58	270.76	2
11	2	12.00	25	4.58	7.83	8.08	270.60	1
11	3	12.00	38	4.92	7.92	7.92	266.24	3
11	4	12.00	51	4.17	8.50	8.42	262.61	2
11	5	12.00	64	3.00	5.92	6.08	272.86	3
11	6	12.00	77	4.83	7.83	7.92	270.87	2
11	7	12.00	90	4.83	8.00	8.00	253.65	2
11	8	12.00	104	3.17	6.17	5.92	285.24	3
11	9	12.00	117	5.08	8.50	8.50	299.18	2
11	10	12.00	130	3.58	7.33	7.42	292.97	2
11	11	12.00	143	3.75	6.83	6.75	276.55	2
11	12	12.00	156	3.42	6.00	6.17	291.93	2
11	13	12.00	169	3.75	6.75	6.58	288.38	3
11	14	12.00	182	3.00	5.50	5.25	280.45	4
11	15	12.00	195	3.17	7.00	6.92	283.25	3
11	16	12.00	208	3.08	5.92	5.83	309.15	3
11	17	12.00	221	3.75	6.25	6.17	274.23	3
11	18	12.00	234	4.92	8.00	7.92	293.80	1
11	19	12.00	247	4.42	7.17	7.00	284.21	3
11	20	12.00	260	3.42	6.92	6.92	297.61	2
11	21	12.00	273	613.25	617.33	639.25	291.80	0
11	22	12.00	286	610.83	616.25	638.67	320.42	0
11	23	12.00	299	3.00	6.50	6.25	321.24	3

7/24/12

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
3072157080	12489	Swipe H3 C14	15	2	7/18/12 1210	12	NA	RMK
LCS	NA							
LCSD	↓							
MB (459080)	12489							
3072157081	12490		34	1	7/18/12 1710	12	NA	JLK
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92			↓					
93			4					
94								
95								
96								
97								
98								
99								
100								

Run comments: _____

Peer Review: _____

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Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
LCS	12490	Supe-H3.c14	4	11	7/18/12 1710	12	NA	JLK
LCSD	↓	↓	↓	↓	↓	↓	↓	↓
MB (459082)	↓	↓	↓	↓	↓	↓	↓	↓
3072158001	12491	Supe_H3.c14	17	7	7/19/12 0945	7	NA	JLK
2	↓	↓	↓	↓	↓	↓	↓	↓
3	↓	↓	↓	↓	↓	↓	↓	↓
4	↓	↓	↓	↓	↓	↓	↓	↓
5	↓	↓	↓	↓	↓	↓	↓	↓
6	↓	↓	↓	↓	↓	↓	↓	↓
7	↓	↓	↓	↓	↓	↓	↓	↓
8	↓	↓	↓	↓	↓	↓	↓	↓
9	↓	↓	↓	↓	↓	↓	↓	↓
10	↓	↓	↓	↓	↓	↓	↓	↓
11	↓	↓	↓	↓	↓	↓	↓	↓
12	↓	↓	↓	↓	↓	↓	↓	↓
13	↓	↓	15	↓	↓	↓	↓	↓
14	↓	↓	↓	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓	↓	↓	↓
16	↓	↓	↓	↓	↓	↓	↓	↓
17	↓	↓	↓	↓	↓	↓	↓	↓
18	↓	↓	↓	↓	↓	↓	↓	↓
19	↓	↓	↓	↓	↓	↓	↓	↓
20	↓	↓	↓	↓	↓	↓	↓	↓
LCS	↓	↓	↓	↓	↓	↓	↓	↓

Run comments: _____

Peer Review: _____

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

Bkg CPM 6.30
Bkg Duration 30.0 min
Bkg Ref bkg 07/20/2012
Bkg Ct Date/Time: 7/20/2012 10:25
Instrument ID: System #3

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Sample	Analysis Volume (Sample)	Ref. Date	Count Duration (min)	Count Start Date/Time	Sample Gross CPM	TSIE #	Activity Report Units	TSIE Within Quench Curve
459058	1.0	1/0/00 0:00	7.0				dpm/S	Low, Reprep
LCS12489	1.0	7/20/12 14:48	7.0	7/20/12 14:48	59.71	328.5	dpm/S	High, Evaluate
LCSD12489	1.0	7/20/12 14:56	7.0	7/20/12 14:56	65.57	318.3	dpm/S	High, Evaluate
LCS12490	1.0	7/20/12 15:04	7.0	7/20/12 15:04	57.43	329.3	dpm/S	High, Evaluate
LCSD12490	1.0	7/20/12 15:12	7.0	7/20/12 15:12	59.14	327.2	dpm/S	High, Evaluate
LCS12491	1.0	7/20/12 15:20	7.0	7/20/12 15:20	55.43	309.2	dpm/S	Pass
LCSD12491	1.0	7/20/12 15:28	7.0	7/20/12 15:28	58.00	317.4	dpm/S	High, Evaluate
LCS12492	1.0	7/20/12 15:36	7.0	7/20/12 15:36	58.43	268.8	dpm/S	Pass
LCSD12492	1.0	7/20/12 15:44	7.0	7/20/12 15:44	59.86	320.7	dpm/S	High, Evaluate
LCS12493	1.0	7/20/12 15:52	7.0	7/20/12 15:52	56.29	311.8	dpm/S	Pass
LCSD12493	1.0	7/20/12 16:00	7.0	7/20/12 16:00	61.71	319.8	dpm/S	High, Evaluate
LCS12494	1.0	7/20/12 16:08	7.0	7/20/12 16:08	59.14	314.9	dpm/S	High, Evaluate
LCSD12494	1.0	7/20/12 16:16	7.0	7/20/12 16:16	58.57	328.3	dpm/S	High, Evaluate

LEB Data Input
Printed 7/22/2012 at 10:05 AM

M 7/24/12

Pace Analytical Services
Low Energy Beta Emitters by Liquid Scintillation

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

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

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Sample	Low Energy Beta Emitters Efficiency (cpm/dpm)	Decay Time (Years)	Decay Factor	Activity (dpm/S)	Count Uncertainty (dpm/S)	C.S.U. (dpm/S)	MDC (dpm/S)	Critical Level (dpm/S)	Zero UNC	Use UNC	Unit Conversion Factor
459058	-0.0406	0.0000	1.0000	155.001	-22.098	22.369	-118.059	-42.770	-12.594	-12.594	1.00
LCS12489	0.4958	0.0000	1.0000	107.723	11.687	17.368	9.678	3.506	1.032	11.687	1.00
LCSD12489	0.5042	0.0000	1.0000	117.548	12.030	18.474	9.517	3.448	1.015	12.030	1.00
LCS12490	0.4951	0.0000	1.0000	103.270	11.483	16.840	9.692	3.511	1.034	11.483	1.00
LCSD12490	0.4970	0.0000	1.0000	106.321	11.605	17.190	9.655	3.498	1.030	11.605	1.00
LCS12491	0.5103	0.0000	1.0000	96.271	10.950	15.866	9.403	3.406	1.003	10.950	1.00
LCSD12491	0.5048	0.0000	1.0000	102.409	11.316	16.651	9.505	3.443	1.014	11.316	1.00
LCS12492	0.5221	0.0000	1.0000	99.851	10.982	16.200	9.191	3.330	0.981	10.982	1.00
LCSD12492	0.5023	0.0000	1.0000	106.619	11.549	17.178	9.552	3.461	1.019	11.549	1.00
LCS12493	0.5087	0.0000	1.0000	98.267	11.067	16.120	9.433	3.417	1.006	11.067	1.00
LCSD12493	0.5030	0.0000	1.0000	110.151	11.706	17.596	9.539	3.456	1.018	11.706	1.00
LCS12494	0.5066	0.0000	1.0000	104.297	11.384	16.862	9.471	3.431	1.010	11.384	1.00
LCSD12494	0.4960	0.0000	1.0000	105.383	11.573	17.086	9.674	3.505	1.032	11.573	1.00

7/24/12

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

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

Miscellaneous Defaults

PrepSOP1
PrepSOP2 n/a
AnalSOP1
AnalSOP2 n/a

Sigma 1.96
Zero Factor 2.71

Low Energy Beta CSU Derivation

CSU Analysis for Preparation

Mass Aliquot

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

Decay/Ingrowth Correction

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

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%

Protocol #: 4 SWIPE_H3_C14 User :

Time: 30.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	0.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
4	1	30.00	30	2.97	6.60	6.30	301.41	3

BKG 072012

Pace Analytical Services
Count Start Date/Time Calculator

System #3		Protocol ID:	SWIPE_H3_C14
		Data File:	
Date in upper Left hand corner of Printout			7/20/2012 14:55
		Sample Ct Duration (min)	7.0
S#	ELTIME	Calculated Count Start Date/Time	Sample ID
2	7	7/20/2012 14:48	LCS12489
3	15	7/20/2012 14:56	LCSD12489
4	23	7/20/2012 15:04	LCS12490
5	31	7/20/2012 15:12	LCSD12490
6	39	7/20/2012 15:20	LCS12491
7	47	7/20/2012 15:28	LCSD12491
8	55	7/20/2012 15:36	LCS12492
9	63	7/20/2012 15:44	LCSD12492
10	71	7/20/2012 15:52	LCS12493
11	79	7/20/2012 16:00	LCSD12493
12	87	7/20/2012 16:08	LCS12494
13	95	7/20/2012 16:16	LCSD12494

7/24/12

Protocol #: 7 SWIPE_H3_C14 User :

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	0.0	0.00
Region C:	1.0 -	160	0	6.0	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	MISSING	TUBE(S)						
7	2	7.00	7	46.29	59.71	59.71	328.50	1
7	3	7.00	15	47.29	64.86	65.57	318.26	0
7	4	7.00	23	41.86	56.71	57.43	329.27	0
7	5	7.00	31	41.00	58.71	59.14	327.18	1
7	6	7.00	39	39.29	55.00	55.43	309.17	1
7	7	7.00	47	41.29	57.43	58.00	317.42	0
7	8	7.00	55	39.71	58.43	58.43	268.79	1
7	9	7.00	63	42.57	59.43	59.86	320.72	1
7	10	7.00	71	41.86	56.00	56.29	311.77	0
7	11	7.00	79	45.43	61.14	61.71	319.83	0
7	12	7.00	87	43.71	59.00	59.14	314.90	0
7	13	7.00	95	44.43	58.00	58.57	328.29	1

...ytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

...ocument ID: 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
307211600 18	12502	Swipe_H3_C14	9	20	7/20/12 0900	7	NA	RMK
19								
20								
LCS 12502								
LCSD 12502								
LCS 12476	12476	Swipe_H3_C14	18	7	7/20/12 0950	7	NA	RMK
LCSD 12476								
LCS 12477	12477							
LCSD 12477								
LCS 12478	12478							
LCSD 12478								
LCS 12479	12479							
LCSD 12479								
LCS 12480	12480		6					
LCSD 12480								
LCS 12486	12486							
LCSD 12486								
LCS 12487	12487							
LCSD 12487								
LCS 12488	12488							
LCSD 12488								
LCS 12489	12489	Swipe_H3_C14	11	7	7/20/12 1130	7	NA	RMK
LCSD 12489								
LCS 12490	12490							

Run comments: _____

Peer Review: _____

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
LCSD 12490	12490	Swipe-H3_C14	11	7	7/20/12 1130	7	NA	RMK
LCS 12491	12491	↓	↓	↓	↓	↓	↓	↓
LCSD 12491	↓							
LCS 12492	12492							
LCSD 12492	↓							
LCS 12493	12493							
LCSD 12493	↓							
LCS 12494	12494							
LCSD 12494	↓							

8/1/2012

Run comments: _____

Peer Review: _____

Low Energy Beta Calibration Documentation

Low Energy Beta Smear Calibration Narrative
Applicable to Methods: Smear Counting
Date: 7/19/2012
Calibration Source Prep Analyst: JLK
Calibration Calculations by: JLK

Calibration Description Details:

Five (5.0) mL of DI water was added to each of ten glass liquid scintillation vials with reflective lids. Portions of Analytics SRM 81012-493 were added to each of the calibration vials in the masses documented in the table below. Fifteen (15) ml of Ultima Gold LLT liquid scintillation cocktail was added to each vial. The vials were capped and shaken gently to mix the contents. The caps were carefully removed, and varying volumes of nitromethane were added to the calibration vials in the quantities documented in the table. The calibration sources were capped and shaken to mix, wiped clean with methanol and DI water. A label was attached to the outside of each vial to be consistent with the sample vials.

The samples were counted on each of Pace's 2 liquid scintillation counters, and calculations were performed to determine the ratio of detector Ni-63 efficiency versus quench number (TSIE) for each detector system.

Cal Source ID	Mass (g) of Ni-63 Standard 81012-493	Volume of Nitromethane Added (uL)
Ni63-20120719-N1	0.1019	0
Ni63-20120719-N2	0.0995	10
Ni63-20120719-N3	0.0998	20
Ni63-20120719-N4	0.1040	30
Ni63-20120719-N5	0.1014	40
Ni63-20120719-N6	0.1015	50
Ni63-20120719-N7	0.2060	60
Ni63-20120719-N8	0.2034	70
Ni63-20120719-N9	0.2044	80
Ni63-20120719-N10	0.2036	90

7/20/12
7/20/12

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

81012-493

Ni-63 5 mL Liquid in Flame Sealed Vial

Customer: Pace Analytical Services, Inc.
P.O. No.: PI-12089, Item 18

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France. The master solution was calibrated by liquid scintillation counting. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Ni-63	3.656E+04	3.456E+03	0.2	1.5	3.0	11/05/2009

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities < 0.1 %. 4.99626 g 0.1M HCl solution with approximately 30 µg/g Ni carrier.

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

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

Date: 11-6-09

ACCREDITED SOURCE CALIBRATION LABORATORY
HEALTH PHYSICS SOCIETY
FOUNDED 1956

Nickel-63 Efficiency Quench Curve Calibration

Analyst:	JLK
Calibration Date:	7/20/2012
Ni-63 Standard:	81012-493
Standard Bq on Reference Date	3456
Standard Total Mass (g)	4.99626
System ID:	System #2
Background:	7.83

Detector System Settings

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

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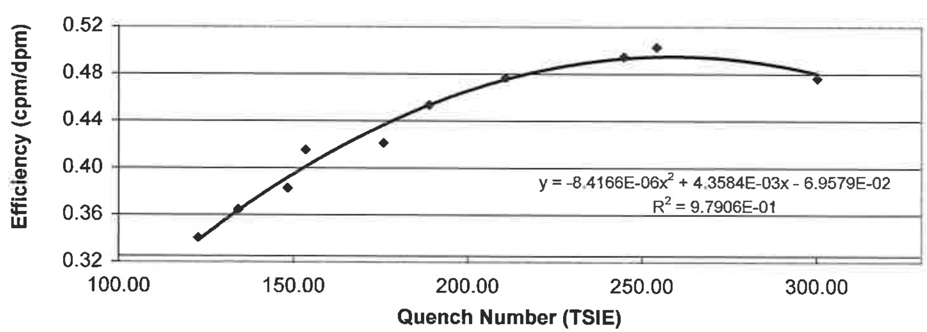
Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Decay Corrected Standard dpm/g	Standard Source dpm	Region 1-160 Ni-63 ROI Standard Source cpm	Source Ct. time (min)	Source Net Counts	TSIE	Region 1-160 Ni-63 Source Efficiency (cpm/dpm)	Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
Ni-63 20120719-N1	0.1019	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4228.94	2020.85	6.00	12078.12	300.10	0.4760	0.4804	0.92%	Yes
Ni-63 20120719-N2	0.0995	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4129.34	2082.61	6.00	12448.68	254.20	0.5024	0.4945	-1.59%	Yes
Ni-63 20120719-N3	0.0998	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4141.79	2055.91	6.00	12288.48	244.90	0.4945	0.4930	-0.30%	Yes
Ni-63 20120719-N4	0.1040	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4316.10	2065.34	6.00	12345.06	210.90	0.4767	0.4752	-0.31%	Yes
Ni-63 20120719-N5	0.1014	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4208.19	1915.89	6.00	11448.36	188.90	0.4534	0.4534	-0.01%	Yes
Ni-63 20120719-N6	0.1015	11/5/2009	7/20/2012	988.38	0.99995	41500.9	4212.34	1781.94	7.00	12418.77	175.80	0.4212	0.4365	3.64%	Yes
Ni-63 20120719-N7	0.2060	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8549.19	3557.22	3.00	10648.17	153.50	0.4152	0.4011	-3.38%	Yes
Ni-63 20120719-N8	0.2034	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8441.29	3239.40	4.00	12926.28	148.30	0.3828	0.3917	2.31%	Yes
Ni-63 20120719-N9	0.2044	11/5/2009	7/20/2012	988.38	0.99995	41500.9	8482.79	3100.91	4.00	12372.32	134.20	0.3646	0.3637	-0.24%	Yes
Ni-63 20120719-N10	0.2036	11/5/2009	7/20/2012	988.42	0.99995	41500.9	8449.59	2889.22	4.00	11525.56	122.70	0.3410	0.3385	-0.74%	Yes

Pace Analytical™

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



C	-8.4166E-06
D	4.3584E-03
E	-6.9579E-02

Jn 7/20/12
Om 7/20/12

Printed 7/20/2012 at 11:26 AM

Ni63 quench cal 20120719 SYS2
P:\QA Folders\Calibrations\Ni59 and Ni63 Cals\Ni63 quench cal 20120719 SYS2

Assay Definition-

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

Assay Type: CPM
Report Name: H3report
Output Data Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E
Raw Results Path: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\20120720_0859.results
RTF File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\H3cpm.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\SWIPE_H-3_C-14_E\12482.txt
Assay File Name: C:\Packard\TriCarb\Assays\SWIPE_H-3_C-14_E.lsa

Count Conditions-

Nuclide: FILTER
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 8.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

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

Regions	LL	UL	2Sigma % Terminator
A	2.0	20.0	0.00
B	2.0	160.0	0.00
C	1.0	160.0	1.80

Count Corrections-

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

Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

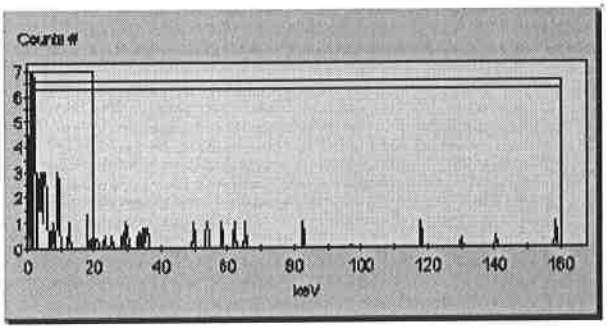
Instrument Block Data
Machine=2900
Version=1.10
426001
MODEL=2900
VERSION=1.10
SERIAL=426001
IPA Block Data
Software Version IC: 2.11
Software Version EC: 1.31
Instrument Model: 2900
Instrument Serial Number: 426001
3H Chi Square: 15.92 Date Processed: 7/19/12 11:40:58 AM

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

Cycle 1 Results

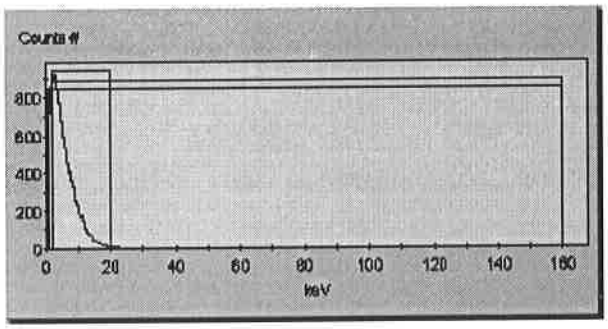
S#	PID	SMPL_ID TIME	C.T. LUM	DATE	CPMA	tSIE	CPMB	CPMC	MESSAGES
			BKG 8	7/20/12	4.34	317.6	6.45	7.83	
1	5	8:59:56 AM	8						

SpectraView Block Data



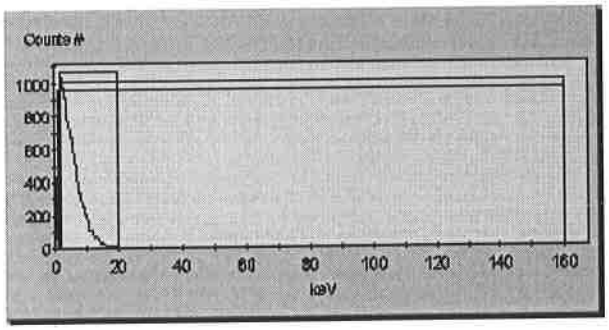
		NI63-20120719-N1	6	7/20/12	1763.93	300.1	1771.83	2020.85	
2	5	9:08:46 AM	0						

SpectraView Block Data



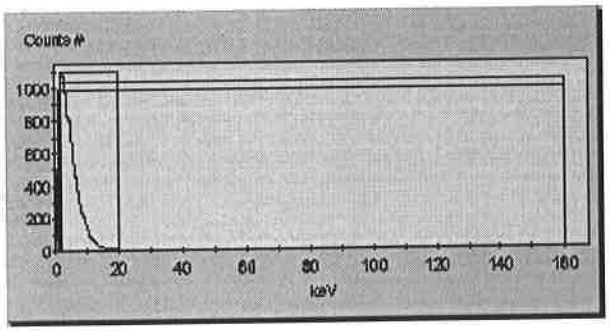
		NI63-20120179-N2	6	7/20/12	1813.72	254.2	1818.36	2082.61	
3	5	9:15:40 AM	0						

SpectraView Block Data



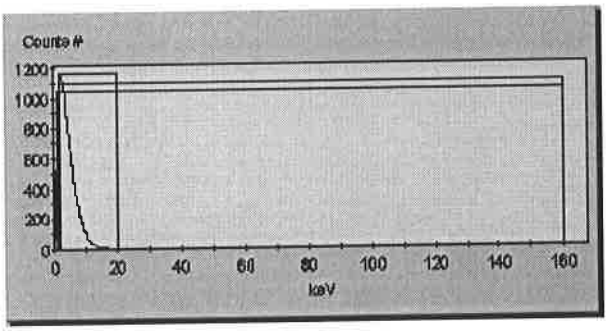
NI63-20120719-N3 6 7/20/12 1748.50 244.9 1754.08 2055.91
4 5 9:22:22 AM 0

SpectraView Block Data



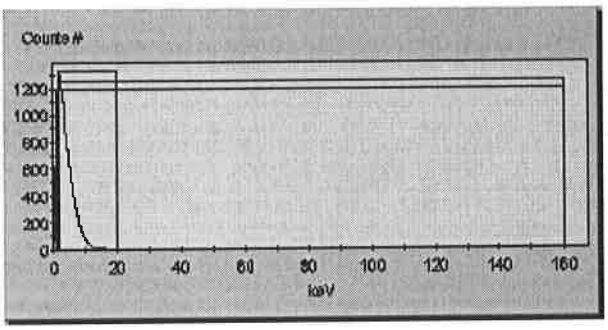
NI63-20120719-N4 6 7/20/12 1753.03 210.9 1756.32 2065.34
5 5 9:29:11 AM 0

SpectraView Block Data



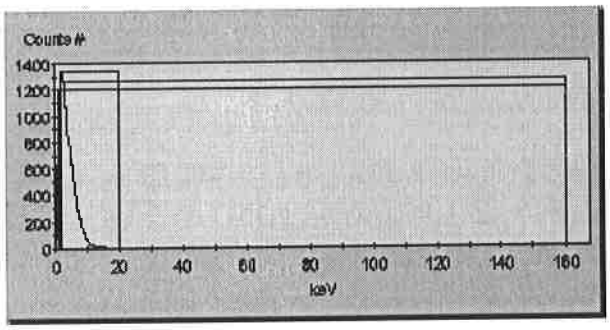
NI63-20120719-N5 6 7/20/12 1573.37 188.9 1575.74 1915.89
6 5 9:35:58 AM 0

SpectraView Block Data



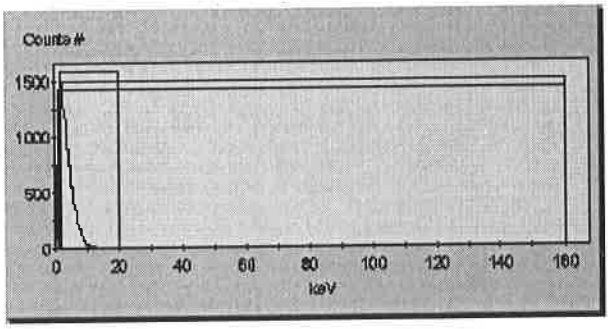
NI63-20120719-N6 7 7/20/12 1456.33 175.8 1458.71 1781.94
7 5 9:43:13 AM 0

SpectraView Block Data



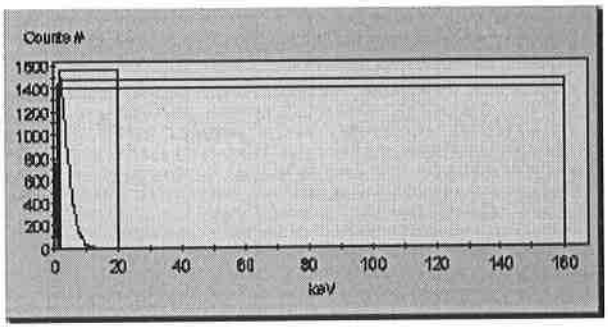
NI63-20120719-N7 3 7/20/12 2818.32 153.5 2821.87 3557.22
8 5 9:50:58 AM 0

SpectraView Block Data



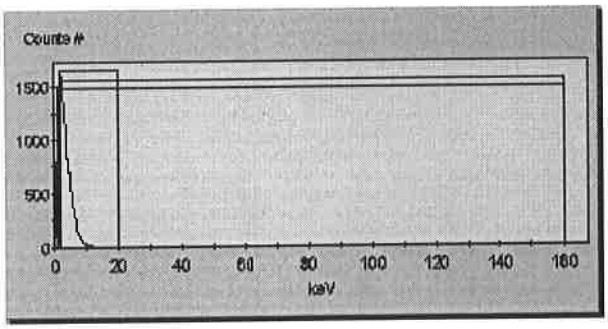
NI63-20120719-N8 4 7/20/12 2526.96 148.3 2529.45 3239.40
9 5 9:55:12 AM 0

SpectraView Block Data



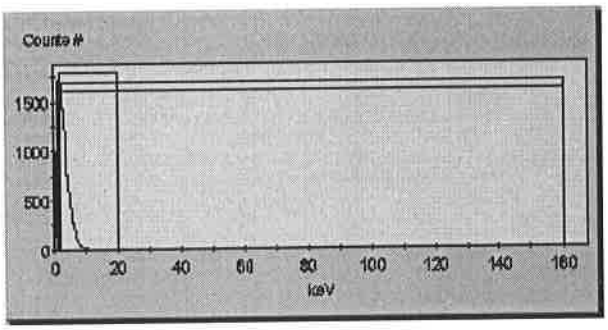
NI63-20120719-N9 4 7/20/12 2389.66 134.2 2392.64 3100.91
10 5 9:59:47 AM 0

SpectraView Block Data



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

SpectraView Block Data



Pace Analytical

Pace Analytical Services, Inc.-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
3KG	N Cal	Supe H3/C14	5	1	7/20/12 0845	8	7/20/12 0900	
N1 6320120719 N1								
N2								
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
3072 158038		Supe H3/C14	12	8	7/20/12 0945	12	NA	
39								
40								
LCS								
LCSD								
BKG								

Run comments: _____

Peer Review: _____

Nickel-63 Efficiency Quench Curve Calibration

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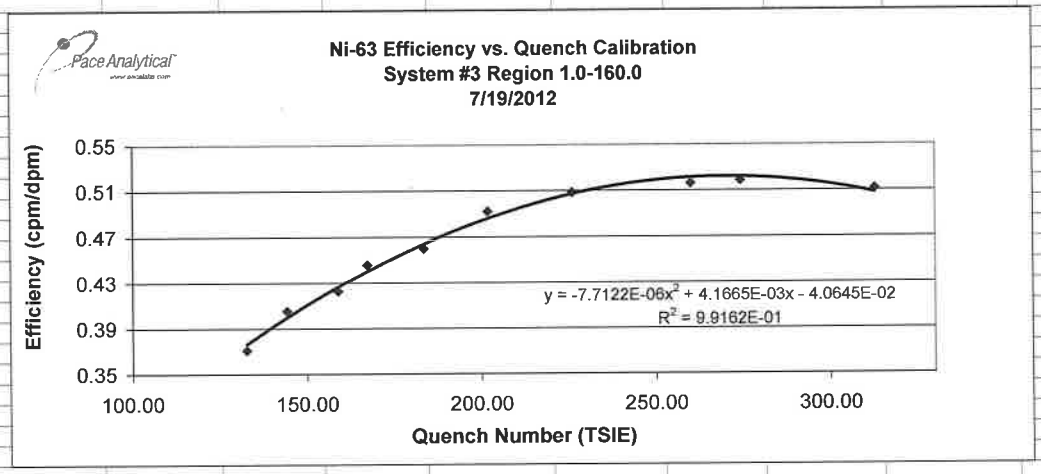
Analyst:	JLK	Detector System Settings	
Calibration Date:	7/19/2012	Count Mode:	Low Level
Ni-63 Standard:	81012-493	Background Subtract:	Off
Standard Bq on Reference Date	3456	Low Level Count Mode:	On
Standard Total Mass (g)	4.99626	Luminescence Correction:	On
System ID:	System #3	Region:	1.0-160.0
Background:	8.00		

Source	Standard Mass	Standard Ref Date	Count Date	Decay Days	Standard Decay Factor	Decay Corrected Standard dpm/g	Standard Source dpm	Region 1-160 Ni-63 ROI Standard Source cpm	Source Ct. time (min)	Source Net Counts	TSIE	Region 1-160 Ni-63 Source Efficiency (cpm/dpm)	Calculated Efficiency from Curve	% Diff from Cal	Source Acceptable (<10%)
Ni-63 20120719-N1	0.1019	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4228.94	2170.96	4.58	9906.36	312.86	0.5115	0.5080	-0.68%	Yes
Ni-63 20120719-N2	0.0995	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4129.34	2150.00	4.64	9938.88	274.25	0.5187	0.5220	0.62%	Yes
Ni-63 20120719-N3	0.0998	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4141.79	2146.02	4.65	9941.79	260.02	0.5162	0.5213	0.99%	Yes
Ni-63 20120719-N4	0.1040	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4316.10	2202.43	4.52	9918.82	226.09	0.5084	0.5071	-0.25%	Yes
Ni-63 20120719-N5	0.1014	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4208.19	2079.17	4.80	9941.62	201.84	0.4922	0.4861	-1.23%	Yes
Ni-63 20120719-N6	0.1015	11/5/2009	7/19/2012	987.52	0.99995	41500.9	4212.34	1946.38	5.11	9905.12	183.62	0.4602	0.4644	0.92%	Yes
Ni-63 20120719-N7	0.2060	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8549.19	3821.07	2.61	9952.11	167.31	0.4460	0.4406	-1.22%	Yes
Ni-63 20120719-N8	0.2034	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8441.29	3576.62	2.78	9920.76	158.90	0.4228	0.4267	0.93%	Yes
Ni-63 20120719-N9	0.2044	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8482.79	3445.83	2.88	9900.95	144.19	0.4053	0.3998	-1.35%	Yes
Ni-63 20120719-N10	0.2036	11/5/2009	7/19/2012	987.52	0.99995	41500.9	8449.59	3141.96	3.17	9934.65	132.62	0.3709	0.3763	1.45%	Yes



C	-7.7122E-06
D	4.1665E-03
E	-4.0645E-02

7/7/2012
OK 7/30/12

Protocol #: 1 SWIPE_H3_C14 User :

Time: 7.00
Data Mode: CPM Nuclide: MANUAL
Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	2.0 -	20.0	0	0.0	0.00
Region B:	2.0 -	160	0	2.0	0.00
Region C:	1.0 -	160	0	2.0	0.00

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count

Pace Analytical Services, Inc. LSC Instrument 3
Luminescence Correction On
Low Level Count Mode On

P#	S#	TIME	ELTIME	CPMA	CPMB	CPMC	tSIE	LUM
1	1	7.00	7	4.14	7.86	8.00	325.58	1
1	2	4.58	13	1638.86	2147.60	2170.96	312.86	0
1	3	4.64	18	1581.68	2130.82	2150.00	274.25	0
1	4	4.65	24	1626.88	2127.31	2146.02	260.02	0
1	5	4.52	30	1663.50	2189.38	2202.43	226.09	0
1	6	4.80	35	1585.42	2070.00	2079.17	201.84	0
1	7	5.11	42	1494.52	1941.29	1946.38	183.62	0
1	8	2.61	45	2947.51	3815.33	3821.07	167.31	0
1	9	2.78	49	2737.77	3572.66	3576.62	158.90	0
1	10	2.88	53	2642.01	3442.01	3445.83	144.19	0
1	11	3.17	58	2460.25	3136.59	3141.96	132.62	0

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Pace Analytical Services, Inc.-Pittsburgh

Liquid Scintillation Counter Run Log System 3

Logbook ID: 4-R023-3

REMINDER: Start Daily Checks Prior to Sample Protocol!

Sample No.	Worklist	Protocol Name	Tray Number	Protocol Number	Added to Detector Date& Time	Count time (min)	Actual Count Start Date & Time	Analyst
N163 20120719 N2	N.63Cal	Swipe H3C14	5	1	7/19/12 1330	7	n/a	
N3								
N4								
N5								
N6								
N7								
N8								
N9								
N10								
MB		Swipe H3C14	27	45	7/20/12 0900			
30 72159041								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52			23					
53								
54								

Run comments: _____

Peer Review: _____

Standards

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 • U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

71157A-493

Ni-63 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ni-63
ACTIVITY (dps):	1.061 E4
HALF-LIFE:	100.1 years
CALIBRATION DATE:	April 5, 2005 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.0%

Impurities: γ-impurities <0.1%

5.08501 grams 0.1M HCl solution with 30 µg/g Ni carrier.

P O NUMBER PI-4864, Item 2

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED: 7-22-05

Rcd 8-16-05

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Radioactive Standards Dilution Logbook

09-009 N:63 Spike Solution

Parent source: 09-008
Parent Conc: 12334.51 dpm/g
Ref date: 4/5/2005 12:00 EST

Explication: ND

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

diluted 25.26 g of 09-008 to 250.0 ml w/ 0.1 N HCl on 5/3/2009

0.1 N HCl DL09-0167

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Radioactive Standards Dilution Logbook

09-008 Ni-63 Spike "A" Solution

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

5.0210 g	10610 DPS	60 dps/dpm = 12334.51 dpm/g
5.08501 g	50.9616 g	

diluted 5.0210 g of 71157A-493 to 50.9616 g w/ 0.1 N HCl on 5/3/2009

0.1 N HCl DL09-0167

ANALYTICS
1380 Seaboard Ind Blvd * Atlanta, GA 30318 * USA * 404-352-8677
Ni-63
SRS 71157A-493 Qty 0.29 µCi QA
Date 04/05/05 12:00 EST Exp. XXXXXX
PO # PI-4864, Item 2
5.08501 g 0.1M HCl solution
CAUTION RADIOACTIVE MATERIAL