

## APPENDIX F

### GEL Laboratories LLC 2015 Annual Quality Assurance Report



Laboratories LLC

## **2015 ANNUAL QUALITY ASSURANCE REPORT**

**FOR THE**

**RADIOLOGICAL ENVIRONMENTAL  
MONITORING PROGRAM (REMP)**



Laboratories LLC

P.O. Box 30712, Charleston, SC 29417

2015 ANNUAL QUALITY ASSURANCE REPORT

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# **2015 ANNUAL QUALITY ASSURANCE REPORT**

## **FOR THE**

### **RADIOLOGICAL ENVIRONMENTAL**

### **MONITORING PROGRAM (REMP)**

Approved By:

A handwritten signature in black ink, appearing to read "Robert L. Pullano".

Robert L. Pullano  
Director, Quality Systems

April 4, 2016 Rev.3

Date



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## 2015 ANNUAL QUALITY ASSURANCE REPORT FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

### 1. Introduction

GEL Laboratories, LLC (GEL) is a privately owned environmental laboratory dedicated to providing personalized client services of the highest quality. GEL was established as an analytical testing laboratory in 1981. Now a full service lab, our analytical divisions use state of the art equipment and methods to provide a comprehensive array of organic, inorganic, and radiochemical analyses to meet the needs of our clients.

At GEL, quality is emphasized at every level of personnel throughout the company. Management's ongoing commitment to good professional practice and to the quality of our testing services to our customers is demonstrated by their dedication of personnel and resources to develop, implement, assess, and improve our technical and management operations.

The purpose of GEL's quality assurance program is to establish policies, procedures, and processes to meet or exceed the expectations of our clients. To achieve this, all personnel that support these services to our clients are introduced to the program and policies during their initial orientation, and annually thereafter during company-wide training sessions.

GEL's primary goals are to ensure that all measurement data generated are scientifically and legally defensible, of known and acceptable quality per the data quality objectives (DQOs), and thoroughly documented to provide sound support for environmental decisions. In addition, GEL continues to ensure compliance with all contractual requirements, environmental standards, and regulations established by local, state and federal authorities.

GEL administers the QA program in accordance with the Quality Assurance Plan, GL-QS-B-001. Our Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures necessary to plan, implement, and assess the work we perform. GEL's QA Program establishes a quality management system (QMS) that governs all of the activities of our organization.

This report entails the quality assurance program for the proficiency testing and environmental monitoring aspects of GEL for 2015. GEL's QA Program is designed to monitor the quality of analytical processing associated with environmental, radiobioassay, effluent (10 CFR Part 50), and waste (10 CFR Part 61) sample analysis.

This report covers the category of Radiological Environmental Monitoring Program (REMP) and includes:

- Intra-laboratory QC results analyzed during 2015.
- Inter-laboratory QC results analyzed during 2015 where known values were available.



## 2. Quality Assurance Programs for Inter-laboratory, Intra-laboratory and Third Party Cross-Check

In addition to internal and client audits, our laboratory participates in annual performance evaluation studies conducted by independent providers. We routinely participate in the following types of performance audits:

- Proficiency testing and other inter-laboratory comparisons
- Performance requirements necessary to retain Certifications
- Evaluation of recoveries of certified reference and in-house secondary reference materials using statistical process control data.
- Evaluation of relative percent difference between measurements through SPC data.

We also participate in a number of proficiency testing programs for federal and state agencies and as required by contracts. It is our policy that no proficiency evaluation samples be analyzed in any special manner. Our annual performance evaluation participation generally includes a combination of studies that support the following:

- US Environmental Protection Agency Discharge Monitoring Report, Quality Assurance Program (DMR-QA). Annual national program sponsored by EPA for laboratories engaged in the analysis of samples associated with the NPDES monitoring program. Participation is mandatory for all holders of NPDES permits. The permit holder must analyze for all of the parameters listed on the discharge permit. Parameters include general chemistry, metals, BOD/COD, oil and grease, ammonia, nitrates, etc.
- Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP). A semiannual program developed by DOE in support of DOE contractors performing waste analyses. Participation is required for all laboratories that perform environmental analytical measurements in support of environmental management activities. This program includes radioactive isotopes in water, soil, vegetation and air filters.
- ERA's MRAD-Multimedia Radiochemistry Proficiency test program. This program is for labs seeking certification for radionuclides in wastewater and solid waste. The program is conducted in strict compliance with USEPA National Standards for Water Proficiency study.
- ERA's InterLaB RadChem Proficiency Testing Program for radiological analyses. This program completes the process of replacing the USEPA EMSL-LV Nuclear Radiation Assessment Division program discontinued in 1998. Laboratories seeking certification for radionuclide analysis in drinking water also use the study. This program is conducted in strict compliance with the USEPA National Standards for Water Proficiency Testing Studies. This program encompasses Uranium by EPA method 200.8 (for drinking water certification in Utah/Primary NELAP), gamma emitters, Gross Alpha/Beta, Iodine-131, naturally occurring radioactive isotopes, Strontium-89/90, and Tritium.
- ERA's Water Pollution (WP) biannual program for waste methodologies includes parameters for both organic and inorganic analytes.



- ERA's Water Supply (WS) biannual program for drinking water methodologies includes parameters for organic and inorganic analytes.
- Environmental Cross-Check Program administered by Eckert & Ziegler Analytics, Inc. This program encompasses radionuclides in water, soil, milk, naturally occurring radioactive isotopes in soil and air filters.

GEL procures single-blind performance evaluation samples from Eckert & Ziegler Analytics to verify the analysis of sample matrices processed at GEL. Samples are received on a quarterly basis. GEL's Third-Party Cross-Check Program provides environmental matrices encountered in a typical nuclear utility REMP. The Third-Party Cross-Check Program is intended to meet or exceed the inter-laboratory comparison program requirements discussed in NRC Regulatory Guide 4.15. Once performance evaluation samples have been prepared in accordance with the instructions provided by the PT provider, samples are managed and analyzed in the same manner as environmental samples from GEL's clients.

### 3. Quality Assurance Program for Internal and External Audits

During each annual reporting period, at least one internal assessment of each area of the laboratory is conducted in accordance with the pre-established schedule from Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001. The annual internal audit plan is reviewed for adequacy and includes the scheduled frequency and scope of quality control actions necessary to GEL's QA program. Internal audits are conducted at least annually in accordance with a schedule approved by the Quality Systems Director. Supplier audits are contingent upon the categorization of the supplier, and may or may not be conducted prior to the use of a supplier or subcontractor. Type I suppliers and subcontractors, regardless of how they were initially qualified, are re-evaluated at least once every three years.

In addition, prospective customers audit GEL during pre-contract audits. GEL hosts several external audits each year for both our clients and other programs. These programs include environmental monitoring, waste characterization, and radiobioassay. The following list of programs may audit GEL at least annually or up to every three years depending on the program.

- NELAC, National Environmental Laboratory Accreditation Program
- DOE CAP, U.S. Department of Energy Consolidated Audit Program
- DOE LAP, U.S. Department of Energy Laboratory Accreditation Program
- DOE QSAS, U.S. Department of Energy, Quality Systems for Analytical Services
- ISO/IEC 17025:2005
- A2LA, American Association for Laboratory Accreditation
- DOD ELAP, US Department of Defense Environmental Accreditation Program
- NUPIC, Nuclear Procurement Issues Committee
- South Carolina Department of Health and Environmental Control (SC DHEC)

The annual radiochemistry laboratory internal audit (15-RAD-001) was conducted in May, 2015. One (1) finding, three (3) observations, and one (1) recommendation resulted from this assessment. By July, 2015, the finding was closed and appropriate laboratory staff addressed each observation and recommendation.



#### **4. Performance Evaluation Acceptance Criteria for Environmental Sample Analysis**

GEL utilized an acceptance protocol based upon two performance models. For those inter-laboratory programs that already have established performance criteria for bias (i.e., MAPEP, and ERA/ELAP), GEL will utilize the criteria for the specific program. For intra-laboratory or third party quality control programs that do not have a specific acceptance criteria (i.e. the Eckert-Ziegler Analytics Environmental Cross-check Program), results will be evaluated in accordance with GEL's internal acceptance criteria.

#### **5. Performance Evaluation Samples**

Performance Evaluation (PE) results and internal quality control sample results are evaluated in accordance with GEL acceptance criteria. The first criterion concerns bias, which is defined as the deviation of any one result from the known value. The second criterion concerns precision, which deals with the ability of the measurement to be replicated by comparison of an individual result with the mean of all results for a given sample set.

At GEL, we also evaluate our analytical performance on a regular basis through statistical process control (SPC) acceptance criteria. Where feasible, this criterion is applied to both measures of precision and accuracy and is specific to sample matrix. We establish environmental process control limits at least annually.

For Radiochemistry analysis, quality control evaluation is based on static limits rather than those that are statistically derived. Our current process control limits are maintained in GEL's AlphaLIMS. We also measure precision with matrix duplicates and/or matrix spike duplicates. The upper and lower control limits (UCL and LCL respectively) for precision are plus or minus three times the standard deviation from the mean of a series of relative percent differences. The static precision criteria for radiochemical analyses are 0 - 20%, for activity levels exceeding the contract required detection limit (CRDL).

#### **6. Quality Control Program for Environmental Sample Analysis**

GEL's internal QA Program is designed to include QC functions such as instrumentation calibration checks (to insure proper instrument response), blank samples, instrumentation backgrounds, duplicates, as well as overall staff qualification analyses and statistical process controls. Both quality control and qualification analyses samples are used to be as similar as the matrix type of those samples submitted for analysis by the various laboratory clients. These performance test samples (or performance evaluation samples) are either actual sample submitted in duplicate in order to evaluate the precision of laboratory measurements, or fortified blank samples, which have been given a known quantity of a radioisotope that is in the interest to GEL's clients.

Accuracy (or Bias) is measured through laboratory control samples and/or matrix spikes, as well as surrogates and internal standards. The UCLs and LCLs for accuracy are plus or minus three times the standard deviation from the mean of a series of recoveries. The static limit for most radiochemical analyses is 75 - 125%. Specific instructions for out-of-control situations are provided in the applicable analytical SOP.

GEL's Laboratory Control Standard (LCS) is an aliquot of reagent water or other blank matrix to which known quantities of the method analytes are added in the laboratory. The LCS is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate and precise measurements. Some methods may refer to these



samples as Laboratory Fortified Blanks (LFB). The requirement for recovery is between 75 and 125% for radiological analyses excluding drinking water matrix.

$$\text{Bias (\%)} = \frac{(\text{observed concentration})}{(\text{known concentration})} * 100 \%$$

Precision is a data quality indicator of the agreement between measurements of the same property, obtained under similar conditions, and how well they conform to themselves. Precision is usually expressed as standard deviation, variance or range in either absolute or relative (percentage) terms.

GEL's laboratory duplicate (DUP or LCSD) is an aliquot of a sample taken from the same container and processed in the same manner under identical laboratory conditions. The aliquot is analyzed independently from the parent sample and the results are compared to measure precision and accuracy.

If a sample duplicate is analyzed, it will be reported as Relative Percent Difference (RPD). The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

$$\text{Difference (\%)} = \frac{(\text{high duplicate result} - \text{low duplicate result})}{(\text{average of results})} * 100 \%$$

## 7. Summary of Data Results

During 2015, forty-four (44) radioisotopes associated with seven (7) matrix types were analyzed under GEL's Performance Evaluation program in participation with ERA, MAPEP, and Eckert/ & Ziegler Analytics. Matrix types were representative of client analyses performed during 2015. Of the four hundred eighty-four (484) total results reported, 98.8% (478 of 484) were found to be acceptable within the PT providers three sigma or other statistical criteria. The list below contains the type of matrix evaluated by GEL.

- Air Filter
- Cartridge
- Water
- Milk
- Soil
- Liquid
- Vegetation

Graphs are provided in Figures 1-9 of this report to allow for the evaluation of trends or biases. These graphs include radioisotopes Cobalt-60, Cesium-137, Tritium, Strontium-90, Gross Alpha, Gross Beta, Iodine-131, Americium-241, and Plutonium-238.



## **8. Summary of Participation in the Eckert & Ziegler Analytics Environmental Cross-Check Program**

Eckert & Ziegler Analytics provided samples for one hundred fifteen (115) individual environmental analyses. The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. is measured by the ratio of GEL's result to the known value. All results fell within GEL's acceptance criteria (100%).

## **9. Summary of Participation in the MAPEP Monitoring Program**

MAPEP Series 32 and 33 were analyzed by the laboratory. Of the one hundred thirty-five (135) analyses, 100% (135 out of 135) of all results fell within the PT provider's acceptance criteria at the three-sigma specification.

## **10. Summary of Participation in the ERA MRaD PT Program**

The ERA MRaD program provided samples (MRAD-22 and MRAD-23) for one hundred eighty-six (186) individual environmental analyses. One hundred eighty-five (185) of the 186 analyses fell within the PT provider's acceptance criteria (99.5%). One analytical failure occurred: Total Uranium in vegetation.

For the corrective actions associated with MRAD-22, refer to CARR150519-954 which are detailed in Table 8.

## **11. Summary of Participation in the ERA PT Program**

The ERA program provided samples (RAD-100, RAD-101, and RAD-102, and RAD-103) for forty-eight (48) individual environmental analyses. Of the 48 analyses, 89.6% (43 out of 48) of all results fell within the PT provider's acceptance criteria. CARR150223-929 documents the unacceptable result of Cs-137 and Rad-228, CARR150610-962 documents the unacceptable result of Iodine-131, CARR150825-971 documents the unacceptable result of Sr-89 and CARR151130-993 documents the unacceptable result for Sr-90. All corrective actions are provided in Table 8.

## **12. Corrective Action Request and Report (CARR)**

There are two categories of corrective action at GEL. One is corrective action implemented at the analytical and data review level in accordance with the analytical SOP. The other is formal corrective action documented by the Quality Systems Team in accordance with GL-QS-E-002. A formal corrective action is initiated when a nonconformance reoccurs or is so significant that permanent elimination or prevention of the problem is required. Formal corrective action investigations include root cause analysis.

GEL includes quality requirements in most analytical standard operating procedures to ensure that data are reported only if the quality control criteria are met or the quality control measures that did not meet the acceptance criteria are documented. A formal corrective action is implemented according to GL-QS-E-002 for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement. Recording and documentation is performed following guidelines stated in GL-QS-E-012 for Client NCR Database Operation.

Any employee at GEL can identify and report a nonconformance and request that corrective action be taken. Any GEL employee can participate on a corrective action team as requested by the QS team or



Group Leaders. The steps for conducting corrective action are detailed in GL-QS-E-002. In the event that correctness or validity of the laboratory's test results in doubt, the laboratory will take corrective action. If investigations show that the results have been impacted, affected clients will be informed of the issue in writing within five (5) calendar days of the discovery.

Table 8 provides the status of CARRs for radiological performance testing during 2015. **It has been determined that causes of the failures did not impact any data reported to our clients.**





### 13. References

1. GEL Quality Assurance Plan, GL-QS-B-001
2. GEL Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001
3. GEL Standard Operating Procedure for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement, GL-QS-E-002
4. GEL Standard Operating Procedure for AlphaLIMS Documentation of Nonconformance Reporting and Dispositioning and Control of Nonconforming Items, GL-QS-E-004
5. GEL Standard Operating Procedure for Handling Proficiency Evaluation Samples, GL-QS-E-013
6. GEL Standard Operating Procedure for Quality Assurance Measurement Calculations and Processes, GL-QS-E-014
7. 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants
8. ISO/IEC 17025-2005, General Requirements for the Competence of Testing and Calibration Laboratories
9. ANSI/ASQC E4-1994, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs, American National Standard
10. 2003 NELAC Standard, National Environmental Laboratory Accreditation Program
11. 2009 TNI Standard, The NELAC Institute, National Environmental Accreditation Program
12. MARLAP, Multi-Agency Radiological Laboratory Analytical Protocols
13. 10 CFR Part 21, Reporting of Defects and Noncompliance
14. 10 CFR Part 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
15. 10 CFR Part 61, Licensing Requirements for Land Disposal and Radioactive Waste
16. NRC REG Guide 4.15 and NRC REG Guide 4.8

**TABLE 1**  
**2015 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA**

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	4th/2014	03/10/15	E11057	Cartridge	pCi	Iodine-131	8.70E+01	9.89E+01	0.88	Acceptable
EZA	4th/2014	03/10/15	E11058	Milk	pCi/L	Strontium-89	9.09E+01	9.57E+01	0.95	Acceptable
EZA	4th/2014	03/10/15	E11058	Milk	pCi/L	Strontium-90	1.39E+01	1.56E+01	0.89	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Iodine-131	9.34E+01	9.51E+01	0.98	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cerium-141	2.33E+02	2.19E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cr-51	4.22E+02	4.06E+02	1.04	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cesium-134	1.50E+02	1.64E+02	0.91	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cesium-137	2.16E+02	1.98E+02	1.09	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cobalt-58	1.32E+02	1.30E+02	1.02	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Mn-54	2.39E+02	2.25E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Iron-59	1.80E+02	1.75E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Zinc-65	3.32E+02	2.97E+02	1.12	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cobalt-60	2.49E+02	2.35E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Iodine-131	1.11E+02	9.53E+01	1.16	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cerium-141	3.02E+02	2.84E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cr-51	5.43E+02	5.26E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cesium-134	1.90E+02	2.13E+02	0.89	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cesium-137	2.58E+02	2.57E+02	1.01	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cobalt-58	1.73E+02	1.68E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Mn-54	3.06E+02	2.92E+02	1.05	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Iron-59	2.51E+02	2.26E+02	1.11	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Zinc-65	4.20E+02	3.84E+02	1.09	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cobalt-60	3.24E+02	3.04E+02	1.06	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Barium-133	73.2	67.6	56.4-74.4	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cesium-134	51.9	51.3	41.3-56.4	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cesium-137	142	124	112-139	Not Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cobalt-60	62.7	62.4	56.2-71.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Zinc-65	107	98.7	88.8-118	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	67.2	62.3	32.6-77.3	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Beta	43.2	48.9	33.1-56.0	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	66.7	62.3	32.6-77.3	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.1	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.9	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.8	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	4.50	5.12	3.07-6.85	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	7.40	5.12	3.07-6.85	Not Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.0	10.6	8.27-12.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	16.4	15.5	12.1-17.9	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.3	10.6	8.27-12.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	17.1	15.5	12.1-17.9	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Tritium	10000	10600	9220-11700	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	47.3	52.1	41.2-59.6	Acceptable



PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	26.7	32.4	23.7-37.5	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	54.6	52.1	41.2-59.6	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	24.6	32.4	23.7-37.5	Acceptable
EZA	1st/2015	05/21/15	E11174	Cartridge	pCi	Iodine-131	8.01E+01	7.74E+01	1.03	Acceptable
EZA	1st/2015	05/21/15	E11175	Milk	pCi/L	Strontium-89	9.75E+01	1.05E+02	0.93	Acceptable
EZA	1st/2015	05/21/15	E11175	Milk	pCi/L	Strontium-90	1.10E+01	1.44E+01	0.77	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Iodine-131	9.60E+01	9.75E+01	0.98	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cerium-141	2.13E+02	2.11E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Chromium-51	5.88E+02	5.55E+02	1.06	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cesium-134	1.71E+02	1.91E+02	0.9	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cesium-137	2.59E+02	2.53E+02	1.02	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cobalt-58	2.64E+02	2.72E+02	0.97	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Manganese-54	2.43E+02	2.40E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Iron-59	3.14E+02	2.95E+02	1.06	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Zinc-65	4.67E+02	4.53E+02	1.03	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cobalt-60	4.81E+02	4.98E+02	0.97	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Iodine-131	9.92E+01	9.67E+01	1.03	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cerium-141	1.40E+02	1.39E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Chromium-51	3.95E+02	3.66E+02	1.08	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cesium-134	1.12E+02	1.26E+02	0.89	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cesium-137	1.69E+02	1.67E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cobalt-58	1.78E+02	1.80E+02	0.99	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Manganese-54	1.66E+02	1.59E+02	1.05	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Iron-59	2.14E+02	1.95E+02	1.10	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Zinc-65	3.25E+02	2.99E+02	1.09	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cobalt-60	3.23E+02	3.28E+02	0.98	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- GrF32	Filter	Bq/sample	Gross Alpha	1.520	1.770	0.53-3.01	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- GrF32	Filter	Bq/sample	Gross Beta	0.844	0.750	0.38-1.13	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Americium-241	114.0	97.0	68-126	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15 MaS32	Soil	Bq/Kg	Cesium-134	639	678	475-881	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Cesium-137	-0.279		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Cobalt-57	0.369		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Cobalt-60	852	817	572-1062	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Iron-55	330	205	Sens. Eval.	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Manganese-54	1280	1198	839-1557	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Nickel-63	481	448	314-582	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Plutonium-238	80.3	83.9	58.7-109.1	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Plutonium-239/240	69.1	70.8	49.6-92.0	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Potassium-40	684	622	435-809	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Strontium-90	601	653	457-849	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Technetium-99	694	867	607-1127	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	U-234/233	58	53	36.8-68.3	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Uranium-238	204	201	141-261	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- MaS32	Soil	Bq/Kg	Zinc-65	1190.0	1064	745-1383	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Americium-241	0.657	0.654	0.458-0.850	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Cesium-134	20.80	23.5	16.5-30.6	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Cesium-137	19.7	19.1	13.4-24.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Cobalt-57	30	29.9	20.9-38.9	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Cobalt-60	0.0		False Pos Test	Acceptable



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MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Hydrogen-3	633	563	394-732	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Iron-55	8.81	6.88	4.82-8.94	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Manganese-54	0.314		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Nickel-63	0.350		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Plutonium-238	0.0103	0.0089	Sens. Eval.	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Plutonium-239/240	0.770	0.832	0.582-1.082	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Potassium-40	0.159		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Strontium-90	8.49	9.48	6.64-12.32	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Technetium-99	2.90	3.18	2.23-4.13	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Uranium-234/233	0.146	0.148	0.104-0.192	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Uranium-238	0.918	0.970	0.68-1.26	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaW32	Water	Bq/L	Zinc-65	19.600	18.30	12.8-23.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Gross Alpha	1.050	1.066	0.320-1.812	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Gross Beta	3.220	2.79	1.40-4.19	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-235	0.014	0.015	0.0103-0.0191	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-238	7.65	7.96	5.57-10.35	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-Total	7.96	8.0	5.58-10.36	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Americium-241	0.0657	0.068	0.0477-0.0885	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-134	1.0600	1.15	0.81-1.50	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-137	0.0166		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-57	1.590	1.51	1.06-1.96	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-60	0.016		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Manganese-54	0.998	1.02	0.71-1.33	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-238	0.00005		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-239/240	0.0788	0.0847	0.0593-0.1101	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Strontium-90	-0.025		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-234/233	0.017	0.0155	0.0109-0.0202	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-238	0.0958	0.099	0.069-0.129	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Zinc-65	0.867	0.83	0.58-1.08	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Americium-241	0.116	0.11	0.076-0.140	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-134	6.44	7.32	5.12-9.52	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-137	9.30	9.18	6.43-11.93	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-57	0.037		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-60	5.680	5.55	3.89-7.22	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Manganese-54	0.009		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-238	0.084	0.085	0.060-0.111	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-239/240	0.0898	0.094	0.066-0.122	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Strontium-90	0.852	1.08	0.76-1.40	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-234/233	0.023	0.022	0.0153-0.0283	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-238	0.129	0.128	0.090-0.166	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Zinc-65	-0.0058		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-89	41.7	47.5	33.3-61.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-90	0.749	1.06	0.74-1.38	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-XaW-32	Water	Bq/L	Iodine-129	1.72	1.49	1.04-1.94	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Actinium-228	1090	1250	802-1730	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Americium-241	1410	1500	878-1950	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-212	1090	1780	474-2620	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-214	4340	4430	2670-6380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-134	6020	6390	4180-7680	Acceptable



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ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-137	1540	1490	1140-1920	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cobalt-60	2010	1880	1270-2590	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-212	1200	1230	806-1710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-214	4890	4530	2640-6760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Manganese-54	<49.9	<1000	0-1000	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-238	978	998	600-1380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-239	1240	1210	791-1670	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Potassium-40	10900	10700	7810-14400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Strontium-90	1230	1940	740-3060	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Thorium-234	3840	3890	1230-7320	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Zinc-65	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	3754	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	3565	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	7319	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4040	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4230	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8477	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4480	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4020	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8683	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12000	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12800	11600	6390-14600	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3480	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3090	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6716	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	9370	6280-11900	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Am-241	5130	4340	2650-5770	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-134	2210	2650	1700-3440	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-137	1790	1810	1310-2520	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cobalt-60	1570	1540	1060-2150	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Curium-244	1370	1360	666-2120	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Manganese-54	<31.1	<300	0-300	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-238	4700	3680	2190-5040	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-239	5120	4180	2570-5760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Potassium-40	33100	30900	22300-43400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Strontium-90	5920	6590	3760-8740	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3230	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3340	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6742	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	10000	9370	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	8780	5280	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	8780	6420	4350-7990	Not Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Zinc-65	1250	1090	786-1530	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Americium-241	50.2	49.8	30.7-67.4	Acceptable



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ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-134	951	909	578-1130	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-137	1320	1170	879-1540	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cobalt-60	87.6	79.1	61.2-98.8	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Iron-55	879	836.0	259-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Manganese-54	<6.09	<50	0.00-50.0	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Plutonium-238	57.1	52.1	35.7-68.5	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Plutonium-239	46.0	40.3	29.2-52.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Strontium-90	84.6	96.6	47.2-145	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	34.7	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.5	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	70.9	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	103	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Zinc-65	1190	986	706-1360	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	39.2	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.9	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	75.7	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	105	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	95.5	102	52.9-116	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Alpha	77.2	62.2	20.8-96.6	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Beta	62.7	58.4	36.9-85.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Americium-241	48.5	46.0	31.0-61.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-134	1180	1260	925-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-137	1410	1360	1150-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cobalt-60	1280	1250	1090-1460	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Iron-55	1080	1070	638-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Manganese-54	<5.41	<100	0.00-100	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-238	81.0	72.4	53.6-90.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-239	205	184	143-232	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Strontium-90	865	912	594-1210	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	68.5	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	71.8	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	140	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	214	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Zinc-65	1310	1180	984-1490	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	60.7	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	58.0	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	121	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	174	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	64.1	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	60.4	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	127	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	181	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	176	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Alpha	128	119	42.2-184	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Beta	155.0	158.0	90.5-234	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Tritium	10600	10300	6900-14700	Acceptable



PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/26/15	RAD-101	Water	pCi/L	Iodine-131	18.2	23.8	19.7-28.3	Not Acceptable
ERA	2nd/2015	05/26/15	MRAD-22	Water	pCi/L	Iodine-131	23.5	23.8	19.7-28.3	Acceptable
EZA	2nd/2015	08/06/15	E11216	Cartridge	pCi	Iodine-131	8.92E+01	8.01E+01	1.11	Acceptable
EZA	2nd/2015	08/06/15	E11217	Milk	pCi/L	Strontium-89	9.13E+01	9.26E+01	1.11	Acceptable
EZA	2nd/2015	08/06/15	E11217	Milk	pCi/L	Strontium-90	1.16E+01	1.27E+01	0.91	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Iodine-131	1.05E+02	9.59E+01	1.10	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cerium-141	2.70E+00	Not Pres.	-	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Chromium-51	2.70E+02	2.76E+02	0.98	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cesium-134	1.46E+02	1.63E+02	0.90	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cesium-137	1.31E+02	1.25E+02	1.05	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cobalt-58	7.18E+01	6.84E+01	1.05	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Manganese-54	1.02E+02	1.01E+02	1.01	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Iron-59	1.51E+02	1.51E+02	1.00	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Zinc-65	2.63E+02	2.48E+02	1.06	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cobalt-60	1.96E+02	1.93E+02	1.02	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Iodine-131	9.53E+01	9.34E+01	1.02	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cerium-141	1.24E-01	Not Pres.	-	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Chromium-51	3.47E+02	2.93E+02	1.18	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cesium-134	1.63E+02	1.73E+02	0.94	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cesium-137	1.34E+02	1.33E+02	1.01	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cobalt-58	7.21E+01	7.26E+01	0.99	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Manganese-54	1.17E+02	1.07E+02	1.10	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Iron-59	1.76E+02	1.61E+02	1.09	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Zinc-65	2.85E+02	2.64E+02	1.08	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cobalt-60	2.10E+02	2.05E+02	1.03	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Barium-133	63.9	64.7	53.9-71.2	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-134	45.2	50.1	40.3-55.1	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-137	90.5	89.9	80.8-101	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cobalt-60	58.7	59.9	53.9-68.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Zinc-65	282	265	238-310	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	37.1	34.5	17.7-44.5	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Beta	26.2	25.1	15.6-33.1	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	35.3	34.5	17.7-44.5	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.9	15.2	11.3-17.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.7	15.2	11.3-17.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.1	15.2	11.3-17.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.31	5.12	3.13-6.95	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.14	5.12	3.13-6.95	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	24.2	24	19.3-27.0	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	37.9	35	28.1-39.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	23.4	24	19.3-27.0	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	34.9	35	28.1-39.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Tritium	14500	15600	13600-17200	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-89	24.1	42.1	32.3-49.2	Not Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-90	27.7	26.8	19.4-31.2	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Iodine-131	24.7	25.7	21.3-30.3	Acceptable
EZA	3rd/2015	11/15/15	E11310	Cartridge	pCi	Iodine-131	8.21E+01	8.15E+01	1.01	Acceptable



PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	3rd/2015	11/15/15	E11311	Milk	pCi/L	Strontium-89	8.79E+01	9.91E+01	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11311	Milk	pCi/L	Strontium-90	1.07E+01	1.64E+01	0.65	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Iodine-131	9.61E+01	9.99E+01	0.96	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cerium-141	2.15E+02	2.13E+02	1.01	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Chromium-51	5.82E+02	5.38E+02	1.08	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cesium-134	1.89E+02	2.12E+02	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cesium-137	2.43E+02	2.55E+02	0.95	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cobalt-58	2.50E+02	2.63E+02	0.95	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Manganese-54	3.02E+02	2.90E+02	1.04	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Iron-59	2.30E+02	2.26E+02	1.02	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Zinc-65	3.62E+02	3.53E+02	1.02	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cobalt-60	3.42E+02	3.30E+02	1.04	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Iodine-131	1.00E+02	9.67E+01	1.03	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cerium-141	2.05E+02	1.99E+02	1.03	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Chromium-51	5.42E+02	5.02E+02	1.08	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cesium-134	1.75E+02	1.98E+02	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cesium-137	2.40E+02	2.38E+02	1.01	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cobalt-58	2.45E+02	2.46E+02	1.00	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Manganese-54	2.88E+02	2.71E+02	1.06	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Iron-59	2.31E+02	2.11E+02	1.10	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Zinc-65	3.75E+02	3.30E+02	1.14	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cobalt-60	3.11E+02	3.08E+02	1.01	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Alpha	0.999	0.900	0.27-1.53	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Beta	1.570	1.560	0.78-2.34	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Americium-241	61.7	49.5	34.7-64.4	Warning
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-134	933	1010	707-1313	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-137	861.00	809	566-1052	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-57	1240	1180	826-1534	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-60	2.45	1.30	Sens. Eval.	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Iron-55	557	555	389-722	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Manganese-54	1450	1340	938-1742	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Nickel-63	625	682	477-887	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-238	100.00	97.50	68.3-126.8	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-239/240	76.7	80.4	56.3-104.5	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Potassium-40	687	599	419-779	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Strontium-90	403	425	298-553	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Technetium-99	639	631	442-820	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	U-234/233	59	56	39-73	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Uranium-238	208	220	154-286	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Zinc-65	761.0	662	463-861	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Americium-241	1.030	1.055	0.739-1.372	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cesium-134	21.20	23.1	16.2-30.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cesium-137	0.00355		False Pos Test	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cobalt-57	21	20.8	14.6-27.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cobalt-60	17.5	17.1	12.0-22.2	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Hydrogen-3	212	216	151-281	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Iron-55	12.7	13.1	9.2-17.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Manganese-54	15.9	15.6	10.9-20.3	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Nickel-63	8.7	8.6	5.99-11.12	Acceptable



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MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Plutonium-238	0.607	0.681	0.477-0.885	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Plutonium-239/240	0.843	0.900	0.630-1.170	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Potassium-40	210	214	150-278	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Strontium-90	4.06	4.80	3.36-6.24	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Technetium-99	7.27	7.19	5.03-9.35	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Uranium-234/233	1.130	1.140	0.80-1.48	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Uranium-238	1.180	1.180	0.83-1.53	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Zinc-65	14.7	13.9	9.7-18.1	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrW33	Water	Bq/L	Gross Alpha	0.425	0.429	0.129-0.729	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrW33	Water	Bq/L	Gross Beta	3.59	3.52	1.76-5.28	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	ug/sample	Uranium-235	0.0769	0.086	0.060-0.112	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	ug/sample	Uranium-238	11.2	11.9	8.3-15.5	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	ug/sample	Uranium-Total	11.30	12.0	8.4-15.6	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	ug/sample	Americium-241	0.1550	0.147	0.103-0.191	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Cesium-134	2.2900	2.45	1.72-3.19	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Cesium-137	1.940	1.96	1.37-2.55	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Cobalt-57	2.870	2.74	1.92-3.56	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Cobalt-60	1.800	1.71	1.20-2.22	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Manganese-54	22.200	2.11	1.48-2.74	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Plutonium-238	0.099	0.104	0.073-0.135	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Plutonium-239/240	0.004	0.0025	Sens. Eval.	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Strontium-90	2.090	2.18	1.53-2.83	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Uranium-234/233	0.153	0.143	0.100-0.186	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Uranium-238	0.159	0.148	0.104-0.192	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdF33	Filter	Bq/sample	Zinc-65	1.560	1.32	0.92-1.72	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Americium-241	0.128	0.11	0.076-0.140	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Cesium-134	5.180	5.80	4.06-7.54	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Cesium-137	0.0326		False Pos Test	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Cobalt-57	6.980	6.62	4.63-8.61	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Cobalt-60	4.810	4.56	3.19-5.93	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Manganese-54	7.840	7.68	5.38-9.98	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Plutonium-238	0.000495	0.0007	Sens. Eval.	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Plutonium-239/240	0.0654	0.077	0.054-0.100	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Strontium-90	1.090	1.30	0.91-1.69	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Uranium-234/233	0.192	0.162	0.113-0.211	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Uranium-238	0.192	0.168	0.118-0.218	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-RdV33	Vegetation	Bq/sample	Zinc-65	6.120	5.46	3.82-7.10	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Alpha	0.999	0.900	0.27-1.53	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Beta	1.57	1.56	0.78-2.34	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-SrF-33	Filter	Bq/sample	Strontium-89	3.313	3.98	2.79-5.17	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-SrF-33	Filter	Bq/sample	Strontium-90	0.862	1.05	0.74-1.37	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Actinium-228	1220	1240	795-1720	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Americium-241	667	539	315-700	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-212	1240	1240	330-1820	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-214	1690	2660	1600-3830	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-134	2250	2420	1580-2910	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-137	5400	5120	3920-6590	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cobalt-60	4290	3900	2640-5370	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Lead-212	1290	1240	812-1730	Acceptable



PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Lead-214	2090	2800	1630-4180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Manganese-54	<29.7	<1000	0-1000	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Plutonium-238	934	864	519-1190	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Plutonium-239	982	969	633-1340	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Potassium-40	11700	10600	7740-14200	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Strontium-90	7490	8820	3360-13900	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Thorium-234	3760	3330	1050-6260	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Zinc-65	4610	3620	2880-4810	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-234	2659	3360	2050-4310	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-238	2831	3330	2060-4220	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-Total	5490	6850	3720-9040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8420	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-234	2970	3360	2050-4310	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-238	3010	3330	2060-4220	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-Total	6091	6850	3720-9040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8990	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8470	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Am-241	1780	1590	972-2110	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cesium-134	652	748	481-972	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cesium-137	1140	1230	892-1710	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cobalt-60	1870	1930	1330-2700	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Curium-244	2910	3230	1580-5030	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Manganese-54	<45.2	<300	0-300	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Plutonium-238	4720	3920	2340-5370	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Plutonium-239	2630	2390	1470-3290	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Potassium-40	31200	31000	22400-43500	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Strontium-90	7590	7160	4080-9490	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-234	4280	4010	2640-5150	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-238	4620	3970	2650-5040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-Total	9155	8160	5530-10200	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	ug/kg	Uranium-Total(mass)	13900	11900	3540-6710	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	ug/kg	Uranium-Total(mass)	13100	11900	7970-15100	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Zinc-65	1530	1540	1110-2160	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Americium-241	35.1	36.8	22.7-49.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cesium-134	315	349.0	222-433	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cesium-137	598	613	461-805	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cobalt-60	509	521	403-651	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Iron-55	546	595.0	184-1160	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Manganese-54	<4.53	<50	0.00-50.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Plutonium-238	43.6	42.6	29.2-56.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Plutonium-239	63.6	63.8	46.2-83.4	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Strontium-90	37.1	45.7	22.3-68.5	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	38.4	43.0	26.7-64.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	39.3	42.7	27.6-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	80.1	87.7	48.6-133	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	118	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Zinc-65	727	685	491-946	Acceptable



PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	45.7	43.0	26.7-64.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	43.4	42.7	27.6-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	91.1	87.7	48.6-133	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	130	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	117	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Alpha	98	77.3	25.9-120	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Beta	52.2	41.3	26.1-60.2	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Americium-241	114	113	76.1-152	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-134	702	759	557-872	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-137	622	623	529-747	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cobalt-60	927	896	778-1050	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Iron-55	196	212	126-288	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Manganese-54	<6.14	<100	0.00-100	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-238	117	140	104-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-239	88.5	114	88.5-144	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Strontium-90	505	544	354-719	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	49.2	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	49.7	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	98.9	98.9	72.7-128	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	148	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Zinc-65	786	712	594-898	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	45.8	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	44.4	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	92.8	98.9	72.7-128	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	135.0	144.0	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	49.5	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	43.1	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	95	98.9	72.7-128	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	129	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	135	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Gross Alpha	104.0	136	48.3-211	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Gross Beta	61.6	53.7	30.7-79.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Tritium	20500	21500	14400-30700	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	42	35.7	26.7-42.5	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	26.9	31.1	22.7-36.1	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	41.8	35.7	26.7-42.5	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	22	31.1	22.7-36.1	Not Acceptable
EZA	4th/2015	02/18/16	E11412	Cartridge	pCi	Iodine-131	7.73E+01	7.98E+01	0.97	Acceptable
EZA	4th/2015	02/18/16	E11413	Milk	pCi/L	Strontium-89	9.41E+01	8.68E+01	1.08	Acceptable
EZA	4th/2015	02/18/16	E11413	Milk	pCi/L	Strontium-90	9.74E+00	1.25E+01	0.78	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Iodine-131	1.01E+02	9.12E+01	1.11	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cerium-141	1.36E+02	1.29E+02	1.06	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Chromium-51	2.79E+02	2.81E+02	0.99	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cesium-134	1.45E+02	1.60E+02	0.91	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cesium-137	1.15E+02	1.15E+02	1.00	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cobalt-58	1.06E+02	1.10E+02	0.96	Acceptable



## 2015 ANNUAL QUALITY ASSURANCE REPORT

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Manganese-54	1.53E+02	1.45E+02	1.06	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Iron-59	1.19E+02	1.08E+02	1.10	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Zinc-65	2.69E+02	2.48E+02	1.08	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cobalt-60	2.12E+02	2.13E+02	0.99	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Iodine-131	1.05E+02	9.26E+01	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cerium-141	1.27E+02	1.12E+02	1.14	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Chromium-51	2.60E+02	2.44E+02	1.07	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cesium-134	1.25E+02	1.39E+02	0.90	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cesium-137	1.12E+02	9.95E+01	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cobalt-58	9.73E+01	9.56E+01	1.02	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Manganese-54	1.41E+02	1.26E+02	1.12	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Iron-59	1.11E+02	9.34E+01	1.19	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Zinc-65	2.43E+02	2.15E+02	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cobalt-60	1.92E+02	1.85E+02	1.04	Acceptable



**TABLE 2**  
**2015 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS**

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	4th/2014	03/10/15	E11057	Cartridge	pCi	Iodine-131	8.70E+01	9.89E+01	0.88	Acceptable
EZA	4th/2014	03/10/15	E11058	Milk	pCi/L	Strontium-89	9.09E+01	9.57E+01	0.95	Acceptable
EZA	4th/2014	03/10/15	E11058	Milk	pCi/L	Strontium-90	1.39E+01	1.56E+01	0.89	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Iodine-131	9.34E+01	9.51E+01	0.98	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cerium-141	2.33E+02	2.19E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cr-51	4.22E+02	4.06E+02	1.04	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cesium-134	1.50E+02	1.64E+02	0.91	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cesium-137	2.16E+02	1.98E+02	1.09	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cobalt-58	1.32E+02	1.30E+02	1.02	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Mn-54	2.39E+02	2.25E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Iron-59	1.80E+02	1.75E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Zinc-65	3.32E+02	2.97E+02	1.12	Acceptable
EZA	4th/2014	03/10/15	E11059	Milk	pCi/L	Cobalt-60	2.49E+02	2.35E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Iodine-131	1.11E+02	9.53E+01	1.16	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cerium-141	3.02E+02	2.84E+02	1.06	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cr-51	5.43E+02	5.26E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cesium-134	1.90E+02	2.13E+02	0.89	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cesium-137	2.58E+02	2.57E+02	1.01	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cobalt-58	1.73E+02	1.68E+02	1.03	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Mn-54	3.06E+02	2.92E+02	1.05	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Iron-59	2.51E+02	2.26E+02	1.11	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Zinc-65	4.20E+02	3.84E+02	1.09	Acceptable
EZA	4th/2014	03/10/15	E11060	Water	pCi/L	Cobalt-60	3.24E+02	3.04E+02	1.06	Acceptable
EZA	1st/2015	05/21/15	E11174	Cartridge	pCi	Iodine-131	8.01E+01	7.74E+01	1.03	Acceptable
EZA	1st/2015	05/21/15	E11175	Milk	pCi/L	Strontium-89	9.75E+01	1.05E+02	0.93	Acceptable
EZA	1st/2015	05/21/15	E11175	Milk	pCi/L	Strontium-90	1.10E+01	1.44E+01	0.77	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Iodine-131	9.60E+01	9.75E+01	0.98	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cerium-141	2.13E+02	2.11E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Chromium-51	5.88E+02	5.55E+02	1.06	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cesium-134	1.71E+02	1.91E+02	0.9	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cesium-137	2.59E+02	2.53E+02	1.02	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cobalt-58	2.64E+02	2.72E+02	0.97	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Manganese-54	2.43E+02	2.40E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Iron-59	3.14E+02	2.95E+02	1.06	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Zinc-65	4.67E+02	4.53E+02	1.03	Acceptable
EZA	1st/2015	05/21/15	E11176	Milk	pCi/L	Cobalt-60	4.81E+02	4.98E+02	0.97	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Iodine-131	9.92E+01	9.67E+01	1.03	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cerium-141	1.40E+02	1.39E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Chromium-51	3.95E+02	3.66E+02	1.08	Acceptable



EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cesium-134	1.12E+02	1.26E+02	0.89	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cesium-137	1.69E+02	1.67E+02	1.01	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cobalt-58	1.78E+02	1.80E+02	0.99	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Manganese-54	1.66E+02	1.59E+02	1.05	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Iron-59	2.14E+02	1.95E+02	1.10	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Zinc-65	3.25E+02	2.99E+02	1.09	Acceptable
EZA	1st/2015	05/21/15	E11177	Water	pCi/L	Cobalt-60	3.23E+02	3.28E+02	0.98	Acceptable
EZA	2nd/2015	08/06/15	E11216	Cartridge	pCi	Iodine-131	8.92E+01	8.01E+01	1.11	Acceptable
EZA	2nd/2015	08/06/15	E11217	Milk	pCi/L	Strontium-89	9.13E+01	8.26E+01	1.11	Acceptable
EZA	2nd/2015	08/06/15	E11217	Milk	pCi/L	Strontium-90	1.16E+01	1.27E+01	0.91	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Iodine-131	1.05E+02	9.59E+01	1.10	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cerium-141	2.70E+00	Not Pres.	-	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Chromium-51	2.70E+02	2.76E+02	0.98	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cesium-134	1.46E+02	1.63E+02	0.90	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cesium-137	1.31E+02	1.25E+02	1.05	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cobalt-58	7.18E+01	6.84E+01	1.05	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Manganese-54	1.02E+02	1.01E+02	1.01	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Iron-59	1.51E+02	1.51E+02	1.00	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Zinc-65	2.63E+02	2.48E+02	1.06	Acceptable
EZA	2nd/2015	08/06/15	E11218	Milk	pCi/L	Cobalt-60	1.96E+02	1.93E+02	1.02	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Iodine-131	9.53E+01	9.34E+01	1.02	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cerium-141	1.24E-01	Not Pres.	-	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Chromium-51	3.47E+02	2.93E+02	1.18	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cesium-134	1.63E+02	1.73E+02	0.94	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cesium-137	1.34E+02	1.33E+02	1.01	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cobalt-58	7.21E+01	7.26E+01	0.99	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Manganese-54	1.17E+02	1.07E+02	1.10	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Iron-59	1.76E+02	1.61E+02	1.09	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Zinc-65	2.85E+02	2.64E+02	1.08	Acceptable
EZA	2nd/2015	08/06/15	E11219	Water	pCi/L	Cobalt-60	2.10E+02	2.05E+02	1.03	Acceptable
EZA	3rd/2015	11/15/15	E11310	Cartridge	pCi	Iodine-131	8.21E+01	8.15E+01	1.01	Acceptable
EZA	3rd/2015	11/15/15	E11311	Milk	pCi/L	Strontium-89	8.79E+01	9.91E+01	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11311	Milk	pCi/L	Strontium-90	1.07E+01	1.64E+01	0.65	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Iodine-131	9.61E+01	9.99E+01	0.96	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cerium-141	2.15E+02	2.13E+02	1.01	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Chromium-51	5.82E+02	5.38E+02	1.08	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cesium-134	1.89E+02	2.12E+02	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cesium-137	2.43E+02	2.55E+02	0.95	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cobalt-58	2.50E+02	2.63E+02	0.95	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Manganese-54	3.02E+02	2.90E+02	1.04	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Iron-59	2.30E+02	2.26E+02	1.02	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Zinc-65	3.62E+02	3.53E+02	1.02	Acceptable
EZA	3rd/2015	11/15/15	E11312	Milk	pCi/L	Cobalt-60	3.42E+02	3.30E+02	1.04	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Iodine-131	1.00E+02	9.67E+01	1.03	Acceptable





EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cerium-141	2.05E+02	1.99E+02	1.03	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Chromium-51	5.42E+02	5.02E+02	1.08	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cesium-134	1.75E+02	1.98E+02	0.89	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cesium-137	2.40E+02	2.38E+02	1.01	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cobalt-58	2.45E+02	2.46E+02	1.00	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Manganese-54	2.88E+02	2.71E+02	1.06	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Iron-59	2.31E+02	2.11E+02	1.10	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Zinc-65	3.75E+02	3.30E+02	1.14	Acceptable
EZA	3rd/2015	11/15/15	E11313	Water	pCi/L	Cobalt-60	3.11E+02	3.08E+02	1.01	Acceptable
EZA	4th/2015	02/18/16	E11412	Cartridge	pCi	Iodine-131	7.73E+01	7.98E+01	0.97	Acceptable
EZA	4th/2015	02/18/16	E11413	Milk	pCi/L	Strontium-89	9.41E+01	8.61E+01	1.08	Acceptable
EZA	4th/2015	02/18/16	E11413	Milk	pCi/L	Strontium-90	9.74E+00	1.25E+01	0.78	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Iodine-131	1.01E+02	9.12E+01	1.11	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cerium-141	1.36E+02	1.29E+02	1.06	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Chromium-51	2.79E+02	2.81E+02	0.99	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cesium-134	1.45E+02	1.60E+02	0.91	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cesium-137	1.15E+02	1.15E+02	1.00	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cobalt-58	1.06E+02	1.10E+02	0.96	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Manganese-54	1.53E+02	1.45E+02	1.06	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Iron-59	1.19E+02	1.08E+02	1.10	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Zinc-65	2.69E+02	2.48E+02	1.08	Acceptable
EZA	4th/2015	02/18/16	E11414	Milk	pCi/L	Cobalt-60	2.12E+02	2.13E+02	0.99	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Iodine-131	1.05E+02	9.26E+01	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cerium-141	1.27E+02	1.12E+02	1.14	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Chromium-51	2.60E+02	2.44E+02	1.07	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cesium-134	1.25E+02	1.39E+02	0.90	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cesium-137	1.12E+02	9.95E+01	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cobalt-58	9.73E+01	9.56E+01	1.02	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Manganese-54	1.41E+02	1.26E+02	1.12	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Iron-59	1.11E+02	9.34E+01	1.19	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Zinc-65	2.43E+02	2.15E+02	1.13	Acceptable
EZA	4th/2015	02/18/16	E11415	Water	pCi/L	Cobalt-60	1.92E+02	1.85E+02	1.04	Acceptable





TABLE 3

2015 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM  
(MAPEP) RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2015	06/16/15	MAPEP-15- GrF32	Filter	Bq/sample	Gross Alpha	1.520	1.770	0.53-3.01	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15- GrF32	Filter	Bq/sample	Gross Beta	0.844	0.750	0.38-1.13	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Americium-241	114.0	97.0	68-126	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Cesium-134	639	678	475-881	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Cesium-137	-0.279		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Cobalt-57	0.369		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Cobalt-60	852	817	572-1062	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Iron-55	330	205	Sens. Eval.	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Manganese-54	1280	1198	839-1557	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Nickel-63	481	448	314-582	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Plutonium-238	80.3	83.9	58.7-109.1	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Plutonium-239/240	69.1	70.8	49.6-92.0	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Potassium-40	684	622	435-809	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Strontium-90	601	653	457-849	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Technetium-99	694	867	607-1127	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	U-234/233	58	53	36.8-68.3	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Uranium-238	204	201	141-261	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-MaS32	Soil	Bq/Kg	Zinc-65	1190.0	1064	745-1383	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Americium-241	0.657	0.654	0.458-0.850	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Cesium-134	20.80	23.5	16.5-30.6	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Cesium-137	19.7	19.1	13.4-24.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Cobalt-57	30	29.9	20.9-38.9	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Cobalt-60	0.0		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Hydrogen-3	633	563	394-732	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Iron-55	8.81	6.88	4.82-8.94	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Manganese-54	0.314		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Nickel-63	0.350		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Plutonium-238	0.0103	0.0089	Sens. Eval.	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Plutonium-239/240	0.770	0.832	0.582-1.082	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Potassium-40	0.159		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Strontium-90	8.49	9.48	6.64-12.32	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Technetium-99	2.90	3.18	2.23-4.13	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Uranium-234/233	0.146	0.148	0.104-0.192	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Uranium-238	0.918	0.970	0.68-1.26	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Zinc-65	19.600	18.30	12.8-23.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Gross Alpha	1.050	1.066	0.320-1.812	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-GrW32	Water	Bq/L	Gross Beta	3.220	2.79	1.40-4.19	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-235	0.014	0.015	0.0103-0.0191	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-238	7.65	7.96	5.57-10.35	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Uranium-Total	7.96	8.0	5.58-10.36	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	ug/sample	Americium-241	0.0657	0.068	0.0477-0.0885	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-134	1.0600	1.15	0.81-1.50	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-137	0.0166		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-57	1.590	1.51	1.06-1.96	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-60	0.016		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Manganese-54	0.998	1.02	0.71-1.33	Acceptable





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MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-238	0.00005		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-239/240	0.0788	0.0847	0.0593-0.1101	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Strontium-90	-0.025		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-234/233	0.017	0.0155	0.0109-0.0202	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-238	0.0958	0.099	0.069-0.129	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdF32	Filter	Bq/sample	Zinc-65	0.867	0.83	0.58-1.08	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Americium-241	0.116	0.11	0.076-0.140	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-134	6.44	7.32	5.12-9.52	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-137	9.30	9.18	6.43-11.93	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-57	0.037		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-60	5.680	5.55	3.89-7.22	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Manganese-54	0.009		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-238	0.084	0.085	0.060-0.111	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-239/240	0.0898	0.094	0.066-0.122	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Strontium-90	0.852	1.08	0.76-1.40	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-234/233	0.023	0.022	0.0153-0.0283	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-238	0.129	0.128	0.090-0.166	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-RdV32	Vegetation	Bq/sample	Zinc-65	-0.0058		False Pos Test	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-89	41.7	47.5	33.3-61.8	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-90	0.749	1.06	0.74-1.38	Acceptable
MAPEP	2nd/2015	06/16/15	MAPEP-15-XaW-32	Water	Bq/L	Iodine-129	1.72	1.49	1.04-1.94	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Alpha	0.999	0.900	0.27-1.53	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GrF33	Filter	Bq/sample	Gross Beta	1.570	1.560	0.78-2.34	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Americium-241	61.7	49.5	34.7-64.4	Warning
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-134	933	1010	707-1313	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-137	861.00	809	566-1052	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-57	1240	1180	826-1534	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-60	2.45	1.30	Sens. Eval.	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Iron-55	557	555	389-722	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Manganese-54	1450	1340	938-1742	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Nickel-63	625	682	477-887	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-238	100.00	97.50	68.3-126.8	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-239/240	76.7	80.4	56.3-104.5	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Potassium-40	687	599	419-779	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Strontium-90	403	425	298-553	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Technetium-99	639	631	442-820	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	U-234/233	59	56	39-73	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Uranium-238	208	220	154-286	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaS33	Soil	Bq/Kg	Zinc-65	761.0	662	463-861	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Americium-241	1.030	1.055	0.739-1.372	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cesium-134	21.20	23.1	16.2-30.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cesium-137	0.00355		False Pos Test	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cobalt-57	21	20.8	14.6-27.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Cobalt-60	17.5	17.1	12.0-22.2	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Hydrogen-3	212	216	151-281	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Iron-55	12.7	13.1	9.2-17.0	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Manganese-54	15.9	15.6	10.9-20.3	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Nickel-63	8.7	8.6	5.99-11.12	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Plutonium-238	0.607	0.681	0.477-0.885	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Plutonium-239/240	0.843	0.900	0.630-1.170	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Potassium-40	210	214	150-278	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Strontium-90	4.06	4.80	3.36-6.24	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Technetium-99	7.27	7.19	5.03-9.35	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Uranium-234/233	1.130	1.140	0.80-1.48	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Uranium-238	1.180	1.180	0.83-1.53	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-MaW33	Water	Bq/L	Zinc-65	14.7	13.9	9.7-18.1	Acceptable
MAPEP	4th /2015	12/03/15	MAPEP-15-GW33	Water	Bq/L	Gross Alpha	0.425	0.429	0.129-0.729	Acceptable





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**TABLE 4**  
**2015 ERA PROGRAM PERFORMANCE EVALUATION RESULTS**

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Barium-133	73.2	67.6	56.4-74.4	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cesium-134	51.9	51.3	41.3-56.4	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cesium-137	142	124	112-139	Not Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Cobalt-60	62.7	62.4	56.2-71.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Zinc-65	107	98.7	88.8-118	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	67.2	62.3	32.6-77.3	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Beta	43.2	48.9	33.1-56.0	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	66.7	62.3	32.6-77.3	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.1	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.9	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.8	16.8	12.5-19.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	4.50	5.12	3.07-6.85	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	7.40	5.12	3.07-6.85	Not Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.0	10.6	8.27-12.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	16.4	15.5	12.1-17.9	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.3	10.6	8.27-12.2	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	17.1	15.5	12.1-17.9	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Tritium	10000	10600	9220-11700	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	47.3	52.1	41.2-59.6	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	26.7	32.4	23.7-37.5	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	54.6	52.1	41.2-59.6	Acceptable
ERA	1st / 2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	24.6	32.4	23.7-37.5	Acceptable
ERA	2nd/2015	05/26/15	RAD-101	Water	pCi/L	Iodine-131	18.2	23.8	19.7-28.3	Not Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Barium-133	63.9	64.7	53.9-71.2	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-134	45.2	50.1	40.3-55.1	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-137	90.5	89.9	80.8-101	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Cobalt-60	58.7	59.9	53.9-68.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Zinc-65	282	265	238-310	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	37.1	34.5	17.7-44.5	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Beta	26.2	25.1	15.6-33.1	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	35.3	34.5	17.7-44.5	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.9	15.2	11.3-17.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.7	15.2	11.3-17.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.1	15.2	11.3-17.4	Acceptable





PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
	2015									
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.31	5.12	3.13-6.95	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.14	5.12	3.13-6.95	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	24.2	24	19.3-27.0	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	37.9	35	28.1-39.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	23.4	24	19.3-27.0	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	34.9	35	28.1-39.4	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Tritium	14500	15600	13600-17200	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-89	24.1	42.1	32.3-49.2	Not Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-90	27.7	26.8	19.4-31.2	Acceptable
ERA	3rd / 2015	08/25/15	RAD - 102	Water	pCi/L	Iodine-131	24.7	25.7	21.3-30.3	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	42	35.7	26.7-42.5	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	26.9	31.1	22.7-36.1	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	41.8	35.7	26.7-42.5	Acceptable
ERA	3rd / 2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	22	31.1	22.7-36.1	Not Acceptable



**TABLE 5**  
**2015 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS**

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Actinium-228	1090	1250	802-1730	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Americium-241	1410	1500	878-1950	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-212	1090	1780	474-2620	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-214	4340	4430	2670-6380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-134	6020	6390	4180-7680	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-137	1540	1490	1140-1920	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cobalt-60	2010	1880	1270-2590	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-212	1200	1230	806-1710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-214	4890	4530	2640-6760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Manganese-54	<49.9	<1000	0-1000	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-238	978	998	600-1380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-239	1240	1210	791-1670	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Potassium-40	10900	10700	7810-14400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Strontium-90	1230	1940	740-3060	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Thorium-234	3840	3890	1230-7320	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Zinc-65	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	3754	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	3565	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	7319	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4040	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4230	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8477	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4480	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4020	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8683	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12000	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12800	11600	6390-14600	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3480	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3090	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6716	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	9370	6280-11900	3540-6710	Acceptable



PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Am-241	5130	4340	2650-5770	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-134	2210	2650	1700-3440	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-137	1790	1810	1310-2520	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cobalt-60	1570	1540	1060-2150	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Curium-244	1370	1360	666-2120	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Manganese-54	<31.1	<300	0-300	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-238	4700	3680	2190-5040	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-239	5120	4180	2570-5760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Potassium-40	33100	30900	22300-43400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Strontium-90	5920	6590	3760-8740	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3230	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3340	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6742	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	10000	9370	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	8780	5280	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	8780	6420	4350-7990	Not Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Zinc-65	1250	1090	786-1530	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Americium-241	50.2	49.8	30.7-67.4	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-134	951	909	578-1130	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-137	1320	1170	879-1540	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cobalt-60	87.6	79.1	61.2-98.8	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Iron-55	879	836.0	259-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Manganese-54	<6.09	<50	0.00-50.0	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Plutonium-238	57.1	52.1	35.7-68.5	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Plutonium-239	46.0	40.3	29.2-52.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Strontium-90	84.6	96.6	47.2-145	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	34.7	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.5	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	70.9	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	103	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Zinc-65	1190	986	706-1360	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	39.2	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.9	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	75.7	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	105	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	95.5	102	52.9-116	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Alpha	77.2	62.2	20.8-96.6	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Beta	62.7	58.4	36.9-85.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Americium-241	48.5	46.0	31.0-61.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-134	1180	1260	925-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-137	1410	1360	1150-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cobalt-60	1280	1250	1090-1460	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Iron-55	1080	1070	638-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Manganese-54	<5.41	<100	0.00-100	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-238	81.0	72.4	53.6-90.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-239	205	184	143-232	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Strontium-90	865	912	594-1210	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	68.5	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	71.8	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	140	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	214	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Zinc-65	1310	1180	984-1490	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	60.7	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	58.0	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	121	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	174	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	64.1	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	60.4	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	127	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	181	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	176	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Alpha	128	119	42.2-184	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Beta	155.0	158.0	90.5-234	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Tritium	10600	10300	6900-14700	Acceptable
ERA	2nd/2015	05/26/15	MRAD-22	Water	pCi/L	Iodine-131	23.5	23.8	19.7-28.3	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Actinium-228	1220	1240	795-1720	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Americium-241	667	539	315-700	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-212	1240	1240	330-1820	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-214	1690	2660	1600-3830	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-134	2250	2420	1580-2910	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-137	5400	5120	3920-6590	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Soil	pCi/kg	Cobalt-60	4290	3900	2640-5370	Acceptable





PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Lead-212	1290	1240	812-1730	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Lead-214	2090	2800	1630-4180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Manganese-54	<29.7	<1000	0-1000	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Plutonium-238	934	864	519-1190	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Plutonium-239	982	969	633-1340	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Potassium-40	11700	10600	7740-14200	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Strontium-90	7490	8820	3360-13900	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Thorium-234	3760	3330	1050-6260	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Zinc-65	4610	3620	2880-4810	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-234	2659	3360	2050-4310	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-238	2831	3330	2060-4220	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-Total	5490	6850	3720-9040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	ug/kg	Uranium-Total(mass)	8420	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-234	2970	3360	2050-4310	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-238	3010	3330	2060-4220	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	pCi/kg	Uranium-Total	6091	6850	3720-9040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	ug/kg	Uranium-Total(mass)	8990	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Soil	ug/kg	Uranium-Total(mass)	8470	9990	5510-12600	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Am-241	1780	1590	972-2110	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Cesium-134	652	748	481-972	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Cesium-137	1140	1230	892-1710	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Cobalt-60	1870	1930	1330-2700	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Curium-244	2910	3230	1580-5030	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Manganese-54	<45.2	<300	0-300	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Plutonium-238	4720	3920	2340-5370	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Plutonium-239	2630	2390	1470-3290	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Potassium-40	31200	31000	22400-43500	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Strontium-90	7590	7160	4080-9490	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Uranium-234	4280	4010	2640-5150	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Uranium-238	4620	3970	2650-5040	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Uranium-Total	9155	8160	5530-10200	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	ug/kg	Uranium-Total(mass)	13900	11900	3540-6710	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	ug/kg	Uranium-Total(mass)	13100	11900	7970-15100	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Vegetation	pCi/kg	Zinc-65	1530	1540	1110-2160	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Filter	pCi/Filter	Americium-241	35.1	36.8	22.7-49.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Filter	pCi/Filter	Cesium-134	315	349.0	222-433	Acceptable

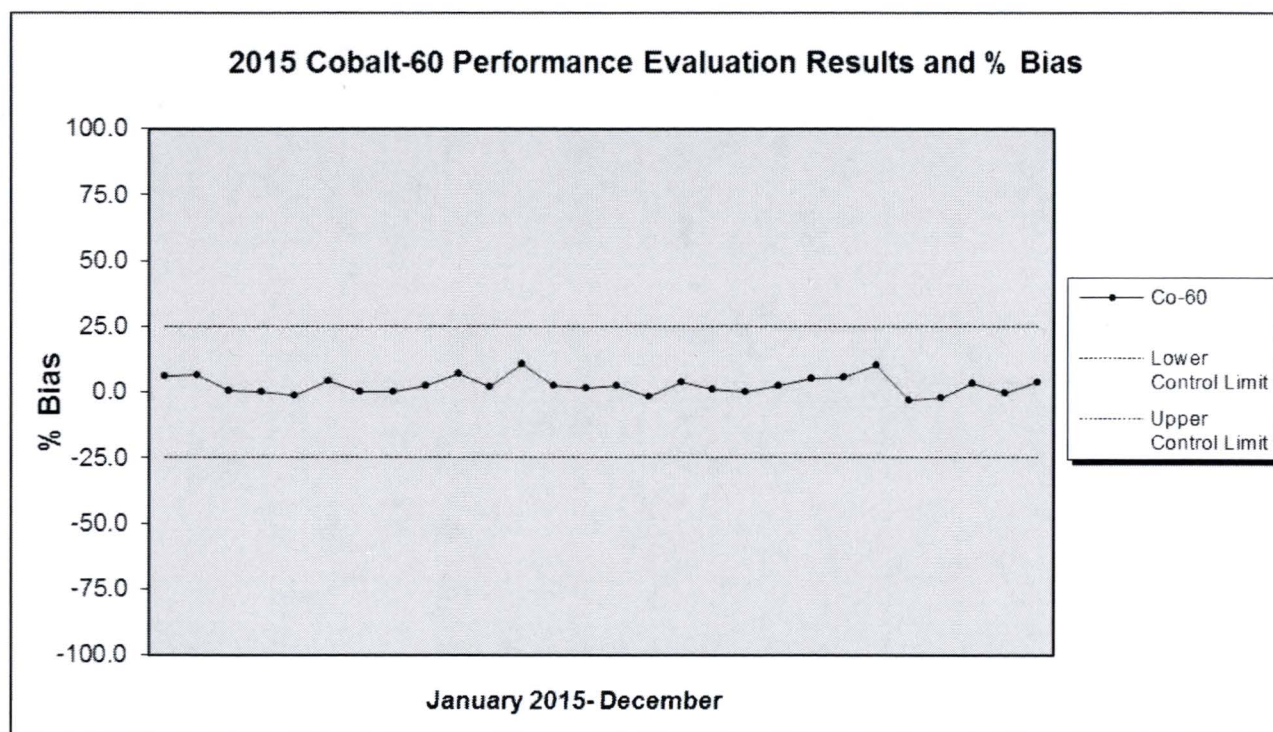




PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cesium-137	598	613	461-805	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cobalt-60	509	521	403-651	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Iron-55	546	595.0	184-1160	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Manganese-54	<4.53	<50	0.00-50.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Plutonium-238	43.6	42.6	29.2-56.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Plutonium-239	63.6	63.8	46.2-83.4	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Strontium-90	37.1	45.7	22.3-68.5	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	38.4	43.0	26.7-64.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	39.3	42.7	27.6-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	80.1	87.7	48.6-133	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	118	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Zinc-65	727	685	491-946	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	45.7	43.0	26.7-64.8	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	43.4	42.7	27.6-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	91.1	87.7	48.6-133	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	130	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	117	128	81.9-180	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Alpha	98	77.3	25.9-120	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Beta	52.2	41.3	26.1-60.2	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Americium-241	114	113	76.1-152	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-134	702	759	557-872	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-137	622	623	529-747	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Cobalt-60	927	896	778-1050	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Iron-55	196	212	126-288	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Manganese-54	<6.14	<100	0.00-100	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-238	117	140	104-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-239	88.5	114	88.5-144	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Strontium-90	505	544	354-719	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	49.2	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	49.7	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	98.9	98.9	72.7-128	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	148	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Zinc-65	786	712	594-898	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	45.8	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	44.4	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	92.8	98.9	72.7-128	Acceptable



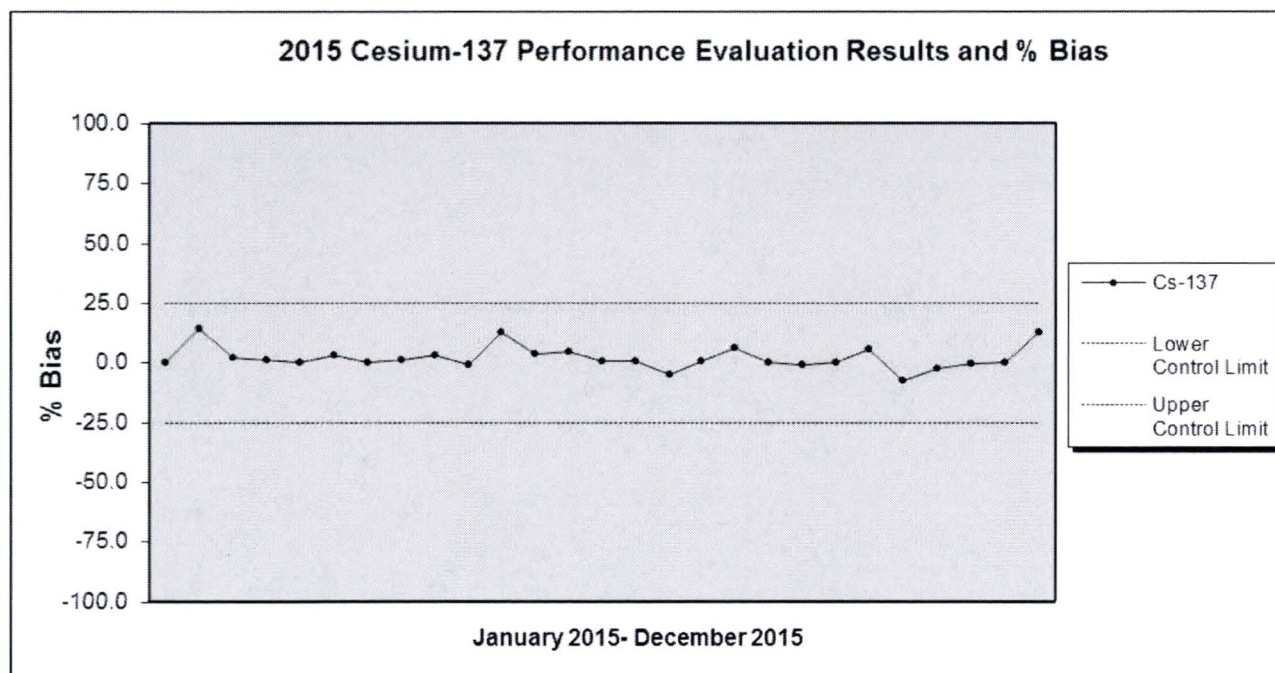
PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	ug/L	Uranium-Total(mass)	135.0	144.0	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Uranium-234	49.5	48.5	36.4-62.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Uranium-238	43.1	48.1	36.7-59.0	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Uranium-Total	95	98.9	72.7-128	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	ug/L	Uranium-Total(mass)	129	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	ug/L	Uranium-Total(mass)	135	144	115-174	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Gross Alpha	104.0	136	48.3-211	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Gross Beta	61.6	53.7	30.7-79.6	Acceptable
ERA	3rd / 2015	11/24/15	MRAD- 23	Water	pCi/L	Tritium	20500	21500	14400-30700	Acceptable

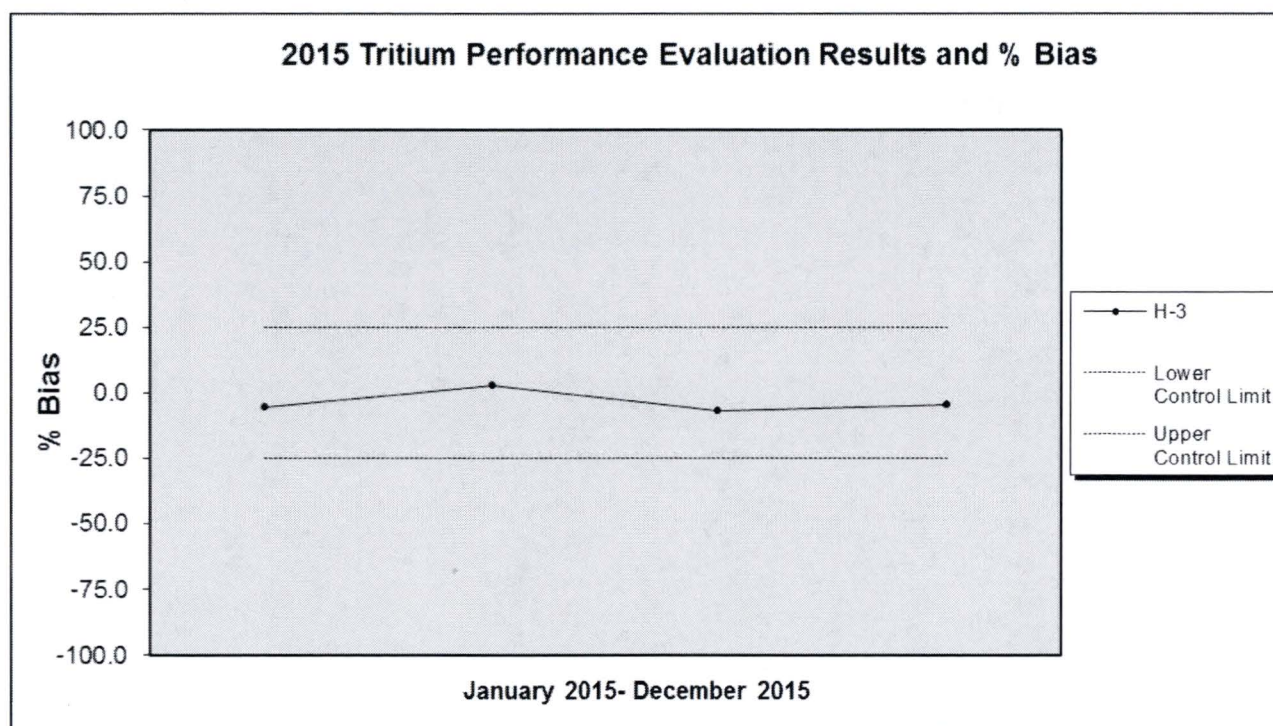
**FIGURE 1****COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS**

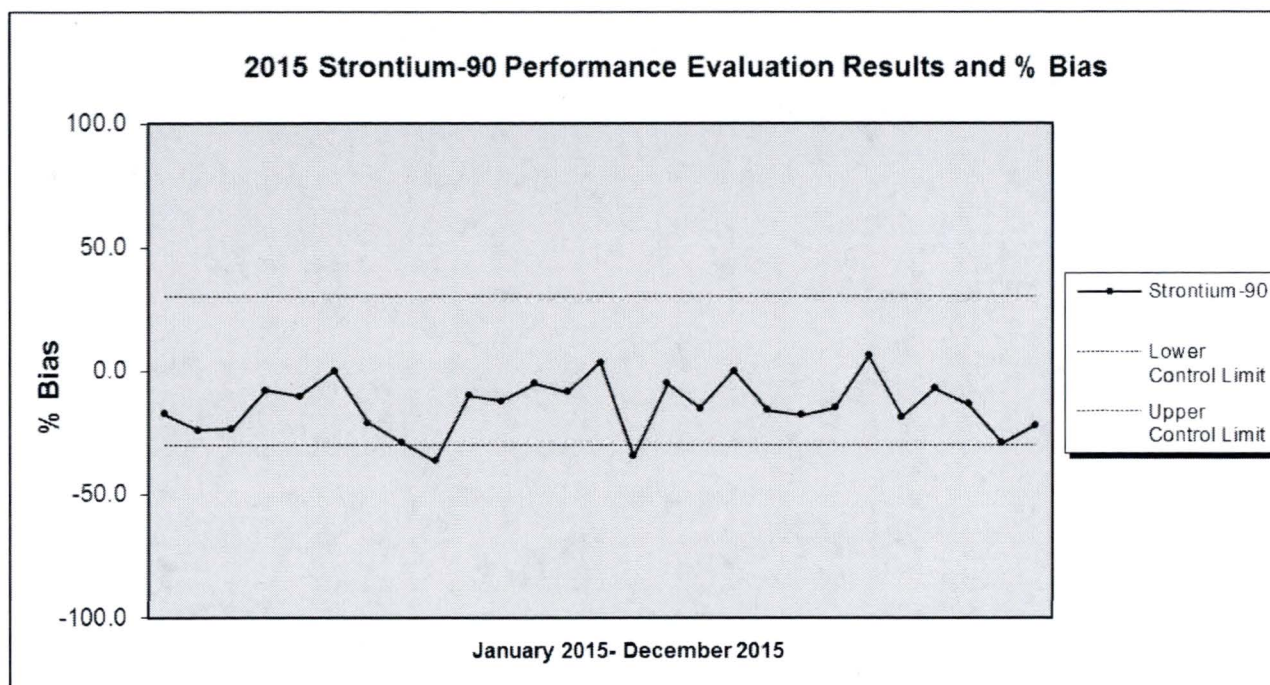


**FIGURE 2**

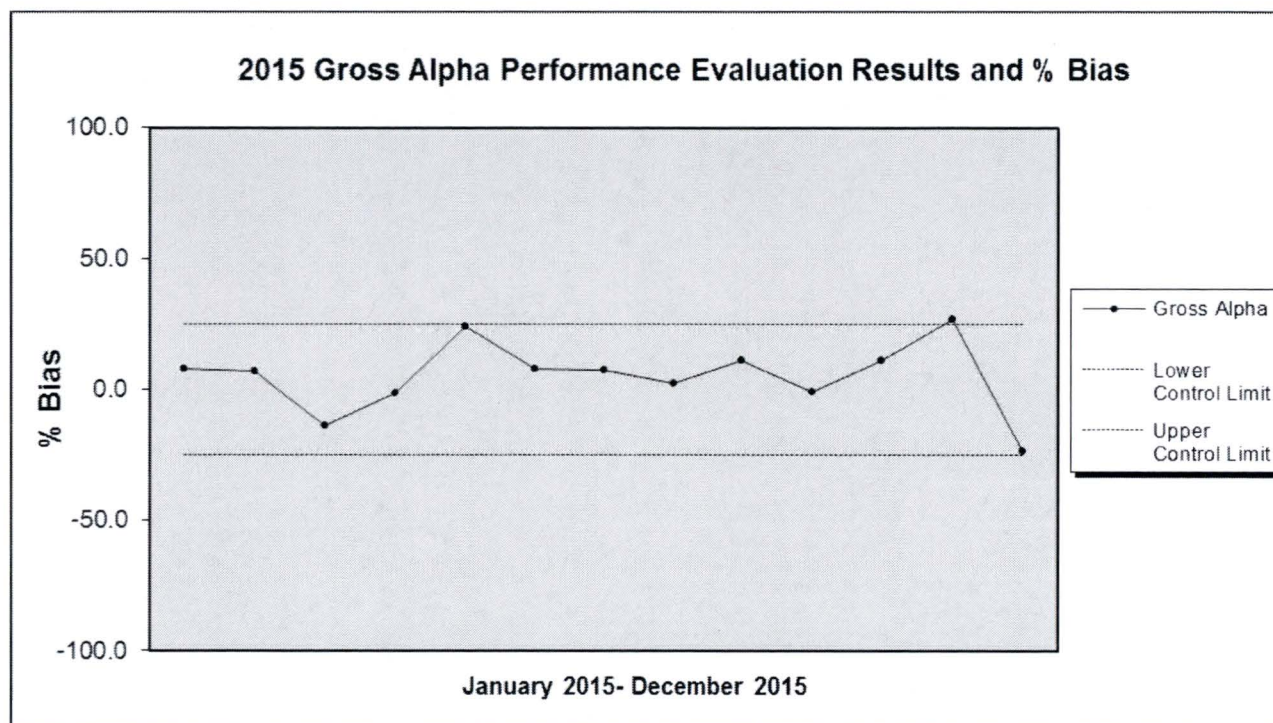
**CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS**

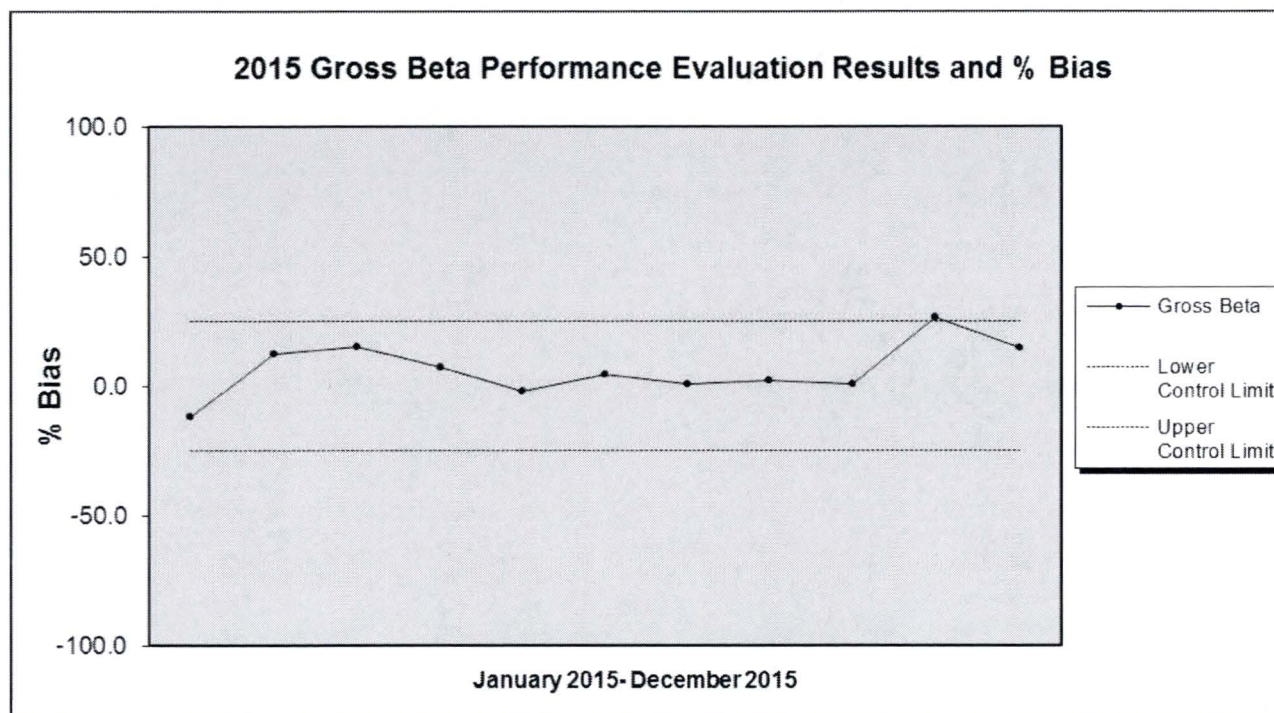


**FIGURE 3****TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS**

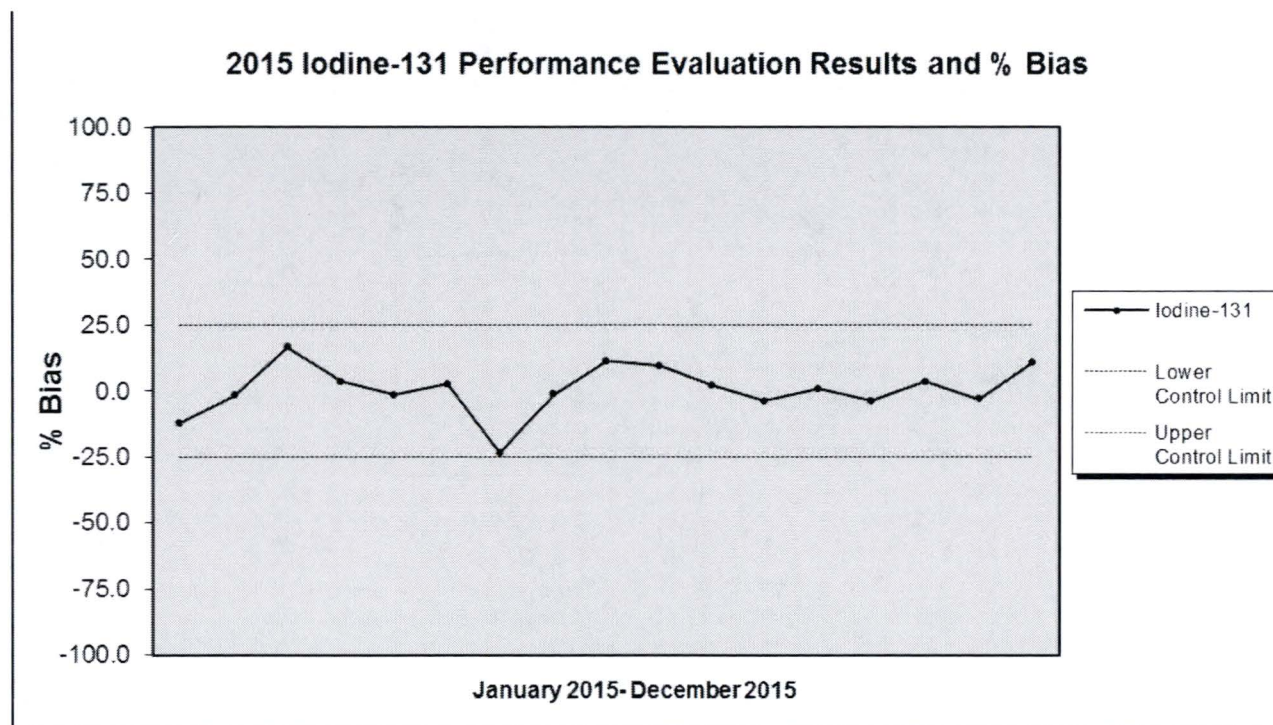
**FIGURE 4****STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS**

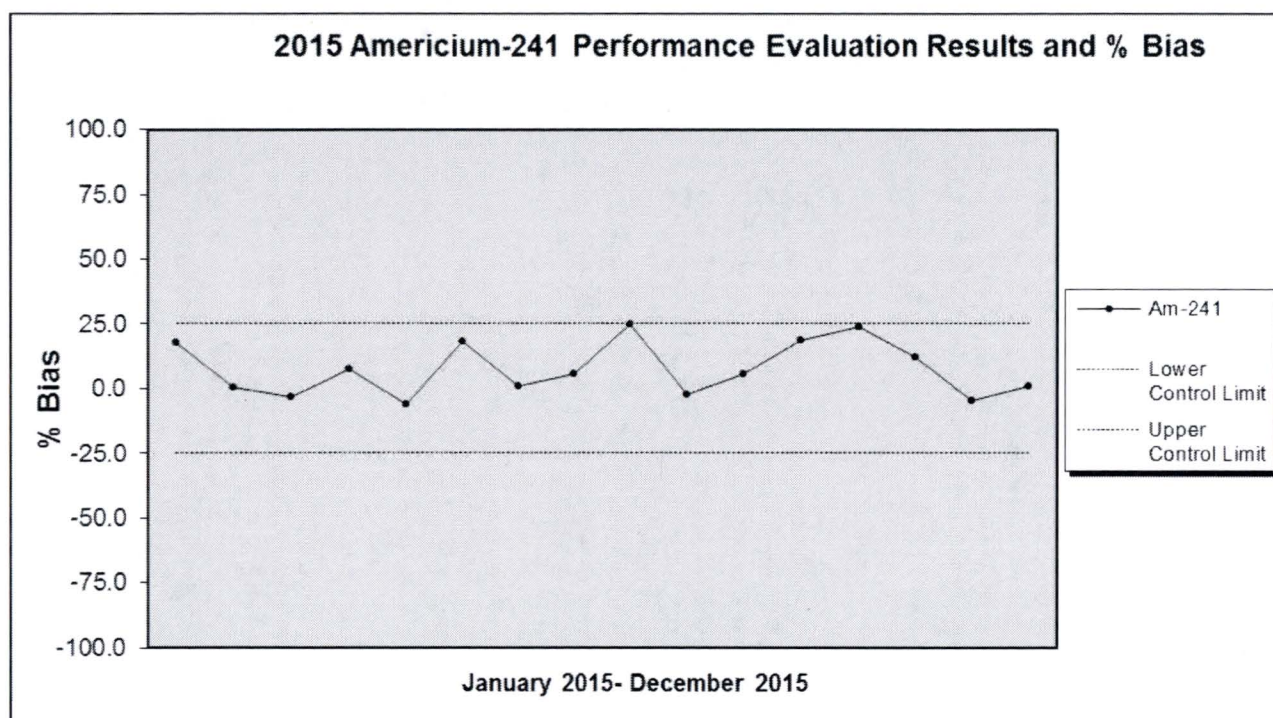


**FIGURE 5****GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS**

**FIGURE 6****GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS**



**FIGURE 7****IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS**

**FIGURE 8****AMERICIUM-241 PERFORMANCE EVALUATION RESULTS AND % BIAS**



**FIGURE 9**

**PLUTONIUM-238 PERFORMANCE EVALUATION RESULTS AND % BIAS**

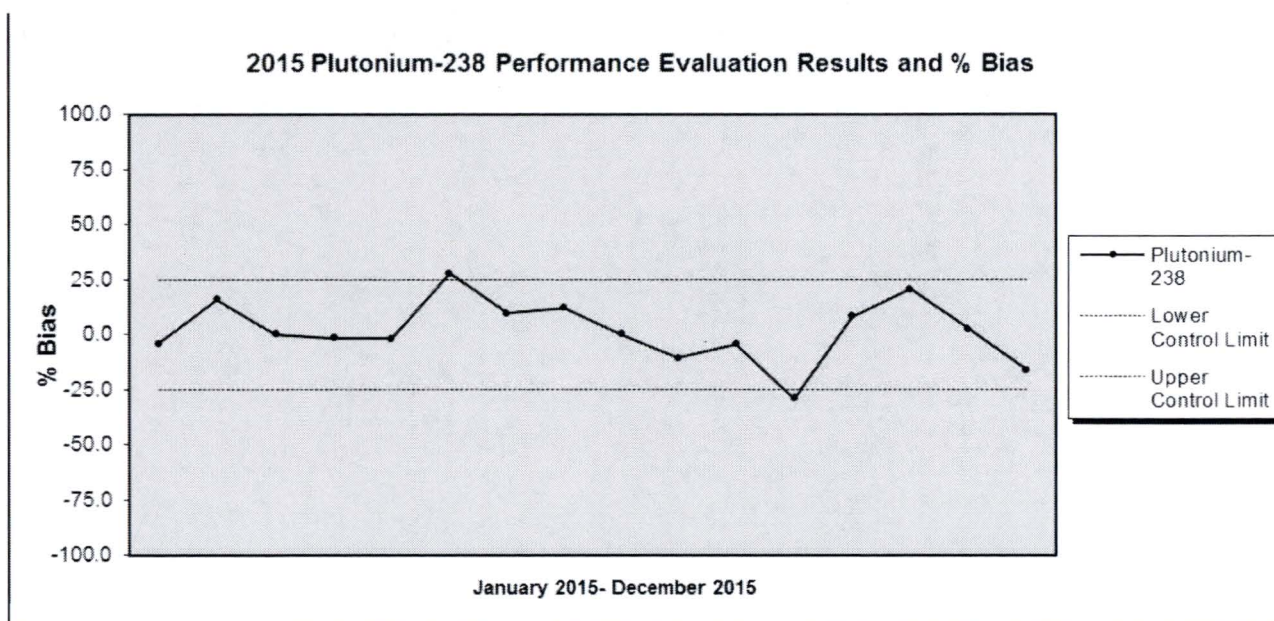




TABLE 6

## REMP INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

REMP 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
<b>MILK</b>				
Gas Flow Sr 2nd count	41	0	44	0
Gas Flow Total Strontium	25	0	25	0
Gamma Spec Liquid RAD A-013 with Ba, La	59	0	117	0
<b>SOLID</b>				
Gamma Spec Solid RAD A-013	22	0	28	0
LSC Nickel 63	3	0	3	0
Gas Flow Sr 2nd count	6	0	6	0
Gas Flow Total Strontium	4	0	4	0
Gamma Spec Solid RAD A-013 with Ba, La	5	0	9	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	6	0
<b>FILTER</b>				
Gas Flow Sr 2nd Count	5	0	5	0
Gross A & B	402	0	402	0
Gamma Spec Filter	42	0	51	0
<b>LIQUID</b>				
Alpha Spec Uranium	10	0	14	0
Tritium	212	0	213	0
LSC Iron-55	12	0	11	0
LSC Nickel 63	14	0	13	0
Gamma Spec Liquid RAD A-013	5	0	5	0
Alpha Spec Am243	4	0	4	0
Gamma Iodine-131	27	0	27	0
Alpha Spec Plutonium	18	0	18	0
Gas Flow Sr 2nd count	10	0	10	0
Alpha Spec Am241 Curium	19	0	19	0
Gas Flow Total Strontium	29	0	26	0
Gross Alpha Non Vol Beta	35	0	39	0
Gamma Spec Liquid RAD A-013 with Ba, La	65	0	158	0
Gamma Spec Liquid RAD A-013 with Iodine	31	0	32	0
<b>TISSUE</b>				



REMP 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Gamma Spec Solid RAD A-013	35	0	36	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Total Strontium	11	0	11	0
Gamma Spec Solid RAD A-013 with Iodine	12	0	12	0
<b>SEA WATER</b>				
LSC Iron-55	7	0	6	0
LSC Nickel 63	7	0	6	0
Gas Flow Total Strontium	4	0	4	0
Gross Alpha Non Vol Beta	3	0	3	0
Gamma Spec Liquid RAD A-013 with Iodine	8	0	8	0
<b>VEGETATION</b>				
Gas Flow Sr 2nd count	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	79	0	86	0
<b>AIR CHARCOAL</b>				
Gamma Iodine 131 RAD A-013	529	0	577	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	35	0	35	0
<b>DRINKING WATER</b>				
Tritium	51	0	50	0
LSC Iron-55	14	0	16	0
LSC Nickel 63	14	0	16	0
Gamma Iodine-131	31	0	32	0
Gas Flow Sr 2nd count	15	0	15	0
Gas Flow Total Strontium	17	0	18	0
Gross Alpha Non Vol Beta	76	0	73	0
Gamma Spec Liquid RAD A-013 with Ba, La	32	0	85	0
Total	2113	0	2400	0

Note 1: The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.



**TABLE 7**  
**ALL RADIOLOGICAL INTRA-LABORATORY DATA SUMMARY:**  
**BIAS AND PRECISION BY MATRIX:**

	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
<b>Total 2015 Intralaboratory QC</b>				
<b>MILK</b>				
Gamma Spec Liquid RAD A-013	6	0	6	0
Gamma Iodine-129	1	0	2	0
Gamma Iodine-131	25	0	119	0
Gas Flow Sr 2nd count	41	0	45	0
Gas Flow Strontium 90	6	0	6	0
Gas Flow Total Strontium	25	0	25	0
Gamma Spec Liquid RAD A-013 with Ba, La	59	0	117	0
Gamma Spec Liquid RAD A-013 with Iodine	6	0	6	0
<b>SOLID</b>				
Gamma Percent Leach	2	0	0	0
Gas Flow Radium 228	50	0	52	0
Tritium	268	0	301	0
Carbon-14	172	0	229	0
LSC Iron-55	143	0	155	0
Alpha Spec Polonium Solid	18	0	21	0
Gamma Nickel 59 RAD A-022	125	0	138	0
LSC Chlorine-36 in Solids	3	0	3	0
Gamma Spec Ra226 RAD A-013	40	0	48	0
Gamma Spec Solid RAD A-013	815	0	1016	0
LSC Nickel 63	184	0	189	0
LSC Plutonium	241	0	250	0
Technetium-99	328	0	360	0
ICP-MS Technetium-99 in Soil	22	0	17	0
LSC Selenium 79	9	0	11	0
Total Activity,	6	0	6	0
Tritium	3	0	3	0
Alpha Spec Am243	40	0	55	0
Gamma Iodine-129	145	0	158	0
Gas Flow Lead 210	4	0	3	0
Total Uranium KPA	5	0	6	0





Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Alpha Spec Uranium	326	0	448	0
LSC Promethium 147	6	0	7	0
LSC, Rapid Strontium 89 and 90	74	0	84	0
Alpha Spec Thorium	232	0	308	0
Gas Flow Radium 228	4	0	21	0
ICP-MS Uranium-233, 234 in Solid	46	0	45	0
Alpha Spec Plutonium	337	0	357	0
ICP-MS Technetium-99 Prep in Soil	27	0	17	0
Alpha Spec Neptunium	277	0	288	0
Alpha Spec Plutonium	163	0	190	0
Alpha Spec Radium 226	12	0	12	0
Gamma Spec Solid with Ra226, Ra228	3	0	3	0
Gas Flow Sr 2nd count	33	0	39	0
Gas Flow Strontium 90	270	0	284	0
Gas Flow Total Radium	0	0	1	0
Lucas Cell Radium 226	90	0	119	0
Total Activity Screen	21	0	25	0
Alpha Spec Am241 Curium	355	0	390	0
Alpha Spec Total Uranium	2	0	5	0
Gas Flow Total Strontium	56	0	59	0
ICP-MS Uranium-233, 234 Prep in Solid	43	0	43	0
ICP-MS Uranium-235, 236, 238 in Solid	56	0	48	0
Gamma Spec Solid RAD A-013 with Ba, La	5	0	9	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	6	0
Organically Bound Tritium	4	0	4	0
GFC Chlorine-36 in Solids	2	0	2	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	0	0	1	0
Tritium	13	0	13	0
Alpha Spec Am241 (pCi/Sample)	2	0	1	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	55	0	44	0
ICP-MS Uranium-235, 236, 238 Prep in Solid	43	0	43	0
ICP-MS U-234, 235, 236, 238 Prep per sample	2	0	1	0
Alpha Spec Uranium	2	0	1	0
Gross Alpha/Beta	297	0	390	0
Alpha Spec Plutonium	1	0	1	0



Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Gas Flow Strontium 90	2	0	1	0
Gross Alpha/Beta (Americium Calibration) Solid	3	0	5	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	27	0	23	0
Lucas Cell Radium 226 by DOE HASL 300 Ra-04 Solid	3	0	3	0
<b>FILTER</b>				
Alpha Spec Uranium	11	0	19	0
Alpha Spec Polonium	0	0	8	0
Gamma I-131, filter	5	0	5	0
LSC Plutonium Filter	127	0	157	0
Tritium	109	0	185	0
Carbon-14	59	0	104	0
Nickel-63	0	0	17	0
LSC Iron-55	118	0	126	0
Gamma Nickel 59 RAD A-022	94	0	102	0
Gamma Spec Solid RAD A-013	2	0	2	0
LSC Nickel 63	111	0	118	0
Technetium-99	83	0	117	0
Gamma Spec Filter RAD A-013	229	0	260	0
LSC Selenium 79	0	0	2	0
Alphaspec Np Filter per Liter	12	0	20	0
Alphaspec Pu Filter per Liter	29	0	37	0
Gamma Iodine-125	5	0	0	0
Gamma Iodine-129	61	0	96	0
Alpha Spec Am243	18	0	23	0
Gas Flow Lead 210	0	0	5	0
LSC Plutonium Filter per Liter	9	0	14	0
Total Uranium KPA	9	0	16	0
Alpha Spec Uranium	55	0	141	0
LSC Promethium 147	5	0	5	0
LSC, Rapid Strontium 89 and 90	112	0	137	0
Alpha Spec Thorium	37	0	48	0
Alpha Spec Plutonium	90	0	127	0
Alpha Spec Neptunium	102	0	113	0
Alpha Spec Plutonium	106	0	129	0
Alpha Spec Polonium,(Filter/Liter)	0	0	9	0
Alpha Spec Radium 226	0	0	3	0
Alpha/Beta (Americium Calibration)	4	0	8	0
Gas Flow Sr 2nd Count	63	0	78	0





Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Gas Flow Strontium 90	72	0	87	0
Lucas Cell Radium-226	3	0	3	0
Alpha Spec Am241Curium	134	0	166	0
Gas Flow Total Strontium	5	0	7	0
ICP-MS Uranium-235, 236, 238 in Filter	0	0	3	0
Total Activity in Filter,	5	0	5	0
Alphaspec Am241 Curium Filter per Liter	20	0	24	0
Tritium	87	0	89	0
Gamma Spec Filter RAD A-013 Direct Count	8	0	8	0
Carbon-14	11	0	11	0
GFC Chlorine-36 in Filters PL	4	0	4	0
Direct Count-Gross Alpha/Beta	69	0	0	0
Gross Alpha/Beta	66	0	75	0
ICP-MS Uranium-234, 235, 236, 238 in Filter	0	0	10	0
ICP-MS Uranium-235, 236, 238 Prep in Filter	0	0	3	0
Alpha Spec U	19	0	42	0
Gross A & B	461	0	456	0
LSC Iron-55	3	0	13	0
Technetium-99	11	0	18	0
Gas Flow Sr-90	10	0	16	0
LSC Nickel 63	13	0	20	0
Gas Flow Pb-210	6	0	20	0
Gas Flow Ra-228	4	0	13	0
Gamma Iodine 129	7	0	7	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Filter	0	0	5	0
Gamma Spec Filter	102	0	132	0
Lucas Cell Ra-226	11	0	21	0
Total Uranium KPA	2	0	4	0
Alpha Spec Thorium	15	0	22	0
<b>LIQUID</b>				
Alpha Spec Uranium	521	0	688	0
Alpha Spec Polonium	1	0	2	0
Electrolytic Tritium	21	0	36	0
Tritium	1292	0	1344	0
Carbon-14	163	0	191	0
Plutonium	65	0	79	0



Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Chlorine-36 in Liquids	3	0	3	0
Iodine-131	2	0	3	0
LSC Iron-55	225	0	285	0
Gamma Nickel 59 RAD A-022	26	0	30	0
Gamma Iodine 131 RAD A-013	1	0	2	0
Gamma Spec Solid RAD A-013	2	0	2	0
LSC Nickel 63	247	0	285	0
LSC Radon 222	15	0	16	0
Technetium-99	619	0	525	0
Gamma Spec Liquid RAD A-013	913	0	936	0
Alpha Spec Total U RAD A-011	66	0	65	0
LSC Selenium 79	9	0	9	0
Total Activity,	3	0	3	0
Alpha Spec Am243	25	0	28	0
Gamma Iodine-129	118	0	135	0
Gamma Iodine-131	27	0	27	0
ICP-MS Technetium-99 in Water	25	0	26	0
Gas Flow Lead 210	22	0	18	0
Total Uranium KPA	125	0	274	0
LSC Promethium 147	9	0	9	0
LSC, Rapid Strontium 89 and 90	16	0	18	0
Alpha Spec Polonium	2	0	2	0
Alpha Spec Thorium	225	0	254	0
Gas Flow Radium 228	274	0	317	0
Gas Flow Radium 228	42	0	43	0
Alpha Spec Plutonium	393	0	512	0
LSC Sulfur 35	5	0	5	0
Alpha Spec Neptunium	185	0	216	0
Alpha Spec Plutonium	41	0	60	0
Alpha Spec Radium 226	30	0	27	0
Gas Flow Sr 2nd count	218	0	233	0
Gas Flow Strontium 90	516	0	585	0
Gas Flow Total Radium	80	0	109	0
ICP-MS Technetium-99 Prep in Water	26	0	27	0
ICP-MS Uranium-233, 234 in Liquid	5	0	13	0
LSC Calcuim 45	5	0	5	0
Lucas Cell Radium 226	380	0	404	0
Lucas Cell Radium-226	14	0	14	0
Total Activity Screen	6	0	11	0





Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Chlorine-36 in Liquids	11	0	14	0
Alpha Spec Am241 Curium	337	0	452	0
Gas Flow Total Strontium	138	0	141	0
Gross Alpha Non Vol Beta	1154	0	1379	0
LSC Phosphorus-32	3	0	3	0
ICP-MS Uranium-233, 234 Prep in Liquid	6	0	14	0
Tritium in Drinking Water by EPA 906.0	13	0	17	0
Gamma Spec Liquid RAD A-013 with Ba, La	65	0	158	0
Gamma Spec Liquid RAD A-013 with Iodine	144	0	138	0
Gas Flow Strontium 89 & 90	4	0	1	0
ICP-MS Uranium-235, 236, 238 in Liquid	10	0	13	0
Gas Flow Total Alpha Radium	6	0	4	0
Gross Alpha Co-precipitation	4	0	24	0
ICP-MS Uranium-235, 236, 238 Prep in Liquid	6	0	14	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	90	0	79	0
Gross Alpha Beta (Americium Calibration) Liquid	31	0	51	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	57	0	55	0
Alpha/Beta (Americium Calibration) Drinking Water	24	0	20	0
<b>TISSUE</b>				
Carbon-14	4	0	4	0
Gamma Spec Solid RAD A-013	77	0	87	0
Tritium	1	0	1	0
Gas Flow Lead 210	1	0	1	0
Alpha Spec Uranium	5	0	11	0
Alpha Spec Thorium	1	0	1	0
Alpha Spec Plutonium	3	0	4	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Strontium 90	21	0	19	0
Gas Flow Total Strontium	11	0	11	0
Gamma Spec Solid RAD A-013 with Iodine	12	0	12	0
Gross Alpha/Beta	4	0	7	0
<b>SEA WATER</b>				
LSC Iron-55	7	0	6	0
LSC Nickel 63	7	0	6	0



Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Gas Flow Total Strontium	4	0	4	0
Gross Alpha Non Vol Beta	3	0	3	0
Gamma Spec Liquid RAD A-013 with Iodine	8	0	8	0
<b>VEGETATION</b>				
Carbon-14	5	0	6	0
Gamma Nickel 59 RAD A-022	1	0	1	0
Gamma Spec Solid RAD A-013	30	0	31	0
LSC Nickel 63	1	0	1	0
LSC Plutonium	1	0	1	0
Technetium-99	3	0	3	0
Tritium	12	0	12	0
Gamma Iodine-129	1	0	0	0
Gas Flow Lead 210	4	0	6	0
Total Uranium KPA	4	0	4	0
Alpha Spec Uranium	25	0	28	0
Alpha Spec Thorium	4	0	7	0
Alpha Spec Plutonium	14	0	13	0
Alpha Spec Neptunium	1	0	1	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	10	0	10	0
Gas Flow Strontium 90	21	0	19	0
Gas Flow Total Radium	3	0	5	0
Alpha Spec Am241 Curium	7	0	5	0
Gamma Spec Solid RAD A-013 with Iodine	79	0	86	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	1	0	1	0
Alpha Spec Am241 (pCi/Sample)	2	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	10	0	4	0
Alpha Spec Uranium	1	0	2	0
Gross Alpha/Beta	8	0	9	0
Alpha Spec Plutonium	1	0	2	0
Gas Flow Strontium 90	4	0	2	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	4	0	2	0
<b>AIR CHARCOAL</b>				
Gamma Iodine 131 RAD A-013	529	0	577	0
Gamma Iodine-129	14	0	8	0
Alpha Spec Uranium	0	0	3	0





Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
Alpha Spec Plutonium	0	0	3	0
Alpha Spec Am241Curium	0	0	3	0
Carbon-14	16	0	16	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	35	0	35	0
Gamma Iodine 129	17	0	17	0
Gamma Spec Filter	17	0	17	0
<b>DRINKING WATER</b>				
Alpha Spec Uranium	2	0	2	0
Alpha Spec Polonium	1	0	1	0
Tritium	54	0	53	0
Carbon-14	1	0	1	0
Iodine-131	11	0	11	0
LSC Iron-55	14	0	16	0
LSC Nickel 63	14	0	16	0
LSC Radon 222	13	0	13	0
Gamma Spec Liquid RAD A-013	31	0	88	0
Gamma Iodine-129	8	0	13	0
Gamma Iodine-131	31	0	32	0
Total Uranium KPA	9	0	26	0
Alpha Spec Thorium	1	0	1	0
Gas Flow Radium 228	1	0	0	0
Gas Flow Radium 228	29	0	30	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	15	0	15	0
Gas Flow Strontium 90	15	0	18	0
Lucas Cell Radium-226	58	0	70	0
Alpha Spec Am241 Curium	1	0	1	0
Gas Flow Total Strontium	17	0	18	0
Gross Alpha Non Vol Beta	313	0	247	0
Tritium in Drinking Water by EPA 906.0	50	0	72	0
Gamma Spec Liquid RAD A-013 with Ba, La	32	0	85	0
Gas Flow Strontium 89 & 90	23	0	16	0
Gross Alpha Co-precipitation	133	0	96	0
Alpha/Beta (Americium Calibration) Drinking Water	17	0	17	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	3	0	3	0
<b>Total</b>	<b>19581</b>	<b>0</b>	<b>22758</b>	<b>0</b>
Note 1: The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5				



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Total 2015 Intralaboratory QC	Bias Criteria (+ / - 25%)	Precision Criteria (Note 1)
times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.		





**TABLE 8**  
**2015 CORRECTIVE ACTION REPORT SUMMARY**

<b>CORRECTIVE ACTION ID# &amp; PE FAILURE</b>	<b>DISPOSITION</b>
<b>CARR150223-929</b>  ISO Documentation of PT Failures in RAD 100 for Cesium-137 and Radium-228.	<b>Root Cause Analysis</b>  <b>Cesium-137 (Cs-137)</b> <b>EPA 901.1, HASL 300 Ga-01, DOE 4.5.2.3</b> After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this low bias was an isolated occurrence and that our overall process is within control. <ol style="list-style-type: none"><li>1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 105%.</li><li>2. Laboratory control data were also reviewed for trends. None were noted.</li><li>3. The instrument calibrations were reviewed for biases that could have attributed to this failure. Biases were not noted.</li><li>4. A sample duplicate was also prepared and counted along with the reported result. The result fell within the method's acceptance range for duplicates.</li></ol> <b>Permanent Corrective/Preventive Actions or Improvements :</b>  The laboratory must assume unidentified random error caused the elevated bias because all quality control criteria were met for the batch. Additionally, a well characterized performance evaluation sample from another vendor was prepped and analyzed a few weeks after this sample. The lab will continue to monitor the recoveries of this parameters to ensure that there are no issues.  <b>A second PT (RAD-102) was successfully analyzed for this matrix.</b>  <b>Radium-228 (Ra-228)</b> <b>RAD Naturals</b> <b>LAB PBMS A-009</b> After a review of the data, an apparent reason for this



	<p>discrepancy could not be determined. The following steps were taken to prove that this low bias was an isolated occurrence and that our overall process is within control.</p> <ol style="list-style-type: none"><li>1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 118%.</li><li>2. Laboratory control data were also reviewed for trends. None were noted.</li><li>3. The instrument calibrations were reviewed for biases that could have attributed to this failure. Biases were not noted.</li><li>4. A sample duplicate was also prepared and counted along with the reported result. The result fell within the method's acceptance limit for duplicates with than RER of 0.62.</li><li>5. Sample was also reanalyzed after the report was received and a result (4.94 pCi/L) that fell well within the acceptance range of the study was obtained. Changes were not made in the prep process for the reanalysis.</li></ol> <p><b>Permanent Corrective/Preventive Actions or Improvements :</b></p> <p>The laboratory must assume unidentified random error caused the elevated bias because all quality control criteria were met for the batch. The lab will continue to monitor the recoveries of this parameters to ensure that there are no issues.</p> <p><b>A second PT was successfully analyzed for this matrix.</b></p>
<p><b>CARR150519-954</b></p> <p>ISO Documentation of PT Failures in –MRAD-22 for Total Uranium in Vegetation by Alpha Spec</p>	<p><b>Root Cause Analysis Uranium – Total ASTM D5174-97 1997</b></p> <p>The cause of this failure was determined to be human error. The Uranium-Total (mass) result was inadvertently entered as the result for Uranium-Total (pCi/Kg). These results are hand entered into the PT provider's database.</p> <p><b>Permanent Corrective/Preventive Actions or Improvements :</b></p> <p>The laboratory is has implemented automatic upload capabilities for performance sample results using CSV files. An EDD-like file is created directly from Alpha Lims and</p>





	<p>uploaded onto the PT provider's website. This will eliminate manual data entry errors.</p> <p><b>A second PT (MRAD-23) was successfully analyzed for this matrix.</b></p>
<p><b>CARR150610-962</b></p> <p>ISO Documentation of PT Failures in RAD-101 for Iodine-131 in drinking water.</p>	<p><b>Root Cause Analysis of Iodine-131 (I-131)</b></p> <p>After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this high bias was an isolated occurrence and that our overall process is within control.</p> <p>The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 103%.</p> <p>Laboratory control data were also reviewed for trends. None were noted.</p> <p>The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted.</p> <p>Sample duplicates were also prepared and counted along with the reported result. All results fell within the method's acceptance range for duplicates.</p> <p><b>Permanent Corrective/Preventive Actions or Improvements</b></p> <p>The laboratory must assume an unidentified random error caused the high bias for this batch. While the LCS recovered outside to its acceptance range, the matrix spike (MS) recovery fell within both the acceptance range for the MS (80%-120%) and the acceptance range for the LCS (90%-110%).</p> <p><b>A second PT (Rad-102) was successfully analyzed for this matrix.</b></p>



**CARR150825-971**

ISO Documentation of PT Failures in RAD-103 for Strontium-89 in drinking water.

**Root Cause Analysis of Strontium-89 (Sr-89)  
EPA 905.0**

The laboratory concluded that an unidentified random error caused the low bias for this batch because all quality control samples fell well within their acceptance ranges. We have reviewed the ERA Sr 89/90's from 2013-2015 to see if there is any consistent issues. The failures in that time frame were both high and low bias failures and were not conducted by the same analyst. We have noticed that the failure came in the series run in the late summer whereas the ones in January/February have been acceptable. We also reviewed the instruments that were used to in the hopes that a preparation or calibration was not properly conducted, but our findings were inconclusive.

Because of the short half life of the Sr-89, the investigations have been post-failure review of the process and the data. In the same time frame, quarterly milk PT's have been run through a similar process (includes an additional column but the basic separation of Sr from daughter products is the same) with acceptable results.

Also, as a note, no procedural changes were made between the acceptable and failed results, ie., the laboratory analyzed the unacceptable PTs the same way we ran the acceptable samples. The lab will continue to monitor the recoveries of this radionuclide to ensure that there are no issues.

**A second PT (RAD-104) was successfully analyzed for this matrix.**



**CARR151130-993**

ISO Documentation of PT Failures in RAD-103 for Strontium-90 in drinking water.

**Root Cause Analysis of Strontium-90 (Sr-90)**

After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this high bias was an isolated occurrence and that our overall process is within control.

The batch quality control samples were reviewed and found to be compliant. The LCS recovered at within acceptance range.

Laboratory control data were also reviewed for trends. No trends were noted.

The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted.

Sample duplicates were also prepared and counted along with the reported result. All results fell within the method's acceptance range for duplicates.

**Permanent Corrective/Preventive Actions or Improvements**

The laboratory must assume an unidentified random error caused the high bias for this batch. While the LCS recovered outside to its acceptance range, the matrix spike (MS) recovery fell within both the acceptance range for the MS (80%-120%) and the acceptance range for the LCS (90%-110%).

**A second PT (RAD-104) was successfully analyzed for this matrix.**