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0CAN051502

May 12, 2015

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Annual Radiological Environmental Operating Report for 2014
Arkansas Nuclear One – Units 1 and 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6

REFERENCE: Entergy letter dated April 28, 2015, "Annual Radioactive Effluent Release Report for 2014" (0CAN041504)

Dear Sir or Madam:

In accordance with Arkansas Nuclear One (ANO), Unit 1 Technical Specification (TS) 5.6.2 and Unit 2 TS 6.6.2, the submittal of an annual radiological environmental operating report for the previous year is required by May 15 of each year. The subject ANO report for the calendar year 2014 is enclosed.

This report fulfills the reporting requirements of the TSs referenced above.

The radionuclides detected by the radiological environmental monitoring program during 2014 were significantly below the regulatory limits. The operation of the ANO station during 2014 had no harmful radiological effects nor resulted in any irreversible damage to the local environment.

Based on ANO's review, no environmental samples from the monitoring program equaled or exceeded the reporting levels for radioactivity concentration due to ANO effluents when averaged over any calendar quarter. A map of all sampling locations and a corresponding table providing the respective distances and directions from the reactor building is included in the Offsite Dose Calculation Manual (ODCM) submitted as part of the referenced Annual Radioactive Effluent Release Report.

This letter contains no new commitments.

If you have any questions or require additional information, please contact me.

Sincerely,

ORIGINAL SIGNED BY STEPHENIE L. PYLE

SLP/rwc

Enclosure: Annual Radiological Environmental Operating Report for 2014

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Enclosure to

0CAN051502

**Annual Radiological Environmental
Operating Report for 2014**

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Summary

The Annual Radiological Environmental Operating Report (AREOR) presents data obtained through analyses of environmental samples collected for Arkansas Nuclear One's (ANO's) Radiological Environmental Monitoring Program (REMP) for the period January 1, 2014, through December 31, 2014. This report fulfills the requirements of ANO Unit 1 Technical Specification (TS) 5.6.2 and Unit 2 TS 6.6.2.

During 2014, as in previous years, ANO detected tritium attributable to plant operations at the discharge location (Station 8) where previously monitored liquid radioactive effluent from the plant is periodically discharged in accordance with the regulatory criteria established in the Offsite Dose Calculation Manual (ODCM). ANO personnel routinely monitor results from this area in order to note any trends. The review of results from this area indicates tritium levels in the surface water media continue to be below regulatory reporting limits and are consistent with concentrations that would typically be seen at this location as discussed in Section 2.3 of this AREOR.

Gross beta concentrations at the Station 14 (City of Russellville) indicator drinking water location continue to remain consistent with previous operational measurements and similar to the levels detected at the Station 57 (City of Danville) control drinking water location.

Radiological Environmental Monitoring Program

ANO established the REMP prior to the station becoming operational (1974) to provide data on background radiation and radioactivity normally present in the area. ANO has continued to monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring radiation directly. ANO also samples milk if milk-producing animals are present commercially within five miles of the plant.

The REMP includes sampling indicator and control locations within an approximate 20-mile radius of the plant. The REMP utilizes indicator locations near the site to show any increases or buildup of radioactivity that might occur due to station operation, and control locations farther away from the site to indicate the presence of only naturally occurring radioactivity. ANO personnel compare indicator results with control and preoperational results to assess any impact ANO operation might have had on the surrounding environment.

In 2014, ANO personnel collected environmental samples for radiological analysis. Personnel compared results of indicator locations with control locations and previous studies and concluded that overall no significant relationship exists between ANO operation and effect on the plant environs. The review of 2014 data, in most cases, showed undetectable radiation levels in the environment and in all instances, no definable trends related to significant pathways associated with ANO.

Harmful Effects or Irreversible Damage

The REMP monitoring did not detect any harmful effects or evidence of irreversible damage in 2014. Therefore, no analysis or planned course of action to alleviate problems was necessary.

Reporting Levels

ANO's review indicates that no samples equaled or exceeded reporting levels for radioactivity concentration in environmental samples due to ANO effluents, as outlined in ODCM Table 2.5-2, when averaged over any calendar quarter. Therefore, 2014 results did not trigger any Radiological Monitoring Program special reports.

Radioactivity Not Attributable to ANO

The ANO REMP has detected radioactivity attributable to other sources. These include the 25th Chinese nuclear test explosion in 1980 and the radioactivity plume release due to reactor core degradation at the Chernobyl Nuclear Power Plant in 1986. Prior to 1981, the ANO REMP detected radioactivity resulting from nuclear weapons testing, with Cesium-137 continuing to be periodically detected. In 2011, ANO detected I-131 radioactivity attributed to the Fukushima Daiichi Nuclear Power Plant accident (March 11, 2011).

Comparison to Federal and State Programs

ANO personnel compared REMP data to state monitoring programs as results became available. Historically, the programs used for comparison have included the U.S. Nuclear Regulatory Commission (NRC) Thermoluminescent Dosimeter (TLD) Direct Radiation Monitoring Network and the Arkansas Department of Health (ADH).

The NRC TLD Network Program was discontinued in 1998. Historically these results have compared to those from the ANO REMP. ANO TLD results continue to remain similar to the historical average and continue to verify that plant operation is not affecting the ambient radiation levels in the environment.

The ADH and the ANO REMP entail similar radiological environmental monitoring program requirements. These programs include collecting air samples and splitting or sharing sample media such as water, sediment and fish. Both programs have obtained similar results over previous years.

Sample Deviations

- Milk

The REMP did not include milk sampling within five miles of ANO in 2014 due to unavailability. The ODCM requires collection of milk samples, if available commercially within 5 miles of the plant. ANO personnel collected vegetation samples to monitor the ingestion pathway, as specified in the ODCM, because of milk unavailability.

- Lower Levels of Detection (LLDs) during this reporting period were within the acceptable limits required by Table 2.5-1 of the ODCM.

- Air Samples

Listed below are air sampler deviations that occurred during 2014 due to electrical power outages and equipment failure. These deviations did not result in exceeding LLD values specified in the ODCM. As described in ODCM, B 2.5.1, Actions A.1 and A.2, deviations are permitted from the required sampling schedule due to malfunction of sampling equipment and other legitimate reasons.

Station	Sampling Period	Comment
56	02/11/2014 – 02/25/2014	As documented on 02/26/2014, totalizer run time for the listed sampling period was 21 hours less than calculated run time. It could not be established if the lost time was due to a power outage or if the totalizer malfunctioned. The totalizer was verified to advance. (CR-ANO-C-2014-00497)
56	03/25/2014 – 04/08/2014	As documented on 04/08/2014, totalizer run time for the listed sampling period was less than expected and totalizer was not advancing. Totalizer was replaced. (CR-ANO-C-2014-00930)
06	04/22/2014 – 05/06/2014	As documented on 05/06/2014, power was lost on 4/24/14 during the listed sampling period. Reset the ground fault circuit interrupter (GFCI) and power was restored on 5/6/14. (CR-ANO-C-2014-01231)
01	03/11/2014 – 03/25/2014	As documented on 03/25/2014, the sample pump was not operating, thus no quantitative results were obtained for the listed sampling period. Pump was replaced. (CR-ANO-C-2014-00785)
56	02/11/2014 – 02/25/2014	As documented on 02/15/2014, Station #56 experienced a brief loss of power. Power was restored before the end of the work shift. (CR-ANO-C-2014-00369)
56	03/11/2014 – 03/25/2014	As documented on 03/12/2014, electrical power was lost to Station #56 on 3/12/2014. Estimated that power restoration would occur before the end of work shift. (CR-ANO-C-2014-00675)

- Missed Samples

First quarter environmental TLD Station #150 missing (CR-ANO-C-2014-00946)

First quarter environmental TLD Station # 127 missing (CR-ANO-C-2014-00966).

Second quarter environmental TLD Station # 4 missing (CR-ANO-C-2014-01890).

Third quarter environmental TLD Station #150 missing (CR-ANO-C-2014-02353)

- Unavailable Results

No results on air volume sampled for the period 3/11/14 – 3/25/14 at Station #1 are available due to pump failure.

Program Modifications

The following revisions were made to OP-1608.005, "Radiological Environmental Monitoring Program (REMP)" in 2014. Collectively, these changes were made through two revisions to the procedure, Revisions 40 and 41.

- Applied cosmetic changes throughout the procedure to improve place-keeping and clarity without changing the process or intent.
- Modified wording throughout OP-1608.005 to improve clarity and consistency. This includes removing the word "procedure" and replacing with "OP-". The modifications made do not change the process or intent of OP-1608.005.
- Added CR-ANO-C-2013-02585 in the References section. Added step to incorporate this condition report (CR) which requires chemists to ensure particulate filter is centered (off-center could allow flow to bypass the filter). A Note was also added above this step in reference to the CR.
- Numerous steps were identified as having more than one action per step. These steps were modified to indicate single actions in separate steps. The intent of this change was to facilitate place-keeping so that steps are not missed.
- Updated ODCM reference requirement to L.2.5.1 in applicable tables to most recent ODCM revision.
- Added reference to CR-ANO-C-2014-01380 to align air station numbering with the ODCM.
- Updated air samples header in Attachment 1 to OP-1608.005 to reflect the required amount of air stations from four to five. Previously, OP-1608.005 indicated that only four were required per ODCM L.2.5.1. With revision 025 of the ODCM, this is required to be five air stations. Though the requirement only stated that four stations were performed, there were five air stations already listed. The change provided consistent numbering throughout OP-1608.005 as well as the ODCM.

Attachments

Attachment 1 contains results of air, TLD, water, sediment, fish, and food product samples collected in 2014. TLDs were analyzed by a vendor (Environmental Dosimetry Company - EDC). All remaining samples were analyzed GEL Laboratories, LLC (GEL), except for the air samples covering December 30-31, 2014, which were analyzed by Teledyne Brown Engineering (TBE). TBE is the ANO vendor for 2015 samples; TBEs first air samples for 2015 also included the closing two days of 2014.

Attachment 2 contains GELs participation in the inter-laboratory comparison program during 2014. No documentation for TBEs participation is included in this report, but will be included in ANOs report for 2015 REMP activities.

Attachment 3 contains dose calculations performed for sediment using a generalized equation from Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1.

1.0 Introduction

1.1 Radiological Environmental Monitoring Program

ANO established the REMP to ensure that plant operating controls properly function to minimize any associated radiation endangerment to human health or the environment. The REMP is designed for:

- Analyzing applicable pathways for anticipated types and quantities of radionuclides released into the environment.
- Considering the possibility of a buildup of long-lived radionuclides in the environment and identifying physical and biological accumulations that may contribute to human exposures.
- Considering the potential radiation exposure to plant and animal life in the environment surrounding ANO.
- Correlating levels of radiation and radioactivity in the environment with radioactive releases from station operation.

1.2 Pathways Monitored

The airborne, direct radiation, waterborne and ingestion pathways are monitored as required by the ODCM. A description of the ANO REMP used to monitor the exposure pathways is described in Table 1.1 and shown in Figures 1-1, 1-2 and 1-3.

Section 2.0 of this report provides a discussion of 2014 sampling results and Section 3.0 provides a summary of results for the monitored exposure pathways.

1.3 Land Use Census

ANO personnel conduct the land use census every 24 months as required by ODCM Surveillance (S) 2.5.2.1. The land use census was last conducted in 2013. This census serves to identify changes in land use within five miles of ANO that would require modifications to the REMP or ODCM. The most important concerns during this census are to determine location in each sector of the nearest:

- 1) Residence
- 2) Animal milked for human consumption
- 3) Garden of greater than 500 square feet producing fresh leafy (broadleaf) vegetables*

* ANO personnel did not perform a garden census since an ODCM Limitation (L) 2.5.2 Note allows the routine sampling of broadleaf vegetation in the highest D/Q sector near the site boundary in lieu of the garden census.

The method used by ANO personnel for conducting the land use census was as follows:

- ANO personnel conducted door-to-door (drive by) field surveys in order to locate the nearest resident in each meteorological sector.
- Consultation with local agricultural authorities was used to identify commercial milk providers within five-miles of the Unit 1 reactor building.
- As a result of these surveys, the following information was obtained in each meteorological sector:
 - 1) Nearest permanent residence
 - 2) Nearest milking animal
- ANO personnel identify locations on the map, measure distances to ANO (or use a GPS system) and record results.
- Locations, if any, are identified which yield a calculated dose or dose commitments greater than those currently calculated in the ODCM.
- ANO personnel compare results to previous census.

TABLE 1.1
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Airborne	<u>Radioiodine and Particulates</u> 3 samples close to the Site Boundary, in (or near) different sectors with the highest calculated annual average ground level D/Q.	Station 2 (243° - 0.5 miles) - South of the sewage treatment plant. Station 56 (264° - 0.4 miles) – West end of the sewage treatment plant. Station 1 (88° - 0.5 miles) - Near the meteorology tower.	Continuous operation of sampler with sample collection as required by dust loading but at least once per 14 days.	Radioiodine Canister – Analyze at least once per 14 days for I-131. Particulate Sampler – Analyze for gross beta radioactivity following filter change.
	<u>Radioiodine and Particulates</u> 1 sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	Station 6 (111° - 6.8 miles) - Entergy local office in Russellville (305 South Knoxville Avenue).		
	<u>Radioiodine and Particulates</u> 1 sample from a control location 15 - 30 km (10 - 20 miles) distance.	Station 7 (210° - 19.0 miles) – Entergy Supply Yard on Highway 10 in Danville.		
Direct Radiation	<u>Thermoluminescent dosimetry (TLDs)</u> 16 inner ring stations with two or more dosimeters in each meteorological sector in the general area of the site boundary.	Station 1 (88° - 0.5 miles) - On a pole near the meteorology tower. Station 2 (243° - 0.5 miles) - South of the sewage treatment plant. Station 3 (5° - 0.7 miles) – West of ANO Gate #2 on Highway 333 (approximately 0.35 miles) Station 4 (181° - 0.5 miles) – West of May Cemetery entrance on south side of the road.	Once per 92 days.	Gamma Dose – Once per 92 days.

TABLE 1.1 (continued)
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<p><u>TLDs</u></p> <p>16 inner ring stations with two or more dosimeters in each meteorological sector in the general area of the site boundary</p>	<p>Station 56 (264° - 0.4 miles) - West end of the sewage treatment plant.</p> <p>Station 108 (306° - 0.9 miles) - South on Flatwood Road on a utility pole.</p> <p>Station 109 (291° - 0.6 miles) - Utility pole across from the junction of Flatwood Road and Round Mountain Road.</p> <p>Station 110 (138° - 0.8 miles) - Bunker Hill Lane on the first utility pole on the left.</p> <p>Station 145 (28° - 0.6 miles) - Near west entrance to the RERTC on a utility pole.</p> <p>Station 146 (45° - 0.6 miles) - South end of east parking lot at RERTC on a utility pole.</p> <p>Station 147 (61° - 0.6 miles) - West side of Bunker Hill Road, approximately 100 yards from intersection with State Highway 333.</p> <p>Station 148 (122° - 0.6 miles) - Intersection of Bunker Hill Road with Scott Lane on county road sign post.</p>	Once per 92 days.	Gamma Dose – Once per 92 days.

TABLE 1.1 (continued)
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<u>TLDs</u> 16 inner ring stations with two or more dosimeters in each meteorological sector in the general area of the Site Boundary.	Station 149 (156° - 0.5 miles) – On a utility pole on the south side of May Road. Station 150 (205° - 0.6 miles) – North side of May Road on a utility pole past the McCurley Place turn. Station 151 (225° - 0.4 miles) – West side of sewage treatment plant near the lake on a metal post. Station 152 (338° - 0.8 miles) – South side of State Highway 333 on a road sign post.	Once per 92 days.	Gamma Dose – Once per 92 days.
	<u>TLDs</u> 8 stations with two or more dosimeters in special interest areas such as population centers, nearby residences, schools, and in 1 - 2 areas to serve as control locations.	Station 6 (111° - 6.8 miles) - Entergy local office in Russellville (305 South Knoxville Avenue). Station 7 (210° - 19.0 miles) – Entergy Supply Yard on Highway 10 in Danville. Station 111 (120° - 2.0 miles) – Marina Road on a utility pole on the left just prior to curve. Station 116 (318° - 1.8 miles) - Highway 333 and Highway 64 in London on a utility pole north of the railroad tracks.		

TABLE 1.1 (continued)
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<u>TLDs</u> 8 stations with two or more dosimeters in special interest areas such as population centers, nearby residences, schools, and in 1 – 2 areas to serve as control locations.	Station 125 (46° - 8.7 miles) - College Street on a utility pole at the southeast corner of the red brick school building. Station 127 (100° - 5.2 miles) - Arkansas Tech Campus on a utility pole across from Paine Hall. Station 137 (151° - 8.2 miles) – On a speed limit sign on the right in front of the Morris R. Moore Arkansas National Guard Armory. Station 153 (304° - 9.2 miles) - Knoxville Elementary School near the school entrance gate on a utility pole.	Once per 92 days.	Gamma Dose – Once per 92 days.
Waterborne	<u>Surface Water</u> 1 indicator location (influenced by plant discharge) 1 control location (uninfluenced by plant discharge)	Station 8 (166° - 0.2 miles) - Plant discharge canal. Station 10 (95° - 0.5 miles) – Plant intake canal.	Once per 92 days.	Gamma isotopic and tritium analyses once per 92 days.
	<u>Drinking Water</u> 1 indicator location (influenced by plant discharge) 1 control location (uninfluenced by plant discharge)	Station 14 (70° - 5.1 miles) - Russellville city water system from the Illinois Bayou. Station 57 (208° - 19.5 miles) - Danville public water supply treatment on Fifth Street.	Once per 92 days.	I-131, gross beta, gamma isotopic and tritium analyses once per 92 days.

TABLE 1.1 (continued)
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Waterborne	<u>Sediment</u> 1 indicator location (influenced by plant discharge) 1 control location (uninfluenced by plant discharge)	Station 8 (243° - 0.9 miles) - Plant discharge canal. Station 16 (287° - 5.5 miles) - Panther Bay on south side of Arkansas River across from mouth of Piney Creek.	Once per 365 days.	Gamma isotopic analysis once per 365 days.
Ingestion	<u>Milk</u> 1 indicator sample location within five-mile distance if commercially available. 1 control sample location at a distance of >five-miles when an indicator exists.	Currently, no available milking animals within 5 miles of ANO.	Once per 92 days.	Gamma isotopic and I-131 analyses once per 92 days.
	<u>Fish</u> 1 sample of commercially and/or recreationally important species in vicinity of plant discharge. 1 sample of same species in area not influenced by plant discharge.	Station 8 (212° - 0.5 miles) – Plant discharge canal. Station 16 (287° - 5.5 miles) - Panther Bay on south side of Arkansas River across from mouth of Piney Creek.	Once per 365 days.	Gamma isotopic on edible portions once per 365 days.
	<u>Food Products</u> 1 sample of broadleaf (edible or non-edible) near the site boundary from one of the highest anticipated annual average ground level D/Q sectors, if milk sampling is not performed. 1 sample location of broadleaf vegetation (edible or non-edible) from a control location 15 – 30 km (10 – 20 miles) distant, if milk sampling is not performed.	Station 13 (273° - 0.5 miles) - West from ANO toward Gate 4 onto Flatwood Road. Station 55 (208° - 16.5 miles) – Intersection of Highway 27 and 154.	Three per 365 days.	Gamma. isotopic and I-131 analyses three times per 365 days

TABLE 1.1 (continued)
RADIOLOGICAL ENVIRONMENT SAMPLING PROGRAM

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Ground water	2 sample locations of Groundwater from a control location up gradient from the protected area	Station 58 (GWM-1, 22° - 0.3 miles) – North of Protected Area on Owner Control Area (OCA). West of Security North Check Point, east side of access road.	Once per 92 days	Control, Tritium, Gross Beta and Gamma Isotopic, once per 92 days.
		Station 62 (GWM-101, 34° - 0.5 miles) – North of Protected Area on OCA. East of outside receiving building.	Once per 92 days	Control, Tritium, Gross Beta and Gamma Isotopic, once per 92 days.
	2 sample locations of Groundwater from indicator locations down gradient from the protected area.	Station 63 (GWM-103, 206° - 0.1 miles) – South of Protected area on OCA. North-east of Stator Rewind Bldg. near wood line.	Once per 92 days	Indicator, Tritium, Gross Beta and Gamma Isotopic, once per 92 days.
		Station 64 (GWM-13, 112° - 0.1 miles) – South of Oily Water Separator facility, northwest corner of U-2 Intake Structure. Inside Protected area.	Once per 92 days	Indicator, Tritium, Gross Beta and Gamma Isotopic, once per 92 days.

FIGURE 1-1
SAMPLE COLLECTION SITES – NEAR FIELD

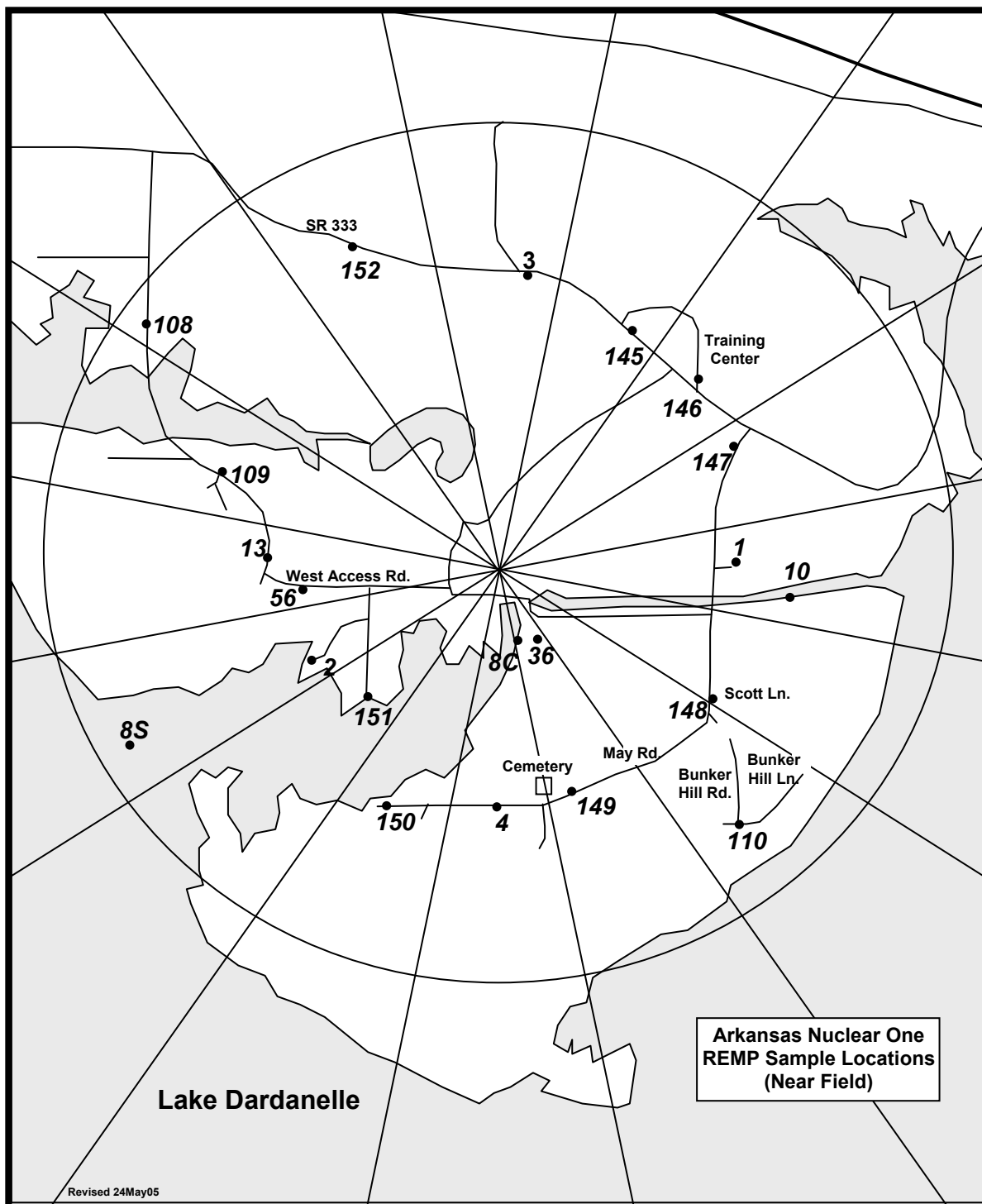


FIGURE 1-2

SAMPLE COLLECTION SITES – FAR FIELD

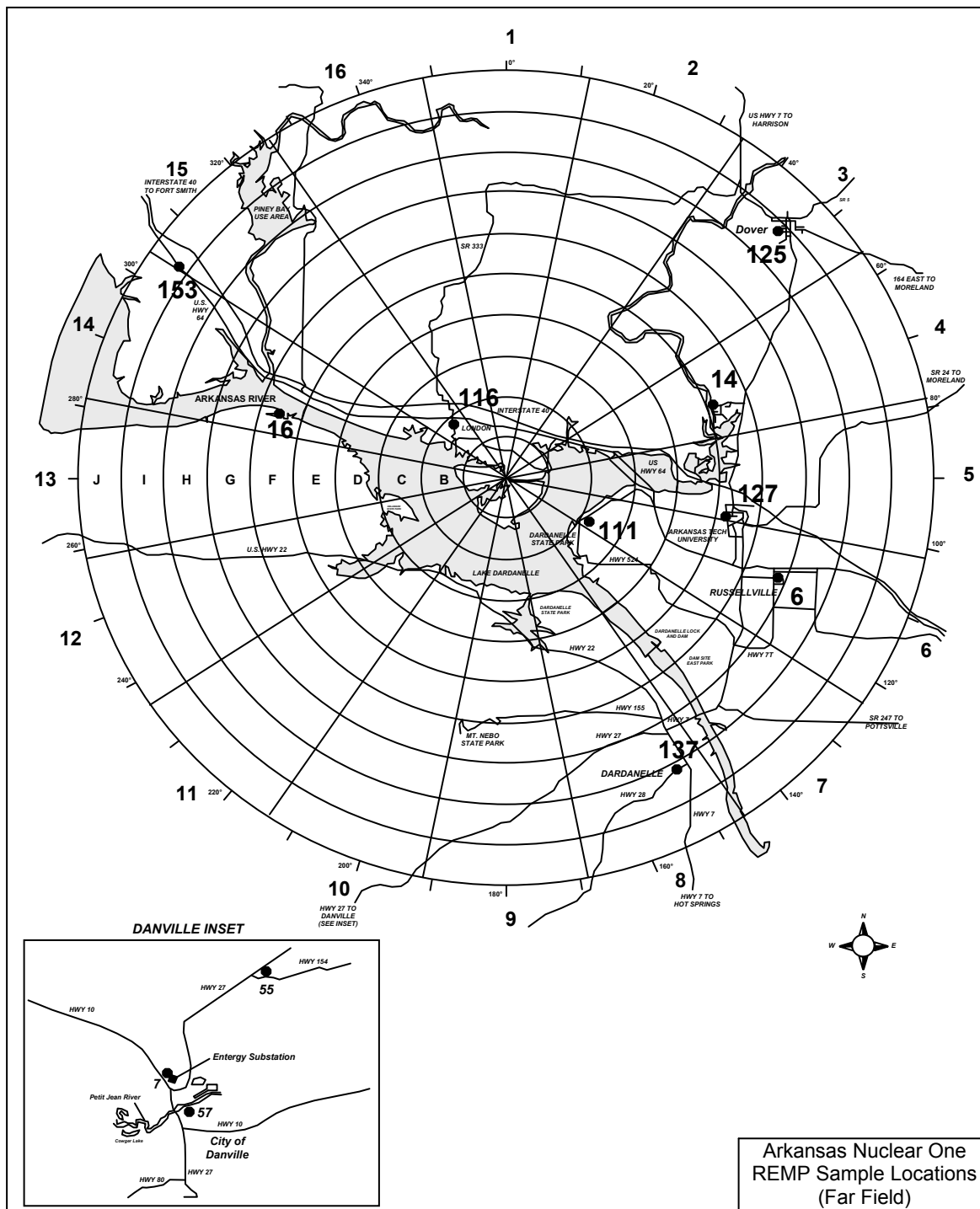
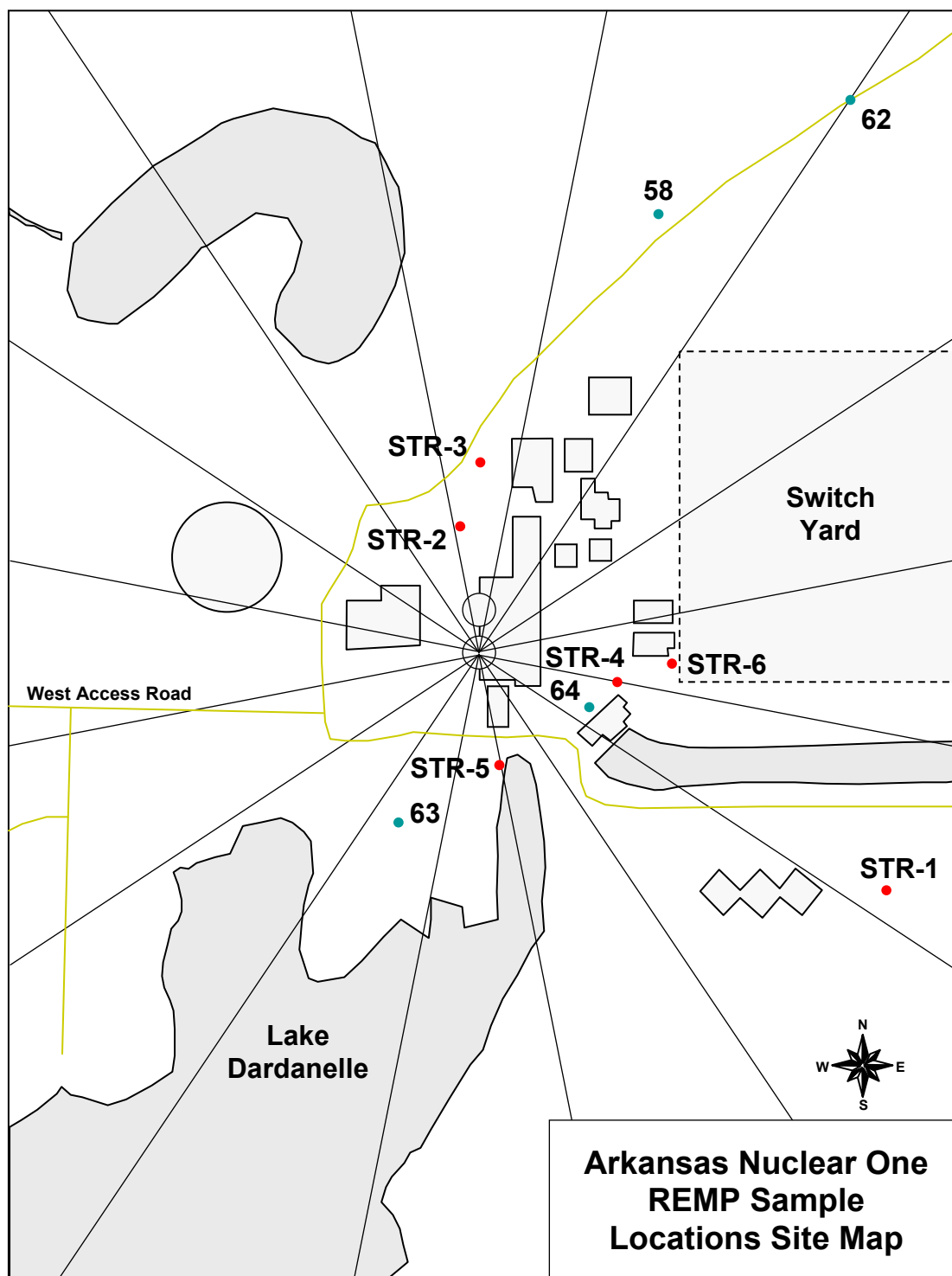


FIGURE 1-3
SAMPLE COLLECTION SITES – SITE MAP



2.0 Interpretation and Trends of Results

2.1 Air Particulate and Radioiodine Sample Results

The REMP has detected radioactivity in the airborne pathway attributable to other sources. These include the 25th Chinese nuclear test explosion in 1980, the radioactive plume release due to reactor core degradation at Chernobyl Nuclear Power Plant in 1986 and the Fukushima Daiichi Nuclear Power Plant accident (Mach 11, 2011).

As in past years, there were no other detections of I-131. Indicator gross beta air particulate results for 2014 were higher compared to results obtained from 2000-2012 of the operational REMP, but less than 2013 when the annual average was 0.043. Also, the 2014 annual average was less than the average for preoperational levels. Results are reported as annual average picocuries per cubic meter (pCi/m³).

<u>Monitoring Period</u>	<u>Result</u>
2000 – 2012 (Minimum Value)	0.020
2014 Value	0.035
2000 – 2012 (Maximum Value)	0.032
Preoperational	0.050

In the absence of plant-related gamma radionuclides, gross beta activity is attributed to naturally occurring radionuclides. Table 3.1, which includes gross beta concentrations and provides a comparison of the indicator and control means and ranges, emphasizes the consistent trends seen in this pathway to support the presence of naturally occurring activity. Therefore, it can be concluded that the airborne pathway continues to be unaffected by ANO operations.

2.2 Thermoluminescent Dosimetry (TLD) Sample Results

ANO reports measured dose as net exposure (field reading less transit reading) normalized to 92 days and relies on comparison of the indicator locations to the control as a measure of plant impact. ANO's comparison of the inner ring and special interest area TLD results to the control, as seen in Table 3.1, identified no noticeable trend that would indicate that the ambient radiation levels are being affected by plant operations. In addition, the inner ring value of 7.83 millirem (mrem) shown in Table 3.1 for 2014 is within the historical bounds of 2000 – 2013 annual average results, which have ranged from 6.6 to 8.9 mrem. Overall, ANO concluded that the ambient radiation levels are not being affected by plant operations.

2.3 Water Sample Results

Analytical results for 2014 drinking water and ground water samples were similar to those reported in previous years. Gamma radionuclides analytical results for 2014 surface water samples were similar to those reported in previous years. Tritium detection in ANO surface water indicator samples continues but at levels below those experienced in 2013 and below the ODCM-required LLD. These results are further explained below.

Surface water samples were collected and analyzed for gamma radionuclides and tritium. Gamma radionuclides were below detectable limits which is consistent with results seen in previous operational years. Tritium continues to be detected at the indicator location (Station 8) where previously monitored liquid radioactive effluent from the plant is periodically discharged in accordance with the regulatory criteria established in the ODCM and, for 2014, at levels considerably lower than the ODCM-required LLD of 3000 picocuries per liter. Furthermore, unlike the elevated tritium levels observed in 2013 attributable to particular plant events, no elevated levels attributable to particular events were observed in 2014. Results are reported as annual average picocuries per liter (pCi/l).

<u>Monitoring Period</u>	<u>Result</u>
2000 – 2013 (Minimum Value)	277.1
2014 Value	554.5
2000 – 2013 (Maximum Value)	1003.5
Preoperational	200.0

ANO personnel have noted no definable increasing trends associated with the tritium levels at the discharge location. Levels detected during 2014 and previous operational years have been well below regulatory reporting limits. Therefore, the operation of ANO had no definable impact on this waterborne pathway during 2014 and levels of radionuclides remain similar to those obtained in previous operational years.

Drinking water samples were collected from two locations (indicator and control). Although ANO personnel utilize Station 14 (City of Russellville) as an indicator location due to the potential for the drinking water pathway to exist, the City of Russellville has not withdrawn water from Lake Dardanelle in the past several years.

Drinking water samples were analyzed for gross beta radionuclides, I-131, gamma radionuclides and tritium. Gamma radionuclides, gross beta radionuclides, I-131 and tritium concentrations were below the LLD limits at the indicator and control locations, which is consistent with 2013 and comparable to the 2000 – 2012 preoperational and operational years as shown below. Results from 2014 are summarized in Table 3.1. Results are reported as annual average pCi/l.

<u>Radionuclide</u>	<u>2014</u>	<u>2013</u>	<u>2000 – 2012</u>	<u>Preoperational</u>
Gross Beta	<LLD	< LLD	2.59	2.0
Iodine-131	<LLD	< LLD	< LLD	< LLD
Gamma	<LLD	< LLD	< LLD	< LLD
Tritium	<LLD	< LLD	< LLD	200.0

ANO personnel have noted no definable trends associated with drinking water results at the indicator location. Therefore, the operation of ANO had no definable impact on this waterborne pathway during 2014 and levels of radionuclides remain similar to those obtained in previous operational years.

Groundwater samples were collected from four REMP locations (2 control, and 2 indicator locations). During 2011, ANO incorporated sixteen additional groundwater monitoring wells into the Groundwater Protection Initiative (GPI) site program. Sample data are compiled, organized and reviewed annually to:

- Analyze for increasing or decreasing trends at individual sample points, wells or groups of wells.
- Review the radionuclides detected to determine whether changes should be made to the analysis suites or sampling frequencies for each sampling location.
- Evaluate the locations of radionuclides in ground water to determine if changes should be made to the sampling locations.
- Review current investigation levels and determine if changes should be made.
- Determine if any change to the ODCM is required.
- Determine if a corrective actions/remediation is required.

Groundwater samples from the four REMP locations were analyzed for tritium and gamma radionuclides. Tritium and gamma concentrations were below the LLD limits at all four locations. Listed below is a comparison of 2014 indicator results to past operational years. Results are reported as annual average pCi/l. REMP Groundwater data are captured in Tables 8.1 and 8.2. Therefore, ANO operations had no significant impact on the environment or public by this waterborne pathway.

<u>Radionuclide</u>	<u>2014</u>	<u>2006 – 2013</u>
Iodine-131	< LLD	< LLD
Gamma	< LLD	< LLD
Tritium	< LLD	< LLD

2.4 Sediment Sample Results

Sediment samples were collected from two locations in 2014 and analyzed for gamma radionuclides. Listed below is a comparison of 2014 indicator results to 2013 and the 2000 – 2012 operational years. Therefore, ANO operations had no significant impact on the environment or public by this waterborne pathway. Results are reported as pCi/kg.

<u>Monitoring Period</u>	<u>Result</u>
2000 – 2012 (Minimum Value)	41.79
2013 Value	< LLD
2014 Value	< LLD
2000 – 2012 (Maximum Value)	1170.0

Since reporting levels for radionuclides in sediment have not been established, an evaluation of potential dose to the public from this media was performed as shown in Attachment 3.

2.5 Milk Sample Results

Milk samples were not collected during 2014 due to the unavailability of indicator locations within five-miles of ANO.

2.6 Fish Sample Results

Fish samples were collected from two locations and analyzed for gamma radionuclides. In 2014, gamma radionuclides were below detectable limits which are consistent with the preoperational monitoring period and operational results since 1997. Therefore, based on these measurements, ANO operations had no significant radiological impact upon the environment or public by this ingestion pathway.

2.7 Food Product Sample Results

The REMP has detected radionuclides prior to 1990 that are attributable to other sources. These include the radioactive plume release due to reactor core degradation at Chernobyl Nuclear Power Plant in 1986 and atmospheric weapons testing.

In 2014, food product samples were collected when available from two locations and analyzed for Iodine-131 and gamma radionuclides. The 2014 levels remained undetectable, as has been the case in previous years. Therefore, based on these measurements, ANO operations had no significant radiological impact upon the environment or public by this ingestion pathway.

2.8 Interlaboratory Comparison Results

GEL Laboratories analyzed interlaboratory comparison samples to fulfill the requirements of ODCM Section 2.5.3. Attachment 2 contains these results.

2.9 Land Use Census Results

The latest land use census (performed in 2013) did not identify any new locations that yielded a calculated dose or dose commitment greater than those currently calculated (see Table 2.1).

Also, the land use census identified no milk-producing animals within a five-mile radius of the plant site. ANO personnel chose not to perform a garden census in 2013, which is allowed by ODCM Section L 2.5.2, in lieu of broadleaf vegetation sampling in the meteorological sector (Sector 13) with the highest D/Q.

TABLE 2.1
2013 LAND USE CENSUS
Nearest Residence Within Five Miles

Direction	Sector	Distance (miles)
N	1	0.9
NNE	2	1.3
NE	3	0.9
ENE	4	0.8
E	5	0.8
ESE	6	0.8
SE	7	0.8
SSE	8	0.8
S	9	0.8
SSW	10	0.7
SW	11	2.8
WSW	12	0.7
W	13	0.8
WNW	14	0.8
NW	15	1.0
NNW	16	0.9

3.0 Radiological Environmental Monitoring Program Summary

3.1 2014 Program Results Summary

Table 3.1 summarizes the 2014 REMP results.

TABLE 3.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Name of Facility: ANO - Units 1 and 2 **Docket No:** 50-313 and 50-368
Location of Facility: Pope County, Arkansas **Reporting Period:** January - December 2014

Sample Type (Units)	Type / Number of Analyses ^a	LLD ^b	Indicator Locations Mean (°F) ^c [Range]	Location with Highest Annual Mean		Control Locations Mean (°F) ^c [Range]	Number of Non-Routine Results ^e
				Location ^d	Mean (°F) ^c [Range]		
Air Particulates (pCi/m ³)	GB / 140	0.01	0.0355 (84 / 84) [0.015 – 0.072]	Station 2 (243°, 0.5 mi)	0.0363 (28 / 28) [0.020 - 0.070]	0.034 (56 / 56) [0.019 - 0.079]	0
Airborne Iodine (pCi/ m ³)	I-131 / 140	0.07	< LLD	N/A	N/A	< LLD	0
Inner Ring TLDs (mR/Qtr)	Gamma / 61	(f)	7.83 (61 / 64) [4.9 – 10.1]	Station 56 (264°, 0.4 mi)	9.2 (4 / 4) [8.1 – 9.7]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma / 27	(f)	6.91 (27 / 28) [4.3 – 9.0]	Station 137 (151°, 8.2 mi)	8.3 (4 / 4) [7.7 – 9.0]	N/A	0
Control TLD (mR/Qtr)	Gamma / 4	(f)	N/A	N/A	N/A	6.1 (4 / 4) [5.6 – 6.6]	0

TABLE 3.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Sample Type (Units)	Type / Number of Analyses ^a	LLD ^b	Indicator Locations Mean (°F) ^c [Range]	Location with Highest Annual Mean		Control Locations Mean (°F) ^c [Range]	Number of Non-Routine Results ^e
				Location ^d	Mean (°F) ^c [Range]		
Surface Water (pCi/l)	H-3 / 8	3000	555 (4* / 4) [344 – 745]	Station 8 (166°, 0.2 mi)	555 (4* / 4) [344 – 745]	< LLD	0
	GS / 24						
	Mn-54	15	< LLD	N/A	N/A	< LLD	0
	Fe-59	30	< LLD	N/A	N/A	< LLD	0
	Co-58	15	< LLD	N/A	N/A	< LLD	0
	Co-60	15	< LLD	N/A	N/A	< LLD	0
	Zn-65	30	< LLD	N/A	N/A	< LLD	0
	Zr-95	30	< LLD	N/A	N/A	< LLD	0
	Nb-95	15	< LLD	N/A	N/A	< LLD	0
	I-131	15	< LLD	N/A	N/A	< LLD	0
	Cs-134	15	< LLD	N/A	N/A	< LLD	0
	Cs-137	18	< LLD	N/A	N/A	< LLD	0
	Ba-140	60	< LLD	N/A	N/A	< LLD	0
	La-140	15	< LLD	N/A	N/A	< LLD	0

* Positive tritium results

TABLE 3.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Sample Type (Units)	Type / Number of Analyses ^a	LLD ^b	Indicator Locations Mean (°F) ^c [Range]	Location with Highest Annual Mean		Control Locations Mean (°F) ^c [Range]	Number of Non-Routine Results ^e
				Location ^d	Mean (°F) ^c [Range]		
Drinking Water (pCi/l)	GB / 8	4	< LLD	N/A	N/A	< LLD	0
	I-131 / 8	1	< LLD	N/A	N/A	< LLD	0
	H-3 / 8	2000	< LLD	N/A	N/A	< LLD	0
	GS / 8						
	Mn-54	15	< LLD	N/A	N/A	< LLD	0
	Fe-59	30	< LLD	N/A	N/A	< LLD	0
	Co-58	15	< LLD	N/A	N/A	< LLD	0
	Co-60	15	< LLD	N/A	N/A	< LLD	0
	Zn-65	30	< LLD	N/A	N/A	< LLD	0
	Zr-95	30	< LLD	N/A	N/A	< LLD	0
	Nb-95	15	< LLD	N/A	N/A	< LLD	0
	Cs-134	15	< LLD	N/A	N/A	< LLD	0
	Cs-137	18	< LLD	N/A	N/A	< LLD	0
	Ba-140	60	< LLD	N/A	N/A	< LLD	0
	La-140	15	< LLD	N/A	N/A	< LLD	0
Bottom Sediment (pCi/kg)	GS / 2						
	Cs-134	150	< LLD	N/A	< LLD	< LLD	0
	Cs-137	180	< LLD	N/A	< LLD	< LLD	0

* Positive GB results.

TABLE 3.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Sample Type (Units)	Type / Number of Analyses ^a	LLD ^b	Indicator Locations Mean (°F) ^c [Range]	Location with Highest Annual Mean		Control Locations Mean (°F) ^c [Range]	Number of Non-Routine Results ^e
				Location ^d	Mean (°F) ^c [Range]		
Fish (pCi/kg)	GS / 2						
	Mn-54	130	< LLD	N/A	N/A	< LLD	0
	Fe-59	260	< LLD	N/A	N/A	< LLD	0
	Co-58	130	< LLD	N/A	N/A	< LLD	0
	Co-60	130	< LLD	N/A	N/A	< LLD	0
	Zn-65	260	< LLD	N/A	N/A	< LLD	0
	Cs-134	130	< LLD	N/A	N/A	< LLD	0
	Cs-137	150	< LLD	N/A	N/A	< LLD	0
Food Products (pCi/kg)	I-131 / 6	60	< LLD	N/A	N/A	N/A	0
	GS / 6						
	Cs-134	60	< LLD	N/A	N/A	N/A	0
	Cs-137	80	< LLD	N/A	N/A	N/A	0

^a GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.

^b LLD = Required lower limit of detection based on ANO Units 1 and 2 ODCM Table 2.5-1.

^c Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis (F).

^d Locations are specified (1) by name and (2) degrees relative to reactor site.

^e Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.

^f LLD is not defined in ANO Units 1 and 2 ODCM Table 2.5-1.

ATTACHMENT 1
SUMMARY OF MONITORING RESULTS

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Table 1.1

Sample Type: Air Particulate

Analysis: Gross Beta

Units: pCi/m³

Start Date	End Date	Station 1 (Indicator)	Station 2 (Indicator)	Station 56 (Indicator)	Station 6 (Control)	Station 7* (Control)
<u>Required LLD</u> →		<u>0.01</u>	<u>0.01</u>	<u>0.01</u>	<u>0.01</u>	<u>0.01</u>
12/31/2013	01/14/2014	0.032	0.034	0.037	0.033	0.042
01/14/2014	01/28/2014	0.027	0.022	0.027	0.022	0.026
01/28/2014	02/10/2014	0.036	0.034	0.034	0.030	0.032
02/10/2014	02/20/2014	0.046	0.037	0.041	0.032	0.039
02/20/2014	02/26/2014	0.025	0.020	0.030	0.023	0.026
02/26/2014	03/11/2014	0.055	0.046	0.050	0.051	0.049
03/11/2014	03/25/2014	0.015	0.029	0.042	0.031	0.032
03/25/2014	04/08/2014	0.031	0.032	0.031	0.030	0.029
04/08/2014	04/22/2014	0.072	0.070	0.056	0.062	0.079
04/22/2014	05/06/2014	0.024	0.031	0.028	0.033	0.027
05/06/2014	05/20/2014	0.030	0.029	0.028	0.028	0.028
05/20/2014	06/03/2014	0.024	0.027	0.026	0.023	0.026
06/03/2014	06/17/2014	0.025	0.023	0.024	0.020	0.023
06/17/2014	07/01/2014	0.028	0.031	0.032	0.028	0.028
07/01/2014	07/15/2014	0.031	0.031	0.028	0.028	0.026
07/15/2014	07/29/2014	0.032	0.034	0.030	0.025	0.032
07/29/2014	08/12/2014	0.041	0.040	0.034	0.039	0.038
08/12/2014	08/26/2014	0.034	0.034	0.033	0.030	0.032
08/26/2014	09/09/2014	0.027	0.033	0.028	0.031	0.028
09/09/2014	09/23/2014	0.034	0.039	0.033	0.033	0.036
09/23/2014	10/07/2014	0.042	0.041	0.037	0.039	0.041
10/07/2014	10/21/2014	0.043	0.038	0.036	0.036	0.037
10/21/2014	11/04/2014	0.047	0.048	0.045	0.046	0.047
11/04/2014	11/18/2014	0.036	0.039	0.037	0.032	0.031
11/18/2014	12/02/2014	0.044	0.047	0.032	0.035	0.034
12/02/2014	12/16/2014	0.054	0.067	0.054	0.047	0.044
12/16/2014	12/30/2014	0.038	0.035	0.034	0.033	0.029
12/30/2014	01/12/2015	0.024	0.026	0.023	0.021	0.019

* Station with highest annual mean.

Table 1.2

Sample Type: Radioiodine Cartridge Analysis: Iodine-131 Units: pCi/m³

Start Date	End Date	Station 1 (Indicator)	Station 2 (Indicator)	Station 56 (Indicator)	Station 6 (Control)	Station 7* (Control)
<u>Required LLD</u> →		<u>0.07</u>	<u>0.07</u>	<u>0.07</u>	<u>0.07</u>	<u>0.07</u>
12/31/2013	01/14/2014	< 0.046	< 0.018	< 0.019	< 0.024	< 0.022
01/14/2014	01/28/2014	< 0.014	< 0.011	< 0.027	< 0.015	< 0.018
01/28/2014	02/10/2014	< 0.017	< 0.022	< 0.025	< 0.025	< 0.023
02/10/2014	02/20/2014	< 0.031	< 0.023	< 0.049	< 0.044	< 0.032
02/20/2014	02/26/2014	< 0.051	< 0.015	< 0.013	< 0.016	< 0.019
02/26/2014	03/11/2014	< 0.023	< 0.017	< 0.016	< 0.016	< 0.021
03/11/2014	03/25/2014	< 0.008	< 0.008	< 0.015	< 0.009	< 0.009
03/25/2014	04/08/2014	< 0.027	< 0.016	< 0.033	< 0.029	< 0.023
04/08/2014	04/22/2014	< 0.023	< 0.012	< 0.016	< 0.019	< 0.013
04/22/2014	05/06/2014	< 0.009	< 0.010	< 0.010	< 0.062	< 0.007
05/06/2014	05/20/2014	< 0.019	< 0.013	< 0.020	< 0.027	< 0.016
05/20/2014	06/03/2014	< 0.026	< 0.033	< 0.013	< 0.028	< 0.021
06/03/2014	06/17/2014	< 0.015	< 0.011	< 0.024	< 0.023	< 0.012
06/17/2014	07/01/2014	< 0.012	< 0.010	< 0.015	< 0.014	< 0.013
07/01/2014	07/15/2014	< 0.038	< 0.020	< 0.021	< 0.035	< 0.029
07/15/2014	07/29/2014	< 0.019	< 0.026	< 0.026	< 0.018	< 0.016
07/29/2014	08/12/2014	< 0.021	< 0.015	< 0.022	< 0.010	< 0.013
08/12/2014	08/26/2014	< 0.025	< 0.030	< 0.035	< 0.033	< 0.033
08/26/2014	09/09/2014	< 0.029	< 0.018	< 0.021	< 0.018	< 0.026
09/09/2014	09/23/2014	< 0.011	< 0.011	< 0.012	< 0.009	< 0.012
09/23/2014	10/07/2014	< 0.018	< 0.018	< 0.019	< 0.019	< 0.027
10/07/2014	10/21/2014	< 0.0120	< 0.017	< 0.034	< 0.026	< 0.026
10/21/2014	11/04/2014	< 0.015	< 0.020	< 0.023	< 0.017	< 0.027
11/04/2014	11/18/2014	< 0.018	< 0.018	< 0.029	< 0.023	< 0.027
11/18/2014	12/02/2014	< 0.019	< 0.021	< 0.021	< 0.019	< 0.017
12/02/2014	12/16/2014	< 0.017	< 0.017	< 0.024	< 0.015	< 0.011
12/16/2014	12/30/2014	< 0.022	< 0.021	< 0.032	< 0.018	< 0.043
12/30/2014	01/12/2015	< 0.019	< 0.034	< 0.034	< 0.034	< 0.034

* Station with highest annual mean.

Table 2.1

Sample Type: Thermoluminescent Dosimeters Analysis: Gamma Dose Units: mrem/Qtr

Inner Ring (Indicators)					
Station	1st Qtr '14 (mrem)	2nd Qtr '14 (mrem)	3rd Qtr '14 (mrem)	4th Qtr '14 (mrem)	Annual Mean '14 (mrem)
1	8.1	7.4	8.9	9.0	8.4
2	7.2	7.9	8.2	8.5	8.0
3	5.8	4.9	5.0	6.6	5.6
4	7.6	LOST	7.2	8.9	7.9
*56	9.3	9.7	8.1	9.6	9.2
108	8.1	7.6	7.1	9.8	8.2
109	8.2	8.3	7.7	9.7	8.5
110	7.4	8.2	8.3	9.2	8.3
145	8.2	7.9	7.5	8.7	8.1
146	7.8	7.9	7.4	8.7	8.0
147	7.1	6.0	6.2	7.6	6.7
148	7.7	7.1	7.6	9.0	7.9
149	7.2	8.1	7.8	8.1	7.8
150	LOST	8.2	LOST	9.8	9.0
151	7.7	7.8	7.9	10.1	8.4
152	6.8	5.9	5.2	7.3	6.3

* Station with highest annual mean.

Table 2.2

Sample Type: Thermoluminescent Dosimeters Analysis: Gamma Dose Units: mrem/Qtr

Special Interest Areas - (Population Centers & Schools)					
Station	1st Qtr '14 (mrem)	2nd Qtr '14 (mrem)	3rd Qtr '14 (mrem)	4th Qtr '14 (mrem)	Annual Mean '14 (mrem)
6	7.2	6.6	6.4	8.0	7.1
111	5.7	5.6	5.3	6.2	5.7
116	8.2	7.6	7.2	8.3	7.8
125	4.9	4.3	4.5	5.2	4.7
127	LOST	7.0	7.0	8.3	7.4
*137	7.9	7.7	8.4	9.0	8.3
153	7.3	7.5	6.5	8.9	7.6

* Stations with highest annual mean.

Special Interest Areas – (Control)					
Station	1st Qtr '14 (mrem)	2nd Qtr '14 (mrem)	3rd Qtr '14 (mrem)	4th Qtr '14 (mrem)	Annual Mean '14 (mrem)
7	6.4	5.6	5.7	6.6	6.1

Table 3.1

Sample Type: Surface Water

Analysis: Gamma Isotopic

Units: pCi/l

Location	Start Date	End Date	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
	Required LLD	→	15	15	30	15	30	15	30	15	15	18	60	15
Station 8 (Indicator)	12/31/2013	01/31/2014	<2.90	<2.20	<5.18	<3.25	<5.81	<2.74	<4.80	<4.80	<3.09	<2.49	<4.33	<4.33
Station 10 (Control)	12/31/2013	01/31/2014	<2.63	<3.22	<5.46	<2.27	<4.94	<3.04	<4.38	<5.10	<3.03	<3.75	<3.99	<3.99
Station 8 (Indicator)	01/31/2014	02/29/2014	<2.17	<2.02	<4.50	<2.60	<4.73	<2.15	<4.05	<3.50	<2.37	<2.39	<3.38	<3.38
Station 10 (Control)	01/31/2014	02/29/2014	<3.19	<3.89	<7.78	<2.92	<7.71	<4.52	<6.31	<7.78	<4.38	<3.92	<5.51	<5.51
Station 8 (Indicator)	02/28/2014	03/31/2014	<4.76	<4.25	<8.28	<5.54	<10.20	<4.20	<9.26	<5.89	<5.37	<4.79	<6.31	<6.31
Station 10 (Control)	02/28/2014	03/31/2014	<4.19	<3.41	<7.34	<4.26	<8.01	<4.31	<8.17	<5.55	<3.93	<4.74	<4.52	<4.52
Station 8 (Indicator)	03/31/2014	04/30/2014	<3.66	<3.61	<7.88	<5.29	<5.70	<3.91	<7.05	<5.96	<4.37	<4.77	<6.73	<6.73
Station 10 (Control)	03/31/2014	04/30/2014	<4.87	<4.42	<10.00	<5.42	<8.54	<4.89	<10.90	<7.65	<4.70	<4.65	<10.60	<10.60
Station 8 (Indicator)	04/30/2014	05/31/2014	<3.78	<5.74	<11.20	<5.37	<10.40	<4.71	<9.57	<8.53	<5.64	<5.00	<7.25	<7.25
Station 10 (Control)	04/30/2014	05/31/2014	<3.90	<3.62	<8.91	<4.95	<8.69	<5.03	<6.67	<9.09	<3.90	<3.87	<7.60	<7.60
Station 8 (Indicator)	05/31/2014	06/30/2014	<1.98	<2.04	<3.71	<1.67	<4.21	<2.02	<3.34	<3.75	<2.07	<2.57	<4.01	<4.01
Station 10 (Control)	05/31/2014	06/30/2014	<1.67	<1.85	<4.41	<2.06	<3.87	<2.13	<3.22	<4.00	<2.05	<1.99	<3.13	<3.13
Station 8 (Indicator)	06/30/2014	07/31/2014	<3.62	<2.93	<6.73	<2.99	<6.35	<3.16	<5.33	<5.44	<3.44	<3.53	<5.40	<5.40
Station 10 (Control)	06/30/2014	07/31/2014	<2.94	<3.09	<6.01	<3.42	<7.13	<3.54	<5.72	<5.08	<3.90	<3.36	<5.68	<5.68
Station 8 (Indicator)	07/31/2014	08/31/2014	<1.90	<1.86	<3.70	<1.90	<3.77	<1.99	<3.25	<2.89	<1.90	<1.91	<2.75	<2.75
Station 10 (Control)	07/31/2014	08/31/2014	<1.95	<1.91	<4.17	<2.16	<3.69	<2.00	<3.51	<3.04	<2.35	<1.98	<3.41	<3.41
Station 8 (Indicator)	08/31/2014	09/30/2014	<3.46	<3.55	<8.19	<4.31	<8.10	<3.40	<7.74	<4.87	<4.37	<4.41	<3.28	<3.28
Station 10 (Control)	08/31/2014	09/30/2014	<1.40	<1.38	<3.05	<1.71	<3.17	<1.46	<2.76	<2.02	<1.61	<1.85	<2.00	<2.00
Station 8 (Indicator)	09/30/2014	10/31/2014	<4.55	<4.01	<9.18	<4.28	<10.20	<5.40	<8.95	<8.66	<5.76	<5.38	<10.10	<10.10
Station 10 (Control)	09/30/2014	10/31/2014	<4.06	<4.98	<7.54	<4.64	<9.06	<5.41	<5.25	<8.88	<5.90	<5.24	<7.89	<7.89
Station 8 (Indicator)	10/31/2014	11/30/2014	<5.14	<5.08	<10.40	<5.20	<9.18	<5.13	<10.10	<10.70	<5.58	<5.60	<6.74	<6.74
Station 10 (Control)	10/31/2014	11/30/2014	<3.37	<3.95	<10.20	<4.84	<10.30	<5.16	<8.45	<8.80	<4.35	<3.81	<4.92	<4.92
Station 8 (Indicator)	11/30/2014	12/31/2014	<3.92	<3.89	<8.66	<4.48	<7.11	<4.52	<7.43	<7.24	<4.55	<4.44	<6.26	<6.26
Station 10 (Control)	11/30/2014	12/31/2014	<5.72	<5.53	<9.45	<4.88	<10.30	<6.01	<9.53	<8.05	<6.68	<5.56	<11.10	<11.10

Table 3.2

Sample Type: Surface Water

Analysis: Tritium

Units: pCi/l

Location	Begin Date	End Date	H-3
		<u>Required LLD</u> → <u>3000</u>	
Station 8 (Indicator)	12/31/2013	03/31/2014	745
Station 10 (Control)	12/31/2013	03/31/2014	< 334
Station 8 (Indicator)	03/31/2014	06/30/2014	344
Station 10 (Control)	03/31/2014	06/30/2014	< 243
Station 8 (Indicator)	06/30/2014	09/30/2014	546
Station 10 (Control)	06/30/2014	09/30/2014	< 343
Station 8 (Indicator)	09/30/2014	12/31/2014	583
Station 10 (Control)	09/30/2014	12/31/2014	< 323

Table 4.1

Sample Type: Drinking Water Analysis: Gross Beta, Iodine-131, Gamma Isotopic Units: pCi/l

Location	Collection Date	Gross Beta	I-131	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
<u>Required LLD</u> →		<u>4.0</u>	<u>1.0</u>	<u>15</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>18</u>	<u>60</u>	<u>15</u>
Station 14 (Indicator)	03/11/2014	< 3.08	< 0.81	< 3.95	< 4.58	< 7.62	< 5.82	< 8.98	< 4.50	< 8.17	< 4.39	< 5.02	< 7.81	< 7.81
Station 57 (Control)	03/11/2014	< 3.47	< 0.804	< 4.47	< 4.27	< 9.84	< 5.50	< 6.48	< 4.33	< 6.83	< 5.54	< 5.23	< 4.32	< 4.32
Station 14 (Indicator)	06/17/2014	< 2.62	< 0.83	< 4.38	< 4.10	< 7.51	< 3.12	< 6.70	< 4.15	< 7.00	< 4.85	< 4.20	< 4.07	< 4.07
Station 57 (Control)	06/17/2014	< 2.71	< 0.876	< 3.51	< 4.10	< 8.86	< 4.56	< 9.97	< 4.24	< 7.45	< 4.64	< 4.31	< 5.68	< 5.68
Station 14 (Indicator)	08/26/2014	< 2.71	< 0.88	< 2.47	< 4.32	< 8.82	< 3.46	< 8.36	< 3.37	< 6.25	< 4.32	< 4.65	< 7.15	< 7.15
Station 57 (Control)	08/26/2014	< 2.55	< 0.826	< 4.34	< 4.04	< 11.60	< 4.59	< 9.86	< 5.16	< 8.32	< 4.10	< 5.26	< 11.40	< 11.40
Station 14 (Indicator)	11/18/2014	< 2.79	< 0.83	< 3.79	< 3.05	< 6.17	< 3.48	< 6.05	< 2.83	< 4.68	< 3.38	< 2.91	< 3.79	< 3.79
Station 57 (Control)	11/18/2014	< 3.10	< 0.792	< 2.10	< 2.50	< 5.07	< 2.66	< 6.38	< 2.47	< 4.67	< 3.22	< 3.24	< 4.06	< 4.06

Table 4.2

Sample Type: Drinking Water

Analysis: Tritium

Units: pCi/l

Location	Collection Date	H-3
	<u>Required LLD</u> →	<u>2000</u>
Station 14 (Indicator)	03/11/2014	< 300
Station 57 (Control)	03/11/2014	< 296
Station 14 (Indicator)	06/17/2014	< 317
Station 57 (Control)	06/17/2014	< 314
Station 14 (Indicator)	08/26/2014	< 295
Station 57 (Control)	08/26/2014	< 297
Station 14 (Indicator)	11/18/2014	< 330
Station 57 (Control)	11/18/2014	< 329

Table 5.1

Sample Type: Sediment

Analysis: Gamma Isotopic

Units: pCi/kg

Location	Collection Date	Cs-134	Cs-137
	<u>Required LLD</u> →	<u>150</u>	<u>180</u>
Station 8 (Indicator)	10/24/2014	< 83.30	< 67.70
Station 16 (Control)*	10/24/2014	< 67.50	< 59.10

Table 6.1

Sample Type: Fish

Analysis: Gamma Isotopic

Units: pCi/kg

Location	Collection Date	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
	<u>Required LLD</u> →	<u>130</u>	<u>130</u>	<u>260</u>	<u>130</u>	<u>260</u>	<u>130</u>	<u>150</u>
Station 8 (Indicator)	10/24/2014	< 8.88	< 8.64	< 23.70	< 8.81	< 19.50	< 83.30	< 67.70
Station 16 (Control)	10/24/2014	< 8.61	< 9.01	< 27.60	< 9.96	< 24.70	< 67.50	< 59.10

Table 7.1

Sample Type: Food Products Analysis: Iodine-131, Gamma Isotopic Units: pCi/kg

Location	Collection Date	I-131	Cs-134	Cs-137
	<u>Required LLD</u> →	<u>60</u>	<u>60</u>	<u>80</u>
Station 13 (Indicator)	06/03/2014	< 33.50	< 29.90	< 28.60
Station 55 (Control)	06/03/2014	< 37.10	< 35.40	< 38.80
Station 13 (Indicator)	07/01/2014	< 20.40	< 12.70	< 12.10
Station 55 (Control)	07/01/2014	< 23.90	< 15.20	< 14.40
Station 13 (Indicator)	08/18/2014	< 51.5	< 28.4	< 31.00
Station 55 (Control)	08/18/2014	< 47.5	< 26.3	< 25.60

Table 8.1

Sample Type: Groundwater

Analysis: Iodine-131, Gamma Isotopic

Units: pCi/l

Sample #	Collection Date	I-131	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
	<u>Required LLD</u> →	<u>15</u>	<u>15</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>30</u>	<u>15</u>	<u>18</u>	<u>60</u>	<u>15</u>
58*	02/18/2014	< 7.79	< 3.41	< 4.14	< 9.23	< 5.05	< 6.61	< 4.71	< 6.51	< 4.27	< 4.38	< 6.53	< 6.53
62*	02/18/2014	< 10.70	< 4.76	< 6.41	< 13.50	< 5.70	< 12.90	< 4.80	< 9.56	< 8.17	< 6.27	< 14.10	< 14.10
63	02/19/2014	< 7.58	< 4.16	< 3.56	< 6.06	< 3.80	< 9.80	< 4.10	< 7.16	< 3.31	< 4.54	< 6.19	< 6.19
64	02/18/2014	< 10.20	< 4.04	< 4.89	< 11.10	< 6.23	< 9.48	< 6.32	< 8.31	< 5.41	< 4.97	< 10.20	< 10.20
58*	04/28/2014	< 7.67	< 5.66	< 4.27	< 9.94	< 5.86	< 7.12	< 5.15	< 8.60	< 3.92	< 4.18	< 8.23	< 8.23
62*	04/28/2014	< 8.09	< 4.67	< 4.09	< 9.94	< 3.46	< 7.22	< 4.26	< 6.70	< 4.92	< 5.81	< 7.66	< 7.66
63	04/28/2014	< 9.50	< 5.00	< 4.97	< 9.24	< 6.16	< 11.00	< 5.35	< 10.20	< 5.33	< 5.26	< 8.18	< 8.18
64	04/29/2014	< 6.63	< 4.87	< 4.56	< 11.20	< 5.09	< 11.80	< 5.78	< 6.54	< 5.92	< 5.47	< 7.54	< 7.54
58*	08/26/2014	< 7.10	< 1.77	< 1.85	< 4.09	< 1.97	< 3.43	< 1.88	< 3.21	< 1.98	< 1.69	< 5.18	< 5.18
62*	08/26/2014	< 8.17	< 1.86	< 2.23	< 4.71	< 2.27	< 4.24	< 2.29	< 3.92	< 2.25	< 2.13	< 5.35	< 5.35
63	08/26/2014	< 13.80	< 3.07	< 3.55	< 7.43	< 3.23	< 6.82	< 3.86	< 5.88	< 3.65	< 3.12	< 9.16	< 9.16
64	08/25/2014	< 5.30	< 1.33	< 1.55	< 3.51	< 1.60	< 3.11	< 1.67	< 2.80	< 1.60	< 1.57	< 3.70	< 3.70
58*	10/27/2014	< 3.09	< 1.89	< 1.93	< 3.80	< 2.07	< 3.88	< 2.42	< 3.37	< 2.13	< 2.04	< 3.33	< 3.33
62*	10/27/2014	< 2.66	< 1.64	< 1.67	< 3.21	< 1.83	< 3.42	< 1.77	< 3.12	< 1.81	< 1.75	< 2.70	< 2.70
63	10/27/2014	< 2.08	< 1.42	< 1.36	< 2.88	< 1.35	< 2.99	< 1.43	< 2.60	< 1.66	< 1.89	< 2.31	< 2.31
64	10/27/2014	< 4.98	< 1.89	< 2.00	< 3.24	< 2.00	< 3.93	< 2.40	< 3.62	< 1.90	< 2.12	< 4.23	< 4.23

* Identifies Control Locations

Table 8.2

Sample Type: Groundwater

Analysis: Tritium

Units: pCi/l

Location	Collection Date	H-3
	<u>Required LLD</u> →	<u>3000</u>
Station 58 (Control)	02/18/2014	< 249
Station 62 (Control)	02/18/2014	< 246
Station 63 (Indicator)	02/19/2014	< 252
Station 64 (Indicator)	02/18/2014	< 277
Station 58 (Control)	04/28/2014	< 279
Station 62 (Control)	04/28/2014	< 281
Station 63 (Indicator)	04/28/2014	< 281
Station 64 (Indicator)	04/29/2014	< 283
Station 58 (Control)	08/26/2014	< 293
Station 62 (Control)	08/26/2014	< 291
Station 63 (Indicator)	08/26/2014	< 287
Station 64 (Indicator)	08/25/2014	< 318
Station 58 (Control)	10/27/2014	< 341
Station 62 (Control)	10/27/2014	< 339
Station 63 (Indicator)	10/27/2014	< 338
Station 64 (Indicator)	10/27/2014	< 327

ATTACHMENT 2
INTERLABORATORY COMPARISON PROGRAM

GEL LABORATORIES LLC

2014 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

**RADIOLOGICAL ENVIRONMENTAL
MONITORING PROGRAM (REMP)**

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2014 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 2014. 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 2014.
- Inter-laboratory QC results analyzed during 2014 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
- DOEAP, U.S. Department of Energy Consolidated Audit Program
- DOELAP, 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 (13-RAD-001) was conducted in July, 2014. One (1) finding, four (4) observations, and eight (8) recommendations resulted from this assessment. By September, 2014, 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 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 2013, 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 2014. Of the four hundred forty-five (445) total results reported, 98.6% (439 of 445) were found to be acceptable. 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 sixty-nine (69) 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 30 and 31 were analyzed by the laboratory. Of the one hundred thirty-eight (138) analyses, 97.8% (135 out of 138) of all results fell within the PT provider's acceptance criteria. Three analytical failures occurred: Uranium-234/233 and Uranium-238 in Soil and Uranium-238 in vegetation.

For the corrective actions associated with MAPEP Series 30, refer to CARR 140605-879 which is detailed in Table 8.

10. Summary of Participation in the ERA MRaD PT Program

The ERA MRad program provided samples (MRAD-20 and MRAD-21) for one hundred eighty-eight (188) individual environmental analyses. One hundred eighty-seven (187) of the 188 analyses fell within the PT provider's acceptance criteria (99.4%). One analytical failure occurred: Americium-241 in water.

For the corrective actions associated with MRAD-20, refer to CARR140520-874 which are detailed in Table 8.

11. Summary of Participation in the ERA PT Program

The ERA program provided samples (RAD-96, RAD-98, and 011014L) for fifty (50) individual environmental analyses. Of the 50 analyses, 98% (49 out of 50) of all results fell within the PT provider's acceptance criteria. One analytical failure occurred: Strontium-89 in water.

For the corrective actions associated with RAD-98 refer to corrective actions CARR140825-902 (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 2014. **It has been determined that causes of the failures did not impact any data reported to our clients.**

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
2014 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
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Barium-133	80.6	76.2	63.8-83.8	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-134	64.7	66.8	54.4-73.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-137	112.0	109	98.1-122	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cobalt-60	95.0	88.7	79.8-99.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Zinc-65	200	185	166-218	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.8	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Beta	19.6	22.3	13.5-30.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.6	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	16.2	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.62	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.39	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.00	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	15.10	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.66	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.47	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.4	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Tritium	3320	3580	3030-3950	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	44.1	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	34.2	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	38.9	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	27.1	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.3	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.2	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	25.2	24.4	20.2-28.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	22.4	24.4	20.2-28.9	Acceptable
EZA	1st / 2014	05/16/14	E10846	Cartridge	pCi	Iodine-131	7.83E+01	7.50E+03	1.04	Acceptable
EZA	1st / 2014	05/16/14	E10847	Milk	pCi/L	Strontium-89	9.14E+01	9.17E+01	1	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-90	1.27E+01	1.51E+01	0.84	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iodine-131	9.84E+01	9.85E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cerium-141	1.21E+02	1.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cr-51	5.19E+02	4.91E+02	1.06	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-134	1.79E+02	2.10E+02	0.85	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-137	2.55E+02	2.53E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-58	2.58E+02	2.68E+02	0.96	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Mn-54	3.01E+02	2.97E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iron-59	2.24E+02	2.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Zinc-65	3.45E+02	3.23E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-60	3.39E+02	3.37E+02	1.00	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iodine-131	9.24E+01	8.99E+01	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cerium-141	8.19E+01	7.71E+01	1.06	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cr-51	3.32E+02	3.19E+02	1.04	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-134	1.27E+02	1.36E+02	0.93	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-137	1.69E+02	1.64E+02	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-58	1.75E+02	1.74E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Mn-54	2.08E+02	1.93E+02	1.08	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iron-59	1.68E+02	1.42E+02	1.18	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Zinc-65	2.25E+02	2.10E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-60	2.31E+02	2.19E+02	1.02	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Beta	0.823	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Americium-241	65	68	47.6-88.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-134	5.44	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-137	1270	1238	867-1609	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-57	947	966	676-1256	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-60	0.581	1.220	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Iron-55	580	643	444-824	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Manganese-54	1470	1430	1001-1859	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Nickel-63	6.95	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-238	89.7	96.0	67-125	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-239/240	69.80	76.8	53.8-99.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Potassium-40	703	622	435-809	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Strontium-90	1.48	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Technetium-99	37.1	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	U-234/233	30.5	81.0	57-105	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Uranium-238	35	83	58-108	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Zinc-65	766	695	487-904	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Americium-241	0.759	0.720	0.504-0.936	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-134	21.4	23.1	16.2-30.0	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-137	29.70	28.9	20.2-37.6	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-57	28.0	27.5	19.3-35.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-60	16.6	16.0	11.2-20.8	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Hydrogen-3	308	321	225-417	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iron-55	0.3	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Manganese-54	14.4	13.9	9.7-18.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Nickel-63	31.4	34.0	23.8-44.2	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Plutonium-238	0.764	0.828	0.580-1.076	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Pu-239/240	0.6590	0.6760	0.473-0.879	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Potassium-40	0.460	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Strontium-90	8.32	8.51	5.96-11.06	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Technetium-99	9.5	10.3	7.2-13.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	U-234/233	0.210	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Uranium-238	1.41	1.45	1.02-1.89	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Zinc-65	-0.126	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Alpha	0.96	0.85	0.255-1.443	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Beta	4.7	4.2	2.10-6.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iodine-129	0.0227	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-235	0.018	0.020	0.014-0.026	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-238	8.77	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-Total	8.80	10.4	7.3-13.5	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/ sample	Americium-241	0.086	0.090	0.063-0.117	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Cesium-134	1.85	1.91	1.34-2.48	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Cesium-137	1.81	1.76	1.23-2.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Cobalt-57	0.0757	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Cobalt-60	1.490	1.39	0.97-1.81	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Manganese-54	0.0138	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Plutonium-238	0.000819	0.00090	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Pu-239/240	0.071	0.7720	0.054-0.1004	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Strontium-90	1.19	1.18	0.83-1.53	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	U-234/233	0.0159	0.0195	0.0137-0.0254	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Uranium-238	0.118	0.129	0.090-0.168	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Zinc-65	0.246	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Gross Beta	0.95	0.85	0.43-1.28	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/ sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/ sample	Uranium-235	0.261	0.0268	0.0188-0.0348	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/ sample	Uranium-238	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/ sample	Uranium-Total	12.7	13.3	9.3-17.3	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Americium-241	0.1100	0.108	0.076-0.140	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-134	5.65	6.04	4.23-7.85	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-137	4.98	4.74	3.32-6.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-57	11.1	10.1	7.1-13.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-60	7.21	6.93	4.85-9.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Manganese-54	9.24	8.62	6.03-11.21	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Plutonium-238	0.116	0.121	0.085-0.157	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Pu-239/240	0.134	0.154	0.108-0.0200	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Strontium-90	1.580	1.46	1.02-1.90	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	U-234/233	0.2640	0.2530	0.0177-0.0329	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Uranium-238	0.174	0.165	0.116-0.215	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Zinc-65	8.87	7.00	4.38-8.13	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Actinium-228	1140	1240	795-1720	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Americium-241	418	399	233-518	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-212	976	1240	330-1820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-214	2290	1960	1180-2820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-134	3080	3390	2220-4070	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-137	8310	8490	6510-10900	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cobalt-60	6570	6830	4620-9400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-212	1330	1240	812-1730	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-214	2800	2070	1210-3090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Manganese-54	<44.3	<1000	0-1000	Acceptable

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ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-238	579	578	348-797	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-239	488	471.00	308-651	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Potassium-40	10500	10500	7660-14100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	2500	2780	1060-4390	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Thorium-234	3420	3360	1060-6320	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Zinc-65	5700	5400	4300-7180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	2602	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	2425	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	5027	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	7110	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3440	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3680	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7310	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11000	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3740	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3780	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7683	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11300	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11200	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Americium-241	1670	1490	911-1980	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-134	657	646	415-839	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-137	861	880	638-1220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cobalt-60	997	926	639-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Curium-244	514	516	253-804	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Manganese-54	<62.2	<300	0.00-300	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-238	2230	2110	1260-2890	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-239	3810	3740	2300-5150	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Potassium-40	30800	31900	23000-44800	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Strontium-90	2330	2580	1470-3420	Acceptable

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ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1920	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	1970	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	4025	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5920	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Zinc-65	1030	919	663-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1730	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	2000	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	3817	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5990	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5620	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Americium-241	60.2	59.7	36.8-80.8	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-134	920	1010	643-1250	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-137	816	828	622-1090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cobalt-60	1130	1120	867-1400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Iron-55	254	240	74.4-469	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Manganese-54	<6.64	<50.0	0-50.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-238	51.3	56.3	38.6-74.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-239	47.5	48.6	35.2-63.5	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Strontium-90	76.7	78.9	38.6-118	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	33.8	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	34.5	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	70.3	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	104	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Zinc-65	737	667	478-921	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	35.5	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	35.3	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	72.4	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	105	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	100	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Alpha	60.9	46	15.4-71.4	Acceptable

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ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Beta	58.9	53.8	34.0-78.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Americium-241	186	114	76.8-153	Not Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-134	1540	1660	1220-1910	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-137	2760	2690	2280-3220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cobalt-60	1320	1270	1100-1490	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Iron-55	1230	1200	716-1630	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Manganese-54	<7.54	<100	0.00-100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-238	37	44	32.6-54.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-239	124	160	124-202	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Strontium-90	95	890	580-1180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Zinc-65	2030	1800	1500-2270	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	82.1	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	84.6	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	170	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	253	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	80.5	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	90.0	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	175	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	269	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	78.3	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	232	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Alpha	141.0	133	47.2-206	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Beta	172	174.0	99.6-258	Acceptable

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ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Tritium	5280	5580	3740-7960	Acceptable
EZA	2nd/2014	08/08/14	E10897	Cartridge	pCi	Iodine-131	8.73E+01	8.54E+01	1.02	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-89	9.84E+01	9.13E+01	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-90	1.44E+01	1.45E+01	0.99	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iodine-131	9.89E+01	9.09E+01	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cerium-141	1.38E+02	1.24E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Chromium-51	2.68E+02	2.53E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-134	1.58E+02	1.62E+02	0.97	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-137	1.27E+02	1.20E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-58	1.20E+02	1.12E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Manganese-54	1.67E+02	1.56E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iron-59	1.02E+02	1.02E+02	1.00	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Zinc-65	2.68E+02	2.52E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-60	2.42E+02	2.24E+02	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iodine-131	1.13E+02	9.83E+01	1.15	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cerium-141	1.52E+02	1.43E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Chromium-51	3.62E+02	2.94E+02	1.23	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-134	1.69E+02	1.88E+02	0.90	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-137	1.48E+02	1.39E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-58	1.34E+02	1.30E+02	1.03	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Manganese-54	1.88E+02	1.80E+02	1.04	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iron-59	1.29E+02	1.19E+02	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Zinc-65	3.29E+02	2.93E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-60	2.74E+02	2.60E+02	1.05	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Barium-133	67.8	68.7	57.3-75.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cesium-134	71	72.3	59.0-79.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cesium-137	161	163	147-181	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cobalt-60	76.7	75.5	68.0-85.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Zinc-65	92	82	73.8-98.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	45.3	45.4	23.6-57.4	Acceptable

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ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Beta	32.3	33.4	21.7-41.1	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	48.6	45.4	23.6-57.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.26	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.54	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	9.7	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.07	5.07	3.03-6.79	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.74	5.07	3.03-6.79	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13.9	13.5	10.7-15.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	22.25	19.8	15.6-22.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13	13.5	10.7-15.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	20.7	19.8	15.6-22.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Tritium	10200	11200	9750-12300	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Tritium	10400	11200	9750-12300	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.3	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	28.2	31.7	23.1-36.7	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.5	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	26	31.7	23.1-36.7	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	28.6	26.1	21.7-30.8	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	22.3	26.1	21.7-30.8	Acceptable
EZA	3rd/2014	11/22/14	E10993	Cartridge	pCi	Iodine-131	9.47E+01	8.99E+01	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-89	9.73E+01	9.69E+01	1.00	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-90	1.31E+01	1.64E+00	0.80	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iodine-131	1.04E+02	9.76E+01	1.07	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cerium-141	1.28E+02	1.26E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Chromium-51	3.12E+02	2.88E+02	1.08	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-134	1.51E+02	1.58E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-137	2.03E+02	1.93E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-58	1.44E+02	1.43E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Manganese-54	1.49E+02	1.42E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iron-59	1.82E+02	1.58E+02	1.15	Acceptable

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EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Zinc-65	7.41E+01	7.30E+01	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-60	3.14E+02	2.94E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iodine-131	1.02E+02	9.88E+01	103	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cerium-141	1.30E+02	1.25E+02	104	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Chromium-51	2.75E+02	2.86E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-134	1.45E+02	1.56E+02	0.93	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-137	1.94E+02	1.92E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-58	1.43E+02	1.42E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Manganese-54	1.46E+02	1.41E+02	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iron-59	1.66E+02	1.57E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Zinc-65	7.55E+01	7.24E+01	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-60	3.09E+02	2.95E+02	1.05	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Alpha	0.433	0.530	0.16-0.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Beta	1.060	1.060	0.53-1.59	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Americium-241	88.4	85.5	59.9-111.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-134	588	622	435-809	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-137	1.67		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-57	1160	1116	781-1451	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-60	821	779	545-1013	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Iron-55	796	680	476-884	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Manganese-54	1060	1009	706-1312	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Nickel-63	924	980	686-1274	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-238	0.92	0.48	Sens. Eval.	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-239/240	61.5	58.6	41.0-76.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Potassium-40	879	824	577-1071	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Strontium-90	891	858	601-1115	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Technetium-99	466	589	412-766	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	U-234/233	905	89	62-116	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Uranium-238	257	259	181-337	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Zinc-65	605.0	541	379-703	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Americium-241	0.915	0.880	0.62-1.14	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-134	-0.06		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-137	18.4	18.4	12.9-23.9	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-57	25	24.7	17.3-32.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-60	12.5	12.4	8.7-16.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Hydrogen-3	216	208	146-270	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Iron-55	34.0	31.5	22.1-41.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Manganese-54	14.2	14.0	9.8-18.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Nickel-63	23.6	24.6	17.2-32.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-238	0.547	0.618	0.433-0.803	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-239/240	0.015	0.005	Sens. Eval.	Acceptable

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MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Potassium-40	174	161	113-209	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Strontium-90	0.03		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Technetium-99	6.92	6.99	4.89-9.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-234/233	0.206	0.205	0.144-0.267	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-238	1.280	1.420	0.99-1.85	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Zinc-65	11.900	10.90	7.6-14.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/ sample	Uranium-235	0.040	0.040	0.0278-0.0516	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/ sample	Uranium-238	19.3	20.3	14.2-26.4	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/ sample	Uranium-Total	19.00	20.4	14.3-26.5	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/ sample	Americium-241	0.0561	0.067	0.0472-0.0876	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Cesium-134	0.8640	0.96	0.67-1.25	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Cesium-137	1.190	1.20	0.84-1.56	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Cobalt-57	1.540	1.43	1.00-1.86	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Cobalt-60	1.200	1.10	0.77-1.43	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Manganese-54	0.808	0.75	0.53-0.98	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Plutonium-238	0.155	0.107	0.075-0.139	Acceptable

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MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Plutonium-239/240	0.048	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Strontium-90	0.762	0.70	0.492-0.914	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Uranium-234/233	0.037	0.0358	0.0251-0.0465	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Uranium-238	0.227	0.253	0.177-0.329	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/ sample	Zinc-65	0.779	0.76	0.53-0.99	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq /sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/ sample	Strontium-89	3.62	3.79	2.65-4.93	Acceptable

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MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/sample	Strontium-90	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-XaW-31	Water	Bq/L	Iodine-129	4.56	4.55	3.19-5.92	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Actinium-228	1280	1240	795-1720	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Americium-241	825	763	431-956	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-212	1620	1240	330-1820	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-214	2900	2810	1690-4040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-134	1960	2140	1400-2570	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-137	6760	6550	5020-8430	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cobalt-60	4480	4260	2880-5860	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-212	1260	1240	812-1730	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-214	3480	2750	1610-4100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Manganese-54	<30.0	<1000	0-1000	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-238	732	739	444-1020	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-239	281	309	202-427	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Potassium-40	11500	10700	7810-14400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Strontium-90	8790	8420	3210-13300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Thorium-234	2000	2350	743-4420	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Zinc-65	3910	3270	2600-4350	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-234	2280	2370	1450-3040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-238	2340	2350	1450-2980	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-Total	4762	4540	2360-6390	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	ug/kg	Uranium-Total(mass)	7020	7050	3890-8870	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Americium-241	2260	2290	1400-3505	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-134	837	849	545-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-137	729	644	467-896	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cobalt-60	818	784	541-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Curium-244	361	367	180-572	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Manganese-54	<25.3	<300	0-300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-238	886	862	514-1180	Acceptable

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ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-239	675	701	430-965	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Potassium-40	35300	30900	22300-43400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Strontium-90	1230	1710	975-2270	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1980	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1970	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	4038	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5910	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1670	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1800	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	3556	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5390	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5860	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Zinc-65	1930	1570	1130-2200	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Americium-241	41.4	38.6	23.8-52.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-134	742	765.0	487-949	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-137	677	647	486-850	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cobalt-60	543	523	405-653	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Iron-55	117	120.0	37.2-234	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Manganese-54	<5.87	<50	0.00-50.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Plutonium-238	32.9	35.7	24.5-46.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Plutonium-239	26.8	29.1	21.1-38.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Strontium-90	187	168	82.1-252	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	26	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	28	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	56	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	82.6	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Zinc-65	629	547	392-755	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	28	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	25	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	55	57	31.4-86.3	Acceptable

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ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	75.1	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	90.7	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Alpha	47.4	36.9	12.4-57.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Beta	27.2	21.1	13.3-30.8	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Americium-241	72.4	68.6	46.2-92.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-134	816.0	850	624-977	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-137	1310	1240	1060-1490	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cobalt-60	1130	1070	930-1250	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Iron-55	130	134	79.9-182	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Manganese-54	<6.34	<100	0.00-100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-238	35	33	24.6-41.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-239	46.4	51	39.7-64.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Strontium-90	300	254	165-336	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	42	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	50	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	92	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	137	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Zinc-65	1070	921	768-1160	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	43	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	45	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	90	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	134	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	49	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	42	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	93	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	126	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	144	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Alpha	96.2	98	34.8-152	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Beta	86.1	77.5	44.4-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Tritium	5490	5500	3680-7840	Acceptable

TABLE 2

2014 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	1st/2014	05/16/14	E10846	Cartridge	pCi	Iodine-131	7.83E+01	7.52E+01	1.04	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-89	9.14E+01	9.17E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-90	1.27E+01	1.51E+01	0.84	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iodine-131	9.84E+01	9.85E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cerium-141	1.21E+02	1.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cr-51	5.19E+02	4.91E+02	1.06	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-134	1.79E+02	2.10E+02	0.85	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-137	2.55E+02	2.53E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-58	2.58E+02	2.68E+02	0.96	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Mn-54	3.01E+02	2.97E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iron-59	2.24E+02	2.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Zinc-65	3.45E+02	3.23E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-60	3.39E+02	3.37E+02	1.00	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iodine-131	9.24E+01	8.99E+01	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cerium-141	8.19E+01	7.71E+01	1.06	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cr-51	3.32E+02	3.19E+02	1.04	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-134	1.27E+02	1.36E+02	0.93	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-137	1.69E+02	1.64E+02	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-58	1.75E+02	1.74E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Mn-54	2.08E+02	1.93E+02	1.08	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iron-59	1.68E+02	1.42E+02	1.18	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Zinc-65	2.25E+02	2.10E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-60	2.31E+02	2.19E+02	1.02	Acceptable
EZA	2nd/2014	08/08/14	E10897	Cartridge	pCi	Iodine-131	8.73E+01	8.54E+01	1.02	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-89	9.84E+01	9.13E+01	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-90	1.44E+01	1.45E+01	0.99	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iodine-131	9.89E+01	9.09E+01	1.09	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cerium-141	1.38E+02	1.24E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Chromium-51	2.68E+02	2.53E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-134	1.58E+02	1.62E+02	0.97	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-137	1.27E+02	1.20E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-58	1.20E+02	1.12E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Manganese-54	1.67E+02	1.56E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iron-59	1.02E+02	1.02E+02	1.00	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Zinc-65	2.68E+02	2.52E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-60	2.42E+02	2.24E+02	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iodine-131	1.13E+02	9.83E+01	1.15	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cerium-141	1.52E+02	1.43E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Chromium-51	3.62E+02	2.94E+02	1.23	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-134	1.69E+02	1.88E+02	0.90	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-137	1.48E+02	1.39E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-58	1.34E+02	1.30E+02	1.03	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Manganese-54	1.88E+02	1.80E+02	1.04	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iron-59	1.29E+02	1.19E+02	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Zinc-65	3.29E+02	2.93E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-60	2.74E+02	2.60E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10993	Cartridge	pCi	Iodine-131	9.47E+01	8.99E+01	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-89	9.73E+01	9.69E+01	1.00	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-90	1.31E+01	1.64E+01	0.80	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iodine-131	1.04E+02	9.76E+01	1.07	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cerium-141	1.28E+02	1.26E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Chromium-51	3.12E+02	2.88E+02	1.08	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-134	1.51E+02	1.58E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-137	2.03E+02	1.93E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-58	1.44E+02	1.43E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Manganese-54	1.49E+02	1.42E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iron-59	1.82E+02	1.58E+02	1.15	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Zinc-65	7.41E+01	7.30E+01	1.01	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-60	3.14E+02	2.94E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iodine-131	1.02E+02	9.88E+01	103	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cerium-141	1.30E+02	1.25E+02	104	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Chromium-51	2.75E+02	2.86E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-134	1.45E+02	1.56E+02	0.93	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-137	1.94E+02	1.92E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-58	1.43E+02	1.42E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Manganese-54	1.46E+02	1.41E+02	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iron-59	1.66E+02	1.57E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Zinc-65	7.55E+01	7.24E+01	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-60	3.09E+02	2.95E+02	1.05	Acceptable

TABLE 3

2014 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/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Beta	0.823	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Americium-241	65	68	47.6-88.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-134	5.44	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-137	1270	1238	867-1609	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-57	947	966	676-1256	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-60	0.581	1.220	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Iron-55	580	643	444-824	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Manganese-54	1470	1430	1001-1859	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Nickel-63	6.95	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-238	89.7	96.0	67-125	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-239/240	69.80	76.8	53.8-99.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Potassium-40	703	622	435-809	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Strontium-90	1.48	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Technetium-99	37.1	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	U-234/233	30.5	81.0	57-105	Not Accept.

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Uranium-238	35	83	58-108	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Zinc-65	766	695	487-904	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Am-241	0.759	0.720	0.504-0.936	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-134	21.4	23.1	16.2-30.0	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-137	29.70	28.9	20.2-37.6	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-57	28.0	27.5	19.3-35.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-60	16.6	16.0	11.2-20.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Hydrogen-3	308	321	225-417	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iron-55	0.3	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Manganese-54	14.4	13.9	9.7-18.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Nickel-63	31.4	34.0	23.8-44.2	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Plutonium-238	0.764	0.828	0.580-1.076	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Pu-239/240	0.6590	0.6760	0.473-0.879	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Potassium-40	0.460	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Strontium-90	8.32	8.51	5.96-11.06	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Technetium-99	9.5	10.3	7.2-13.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	U-234/233	0.210	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Uranium-238	1.41	1.45	1.02-1.89	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Zinc-65	-0.126	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Alpha	0.96	0.85	0.255-1.443	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Beta	4.7	4.2	2.10-6.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iodine-129	0.0227	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-235	0.018	0.020	0.014-0.026	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-238	8.77	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-Total	8.80	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Americium-241	0.086	0.090	0.063-0.117	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-134	1.85	1.91	1.34-2.48	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-137	1.81	1.76	1.23-2.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-57	0.0757	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-60	1.490	1.39	0.97-1.81	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Manganese-54	0.0138	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Plutonium-238	0.000819	0.00090	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Pu-239/240	0.071	0.7720	0.054-0.1004	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Strontium-90	1.19	1.18	0.83-1.53	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	U-234/233	0.0159	0.0195	0.0137-0.0254	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Uranium-238	0.118	0.129	0.090-0.168	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Zinc-65	0.246	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Beta	0.83	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-235	0.261	0.0268	0.0188-0.0348	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-238	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-Total	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Americium-241	0.1100	0.108	0.076-0.140	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-134	5.65	6.04	4.23-7.85	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-137	4.98	4.74	3.32-6.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-57	11.1	10.1	7.1-13.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-60	7.21	6.93	4.85-9.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Manganese-54	9.24	8.62	6.03-11.21	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Plutonium-238	0.116	0.121	0.085-0.157	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Pu-239/240	0.134	0.154	0.108-0.0200	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Strontium-90	1.580	1.46	1.02-1.90	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	U-234/233	0.2640	0.2530	0.0177-0.0329	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Uranium-238	0.174	0.165	0.116-0.215	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Zinc-65	8.87	7.00	4.38-8.13	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Alpha	0.433	0.530	0.16-0.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Beta	1.060	1.060	0.53-1.59	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Americium-241	88.4	85.5	59.9-111.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-134	588	622	435-809	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-137	1.67		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-57	1160	1116	781-1451	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-60	821	779	545-1013	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Iron-55	796	680	476-884	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Manganese-54	1060	1009	706-1312	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Nickel-63	924	980	686-1274	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-238	0.92	0.48	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-239/240	61.5	58.6	41.0-76.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Potassium-40	879	824	577-1071	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Strontium-90	891	858	601-1115	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Technetium-99	466	589	412-766	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	U-234/233	905	89	62-116	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Uranium-238	257	259	181-337	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Zinc-65	605.0	541	379-703	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Americium-241	0.915	0.880	0.62-1.14	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-134	-0.06		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-137	18.4	18.4	12.9-23.9	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-57	25	24.7	17.3-32.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-60	12.5	12.4	8.7-16.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Hydrogen-3	216	208	146-270	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Iron-55	34.0	31.5	22.1-41.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Manganese-54	14.2	14.0	9.8-18.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Nickel-63	23.6	24.6	17.2-32.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-238	0.547	0.618	0.433-0.803	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-239/240	0.015	0.005	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Potassium-40	174	161	113-209	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Strontium-90	0.03		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Technetium-99	6.92	6.99	4.89-9.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-234/233	0.206	0.205	0.144-0.267	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-238	1.280	1.420	0.99-1.85	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Zinc-65	11.900	10.90	7.6-14.2	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-235	0.040	0.040	0.0278-0.0516	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-238	19.3	20.3	14.2-26.4	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-Total	19.00	20.4	14.3-26.5	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Americium-241	0.0561	0.067	0.0472-0.0876	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-134	0.8640	0.96	0.67-1.25	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-137	1.190	1.20	0.84-1.56	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-57	1.540	1.43	1.00-1.86	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-60	1.200	1.10	0.77-1.43	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Manganese-54	0.808	0.75	0.53-0.98	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-238	0.115	0.107	0.075-0.139	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-239/240	0.048	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Strontium-90	0.762	0.70	0.492-0.914	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-234/233	0.037	0.0358	0.0251-0.0465	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-238	0.227	0.253	0.177-0.329	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Zinc-65	0.779	0.76	0.53-0.99	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/ sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/ sample	Strontium-89	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/ sample	Strontium-90	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-XaW-31	Water	Bq/L	Iodine-129	4.56	4.55	3.19-5.92	Acceptable

TABLE 4
2014 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 / 2014	02/24/14	RAD - 96	Water	pCi/L	Barium-133	80.6	76.2	63.8-83.8	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-134	64.7	66.8	54.4-73.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-137	112.0	109	98.1-122	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cobalt-60	95.0	88.7	79.8-99.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Zinc-65	200	185	166-218	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.8	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Beta	19.6	22.3	13.5-30.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.6	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	16.2	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.62	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.39	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.00	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	15.10	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.66	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.47	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.4	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Tritium	3320	3580	3030-3950	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	44.1	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	34.2	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	38.9	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	27.1	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.3	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.2	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	25.2	24.4	20.2-28.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	22.4	24.4	20.2-28.9	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Barium-133	67.8	68.7	57.3-75.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cesium-134	71	72.3	59.0-79.5	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cesium-137	161	163	147-181	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cobalt-60	76.7	75.5	68.0-85.5	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Zinc-65	92	82	73.8-98.5	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	45.3	45.4	23.6-57.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Beta	32.3	33.4	21.7-41.1	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	48.6	45.4	23.6-57.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.26	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.54	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	9.7	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.07	5.07	3.03-6.79	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.74	5.07	3.03-6.79	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13.9	13.5	10.7-15.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	22.25	19.8	15.6-22.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13	13.5	10.7-15.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	20.7	19.8	15.6-22.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Tritium	10200	11200	9750-12300	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Tritium	10400	11200	9750-12300	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.3	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	14.3	31.7	23.1-36.7	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.5	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	26	31.7	23.1-36.7	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	28.6	26.1	21.7-30.8	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	22.3	26.1	21.7-30.8	Acceptable

TABLE 5

2014 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/2014	05/16/14	MRAD-20	Soil	pCi/kg	Actinium-228	1140	1240	795-1720	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Americium-241	418	399	233-518	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-212	976	1240	330-1820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-214	2290	1960	1180-2820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-134	3080	3390	2220-4070	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-137	8310	8490	6510-10900	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cobalt-60	6570	6830	4620-9400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-212	1330	1240	812-1730	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-214	2800	2070	1210-3090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Manganese-54	<44.3	<1000	0-1000	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-238	579	578	348-797	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-239	488	471.00	308-651	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Potassium-40	10500	10500	7660-14100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	2500	2780	1060-4390	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Thorium-234	3420	3360	1060-6320	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Zinc-65	5700	5400	4300-7180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	2602	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	2425	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	5027	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	7110	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3440	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3680	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7310	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11000	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3740	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3780	3360	2080-4260	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7683	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11300	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total (mass)	11200	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Am-241	1670	1490	911-1980	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-134	657	646	415-839	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-137	861	880	638-1220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cobalt-60	997	926	639-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Curium-244	514	516	253-804	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Manganese-54	<62.2	<300	0.00-300	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-238	2230	2110	1260-2890	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-239	3810	3740	2300-5150	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Potassium-40	30800	31900	23000-44800	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Strontium-90	2330	2580	1470-3420	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1920	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	1970	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	4025	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5920	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Zinc-65	1030	919	663-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1730	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	2000	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	3817	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5990	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total (mass)	5620	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Americium-241	60.2	59.7	36.8-80.8	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-134	920	1010	643-1250	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-137	816	828	622-1090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cobalt-60	1130	1120	867-1400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Iron-55	254	240	74.4-469	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Manganese-54	<6.64	<50.0	0-50.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-238	51.3	56.3	38.6-74.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-239	47.5	48.6	35.2-63.5	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Strontium-90	76.7	78.9	38.6-118	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	33.8	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	34.5	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	70.3	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	104	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Zinc-65	737	667	478-921	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	35.5	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	35.3	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	72.4	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	105	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total (mass)	100	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Alpha	60.9	46	15.4-71.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Beta	58.9	53.8	34.0-78.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Americium-241	186	114	76.8-153	Not Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-134	1540	1660	1220-1910	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-137	2760	2690	2280-3220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cobalt-60	1320	1270	1100-1490	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Iron-55	1230	1200	716-1630	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Manganese-54	<7.54	<100	0.00-100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-238	37	44	32.6-54.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-239	124	160	124-202	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Strontium-90	95	890	580-1180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Zinc-65	2030	1800	1500-2270	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	82.1	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	84.6	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	170	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	253	245	195-296	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	80.5	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	90.0	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	175	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	269	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	78.3	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total (mass)	232	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Alpha	141.0	133	47.2-206	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Beta	172	174.0	99.6-258	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Tritium	5280	5580	3740-7960	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Actinium-228	1280	1240	795-1720	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Americium-241	825	763	431-956	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-212	1620	1240	330-1820	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-214	2900	2810	1690-4040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-134	1960	2140	1400-2570	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-137	6760	6550	5020-8430	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cobalt-60	4480	4260	2880-5860	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-212	1260	1240	812-1730	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-214	3480	2750	1610-4100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Manganese-54	<30.0	<1000	0-1000	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-238	732	739	444-1020	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-239	281	309	202-427	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Potassium-40	11500	10700	7810-14400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Strontium-90	8790	8420	3210-13300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Thorium-234	2000	2350	743-4420	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Zinc-65	3910	3270	2600-4350	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-234	2280	2370	1450-3040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-238	2340	2350	1450-2980	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-Total	4762	4540	2360-6390	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	ug/kg	Uranium-Total(mass)	7020	7050	3890-8870	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Am-241	2260	2290	1400-3505	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-134	837	849	545-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-137	729	644	467-896	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cobalt-60	818	784	541-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Curium-244	361	367	180-572	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Manganese-54	<25.3	<300	0-300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-238	886	862	514-1180	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-239	675	701	430-965	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Potassium-40	35300	30900	22300-43400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Strontium-90	1230	1710	975-2270	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1980	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1970	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	4038	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total (mass)	5910	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1670	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1800	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	3556	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total (mass)	5390	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total (mass)	5860	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Zinc-65	1930	1570	1130-2200	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Americium-241	41.4	38.6	23.8-52.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-134	742	765.0	487-949	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-137	677	647	486-850	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cobalt-60	543	523	405-653	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Iron-55	117	120.0	37.2-234	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Manganese-54	<5.87	<50	0.00-50.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Plutonium-238	32.9	35.7	24.5-46.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Plutonium-239	26.8	29.1	21.1-38.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Strontium-90	187	168	82.1-252	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	26	28	27.8-41.9	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	28	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	56	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	82.6	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Zinc-65	629	547	392-755	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	28	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	25	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	55	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	75.1	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total (mass)	90.7	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Alpha	47.4	36.9	12.4-57.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Beta	27.2	21.1	13.3-30.8	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Americium-241	72.4	68.6	46.2-92.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-134	816.0	850	624-977	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-137	1310	1240	1060-1490	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cobalt-60	1130	1070	930-1250	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Iron-55	130	134	79.9-182	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Manganese-54	<6.34	<100	0.00-100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-238	35	33	24.6-41.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-239	46.4	51	39.7-64.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Strontium-90	300	254	165-336	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	42	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	50	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	92	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	137	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Zinc-65	1070	921	768-1160	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	43	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	45	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	90	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	134	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	49	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	42	43.50	33.2-53.4	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	93	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	126	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total (mass)	144	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Alpha	96.2	98	34.8-152	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Beta	86.1	77.5	44.4-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Tritium	5490	5500	3680-7840	Acceptable

FIGURE 1

COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

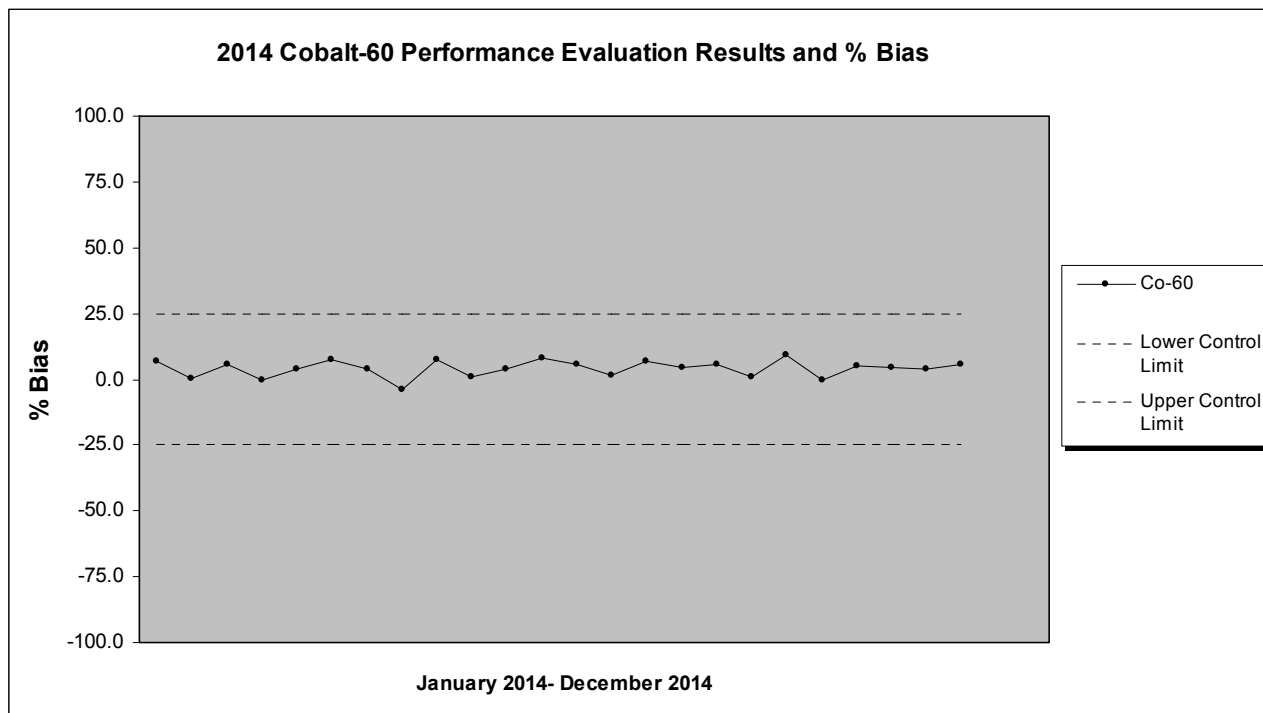


FIGURE 2

CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

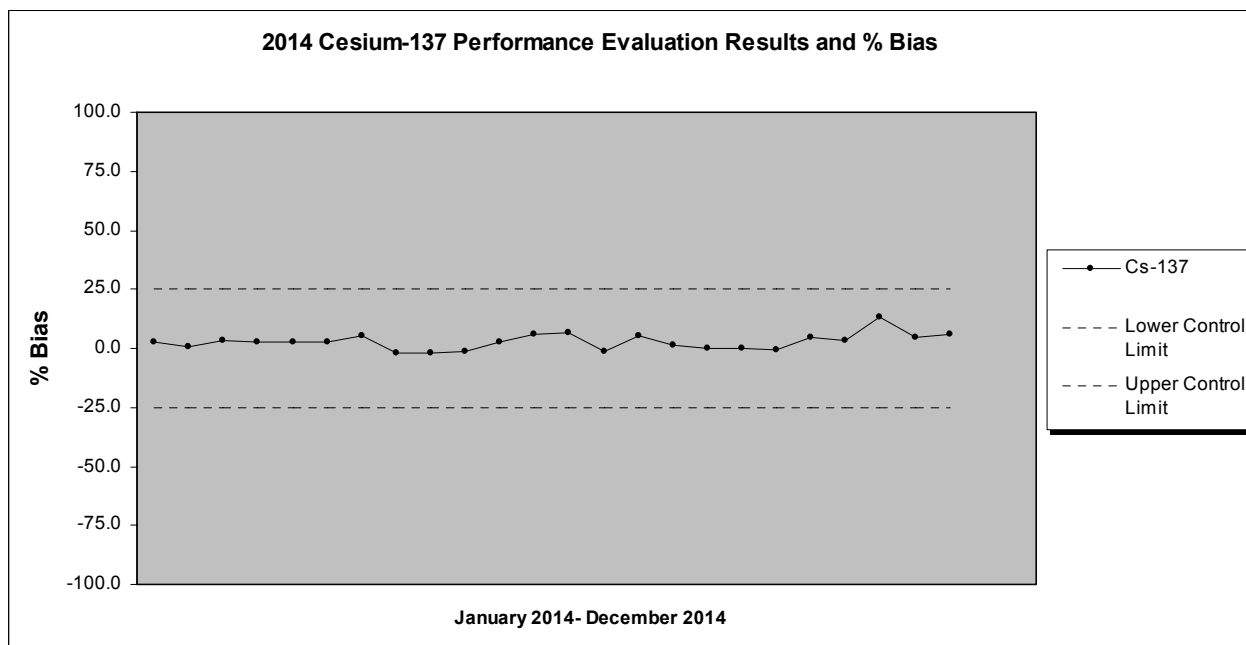


FIGURE 3
TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

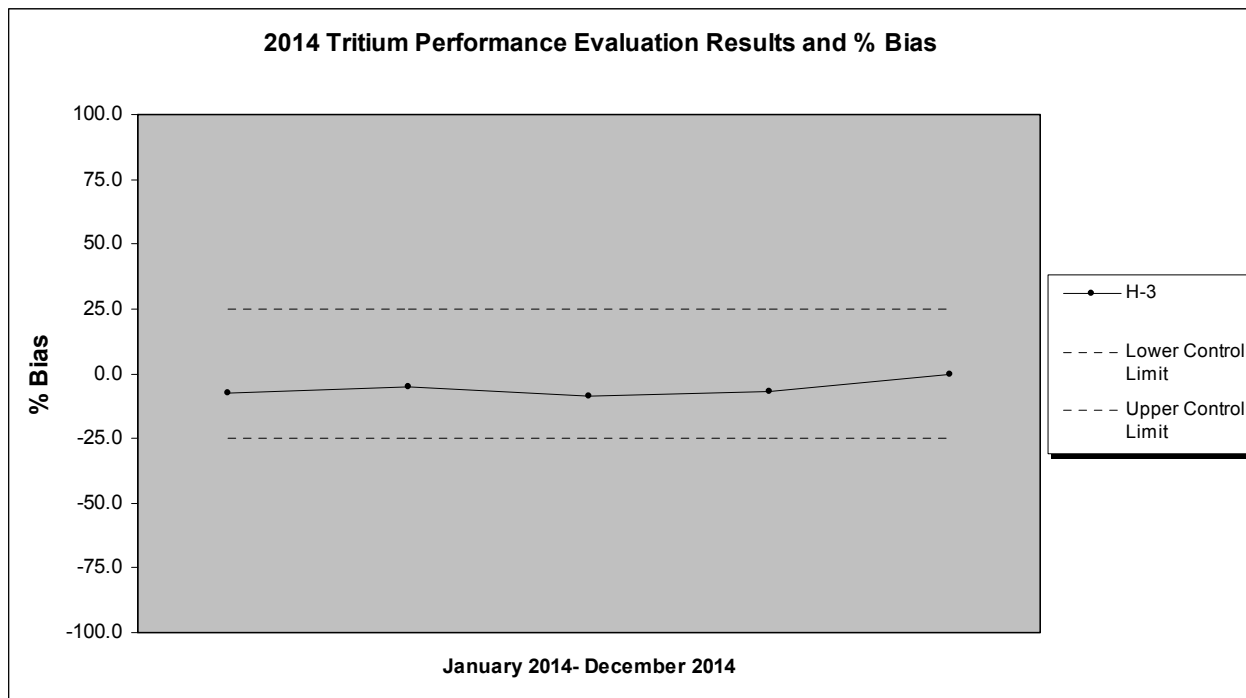


FIGURE 4
STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

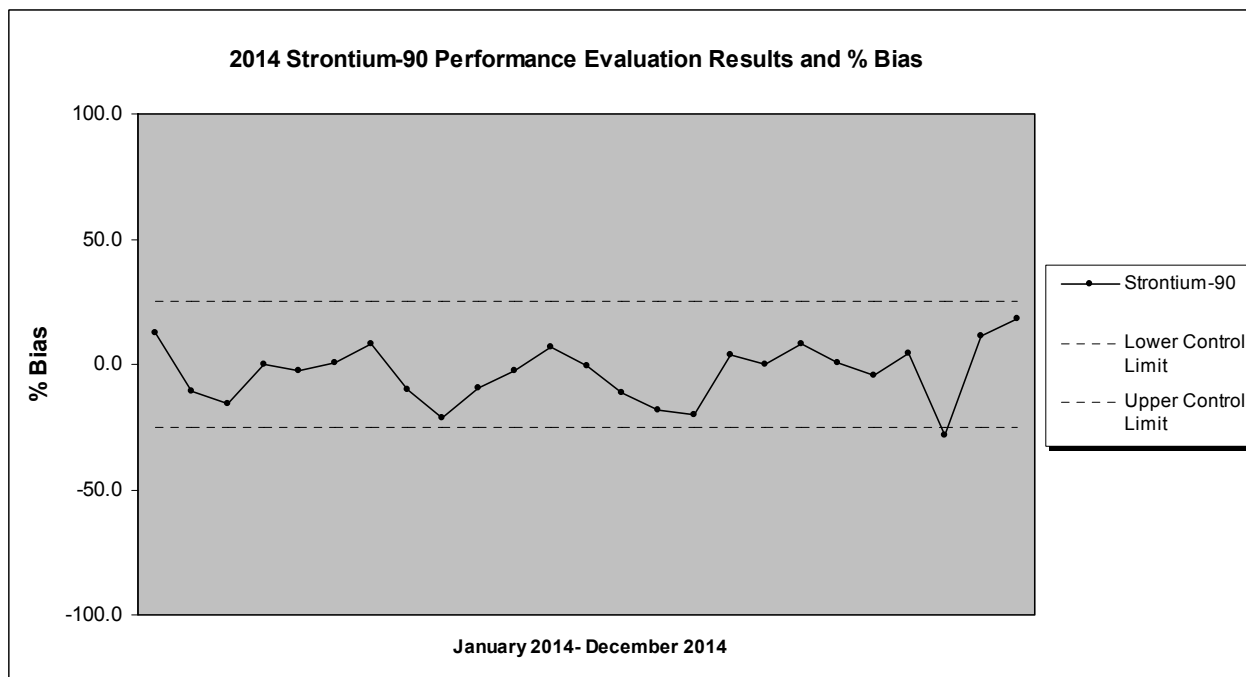


FIGURE 5

GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

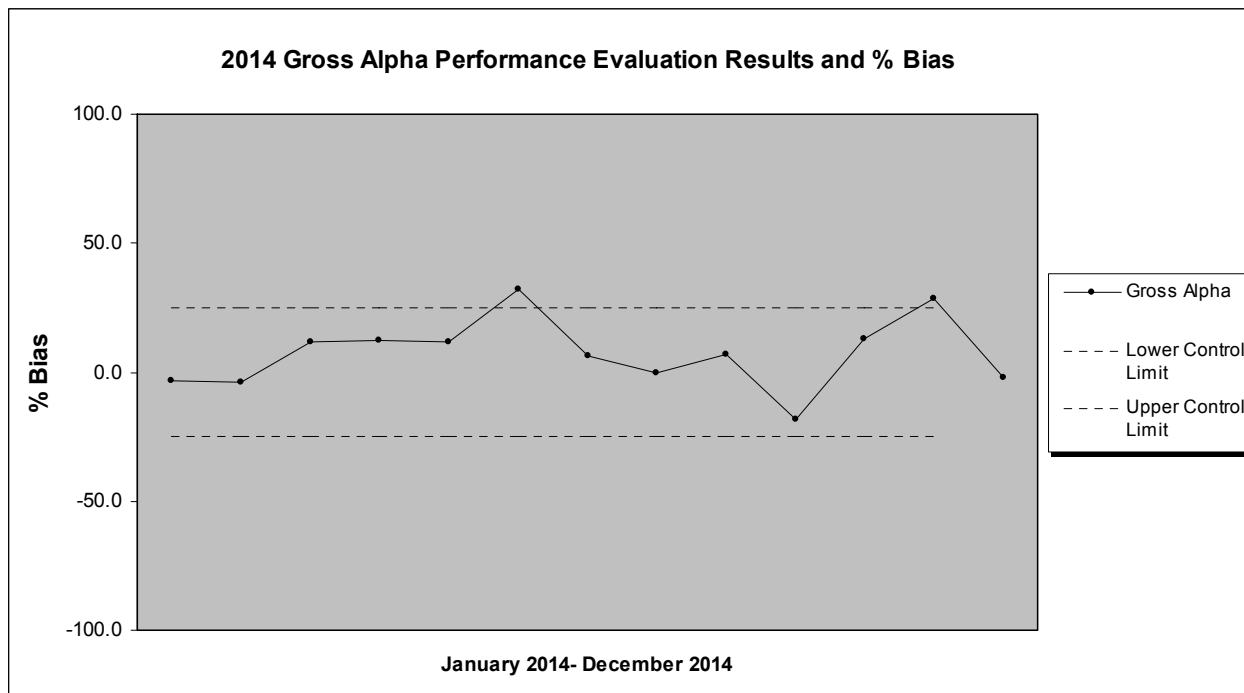


FIGURE 6

GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

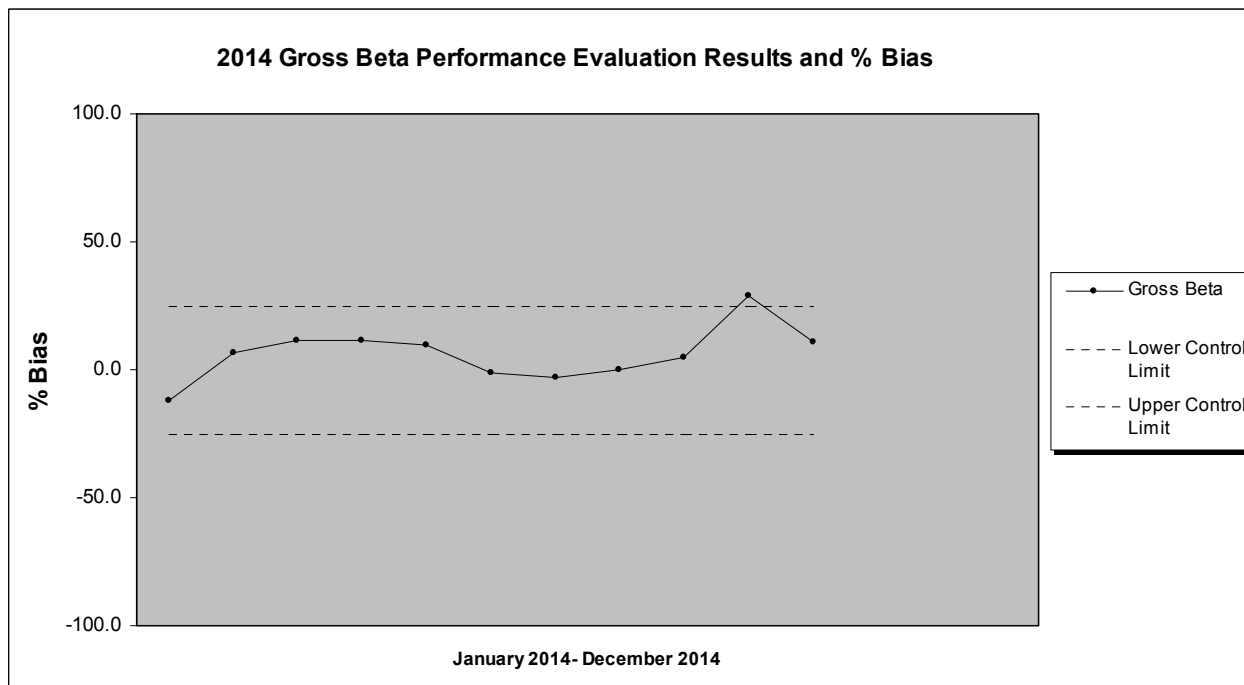


FIGURE 7
IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

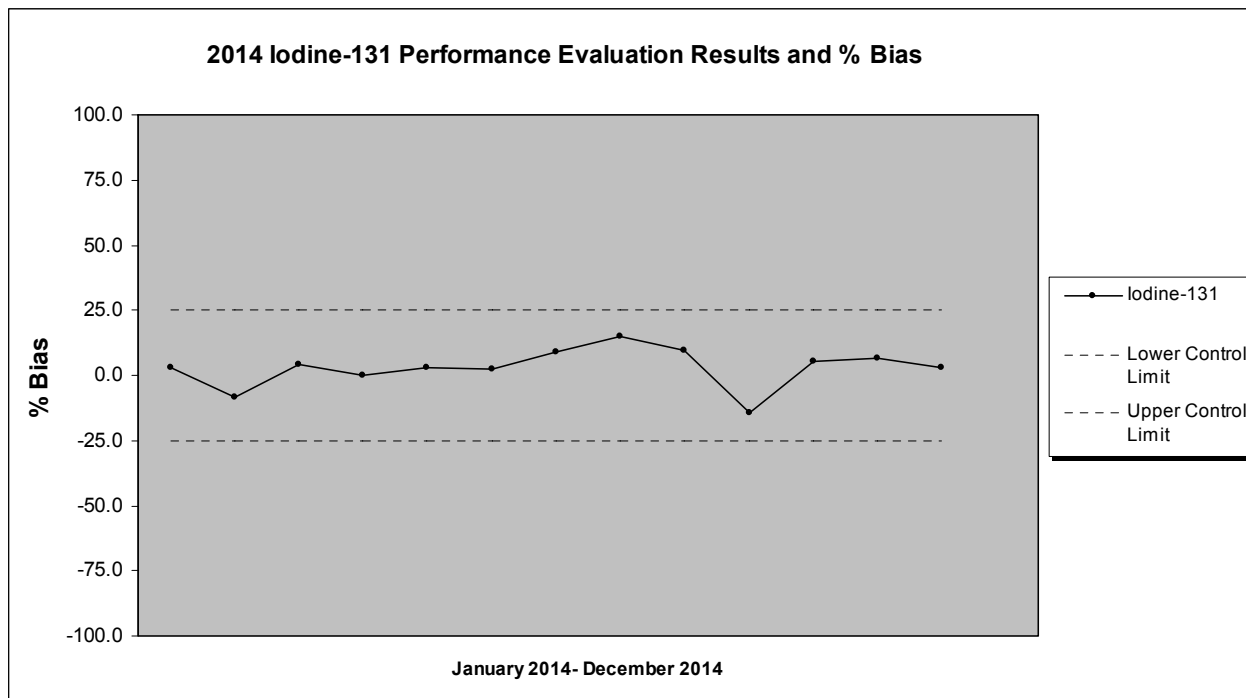


FIGURE 8
AMERICIUM-241 PERFORMANCE EVALUATION RESULTS AND % BIAS

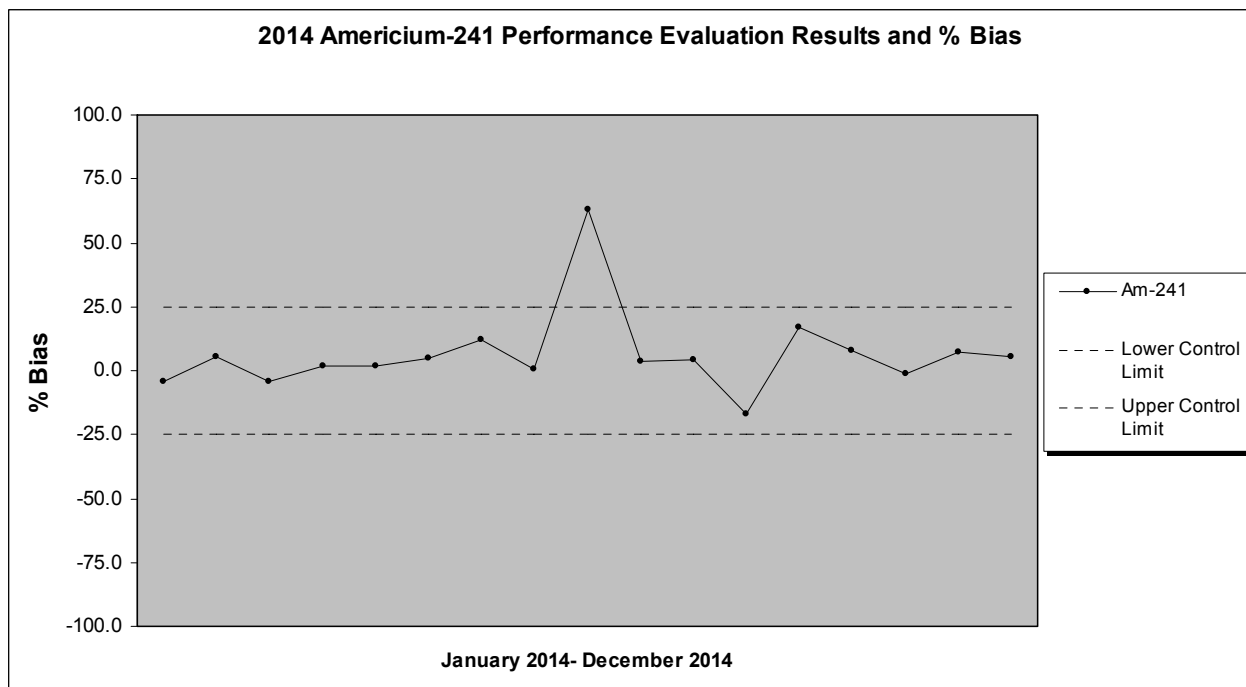


FIGURE 9

PLUTONIUM-238 PERFORMANCE EVALUATION RESULTS AND % BIAS

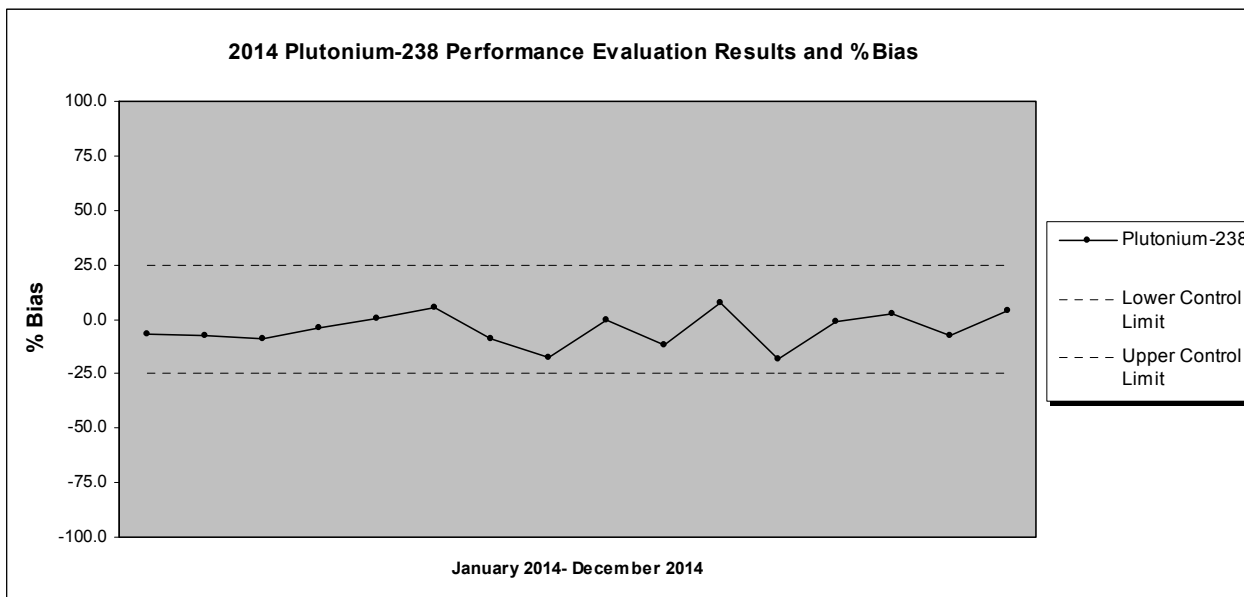


TABLE 6
REMP INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

REMP 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	36	0	36	0
Gas Flow Total Strontium	23	0	23	0
Gamma Spec Liquid RAD A-013 with Ba, La	48	0	109	0
SOLID				
LSC Iron-55	3	0	3	0
Gamma Spec Solid RAD A-013	30	0	43	0
LSC Nickel 63	3	0	3	0
Gas Flow Sr 2nd count	5	0	5	0
Gas Flow Total Strontium	5	0	5	0
Gamma Spec Solid RAD A-013 with Ba, La	2	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
FILTER				
Gas Flow Sr 2nd Count	5	0	5	0
Gross A & B	429	0	429	0
Gas Flow Sr-90	1	0	1	0
Gamma Spec Filter	45	0	47	0
LIQUID				
Alpha Spec Uranium	1	0	2	0
Tritium	206	0	205	0
Plutonium	1	0	1	0
LSC Iron-55	12	0	12	0
LSC Nickel 63	13	0	13	0
Gamma Spec Liquid RAD A-013	4	0	4	0
Alpha Spec Am243	6	0	6	0
Gamma Iodine-131	28	0	28	0
Alpha Spec Plutonium	10	0	10	0
Gas Flow Sr 2nd count	15	0	15	0
Alpha Spec Am241 Curium	8	0	8	0
Gas Flow Total Strontium	30	0	31	0
Gross Alpha Non Vol Beta	45	0	45	0
Gamma Spec Liquid RAD A-013 with Ba, La	84	0	159	0
Gamma Spec Liquid RAD A-013 with Iodine	40	0	40	0

REMP 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
TISSUE				
Gamma Spec Solid RAD A-013	48	0	46	0
Gas Flow Sr 2nd count	8	0	8	0
Gas Flow Total Strontium	17	0	17	0
Gamma Spec Solid RAD A-013 with Ba, La	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	23	0	22	0
SEA WATER				
LSC Iron-55	5	0	6	0
LSC Nickel 63	5	0	6	0
Gas Flow Total Strontium	6	0	6	0
Gross Alpha Non Vol Beta	6	0	6	0
Gamma Spec Liquid RAD A-013 with Iodine	7	0	11	0
VEGETATION				
Gas Flow Sr 2nd count	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	86	0	96	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	560	0	606	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	28	0	28	0
DRINKING WATER				
Tritium	39	0	40	0
LSC Iron-55	17	0	16	0
LSC Nickel 63	16	0	15	0
Gamma Iodine-131	27	0	26	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Total Strontium	19	0	18	0
Gross Alpha Non Vol Beta	72	0	73	0
Gamma Spec Liquid RAD A-013 with Ba, La	35	0	75	0
Total	2200		2456	
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:

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gamma Iodine-129	0	0	1	0
Gamma Iodine-131	36	0	110	0
Gas Flow Sr 2nd count	36	0	36	0
Gas Flow Strontium 90	5	0	5	0
Gas Flow Total Strontium	23	0	23	0
Gamma Spec Liquid RAD A-013 with Ba, La	48	0	109	0
Gamma Spec Liquid RAD A-013 with Iodine	3	0	4	0
SOLID				
Gamma Percent Leach	5	0	0	0
Gas Flow Radium 228	16	0	20	0
Tritium	211	0	247	0
Tritium by Combustion	1	0	1	0
Carbon-14	130	0	181	0
LSC Iron-55	103	0	121	0
Alpha Spec Polonium Solid	52	0	54	0
Gamma Nickel 59 RAD A-022	99	0	117	0
LSC Chlorine-36 in Solids	4	0	4	0
Gamma Spec Ra226 RAD A-013	21	0	24	0
Gamma Spec Solid RAD A-013	649	0	812	0
LSC Nickel 63	141	0	154	0
LSC Plutonium	181	0	202	0
Technetium-99	224	0	250	0
Gamma Spec Liquid RAD A-013	2	0	2	0
ICP-MS Technetium-99 in Soil	61	0	60	0
LSC Selenium 79	11	0	11	0
Total Activity,	4	0	4	0
Tritium	16	0	17	0
Alpha Spec Am243	23	0	37	0
Gamma Iodine-129	100	0	120	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gas Flow Lead 210	6	0	6	0
Total Uranium KPA	7	0	10	0
Alpha Spec Uranium	214	0	309	0
LSC Promethium 147	2	0	2	0
LSC, Rapid Strontium 89 and 90	42	0	61	0
Alpha Spec Thorium	152	0	196	0
ICP-MS Uranium-233, 234 in Solid	49	0	47	0
Alpha Spec Plutonium	231	0	240	0
ICP-MS Technetium-99 Prep in Soil	62	0	61	0
Alpha Spec Neptunium	213	0	237	0
Alpha Spec Plutonium	158	0	206	0
Gamma Spec Solid with Ra226, Ra228	9	0	13	0
Gas Flow Sr 2nd count	21	0	25	0
Gas Flow Strontium 90	195	0	201	0
Gas Flow Total Radium	2	0	3	0
Lucas Cell Radium 226	38	0	47	0
Total Activity Screen	9	0	10	0
Alpha Spec Am241 Curium	304	0	339	0
Alpha Spec Total Uranium	4	0	8	0
Gas Flow Total Strontium	43	0	46	0
Gross Alpha Non Vol Beta	1	0	1	0
ICP-MS Uranium-233, 234 Prep in Solid	49	0	48	0
ICP-MS Uranium-235, 236, 238 in Solid	60	0	81	0
Gamma Spec Solid RAD A-013 with Ba, La	2	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
GFC Chlorine-36 in Solids	3	0	3	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	2	0	2	0
Tritium	8	0	8	0
Alpha Spec Am241 (pCi/Sample)	2	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	148	0	132	0
ICP-MS Uranium-235, 236, 238 Prep in Solid	50	0	49	0
Alpha Spec Thorium	1	0	1	0
Alpha Spec Uranium	1	0	1	0
Gross Alpha/Beta	235	0	316	3
Alpha Spec Neptunium	1	0	1	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gas Flow Sr 2nd count	2	0	1	0
Gross Alpha/Beta (Americium Calibration) Solid	2	0	3	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	69	0	65	0
FILTER				
Alpha Spec Uranium	14	0	18	0
Alpha Spec Polonium	1	0	5	0
Gamma I-131, filter	4	0	4	0
LSC Plutonium Filter	84	0	102	0
Tritium	76	0	112	0
Carbon-14	35	0	66	0
Nickel-63	0	0	8	0
LSC Iron-55	69	0	84	0
Gamma Nickel 59 RAD A-022	55	0	68	0
LSC Nickel 63	60	0	78	0
Technetium-99	51	0	75	0
Gamma Spec Filter RAD A-013	143	0	174	6
Alphaspec Np Filter per Liter	8	0	13	0
Alphaspec Pu Filter per Liter	11	0	22	0
Gamma Iodine-125	5	0	0	0
Gamma Iodine-129	46	0	60	0
Gross Alpha/Beta	5	0	5	0
Alpha Spec Am243	10	0	28	0
Gas Flow Lead 210	0	0	4	0
LSC Plutonium Filter per Liter	9	0	15	0
Total Uranium KPA	9	0	14	0
Alpha Spec Uranium	55	0	96	0
LSC Promethium 147	1	0	2	0
LSC, Rapid Strontium 89 and 90	72	0	94	0
Alpha Spec Thorium	42	0	66	0
Gas Flow Radium 228	1	0	1	0
Alpha Spec Plutonium	81	0	98	0
ICP-MS Uranium-233, 234 in Filter	0	0	3	0
Alpha Spec Neptunium	62	0	83	0
Alpha Spec Plutonium	66	0	96	0
Alpha Spec Polonium,(Filter/Liter)	0	0	14	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Alpha Spec Radium 226	0	0	2	0
Gas Flow Sr 2nd Count	72	0	81	1
Gas Flow Strontium 90	61	0	68	0
Lucas Cell Radium-226	1	0	1	0
Alpha Spec Am241Curium	95	0	117	0
Gas Flow Total Strontium	5	0	5	0
ICP-MS Uranium-233, 234 Prep in Filter	0	0	3	0
ICP-MS Uranium-235, 236, 238 in Filter	0	0	6	0
Total Activity in Filter,	1	0	10	0
Alphaspec Am241 Curium Filter per Liter	15	0	20	0
Tritium	86	0	89	0
Gamma Spec Filter RAD A-013 Direct Count	6	0	6	0
Carbon-14	12	0	12	0
GFC Chlorine-36 in Filters PL	1	0	1	0
Direct Count-Gross Alpha/Beta	48	0	1	0
Gross Alpha/Beta	48	0	60	0
ICP-MS Uranium-234, 235, 236, 238 in Filter	4	0	6	0
ICP-MS Uranium-235, 236, 238 Prep in Filter	0	0	3	0
Alpha Spec U	13	0	35	0
Gross A & B	497	0	473	0
LSC Iron-55	8	0	19	0
Technetium-99	7	0	13	0
Gas Flow Sr-90	6	0	13	0
LSC Nickel 63	14	0	19	0
Gas Flow Pb-210	8	0	22	0
Gas Flow Ra-228	5	0	10	0
Gamma Iodine 129	8	0	8	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Filter	2	0	3	0
Gamma Spec Filter	97	0	117	0
Lucas Cell Ra-226	8	0	23	0
Alpha Spec Thorium	7	0	22	0
LIQUID				
Alpha Spec Uranium	390	0	553	0
Alpha Spec Polonium	4	0	7	0
Electrolytic Tritium	14	0	25	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Tritium	1125	0	1177	0
Carbon-14	149	0	161	0
Plutonium	43	0	63	0
Iodine-131	3	0	4	0
LSC Iron-55	192	0	233	0
Gamma Nickel 59 RAD A-022	18	0	21	0
Gamma Iodine 131 RAD A-013	2	0	2	0
Gamma Radium 228 RAD A-013	3	0	3	0
LSC Nickel 63	209	0	236	0
LSC Radon 222	18	0	21	0
Technetium-99	377	0	425	0
Gamma Spec Liquid RAD A-013	702	0	732	0
Alpha Spec Total U RAD A-011	31	0	56	0
LSC Selenium 79	2	0	2	0
Alpha Spec Am243	17	0	18	0
Gamma Iodine-129	80	0	92	0
Gamma Iodine-131	28	0	28	0
ICP-MS Technetium-99 in Water	8	0	31	0
Gas Flow Lead 210	19	0	19	0
Total Uranium KPA	101	0	203	0
LSC Promethium 147	4	0	4	0
LSC, Rapid Strontium 89 and 90	7	0	8	0
Alpha Spec Thorium	145	0	186	0
Gas Flow Radium 228	171	0	206	0
Gas Flow Radium 228	40	0	37	0
Gas Flow Radium 228	1	0	1	0
Alpha Spec Plutonium	288	0	387	0
LSC Sulfur 35	1	0	1	0
Alpha Spec Neptunium	90	0	141	0
Alpha Spec Plutonium	21	0	49	0
Alpha Spec Radium 226	7	0	7	0
Gas Flow Sr 2nd count	191	0	199	0
Gas Flow Strontium 90	365	0	422	0
Gas Flow Strontium 90	1	0	1	0
Gas Flow Total Radium	78	0	103	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
ICP-MS Technetium-99 Prep in Water	8	0	32	0
ICP-MS Uranium-233, 234 in Liquid	6	0	11	0
LSC Calcuim 45	1	0	1	0
Lucas Cell Radium 226	310	0	366	0
Lucas Cell Radium-226	10	0	10	0
Total Activity Screen	7	0	7	0
Chlorine-36 in Liquids	13	0	14	0
Alpha Spec Am241 Curium	217	0	333	0
Gas Flow Total Strontium	112	0	116	0
Gross Alpha Non Vol Beta	980	0	1167	0
LSC Phosphorus-32	2	0	3	0
Lucas Cell Radium 226 by Method Ra-04	2	0	2	0
ICP-MS Uranium-233, 234 Prep in Liquid	6	0	11	0
Tritium in Drinking Water by EPA 906.0	9	0	12	0
Gamma Spec Liquid RAD A-013 with Ba, La	84	0	159	0
Gamma Spec Liquid RAD A-013 with Iodine	162	0	189	0
Gas Flow Strontium 89 & 90	5	0	3	0
ICP-MS Uranium-235, 236, 238 in Liquid	10	0	18	0
Gas Flow Total Alpha Radium	6	0	7	0
Gross Alpha Co-precipitation	3	0	13	0
ICP-MS Uranium-235, 236, 238 Prep in Liquid	6	0	11	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	31	0	74	0
Gross Alpha Beta (Americium Calibration) Liquid	32	0	46	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	15	0	38	0
Alpha/Beta (Americium Calibration) Drinking Water	23	0	18	0
TISSUE				
Carbon-14	3	0	3	0
Gamma Spec Solid RAD A-013	76	0	78	0
Technetium-99	4	0	4	0
Tritium	1	0	1	0
Alpha Spec Uranium	5	0	8	0
Alpha Spec Plutonium	5	0	10	0
Gas Flow Sr 2nd count	8	0	8	0
Gas Flow Strontium 90	11	0	12	0
Alpha Spec Am241 Curium	2	0	2	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gas Flow Total Strontium	17	0	17	0
Gamma Spec Solid RAD A-013 with Ba, La	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	23	0	22	0
Gross Alpha/Beta	2	0	2	0
SEA WATER				
LSC Iron-55	5	0	6	0
LSC Nickel 63	5	0	6	0
Gas Flow Total Strontium	6	0	6	0
Gross Alpha Non Vol Beta	6	0	6	0
Gamma Spec Liquid RAD A-013 with Iodine	7	0	11	0
VEGETATION				
LSC Iron-55	2	0	2	0
Gamma Nickel 59 RAD A-022	1	0	0	0
Gamma Spec Solid RAD A-013	26	0	25	0
LSC Nickel 63	2	0	1	0
LSC Plutonium	1	0	1	0
Technetium-99	4	0	3	0
Tritium	11	0	11	0
Gamma Iodine-129	1	0	0	0
Gas Flow Lead 210	2	0	3	0
Total Uranium KPA	4	0	4	0
Alpha Spec Uranium	22	0	22	0
Alpha Spec Thorium	5	0	5	0
Alpha Spec Plutonium	13	0	11	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	12	0	11	0
Gas Flow Total Radium	2	0	2	0
Alpha Spec Am241 Curium	6	0	6	0
Gamma Spec Solid RAD A-013 with Iodine	86	0	96	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	2	0	2	0
Alpha Spec Am241 (pCi/Sample)	1	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	12	0	7	0
Alpha Spec Uranium	0	0	2	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gross Alpha/Beta	7	0	9	0
Alpha Spec Plutonium	0	0	2	0
Gas Flow Strontium 90	4	0	2	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	7	0	4	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	560	0	606	0
Gamma Iodine-129	7	0	6	0
Carbon-14	7	0	7	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	28	0	28	0
Gamma Iodine 129	7	0	7	0
Gamma Spec Filter	7	0	7	0
DRINKING WATER				
Alpha Spec Uranium	4	0	5	0
Alpha Spec Polonium	1	0	25	0
Tritium	39	0	40	0
Carbon-14	3	0	2	0
Iodine-131	2	0	2	0
LSC Iron-55	17	0	16	0
LSC Nickel 63	16	0	15	0
LSC Radon 222	13	0	13	0
Technetium-99	2	0	1	0
Gamma Spec Liquid RAD A-013	17	0	18	0
Gamma Iodine-129	2	0	4	0
Gamma Iodine-131	27	0	26	0
Gas Flow Lead 210	4	0	3	0
Total Uranium KPA	17	0	34	0
Alpha Spec Thorium	1	0	1	0
Gas Flow Radium 228	22	0	26	0
Alpha Spec Plutonium	3	0	3	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Strontium 90	20	0	22	0
LSC Calcuim 45	2	0	2	0
Lucas Cell Radium-226	23	0	49	0
Alpha Spec Am241 Curium	2	0	2	0
Gas Flow Total Strontium	19	0	18	0

Total Radiological 2014	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gross Alpha Non Vol Beta	247	0	214	0
Tritium in Drinking Water by EPA 906.0	28	0	26	0
Gamma Spec Liquid RAD A-013 with Ba, La	35	0	75	0
Gas Flow Strontium 89 & 90	17	0	11	0
Gas Flow Total Alpha Radium	1	0	1	0
Gross Alpha Co-precipitation	99	0	91	0
Alpha/Beta (Americium Calibration) Drinking Water	16	0	16	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	7	0	7	0
Total	16535		19734	

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 8
2014 CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
<p>CARR140605-879</p> <p>ISO Documentation of PT Failures in MAPEP-14-RdV30 for Uranium 235 in Vegetation by ICP/MS and 14-MaS30 Uranium-233/234 and Uranium 238 by Alpha Spec.</p>	<p>Root Cause Analysis of MAPEP-14-RdV28 in vegetation for Uranium-235 by ICP/MS</p> <p>The root cause of this failure was human error and inattention to detail. The QAO inadvertently entered the incorrect activity for this parameter when she was entering the results on the MAPEP website. 0.261 ug/sample instead of 0.0261 ug/sample was entered. The data entry error was not caught during the GL review process. MAPEP results only are peer reviewed by the GL of the applicable area to ensure that the data was entered correctly.</p> <p>A second PT was successfully analyzed for this matrix.</p> <p>Uranium-234/233, and Uranium-238 in soil by Alpha Spec:</p> <p>Following reviews of our process and data and conversations with personnel from the affected laboratories, it was determined that all failures were due to an incomplete sample digestion. A total digestion technique using Hydrofluoric Acid was performed on the sample. However, this digestion was not vigorous enough to extract all the U-234 and U-238 from the soil because the analytes were fused into the soil at an extremely high temperature. Due to the high number of labs that received a Not Acceptable rating for this analysis, MAPEP has posted an explanation on the preparation of the Uranium Soil standard on their website.</p> <p>Permanent Corrective/Preventive Actions or Improvements:</p> <p>Upon notification of the failure, the sample was re-digested using a Sodium Hydroxide fusion method prior to ion-exchange separation chemistry. The results for both the U-234 and U-238 fall within acceptable range. In the future, all MAPEP soil samples will be analyzed with a NaOH fusion dissolution technique. Our analytical procedures provide the flexibility to perform different extraction techniques (leaching, HF dissolution) based on client requests. For our DOE clients, complete dissolution using HF has been the approved method for Uranium. Some clients also ask for the Uranium analysis using a leach procedure. In all cases, GEL performs the required contractual procedure for the analysis.</p> <p>A second PT was successfully analyzed for this matrix.</p>

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
<p>CARR140520-874</p> <p>ISO Documentation of PT Failures in –MRAD-20 for Americium-241 in water.</p>	<p>Root Cause Analysis</p> <p>After a thorough review of all data, a definite reason for the failure could not be determined.</p> <p>The following steps were taken to prove that this elevated bias was an isolated occurrence and that our overall process is within control.</p> <ol style="list-style-type: none"> 1. The batch quality control samples were reviewed and found to be compliant. The recoveries in the Laboratory Control Sample (LCS) recovered at 98.2%. Two sample duplicates were also prepared in the batch. The RPDs were 4.8 and 8.6. 2. The sample was re-analyzed in duplicate after the report was received. One with our normal Am-243 tracer, and another with Cm-244 tracer. Both of the reanalysis confirm the original reported result (which is outside the range of acceptable results). <p>Control charts for all Am tracer recoveries were also reviewed to determine if there may be an issue with the tracers. While there is a slight bias in the average LCS recovery, it was not significant enough to consider abnormal, and did not come close to accounting for the high result on this analysis. Additionally, since the sample was reanalyzed using two different tracers and achieved the same result, a tracer issue was ruled out as the potential culprit.</p> <p>Permanent Corrective/Preventive Actions or Improvements:</p> <p>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 Am-241 recovered at 105% for this sample and fell well within its acceptance range.</p> <p>A second PT was successfully analyzed for this matrix.</p>

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
<p>CARR140825-902</p> <p>For Failures of RAD-98 for Strontium-89 in Water</p>	<p>Root Cause Analysis of Strontium-89 (Sr-89)</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> <ol style="list-style-type: none"> 1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 103%. 2. Laboratory control data were also reviewed for trends. None was noted. 3. The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted. 4. Sample duplicates were also prepared and counted along with the reported result. All results fell within the method's acceptance range for duplicates. <p>Permanent Corrective/Preventive Actions or Improvements:</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%). The result was also confirmed using Method LAB PBMS-A-004. The lab will continue to monitor the recoveries of this radionuclide to ensure that there are no issues.</p> <p>A second PT was successfully analyzed for this matrix.</p>

ATTACHMENT 3
SEDIMENT DOSE CALCULATIONS

Sediment Sample Results

Sediment samples were collected from two locations in 2014 and analyzed for gamma radionuclides. Although Cesium-137 has been detected in previous years prior to 2013, all gamma radionuclides from 2014 samples were below detectable limits. These results are consistent with 2013 results where all gamma radionuclides were also below detectable limits. Therefore, ANO operations had no significant impact on the environment or public by this waterborne pathway.

In previous reports, ANO has included annual maximum dose calculations to the skin and total body. However since gamma radionuclides were below detectable limits, no calculation is being provided since there is no associated dose.