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April 27, 2020

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT
DOCKET NOS. 50-445 AND 50-446
2019 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Dear Sir or Madam:

Vistra Operations Company LLC ("Vistra OpCo") hereby submits the Comanche Peak Nuclear Power Plant (CPNPP) 2019 Annual Radiological Environmental Operating Report. The enclosed report is provided pursuant to CPNPP Technical Specification 5.6.2 and the CPNPP Offsite Dose Calculation Manual. The report covers the period from January 1, 2019 to December 31, 2019.

This communication contains no new commitments regarding CPNPP Units 1 and 2.

Should you have any questions, please contact Jim Barnette at (254) 897-5866 or Bob Knapp at (254) 897-5999.

Sincerely,

Jack C. Hicks

Jack C. Hicks

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NRR

Enclosure: CPNPP 2019 Annual Radiological Environmental Operating Report

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LUMINANT

COMANCHE PEAK NUCLEAR POWER PLANT

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1, 2019 through DECEMBER 31, 2019

LUMINANT REVIEW and APPROVAL

CREATED BY: Todd Emery 2-27-2020
Todd Emery — Date
Radiation Protection Technician

REVIEWED BY: Shari Mosty 3/24/2020
Shari Mosty — Date
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APPROVED BY: Robert Knapp 3/24/2020
Robert Knapp — Date
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Documented on RPI-710-2

Table of Contents

Introduction

Results of the Radiological Environmental Monitoring Program for the Comanche Peak Nuclear Power Plant (CPNPP) are contained within this report. This report covers the period from January 1, 2019 through December 31, 2019 and summarizes the results of measurements and analysis of data obtained from environmental samples collected during this same timeframe.

A. Site and Station Description

CPNPP consists of two pressurized water reactor units, each designed to operate at a power level of about 1250 megawatts (electrical). The Station is located on Squaw Creek reservoir in Somervell and Hood counties, about forty miles southwest of Fort Worth, Texas. Unit 1 received a low power operating license February 8, 1990 and achieved initial criticality on April 3, 1990. A full power license for Unit 1 was issued on April 17, 1990 and commercial operation was declared on August 13, 1990. Unit 2 achieved initial criticality on March 24, 1993 and synchronized to the electrical grid on April 9, 1993.

B. Objectives and Overviews of the CPNPP Radiological Environmental Monitoring Program

The United States Nuclear Regulatory Commission (USNRC) regulations require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable (ALARA). To assure that these criteria are met, each license authorizing reactor operation includes technical specifications governing the release of radioactive effluents.

In-plant monitoring is used to assure that these predetermined release limits are not exceeded. However, as a precaution against unexpected and undefined processes that might allow undue accumulation of radioactivity in any sector of the environment, a program for monitoring the plant environs is also included.

Sampling locations were selected on the basis of local ecology, meteorology, physical characteristics of the region, and demographic and land use features of the site vicinity. The radiological environmental monitoring program was designed on the basis of the USNRC Branch Technical Position "An Acceptable Radiological Environmental Monitoring Program" on radiological environmental monitoring issued by the Radiological Assessment Branch, Revision 1 (November 1979), the CPNPP Technical Specification "Technical Specifications for Comanche Peak Nuclear Power Plant Units 1 and 2" and the "CPSES Offsite Dose Calculation Manual" (ODCM).

The Radiological Environmental Monitoring Program includes the following:

- The measurement of ambient gamma radiation by Thermal Luminescent dosimetry;
- The determination of airborne gross beta, gamma emitters, and Iodine-131;
- The determination of tritium and gamma emitters in Discharge Pathway surface water;
- The determination of gross beta, tritium, Iodine-131, and gamma emitters in potential drinking water sources;
- The determination of tritium and gamma emitters in ground water and fish;
- The determination of gamma emitters in sediment;
- The determination of gamma emitters in food products and;
- The determination of gamma emitters and Iodine-131 in broadleaf vegetation.

The regulations governing the quantities of radioactivity in reactor effluents allow nuclear power plants to contribute, at most, only a small percentage increase above normal background radioactivity. Background levels at any one location are not constant but vary with time as they are influenced by external events such as cosmic ray bombardment; weapons test fallout, and seasonal variations. These levels also can vary spatially within relatively short distances reflecting variations in geological composition. To differentiate between background radiation levels and increases resulting from operation of CPNPP, the radiological surveys of the plant environs were divided into pre-operational and operational phases.

The pre-operational phase of the program provided a general characterization of the radiation levels and concentrations prevalent in these areas prior to plant operation along with an indication of the degree of natural variation to be expected. The operational phase of the program obtains data which, when considered along with the data obtained in the pre-operational phase, assists in the evaluation of the radiological impact of plant operation.

Pre-operational measurements were conducted at CPNPP from 1981 to 1989. These pre-operational measurements were performed to:

- Evaluate procedures, equipment, and techniques;
- Identify potentially important pathways to be monitored after plant operation;
- Measure background levels and the variations along potentially important pathways;
- Provide baseline data for statistical comparisons with future operational analytical results.

The operational Radiological Environmental Monitoring Program is conducted to:

- Verify that measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways;
- Verify the effectiveness of in-plant measures used for controlling the release of radioactive materials;
- Identify changes in the areas at and beyond the site boundary that may impact the principal pathways of exposure.

This report documents the **30th** year of operational measurements and is submitted in accordance with the requirements of the CPSES Offsite Dose Calculation Manual, Part I, Administrative Control 6.9.1.3.
Note: Comanche Peak Steam Electric Station (CPSES) is equivalent to Comanche Peak Nuclear Power Plant (CPNPP).

Program Descriptions and Results

A. Sample Locations

Within a radius of twenty miles of the CPNPP site there are seventy-two (72) sample locations included in the monitoring program. The number of sample points and the specific locations for the sample points were determined by considering locations where the highest off-site environmental concentrations have been predicted from plant effluent source terms, site hydrology, and site meteorological conditions. Other factors considered were applicable regulations, population distribution, and ease of access to sampling stations, availability of samples at desired locations, security and future program integrity. Additionally, an annual land use census is conducted to identify changes in the areas surrounding the plant. If changes are identified that impact the principle pathways of exposure, appropriate changes to the radiological environmental monitoring program are implemented. A copy of the report "Comanche

Peak Nuclear Power Plant Land Use Census" is provided in Appendix B to this report.

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program contains a brief outline of the current program. This table specifies the sample media type, the number of locations for each media type, the sector and distance identifier for each sample location, the sample frequency, the type of analysis required and the frequency each analysis is required to be performed (Analytical Frequency).

Table 2 – Key to Environmental Sampling Locations provides a reference that links the sampling point designations used in procedures and forms to the appropriate physical sample location (sector and distance) and to the correct sample type. This cross-reference enhances the ability to review data and tie the data to the correct sample points and to ensure all samples are collected and analyzed as specified.

Currently there are no milk sample locations within ten miles of the CPNPP site. CPNPP already samples extra broadleaf locations as required due to no milk locations within the ten-mile radius therefore, no changes to the program are necessary. Milk sampling will be resumed if any future annual land use census determines a dairy has been established within the specified area.

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program

Media	Number of Locations	Identification by Sector and Distance (miles)	Sampling Frequency (a)	Analysis	Analytical Frequency (a)
Gamma Exposure	47	N-1.45; N-4.4; N-6.5; N-9.4; NNE-1.1; NNE-5.65; NE-1.7; NE-4.8; ENE-2.5; ENE-5.0; E-0.5; E-1.9; E-3.5; E-4.2; ESE-1.4; ESE-4.7; SE-0.6 SE-1.3; SE-3.85; SE-4.6; SSE-1.3; SSE-4.4; SSE-4.5; S-1.5; S-4.2; SSW-1.1; SSW-4.4; SW-0.9; SW-4.8; SW-12.3; WSW-1.0; WSW-5.35; WSW-7.0; W-1.0; W-2.0; W-5.5; WNW-1.0; WNW-5.0; WNW-6.7; NW-1.0; NW-5.7; NW-9.9; NNW-1.35; NNW-4.6	Q, A	Thermo Luminescent (TLD)Dosimetry	Q, A
Air Particulate Air Iodine	8	N-9.4; E-3.5; SSE-4.5; SW-12.3; NW-1.0; N-1.45; SW/WSW-0.95; S/SSW-1.2	W	Gross Beta Gamma Isotopic Filter Gamma Isotopic Charcoal	W QC W
Discharge Pathway Surface Water	4	N-19.3; ESE-1.4; N-1.5; NE-7.4	M(b)	Gamma Isotopic Tritium	M QC
Surface Water & Drinking sources	2	NNW-0.1; N-9.9	M(c)	Gross Beta Gamma Isotopic Iodine-131 Tritium	M M M QC
Ground Water	5	SSE-4.6; W-1.2; WSW-0.1; N-9.8; N-1.45	Q	Gamma Isotopic Tritium	Q Q
Sediment	4	N-9.9; NNE-1.0; NE-7.4; SE-5.3	SA	Gamma Isotopic	SA
Fish	2	NNE-8.0; ENE-2.0	SA	Gamma Isotopic	SA
Food Products	1	ENE-9.0, E-4.2	MH	Gamma Isotopic Iodine-131	MH MH
Broadleaf Vegetation	3	N-1.45; SW-1.0; SW-13.5	M	Gamma Isotopic	M

(a) Frequency codes are: W–Weekly; M-Monthly; Q-Quarterly; QC-Quarterly Composite; MH-Monthly at Harvest; SA-Semiannual; A-Annual

(b) Surface water samples from Squaw Creek are monthly composites of weekly grab samples. Surface water samples from Lake Granbury are monthly grab samples.

(c) Surface water drinking samples are a monthly composite of weekly grab samples.

Table 2
Key to Environmental Sampling Locations

SAMPLING POINT	LOCATION (SECTOR-MILE)	SAMPLE TYPE*	SAMPLING POINT	LOCATION (SECTOR-MILE)	SAMPLE TYPE*
A1	N-1.45	A	R32	WSW-7.0	R
A2	N-9.4	A	R33	W-1.0	R
A3	E-3.5	A	R34	W-2.0	R
A4	SSE-4.5	A	R35	W-5.5	R
A5	S/SSW-1.2	A	R36	WNW-1.0	R
A6	SW-12.3	A	R37	WNW-5.0	R
A7	SW/WSW-0.95	A	R38	WNW-6.7	R
A8	NW-1.0	A	R39	NW-1.0	R
R1	N-1.45	R	R40	NW-5.7	R
R2	N-4.4	R	R41	NW-9.9	R
R3	N-6.5	R	R42	NNW-1.35	R
R4	N-9.4	R	R43	NNW-4.6	R
R5	NNE-1.1	R	R44	SE-0.6	R
R6	NNE-5.65	R	R45	SE-0.6	R
R7	NE-1.7	R	R46	SE-0.6	R
R8	NE-4.8	R	R47	SE-0.6	R
R9	ENE-2.5	R	SW1	N-1.5	SW
R10	ENE-5.0	R	SW2	N-9.9	SW/DW
R11	E-0.5	R	SW3	N-19.9	SW
R12	E-1.9	R	SW4	NE-7.4	SW
R13	E-3.5	R	SW5	ESE-1.4	SW
R14	E-4.2	R	SW6	NNW-0.1	SW/DW
R15	ESE-1.4	R	GW1	W-1.2	GW/DW
R16	ESE-4.7	R	GW2	WSW-0.1	GW/DW
R17	SE-1.3	R	GW3	SSE-4.6	GW/DW
R18	SE-3.85	R	GW4	N-9.8	GW/DW
R19	SE-4.6	R	GW5	N-1.45	GW/DW
R20	SSE-1.3	R	SS1	NNE-1.0	SS
R21	SSE-4.4	R	SS2	N-9.9	SS
R22	SSE-4.5	R	SS3	NE-7.4	SS
R23	S-1.5	R	SS4	SE-5.3	SS
R24	S-4.2	R	F1	ENE-2.0	F
R25	S/SSW-1.2	R	F2	NNE-8.0	F
R26	SSW-4.4	R	FP1	ENE-9.0	FP
R27	SW-0.9	R	FP2	E-4.2	FP
R28	SW-4.8	R	BL1	N-1.45	BL
R29	SW-12.3	R	BL2	SW-1.0	BL
R30	WSW-1.0	R	BL3	SW-13.5	BL
R31	WSW-5.35	R			

Sample Type*

A – AIR SAMPLE
F – FISH
SS – SHORELINE SEDIMENT
SW – SURFACE WATER
DW – DRINKING WATER
GW – GROUND WATER
R – DIRECT RADIATION
FP – FOOD PRODUCT
BL – BROADLEAF VEGETATION

B. Direct Radiation

Starting in 2013 Thermo Luminescent Dosimeters (TLDs) were used to determine the direct (ambient) radiation levels at the designated monitoring locations. The monitoring locations were chosen according to the criteria given in the USNRC Branch Technical Position on Radiation Monitoring (Revision 1, November 1979). The area around the station was divided into 16 radial sectors of 22-1/2 degrees each, corresponding to the cardinal points of the compass. TLDs were placed in each of these sectors. The TLDs were placed in two rings around the station. An inner ring was located as close as possible to the site boundary and an outer ring was located at a distance of 4 to 6 miles from the station. Eleven additional TLDs were located at points of special interest, including two control locations. For routine direct radiation measurements, two sets of the TLDs were used at each of the 43 monitoring locations. One set of TLDs was exchanged on a quarterly basis and a second set of TLDs was exchanged on a yearly basis. Additional sets of in-transit TLDs were used as control TLDs for the quarterly and annual TLDs.

Mirion Technologies provides and processes Thermo Luminescent Dosimeters (TLDs.) The TLDs are used to determine the direct (ambient) radiation levels in designated monitoring locations. Mirion Technologies is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP.)

D. C. Oakley's report "National Radiation Exposure in the United States", published in 1972, calculated a background radiation dose rate equivalent of 0.22 mR/day for the area surrounding Fort Worth, Texas. This calculated value varies widely with changes in location but represents an appropriate reference value to compare with actual measured TLD doses.

Using data from the pre-operational program for the two years prior to the startup of Unit 1, the quarterly TLDs averaged a calculated dose rate of 0.14 mR/day while the yearly TLDs averaged a calculated dose rate of 0.16 mR/day. The range of measured values from this same two-year period varied from a minimum of 0.11 mR/day to a maximum of 0.22 mR/day.

Table 3 – Environmental Direct Radiation Results contains the measured dose (mR) for each quarterly TLD from each of the 43 monitoring locations. The corresponding quarterly calculated dose rate (mR/day) values are listed as well. The statistical average doses (mR) and dose rate (mR/day) values for each set of quarterly TLDs is also displayed. Additionally, the table includes the total dose (mR) of all four quarters for each specific location. The table also includes the measured dose (mR) for each annual TLD from each of the 43 monitoring locations. The corresponding annual calculated dose rate (mR/day) values are listed as well. The statistical annual average dose (mR) for the entire set of annual TLDs is reported along with the average dose rate (mR/day) for the entire set of annual TLDs.

The measured dose rates of all the quarterly TLDs ranged from a minimum of **0.067 mR/day** to a maximum of **2.337 mR/day** with an average dose rate of **0.224 mR/day**. This resulted in an average quarterly dose of **15 mR** and a total annual dose of **66 mR** for all of the forty-three monitoring stations.

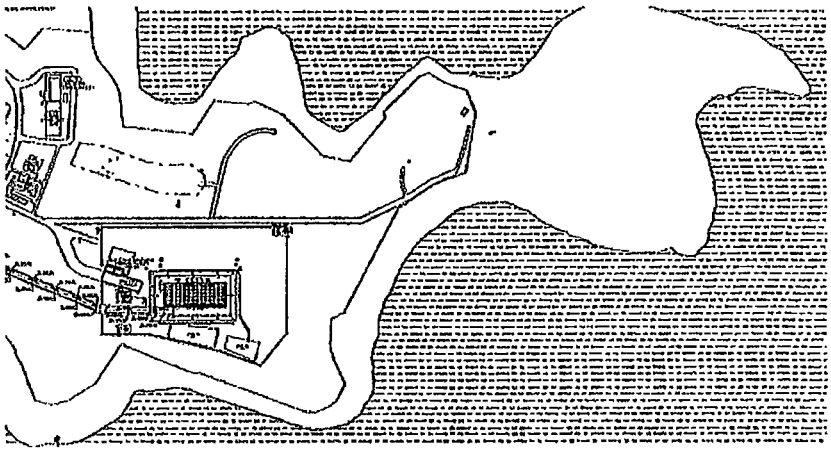
The measured dose rates of all the annual TLDs ranged from a minimum of **0.078 mR/day** to a maximum of **1.982 mR/day** with an average dose rate of **0.200 mR/day**. This resulted in an average annual dose of **12 mR** and a total annual dose average of **66.4 mR** for all of the forty-three monitoring stations.

Comparing the pre-operational data and operational data collected through the year 2019 did not produce any anomalies. The direct radiation dose data was consistent with previous years of data during the pre-operational program. Annual Environmental TLDs were compared against the baseline data established in EV-TR-2015-007304-6 and no anomalies were identified.

Table 6 – TLD Trend Quarterly Average contains the average quarterly TLD data for the five most current years and the Annual totals for 2019 from each of the 47 monitoring locations. The implementation of the Mirion TLDs and the background subtract method used to report the data from the TLDs accounts for the lower values and accounts for consistent response from each location's total quarterly TLDs to the Annual TLDs. See CR-2013-004934 for additional clarification on the background subtraction method.

2019 addition of ISFISI PAD Environmental Direct Radiation (CR-2019-002770)

Six(6) spent fuel dry casks were loaded and moved onto the CPNPP ISFISI pad in the last six months of 2019. The total number of fuel dry casks located at the CPNPP ISFISI pad by the end of 2019 was forty-two(42). The IFISI PAD is located within the same CPNPP owner controlled area as the Unit 1 and 2 Protected Area. Prior to 2019 Direct Radiation monitoring was accomplished and reported with the established owner controlled area Direct Radiation monitoring programs. In 2019, Four (4) TLDs were added on each side of the PAD's fence for radiation monitoring, trending, and reporting within the Annual Environmental Report.



During the year 2019, there were no exceptions to the TLD Program.

Table 3 - Environmental Direct Radiation Results (Units of mR dose and mR/day dose rate)

Location		1ST QTR Total	Average mR/Day	2ND QTR Total	Average mR/Day	3RD QTR Total	Average mR/Day	4TH QTR Total	Average mR/Day	AVG QTR TLD Total	Qtly TLD Average mR/Day
N-1.45	R1	12	0.133	12	0.140	11	0.114	12	0.128	12	0.129
N-4.4	R2	13	0.144	13	0.151	12	0.135	15	0.161	13	0.148
N-6.5	R3	11	0.122	14	0.163	10	0.114	12	0.128	12	0.132
N-9.4	R4	12	0.133	15	0.174	12	0.135	14	0.150	13	0.148
NNE-1.1	R5	8	0.089	11	0.129	7	0.082	9	0.095	9	0.099
NNE-5.65	R6	11	0.122	14	0.163	11	0.124	14	0.150	13	0.140
NE-1.7	R7	8	0.089	11	0.129	6	0.071	10	0.106	9	0.099
NE-4.8	R8	12	0.133	15	0.174	12	0.135	14	0.150	13	0.148
ENE-2.5	R9	12	0.133	15	0.174	12	0.135	14	0.150	13	0.148
ENE-5.0	R10	14	0.155	16	0.186	13	0.146	15	0.161	15	0.162
E-0.5	R11	10	0.111	14	0.163	11	0.124	13	0.139	12	0.134
E-1.9	R12	11	0.122	13	0.151	9	0.103	11	0.117	11	0.123
E-3.5	R13	11	0.122	12	0.140	10	0.114	12	0.128	11	0.126
E-4.2	R14	12	0.133	14	0.163	12	0.135	14	0.150	13	0.145
ESE-1.4	R15	10	0.111	14	0.163	10	0.114	13	0.139	12	0.132
ESE-4.7	R16	11	0.122	15	0.174	11	0.124	14	0.150	13	0.143
SE-1.3	R17	12	0.133	15	0.174	11	0.124	14	0.150	13	0.145
SE-3.85	R18	10	0.111	14	0.163	9	0.103	12	0.128	11	0.126
SE-4.6	R19	10	0.111	14	0.163	10	0.114	13	0.139	12	0.132
SSE-1.3	R20	10	0.111	14	0.163	11	0.124	12	0.128	12	0.132
SSE-4.4	R21	12	0.133	14	0.163	10	0.114	14	0.150	13	0.140
SSE-4.5	R22	11	0.122	14	0.163	10	0.114	13	0.139	12	0.135
S-1.5	R23	10	0.111	13	0.151	7	0.082	12	0.128	11	0.118
S-4.2	R24	12	0.133	15	0.174	11	0.124	13	0.139	13	0.143
S/SSW-1.2	R25	10	0.111	14	0.163	11	0.124	14	0.150	12	0.137
SSW-4.8	R26	11	0.122	14	0.163	10	0.114	13	0.139	12	0.135
SW-0.9	R27	11	0.122	13	0.151	10	0.114	12	0.128	12	0.129
SW-4.8	R28	9	0.100	13	0.151	10	0.103	12	0.128	11	0.121
SW-12.3 (C)	R29	11	0.122	14	0.163	10	0.114	9	0.095	11	0.124
WSW-1.0	R30	10	0.111	14	0.163	11	0.124	12	0.128	12	0.132
WSW-5.35	R31	10	0.111	13	0.151	11	0.124	12	0.128	12	0.129
WSW-7.0 (C)	R32	12	0.133	15	0.174	12	0.135	13	0.139	13	0.145
W-1.0	R33	9	0.100	12	0.140	9	0.103	9	0.095	10	0.110
W-2.0	R34	10	0.111	12	0.140	9	0.103	12	0.128	11	0.121
W-5.5	R35	10	0.111	13	0.151	9	0.103	10	0.106	11	0.118
WNW-1.0	R36	11	0.122	15	0.174	10	0.114	11	0.117	12	0.132
WNW-5.0	R37	11	0.122	14	0.163	11	0.124	11	0.117	12	0.132
WNW-6.7	R38	11	0.122	13	0.151	10	0.114	11	0.117	11	0.126
NW-1.0	R39	10	0.111	13	0.151	10	0.114	11	0.117	11	0.123
NW-5.7	R40	12	0.133	15	0.174	10	0.114	13	0.139	13	0.140
NW-9.9	R41	10	0.111	13	0.151	9	0.103	11	0.117	11	0.121
NNW-1.35	R42	6	0.067	11	0.129	6	0.071	9	0.095	8	0.091
NNW-4.6	R43	12	0.133	15	0.174	12	0.135	13	0.139	13	0.145
SE-0.6	R44	21	0.232	25	0.288	23	0.252	30	0.325	25	0.274
SE-0.6	R45	77	0.847	93	1.061	96	1.050	97	1.062	91	1.00
SE-0.6	R46	180	1.979	192	2.186	213	2.337	209	2.292	199	2.20
SE-0.6	R47	102	1.122	119	1.356	120	1.316	172	1.886	128	1.42
AVERAGES		**18**	**0.198**	**15**	**0.249**	**16**	**0.211**	**12**	**0.238**	**15**	**0.224**

Table 6 – TLD Trend Quarterly Average (Five most current years)

	2015	2016	2017	2018	2019		2015-2019 mR Avg	Quarterly Baseline	Annual TLD Total	Annual Baseline
								mrem		mrem
R1	12	13	12	11	11		11.80	12.4	43	47
R2	14	14	13	13	12		13.20	14.4	49	53.9
R3	13	12	12	12	11		12.00	14	45	51.7
R4	13	12	12	12	11		12.00	13.4	46	51.2
R5	9	9	8	8	8		8.40	9	31	34.4
R6	14	13	12	12	11		12.40	13.3	45	50.6
R7	9	8	8	8	8		8.20	9	31	35
R8	15	13	13	13	12		13.20	13.8	50	54.2
R9	15	14	14	13	12		13.60	14.7	50	53.8
R10	16	15	15	15	15		15.20	15.8	59	59.1
R11	13	12	11	11	11		11.60	13.8	43	47.7
R12	11	12	11	10	10		10.80	11.6	39	44.5
R13	12	12	10	11	11		11.20	11.4	43	47.9
R14	14	13	13	13	12		13.00	14.4	49	55
R15	13	12	10	11	11		11.40	13.2	44	48.5
R16	14	13	8	12	11		11.60	14.6	46	51.8
R17	13	12	10	12	12		11.80	13.2	48	48.9
R18	12	11	11	11	12		11.40	12.1	41	47.7
R19	12	13	11	12	11		11.80	12.5	45	49.5
R20	12	12	11	11	11		11.40	12.4	43	50.2
R21	13	13	10	11	11		11.60	13	44	53
R22	13	12	12	11	11		11.80	12.6	44	50.2
R23	12	12	11	11	10		11.20	12	41	46.3
R24	14	13	13	12	12		12.80	13.1	48	50.2
R25	13	12	13	11	11		12.00	13.1	44	50.2
R26	13	12	11	12	11		11.80	13.2	45	49.1
R27	12	12	12	11	11		11.60	12.4	44	46.4
R28	11	13	10	10	10		10.80	12.1	39	45.1
R29	13	12	12	12	11		12.00	12.8	45	50.2
R30	13	12	12	12	12		12.20	13.6	47	51.1
R31	12	12	12	11	10		11.40	12.4	42	47.7
R32	14	14	7	13	12		12.00	13.6	50	52.2
R33	11	11	10	10	10		10.40	11.7	39	42.6
R34	11	11	10	10	10		10.40	11.8	40	42.7
R35	11	10	11	8	8		9.60	11.4	32	46.2
R36	13	12	12	12	12		12.20	13.9	47	52.3
R37	13	12	12	12	11		12.00	13.5	46	50.5
R38	13	12	11	11	11		11.60	12.5	43	50.7
R39	12	12	11	11	10		11.20	12.1	41	45.2
R40	13	13	12	12	12		12.40	13.3	48	52.1
R41	12	11	11	10	10		10.80	12.4	40	48.4
R42	8	8	8	8	7		7.80	8	29	30.4
R43	14	13	13	13	12		13.00	14.6	50	52.6
Averages	**13**	**12**	**11**	**11**	**12**		**11.82**	**13**	**44**	**49**

Airborne Program

Air particulate and air iodine samples were collected each week from the eight monitoring locations described in Table 1 – Comanche Peak Nuclear Power Plant Environmental Radiological Monitoring Program (as seen in section II.A). Each air particulate sample was collected by drawing air through a 47 millimeter-diameter glass-fiber filter. Air iodine was collected by drawing air through an impregnated charcoal cartridge which was connected in series behind the air particulate filter. Shipped to an independent laboratory, air particulate filters were analyzed weekly for gross beta activity and were composited quarterly for gamma spectrometry analysis. Charcoal cartridges were analyzed weekly for Iodine-131.

A total of 416 air particulate filters were collected and analyzed for gross beta activity. The reported gross beta activity ranged from a minimum value of **1.76E-02 pCi/m^3** to a maximum value of **1.12E-01 pCi/m^3** (control group excluded). Table 4 – Environmental Airborne Particulate Gross Beta Results contains the reported values of all samples. There were no anomalies noted in the data reported for 2019 when compared to pre-operational and previous operational data. Graph 1 – Environmental Air Sample Gross Beta Results – Maximum and Minimum trends the weekly high and low gross beta values to show the seasonal variation of the results as well as providing indication of consistency between the individual monitoring locations.

A total of 416 charcoal cartridges were analyzed for airborne Iodine-131. Table 5 – Environmental Air Sample Iodine-131 Results contains the reported values of each Iodine-131 analysis, all of which are less than reportable levels.

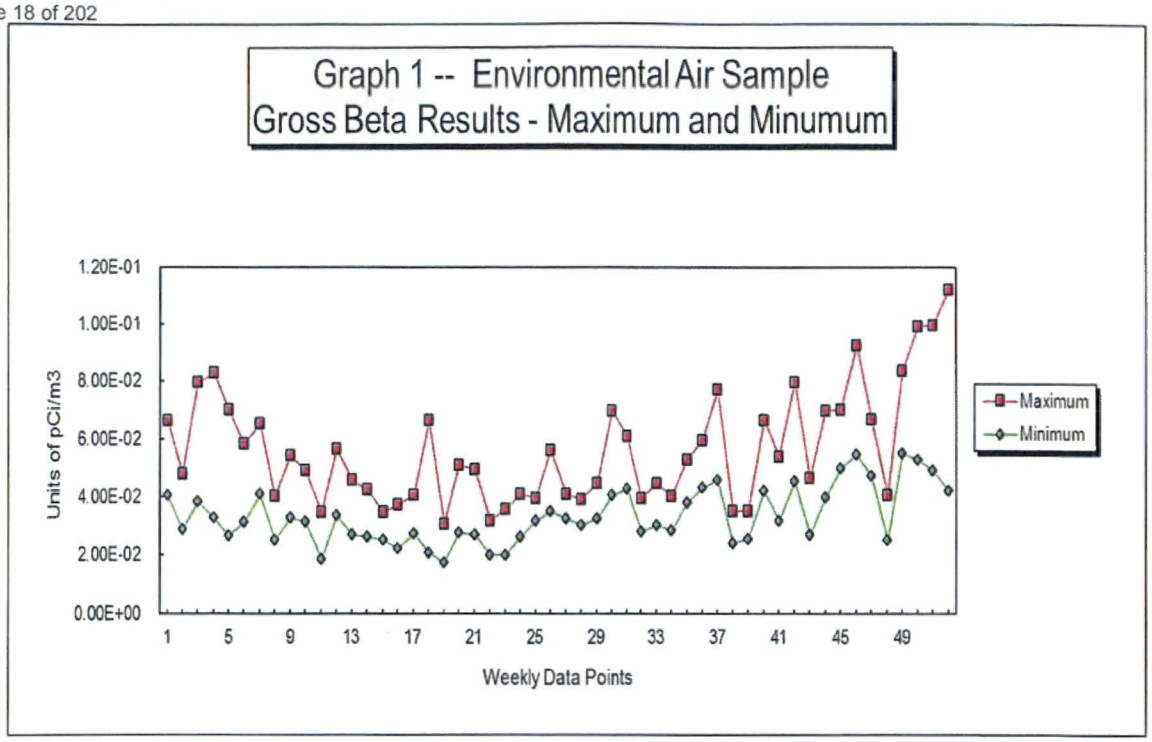
All air particulate filters were collected and composited quarterly and then analyzed by gamma spectrometry. Typical of pre-operational and previous operational data results, the only radioactive nuclide identified in all the samples was cosmogenic Beryllium-7, a naturally occurring isotope.

During the year 2019, there were two exceptions to the Airborne Program.

IR-2019-003969: It was found the Air Sample Station A-5 did not have any power. The cut off fuse to the overhead line was out of place. The air sample had a run time of 54 hours. Maintenance notified for repair. Air sample power was restored.

Table 4 -- Environmental Airborne Particulate Gross Beta Results
(Units of pCi/m3)

	A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2
	Location							
	NW-1.0	SW/WSW-0.95	S/SSW-1.2	SW-12.3	SSE-4.5	E-3.5	N-1.45	N-9.4
Date				Control				Control
01-08-19	5.57E-02	6.64E-02	4.09E-02	4.09E-02	4.53E-02	4.72E-02	5.74E-02	5.05E-02
01-15-19	3.13E-02	3.29E-02	3.60E-02	2.90E-02	3.49E-02	4.81E-02	3.01E-02	3.31E-02
01-22-19	3.88E-02	4.79E-02	4.19E-02	3.87E-02	4.19E-02	7.98E-02	4.11E-02	4.12E-02
01-29-19	3.32E-02	4.27E-02	4.56E-02	3.97E-02	3.63E-02	8.32E-02	4.32E-02	4.75E-02
02-05-19	2.69E-02	3.88E-02	4.23E-02	3.74E-02	4.04E-02	7.03E-02	3.66E-02	3.95E-02
02-12-19	3.19E-02	4.91E-02	4.17E-02	3.39E-02	3.95E-02	3.17E-02	5.84E-02	4.40E-02
02-19-19	4.91E-02	5.70E-02	6.54E-02	5.22E-02	5.93E-02	4.13E-02	5.71E-02	5.56E-02
02-26-19	3.28E-02	3.41E-02	3.59E-02	3.07E-02	4.05E-02	2.55E-02	3.91E-02	3.22E-02
03-05-19	4.35E-02	4.59E-02	5.45E-02	4.06E-02	4.81E-02	3.32E-02	4.93E-02	4.64E-02
03-12-19	3.65E-02	4.28E-02	4.93E-02	4.47E-02	4.90E-02	3.15E-02	4.76E-02	4.40E-02
03-19-19	1.99E-02	2.84E-02	3.50E-02	2.54E-02	2.99E-02	1.87E-02	3.11E-02	2.57E-02
03-26-19	3.38E-02	5.08E-02	5.66E-02	3.66E-02	4.56E-02	3.44E-02	4.79E-02	4.92E-02
04-02-19	2.71E-02	4.35E-02	4.58E-02	3.79E-02	3.62E-02	2.96E-02	4.06E-02	4.60E-02
04-09-19	2.87E-02	3.65E-02	4.28E-02	3.28E-02	2.96E-02	2.63E-02	3.49E-02	3.47E-02
04-16-19	2.53E-02	3.50E-02	3.15E-02	2.91E-02	3.18E-02	2.83E-02	2.57E-02	2.77E-02
04-23-19	2.36E-02	3.45E-02	3.75E-02	3.15E-02	3.33E-02	2.24E-02	3.17E-02	3.31E-02
04-30-19	2.77E-02	3.84E-02	3.70E-02	3.07E-02	3.19E-02	3.12E-02	4.08E-02	3.80E-02
05-07-19	2.26E-02	2.68E-02	6.67E-02	3.08E-02	3.12E-02	2.10E-02	2.93E-02	3.13E-02
05-14-19	1.97E-02	2.44E-02	2.27E-02	2.06E-02	2.16E-02	1.76E-02	3.07E-02	2.81E-02
05-21-19	3.14E-02	5.10E-02	4.45E-02	3.52E-02	3.92E-02	2.78E-02	4.29E-02	4.15E-02
05-28-19	2.73E-02	4.53E-02	4.96E-02	4.24E-02	3.95E-02	2.90E-02	4.81E-02	3.63E-02
06-04-19	2.00E-02	3.18E-02	2.75E-02	2.37E-02	2.33E-02	2.05E-02	2.51E-02	2.45E-02
06-11-19	2.35E-02	3.03E-02	3.59E-02	2.58E-02	2.96E-02	2.00E-02	2.54E-02	2.87E-02
06-18-19	2.64E-02	4.12E-02	4.09E-02	3.01E-02	3.46E-02	2.85E-02	3.14E-02	3.67E-02
06-25-19	3.69E-02	3.28E-02	3.21E-02	3.27E-02	3.97E-02	3.90E-02	3.67E-02	3.22E-02
07-02-19	5.63E-02	4.37E-02	3.54E-02	4.63E-02	5.00E-02	4.54E-02	4.98E-02	4.43E-02
07-09-19	3.67E-02	3.33E-02	3.56E-02	4.13E-02	3.25E-02	3.93E-02	3.46E-02	3.36E-02
07-16-19	3.66E-02	3.13E-02	3.06E-02	3.61E-02	3.94E-02	3.79E-02	3.67E-02	3.85E-02
07-23-19	4.35E-02	3.29E-02	3.28E-02	3.87E-02	4.24E-02	4.09E-02	4.49E-02	4.00E-02
07-30-19	6.99E-02	4.06E-02	4.27E-02	4.38E-02	5.15E-02	4.62E-02	4.66E-02	4.23E-02
08-06-19	4.94E-02	4.29E-02	4.40E-02	4.54E-02	5.25E-02	6.11E-02	5.59E-02	4.54E-02
08-13-19	3.95E-02	3.19E-02	2.84E-02	3.79E-02	3.93E-02	3.90E-02	3.95E-02	3.65E-02
08-20-19	3.90E-02	3.06E-02	3.46E-02	3.52E-02	4.49E-02	4.14E-02	3.95E-02	3.40E-02
08-27-19	3.88E-02	2.87E-02	3.02E-02	3.19E-02	3.87E-02	4.04E-02	3.82E-02	2.99E-02
09-03-19	4.82E-02	3.83E-02	4.52E-02	4.27E-02	4.90E-02	4.45E-02	5.31E-02	3.86E-02
09-10-19	5.94E-02	4.36E-02	4.45E-02	5.43E-02	5.84E-02	4.33E-02	5.90E-02	5.42E-02
09-17-19	7.13E-02	4.58E-02	5.07E-02	6.38E-02	7.36E-02	6.08E-02	7.71E-02	6.02E-02
09-24-19	3.02E-02	2.64E-02	2.41E-02	2.69E-02	3.52E-02	2.84E-02	3.48E-02	2.62E-02
10-01-19	3.44E-02	2.56E-02	2.75E-02	3.02E-02	2.99E-02	3.13E-02	3.52E-02	3.32E-02
10-08-19	4.22E-02	5.88E-02	5.31E-02	5.78E-02	6.51E-02	5.56E-02	6.66E-02	5.05E-02
10-15-19	4.87E-02	3.21E-02	3.53E-02	5.39E-02	5.17E-02	3.98E-02	4.72E-02	4.79E-02
10-22-19	5.64E-02	4.56E-02	6.35E-02	5.03E-02	6.06E-02	5.17E-02	7.99E-02	5.00E-02
10-29-19	3.82E-02	2.70E-02	3.51E-02	3.84E-02	3.96E-02	3.46E-02	4.67E-02	2.96E-02
11-05-19	6.45E-02	4.01E-02	4.31E-02	4.88E-02	7.00E-02	4.41E-02	5.63E-02	4.26E-02
11-12-19	6.21E-02	5.65E-02	5.26E-02	5.64E-03	6.58E-02	7.02E-02	6.31E-02	4.99E-02
11-19-19	9.27E-02	4.65E-02	5.25E-02	6.18E-02	8.19E-02	5.82E-02	6.96E-02	5.48E-02
11-26-19	6.48E-02	4.75E-02	5.11E-02	6.68E-02	6.46E-02	4.94E-02	6.29E-02	6.05E-02
12-03-19	3.60E-02	2.55E-02	2.60E-02	4.06E-02	3.46E-02	3.63E-02	3.48E-02	3.29E-02
12-10-19	8.39E-02	5.51E-02	6.81E-02	8.21E-02	7.79E-02	6.63E-02	8.27E-02	7.64E-02
12-17-19	7.74E-02	8.20E-02	6.53E-02	9.46E-02	7.10E-02	9.92E-02	5.31E-02	7.39E-02
12-24-19	6.57E-02	9.43E-02	7.19E-02	5.93E-02	8.01E-02	9.98E-02	4.92E-02	5.11E-02
12-31-19	7.71E-02	1.12E-01	6.20E-02	7.03E-02	5.23E-02	1.06E-01	4.22E-02	6.15E-02
Required LLD	1.00E-02							



Graph 2 -- Environmental Airborne Particulate Gross Beta Results by Station

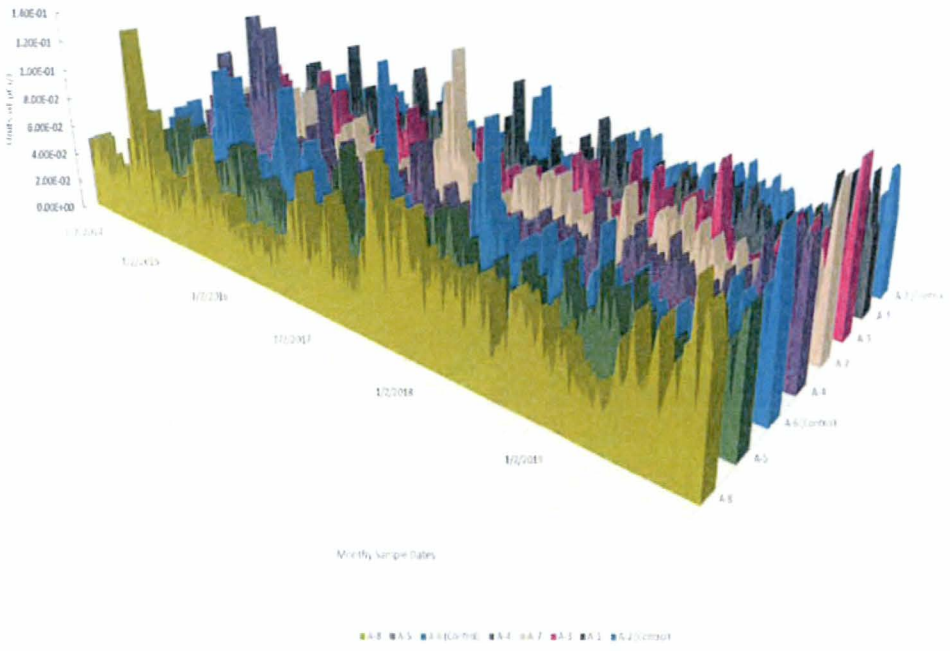


Table 5 -- -- Environmental Air Sample Iodine-131 Results
(Units of pCi/m3)
All sample analysis results are <MDC values listed below in the following table

	A-8	A-7	A-5	A-6	A-4	A-3	A-1	A-2
	Location							
	NW-1.0	SW/WSW-0.95	S/SSW-1.2	SW-12.3	SSE-4.5	E-3.5	N-1.45	N-9.4
Date				Control				Control
01-08-19	2.03E-02	2.24E-02	1.18E-02	2.06E-02	3.36E-02	1.35E-02	1.75E-02	3.80E-02
01-15-19	1.50E-02	2.16E-02	1.79E-02	1.72E-02	1.97E-02	2.15E-02	1.63E-02	1.19E-02
01-22-19	1.73E-02	1.21E-02	1.12E-02	1.11E-02	1.30E-02	1.40E-02	9.94E-03	1.01E-02
01-29-19	1.38E-02	1.26E-02	1.13E-02	9.32E-03	2.26E-02	9.85E-03	1.22E-02	9.84E-03
02-05-19	1.58E-02	1.71E-02	1.71E-02	1.86E-02	2.95E-02	1.48E-02	1.85E-02	2.54E-02
02-12-19	2.48E-02	1.29E-02	1.97E-02	3.78E-02	2.68E-02	2.30E-02	2.11E-02	1.81E-02
02-19-19	1.54E-02	1.21E-02	2.24E-02	2.58E-02	1.93E-02	2.11E-02	1.88E-02	2.52E-02
02-26-19	1.70E-02	2.02E-02	1.36E-01	1.91E-02	1.99E-02	1.27E-02	2.76E-02	3.38E-02
03-05-19	1.80E-02	1.83E-02	1.98E-02	2.97E-02	1.75E-02	1.53E-02	2.03E-02	1.17E-02
03-12-19	7.90E-03	1.24E-02	1.21E-02	1.57E-02	1.04E-02	1.05E-02	1.11E-02	2.13E-02
03-19-19	2.85E-02	1.47E-02	2.97E-02	1.18E-02	3.68E-02	2.26E-02	1.68E-02	2.55E-02
03-26-19	2.96E-02	1.72E-02	1.89E-02	1.93E-02	2.57E-02	1.57E-02	1.83E-02	1.61E-02
04-02-19	2.49E-02	1.89E-02	1.89E-02	1.58E-02	1.46E-02	1.55E-02	1.80E-02	2.03E-02
04-09-19	2.30E-02	1.64E-02	1.64E-02	1.48E-02	1.48E-02	8.81E-03	9.84E-03	1.03E-02
04-16-19	3.00E-02	1.96E-02	1.46E-02	1.42E-02	3.52E-02	1.32E-02	1.19E-02	1.70E-02
04-23-19	1.56E-02	2.49E-02	1.93E-02	1.47E-02	2.43E-02	2.16E-02	1.60E-02	3.13E-02
04-30-19	1.60E-02	1.41E-02	1.42E-02	1.36E-02	1.38E-02	1.27E-02	1.28E-02	1.79E-02
05-07-19	8.18E-03	2.26E-02	3.98E-03	9.78E-03	8.58E-03	1.25E-02	1.37E-02	1.41E-02
05-14-19	2.19E-02	1.80E-02	2.34E-02	1.47E-02	2.47E-02	2.64E-02	3.35E-02	2.27E-02
05-21-19	3.22E-02	2.29E-02	1.30E-02	2.22E-02	2.68E-02	2.12E-02	1.77E-02	2.23E-02
05-28-19	2.20E-02	2.30E-02	2.58E-02	1.48E-02	2.04E-02	2.02E-02	2.38E-02	1.96E-02
06-04-19	2.05E-02	1.30E-02	3.47E-02	1.91E-02	2.87E-02	1.96E-02	2.23E-02	4.31E-02
06-11-19	1.95E-02	6.91E-02	6.01E-02	2.41E-02	2.78E-02	1.33E-02	3.06E-02	1.60E-02
06-18-19	1.10E-02	1.24E-02	1.36E-02	1.21E-02	1.40E-02	1.18E-02	7.97E-03	1.32E-02
06-25-19	1.43E-02	1.36E-02	2.33E-02	1.71E-02	2.54E-02	1.45E-02	2.02E-02	1.99E-02
07-02-19	2.13E-02	2.69E-02	2.46E-02	2.29E-02	4.17E-02	1.77E-02	2.30E-02	3.24E-02
07-09-19	9.31E-03	1.35E-02	1.57E-02	1.30E-02	1.29E-02	7.77E-03	1.05E-02	1.10E-02
07-16-19	3.10E-02	1.77E-02	2.83E-02	4.01E-02	3.50E-02	1.60E-02	3.26E-02	1.40E-02
07-23-19	1.16E-02	1.11E-02	1.15E-02	1.11E-02	8.54E-03	9.33E-03	9.52E-03	1.68E-02
07-30-19	2.10E-02	2.08E-02	1.55E-02	1.95E-02	1.61E-02	1.67E-02	2.36E-02	1.95E-02
08-06-19	1.75E-02	1.40E-02	1.65E-02	1.30E-02	1.41E-02	1.57E-02	9.65E-03	1.15E-02
08-13-19	1.07E-02	1.03E-02	1.22E-02	8.45E-03	8.41E-03	1.17E-02	1.04E-02	1.00E-02
08-20-19	2.13E-02	2.55E-03	2.88E-02	1.91E-02	2.29E-02	2.39E-02	4.46E-02	1.77E-02
08-27-19	1.06E-02	2.09E-02	1.10E-02	1.09E-02	1.54E-02	1.44E-02	1.57E-02	1.07E-02
09-03-19	3.53E-02	2.63E-02	4.22E-02	3.91E-03	3.26E-02	4.36E-02	4.43E-02	4.31E-02
09-10-19	3.25E-02	2.82E-02	3.32E-02	2.20E-02	4.09E-02	2.21E-02	2.17E-02	3.21E-02
09-17-19	1.89E-02	2.14E-02	1.52E-02	4.71E-02	2.41E-02	2.03E-02	1.80E-02	2.00E-02
09-24-19	1.69E-02	8.79E-03	1.46E-02	2.44E-02	1.71E-02	1.31E-02	1.09E-02	1.35E-02
10-01-19	1.31E-02	2.25E-02	1.30E-02	2.31E-02	1.89E-02	1.69E-02	1.68E-02	1.98E-02
10-08-19	1.80E-02	1.37E-02	2.06E-02	2.14E-02	2.85E-02	2.30E-02	1.28E-02	2.51E-02
10-15-19	1.94E-02	1.70E-02	1.08E-02	1.70E-02	1.79E-02	1.66E-02	1.98E-02	1.94E-02
10-22-19	1.07E-02	1.02E-02	9.18E-03	1.42E-02	8.15E-03	8.52E-03	2.00E-02	1.57E-02
10-29-19	2.23E-02	2.25E-02	1.38E-02	1.29E-02	2.04E-02	2.16E-02	1.92E-02	1.95E-02
11-05-19	1.42E-02	1.71E-02	1.71E-02	1.30E-02	1.24E-02	1.42E-02	1.25E-02	1.19E-02
11-12-19	1.30E-02	1.55E-02	2.12E-02	1.63E-02	1.48E-02	1.34E-02	1.60E-02	2.03E-02
11-19-19	1.38E-02	1.36E-02	1.25E-02	1.93E-02	1.54E-02	1.24E-02	1.62E-02	1.39E-02
11-26-19	1.13E-02	1.63E-02	1.29E-02	1.40E-02	1.69E-02	1.25E-02	1.47E-02	1.32E-02
12-03-19	1.55E-02	1.33E-02	1.05E-02	1.69E-02	1.37E-02	1.26E-02	1.65E-02	1.84E-02
12-10-19	1.93E-02	1.66E-02	1.48E-02	1.87E-02	2.20E-02	1.50E-02	1.69E-02	1.41E-02
12-17-19	1.86E-02	1.21E-02	1.36E-02	2.52E-02	1.91E-02	1.75E-02	1.91E-02	1.26E-02
12-24-19	1.86E-02	1.25E-02	2.02E-02	1.44E-02	1.53E-02	1.24E-02	2.04E-02	1.17E-02
12-31-19	1.20E-02	1.42E-02	1.04E-02	5.86E-03	1.64E-02	1.27E-02	1.53E-02	1.42E-02
Required LLD 7.00E-02								

D. Discharge Pathway Surface Water Program

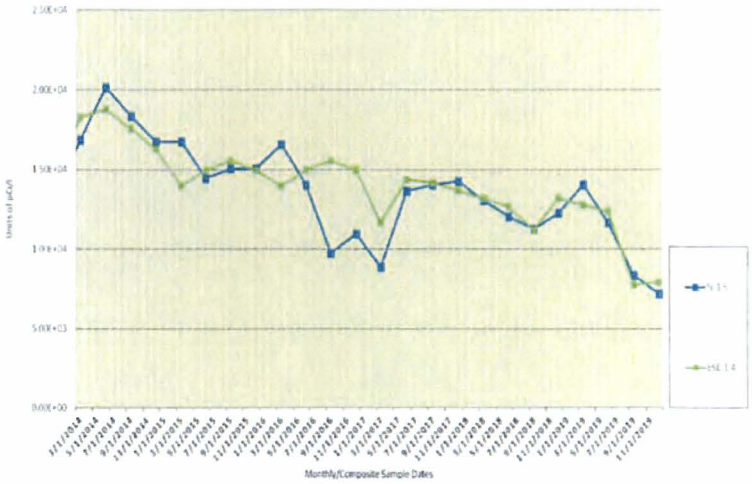
Discharge Pathway Surface water monitoring stations are found at four locations as detailed in Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program. Location N-1.5 provides samples representative of Squaw Creek reservoir surface water at a location beyond significant influence of the plant discharge. Location ESE-1.4 provides samples representative of discharges from Squaw Creek reservoir downstream to Squaw Creek and to Lake Granbury via an installed return line. [*NOTE: The installed return line to Lake Granbury has never been used to send water back to Lake Granbury.*] Location NE-7.4 provides samples of Lake Granbury surface water downstream of the discharge from the return line from Squaw Creek reservoir. A control sample is obtained from the Brazos River, upstream of Lake Granbury at location N-19.3. Discharge Pathway Surface water samples from Squaw Creek reservoir locations were collected weekly and composited for monthly gamma isotopic analysis. Samples from Lake Granbury locations were collected monthly and analyzed by gamma spectrometry. All Discharge Pathway Surface Water samples were also composited quarterly by location for tritium analysis.

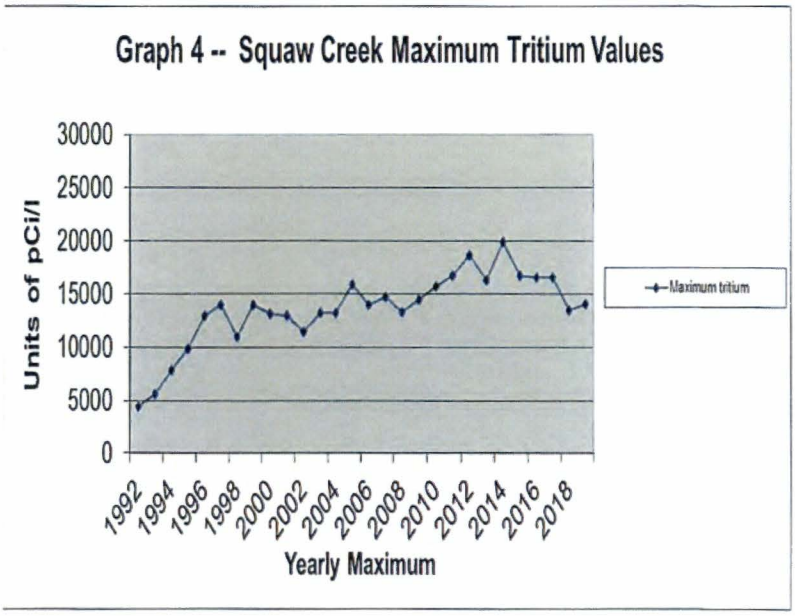
All Discharge Pathways Surface Water samples were collected as required. Forty-eight samples were analyzed by gamma spectrometry. All results for the required radionuclides were reported as less than the required LLDs. Sixteen quarterly composited samples were analyzed for tritium. The results of the reported tritium values for Squaw Creek reservoir were in line with expected concentrations. The tritium values ranged from a high of **1.41E+04** pCi/l to a low of **7.22E+03** pCi/l. The results from Lake Granbury were all less than the required LLDs as expected. The tritium concentration reported in Squaw Creek is well below the action level of **3.00E+4** pCi/l and is following the expected concentration variations based on fuel cycles, power histories and reservoir makeup due to rain and pump transfers from Lake Granbury. Graph 3 – Environmental Surface Water Tritium Results indicates the current results and the short-term trend of the tritium concentration in Squaw Creek reservoir, Squaw Creek spillway, Lake Granbury, and Brazos River (control location). Graph 4 – Squaw Creek Maximum Tritium Values trends the reservoir tritium concentration since it was first detected in 1990 after Unit 1 startup. **Squaw Creek reservoir tritium is a direct product from the operation of CPNPP.**

There should not be any significant changes in the tritium concentrations in the near future and no action levels are anticipated. A review of pre-operational and operational data indicated the 2019 results were both expected and consistent with previous data and that no anomalies had occurred.

During the year 2019, there were no exceptions to the Discharge Pathway Surface Water.

GRAPH 3 -- ENVIROMENTAL SURFACE WATER TRITIUM RESULTS





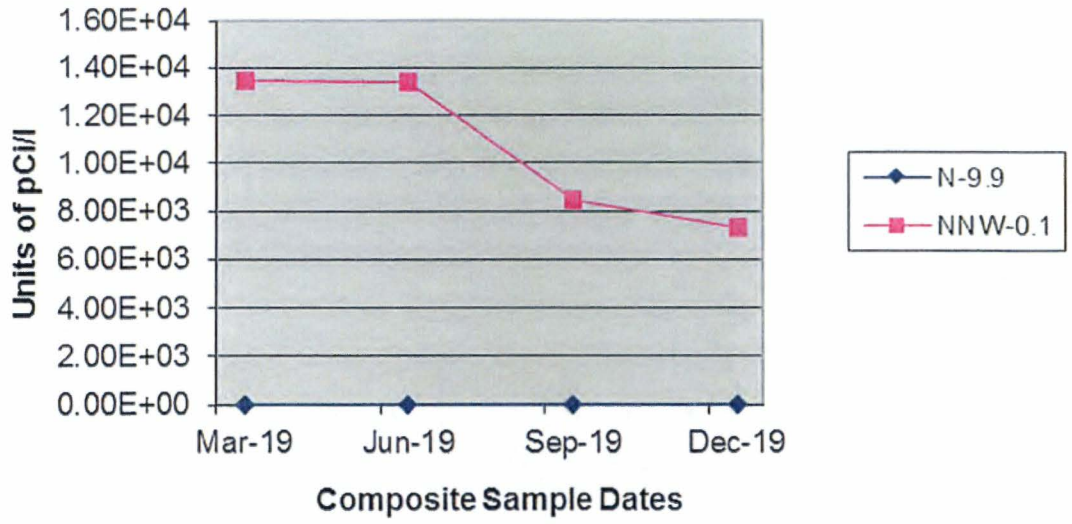
E. Squaw Creek and Lake Granbury Surface Water Program

Surface water was collected at two monitoring locations. Table 1 -- Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program details the location and types of analysis required. Samples of water from Squaw Creek reservoir were collected at the monitoring location NNW-0.1. There is not a surface water drinking source within a mile of CPNPP. Monitoring location N-9.9 is used as a surface drinking water location based on the proximity of the City of Granbury intake to the Granbury potable water system. All surface water samples were collected weekly and then composited for Iodine-131 analysis, gamma isotopic analysis, and gross beta analysis on a monthly basis. Tritium analysis was performed on a quarterly basis.

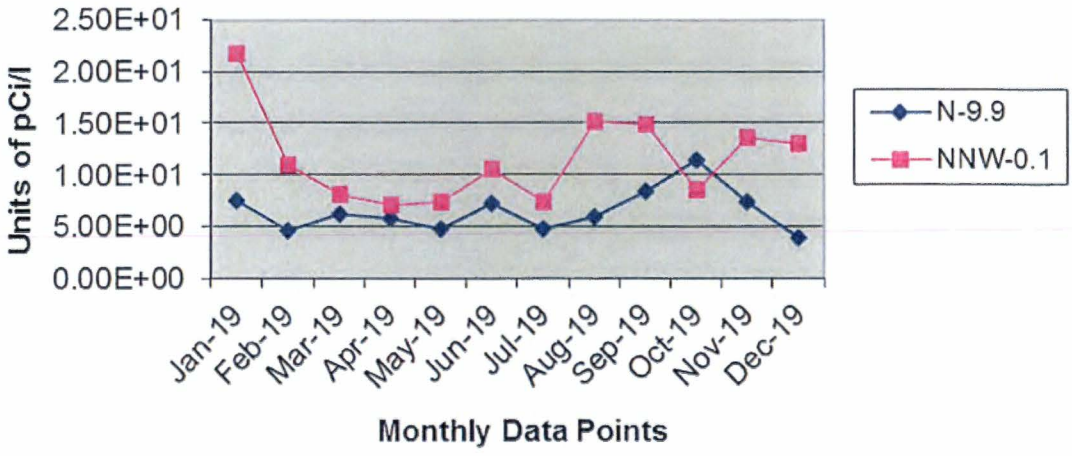
All samples were analyzed for gamma emitting radionuclides. There were no gamma emitting radionuclides identified in any of the twenty-four composite samples. Tritium reported in Squaw Creek reservoir ranged from **7.22E+03 pCi/l to 2.02E+04 pCi/l** and **averaged 1.37E+04 pCi/l.** Tritium reported from all Lake Granbury water samples indicated less than the required LLD as expected. Graph 5 – Environmental Squaw Creek and Lake Granbury Surface Water Tritium Results trends the results reported for the year 2019. Graph 6 – Environmental Squaw Creek and Lake Granbury Surface Water Gross Beta Results trends the gross beta results for the two monitor locations and indicates no influence from Comanche Peak in the levels detected in the two different bodies of water. Gross Beta results at the indicator location NNW-0.1 ranged from **7.04+00 pCi/l to 2.18E+01 pCi/l** with an average of **14.4E+01 pCi/l.** Gross Beta results at the control location N-9.9 ranged from **3.89E+00 pCi/l to 1.14E+01 pCi/l** with an average of **5.87E+00 pCi/l.** Past gross beta results for Lake Granbury have been as high as **1.23E+01 pCi/l**, which is still within acceptable levels for gross beta. The gross beta results received are within values previously reported and there is no reportable level for gross beta so no action is required at this time.

During the year 2019, there were no exception to the Surface Water Program.

Graph 5 -- Environmental Squaw Creek and Lake Granbury Surface Water Tritium Results



Graph 6 -- Environmental Squaw Creek and Lake Granbury Surface Water Gross Beta Results



F. Ground Water Program

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program specifies the five groundwater monitoring locations. Groundwater supplies in the site area are not affected by plant effluents and are sampled only to provide confirmation that groundwater is not affected by plant discharges. Groundwater samples were collected quarterly and analyzed for gamma isotopes and tritium at each location.

A total of twenty groundwater samples were collected from the five different monitoring locations. There were no radionuclides identified in any of the samples. All required LLDs were met for each required gamma emitting radionuclide. Tritium analysis was performed on twenty samples, all indicated less than the required LLD. The results confirm that plant discharges are having no effect on groundwater in the area surrounding Comanche Peak.

Groundwater samples are taken quarterly in accordance with STA-654, "Groundwater Protection Program".

During the year 2019, there were no exceptions to the Ground Water Program.

G. Sediment Program

Table 1 – Comanche Peak Nuclear Power Plant Radiological Environmental Monitoring Program specifies shoreline sediments were collected at four different monitoring locations. One sample location is along the shore of Squaw Creek Reservoir, one sample location is on Squaw Creek downstream of the dam discharge and two locations are along Lake Granbury's shores. Each sample is collected on a six-month frequency and sent to the contract laboratory for analysis by gamma spectrometry.

The process of shoreline sedimentation is a complex evolution whereby potential radionuclides and stable elements may concentrate in the bottom sediment of particular bodies of water. The concentrations are effected by such things as colloidal particles combining with chelating agents and biological action of bacteria and other benthic organisms. Monitoring of the area shorelines provides one of the first and best indicators of radionuclide deposition.

As expected and in agreement with previous results from both the pre-operational and operational programs, naturally occurring Potassium-40 was detected in all eight samples and Beryillum-7 was detected in one samples. All required radionuclide results were reported as less than the required LLDs. During previous years, both pre-operational and operational, positive indications occasionally had been noted for Cesium-137 however during 2019 there were no positive Cesium-137 results reported. As expected, there were no results in any sediment sample that indicated any direct influence from CPNPP discharges to the local environment.

During the year 2019, there were no exceptions to the Sediment Program

H. Fish Program

Fish samples were collected at two locations. One monitoring location is an area approximately two miles east-northeast of the site on Squaw Creek Reservoir. The second location is on Lake Granbury approximately eight miles north-northeast of the site. Fish sampling is scheduled for the months of April and November. The collected fish are frozen and shipped to the independent laboratory where the edible portions are analyzed for gamma emitting radio-nuclides.

Tritium analysis is performed annually on Squaw Creek fish (CR-2014-013335). The analysis of the (cooked) fish sample collected on Jun 4, 2019 from Squaw Creek indicates a positive Tritium (CR-2019-009052) analysis result consistent with previous years. This is not an ODCM required sample/analysis, and there is NO reporting level. The sample/analysis of cooked fish from Squaw Creek was a recommendation during an audit.

Catfish and Bass samples were analyzed. There were no positive results reported except for the expected Potassium-40, which is naturally occurring in all living organisms. All required radionuclide results were reported as less than the required LLDs. As a result of the fish-sampling program, there were no anomalies noted and no indication of any influence on the surrounding environment from Comanche Peak plant discharges.

No abnormal results were reported by CPNPP or by the State of Texas. As expected, Potassium-40 was the only positive isotope found.

During the year 2019 there was one exception to the Fish Program.

CR-2020-000122- During the fall collection period the catfish sample from Lake Granbury was not obtained thru multiple attempts.

RPI-710, RADIOLOGICAL ENVIRONMENTAL MONITORING, SAMPLING, AND ANALYSIS PROGRAM Attachment 1 and CPNPP ODCM outlines that "One sample of same species in areas not influent by plant discharge for fish and invertebrates". A single species was collected to meet the ODCM requirements. Normally two (2) different species are collected for radiological analysis similar to the additional requirement by the CPNPP ODCM for Collection of " One sample of at least two recreationally important species in vicinity of plant discharge area".

RP routinely provides two different species of fish in an area not influent by the discharge to match the samples taken in the vicinity of plant discharge. The Issue Report documents that, a normally not required sample which is routinely provided, was not provided during this period due to difficulty in obtaining the second fish species after numerous attempts.

I. Food Products Program

Food products (pecans) were collected at the time of harvest. The samples are obtained at monitoring location ENE-9.0 at the time of harvest and are shipped to the contract laboratory for gamma isotopic analysis. There were food products produced that required monitoring for location E-4.2 in 2019.

Naturally occurring Potassium 40 was detected in the samples as expected and all other required radionuclide results were reported as less than the required LLDs.

During the year 2019, there were no exceptions to the Food Products Program.

J. Broadleaf Program

Broadleaf sample collection is conducted in accordance with the requirements of the Radiological Environmental Monitoring Program. The program specifies the sampling based on the absence of milk monitoring locations. One broadleaf control location is located at SW-13.5 in the vicinity of the previous control milk location. The two indicator locations, N-1.45 and SW-1.0, are located near the site boundaries. The broadleaf samples consist of mainly native grasses and are analyzed for Iodine-131 and gamma emitting isotopes.

All radionuclide analysis met their required LLDs. The naturally occurring radionuclides of Potassium-40 was found in 36 of 36 samples taken and radionuclide Beryllium-7 was present in 35 of 36 samples.

During the year 2019, there was one exception to the Broadleaf Program.

CR-2019-004249- Received a notification from the Texas Department of State Health Services that a vegetation sample collected at the Squaw Creek Park identified a trace amount of Co-60. The offsite radiochemistry analysis vendor (GEL), that CPNPP currently uses, was contacted to determine if the same vegetation sample showed any Co-60 activity. GEL confirmed that the vegetation sample identified Co-60 at 0.05675 pCi/gm. There are no regulatory reporting requirements for this in STA-501, Non-Routine Reporting, which references the ODCM.

K. Conclusions

Based on the results presented in this report and from comparisons with the pre-operational and operational program results from previous years, it can be concluded that the impact of Comanche Peak on the environment is minimal. The only indication directly attributable to Comanche Peak is the tritium detected in Squaw Creek reservoir.

The tritium in Squaw Creek reservoir is reaching equilibrium and is expected to remain well below the reportable level.

Gross beta trend indications concerning Squaw Creek Reservoir are consistent with previous values and do not indicate any increase due to influence from Comanche Peak. Future data will be evaluated as it is received and will be addressed as necessary.

There were no values reported during the year 2019 that exceeded any NRC reportable limit.

L. Inter Laboratory Comparison and Cross Check Program

GEL Laboratories LLC

GEL Laboratories LLC is the independent contract laboratory that processes the radiological environmental monitoring samples collected by CPNPP. The contract laboratory is required to participate in an Interlaboratory Comparison Program in accordance with the ODCM Control 3.12.3. GEL participates in multiple programs to ensure all environmental media sent to them are analyzed to the proper standards.

GEL Laboratories, LLC (GEL) is a privately owned environmental laboratory. GEL was established as an analytical testing laboratory in 1981. Now a full service lab, their analytical divisions use state of the art equipment and methods to provide a comprehensive array of organic, inorganic, and radiochemical analyses.

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

GEL Laboratories NUPIC Audit

Summary

The NUPIC Audit was conducted at GEL Laboratories, 2040 Savage Road, Charleston, SC 29407 during the time period of August 29, 2019. A Technical Specialist, conducted tours, observations, interviews, reviewed Standard Operating Procedures, and reviewed data. Radiochemical, Radiation Environmental Monitoring Program (REMP), Radiological Effluent, and Ground Water analyses were observed in the various laboratories. Previous Technical Audit reports from GEL were reviewed prior to the audit visit. Recommended actions or deltas from previous audits were pursued during this visit to see how GEL had reconciled these previously identified issues. Additionally, known deviations (data error reports) in data reporting from working through with GEL through EnRad Laboratories were a topic of interest. GEL's Quality Assurance Plan is designed to comply with the specifications outlined in the following NUPIC recognized documents: ANSI N42.23-1996 Measurement and Associated Instrument Quality Assurance for Radiobioassay Laboratories, 10 CFR Part 21 – Reporting of Defects and Noncompliance, 10 CFR Part 50 Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, 10 CFR Part 61 – Licensing Requirements for Land Disposal of Radioactive Waste, NRC Reg Guide 4.8, and NRC Reg Guide 4.15. At the conclusion of the technical audit, it was found that GEL is in compliance with the quality control standards imposed by the above regulations and those of their Quality Assurance Plan and Standard Operating Procedures.

Technical Specialist Conclusion

The results of this audit were discussed during the Exit Meeting on August 29, 2019. It was found that GEL is in compliance with the quality control standards imposed by the specifications outlined in the following NUPIC recognized documents: ANSI N42.23-1996 - Measurement and Associated Instrument Quality Assurance for Radiobioassay Laboratories, 10 CFR Part 21 – Reporting of Defects and Noncompliance, 10 CFR Part 50 Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, 10 CFR Part 61 – Licensing Requirements for Land Disposal of Radioactive Waste, NRC Reg Guide 4.8, and NRC Reg Guide 4.15, and the requirements of their Quality Assurance Plan and their Standard Operating Procedures.

Appendix A Gel Environmental Lab Results

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To: **Distribution List**

From: **Robert L. Pullano, Director, Quality Systems, GEL Laboratories, LLC**

Date: **April 15, 2019**

Subject: **Environmental Laboratory Quarterly Quality Assurance Report for Environmental Analyses (January - March 2019)**

Attached is GEL Laboratories, LLC (GEL) first quarter 2019 quality assurance report covering Environmental Analyses. This report includes internal quality assurance comparisons, analytical Performance Test (PT) sample cross check programs in support of client Radiological Environmental Monitoring Programs (REMP) and analysis of additional radionuclides in environmental samples that are typically outside the REMP scope.

A total of 21 individual PT analyses were evaluated during this period. GEL received performance evaluation samples from ERA's RadChem Proficiency Testing Program.

Please do not hesitate to contact your project manager or me with any additional questions or comments about the report. I can be reached by email bob.pullano@gel.com, or by phone at 843-556-8171 ext. 4429.

Robert L. Pullano
Director, Quality Systems

Attachment

problem solved

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ENVIRONMENTAL LABORATORY QUALITY REPORT
2019 – FIRST QUARTER

In accordance with the U.S. Nuclear Regulatory Commission requirements, GEL Laboratories, LLC (GEL) participates in an Interlaboratory Comparison Program (ICP). This satisfies the requirements of both Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment", February 1979 and Regulatory Guide 4.15, Revision 2, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) - Effluent Streams and the Environment", July, 2007. Both guides indicate the ICP is to be conducted with the U.S. Environmental Protection Agency (EPA) Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program or an equivalent program, and the ICP should include all sample medium/radionuclide combinations that are offered by the EPA and included in the REMP.

Throughout the year, GEL receives performance evaluation samples from the U.S. Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP), ERA's Mixed Rad (MRAD) Proficiency Testing Program, ERA's RadChem Proficiency Testing Program (RAD), and ERA's Quik Response Proficiency Testing Program. Each provider has a documented Quality Assurance (QA) program and the capability to prepare Quality Control (QC) materials traceable to the National Institute of Standards and Technology. The ICP is a third party blind testing program which provides a means to ensure independent checks are performed on the accuracy and precision of the measurements of radioactive materials in environmental sample matrices. The providers supply the crosscheck samples to GEL. Upon receipt, the laboratory performs the analyses in a normal manner. Laboratory results are given to each provider for evaluation.

The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. (EZA) is measured by the ratio of GEL's result to the known value. Accuracy for all other results is based on statistically derived acceptance ranges calculated by the providers. An investigation is undertaken whenever the ratio or reported result falls outside of the acceptance range.

A summary of GEL's results received during First Quarter 2019 is provided in Table 2 for the required sample matrix types and isotopic distribution. GEL's results met acceptance criteria for 19 of 21 reported analytes. Investigation on the non-acceptable results were initiated as outlined in GEL's standard operating procedures for corrective action. A summary of the corrective action is provided in Table 3.

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TABLE 1

INTERNAL LABORATORY QUALITY CONTROL RESULT SUMMARY

January through March 2019

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First Quarter 2019	Bias Criteria (+ / - 25%) WITHIN CRITERIA	Bias Criteria (+ / - 25%) OUTSIDE CRITERIA	Precision Criteria (Note 1) WITHIN CRITERIA	Precision Criteria (Note 1) OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	9	0	11	0
Gas Flow Total Strontium	4	0	4	0
Gamma Spec Liquid RAD A-013 with Ba, La	6	0	14	0
SOLID				
Gamma Spec Solid RAD A-013	2	0	3	0
LSC Nickel 63	1	0	1	0
Gas Flow Total Strontium	1	0	1	0
Gamma Spec Solid RAD A-013 with Iodine	3	0	4	0
FILTER				
Gas Flow Sr 2nd Count	2	0	2	0
Gross A & B	122	0	87	0
Gas Flow Sr-90	1	0	1	0
Gamma Spec Filter	7	0	20	0
LIQUID				
Alpha Spec Uranium	5	0	5	0
Tritium	37	0	57	0
LSC Iron-55	7	0	6	0
LSC Nickel 63	8	0	7	0
Gamma Iodine-131	6	0	6	0
Alpha Spec Plutonium	5	0	5	0
Gas Flow Sr 2nd count	3	0	3	0
Alpha Spec Am241 Curium	5	0	5	0
Gas Flow Total Strontium	3	0	2	0
Gross Alpha Non Vol Beta	9	0	15	0
Gamma Spec Liquid RAD A-013 with Ba, La	10	0	26	0
Gamma Spec Liquid RAD A-013 with Iodine	4	0	26	0
TISSUE				
Gas Flow Total Strontium	2	0	2	0
Gamma Spec Solid RAD A-013 with Iodine	1	0	1	0

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VEGETATION				
Gamma Spec Solid RAD A-013 with Iodine	7	0	7	0
AIR CHARCOAL				
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	6	0	6	0
DRINKING WATER				
Tritium	4	0	5	0
LSC Iron-55	3	0	4	0
LSC Nickel 63	3	0	4	0
Gamma Iodine-131	6	0	4	0
Gas Flow Sr 2nd count	3	0	3	0
Gas Flow Total Strontium	3	0	4	0
Gross Alpha Non Vol Beta	13	0	17	0
Gamma Spec Liquid RAD A-013 with Ba, La	4	0	12	0
Gamma Spec Liquid RAD A-013 with Iodine	0	0	1	0

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

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TABLE 2

GEL QUARTERLY INTERLABORATORY COMPARISON

January through March 2019

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PT Provider	Quarter / Year	Report Closing / Received Date	Sample Number	Sample Media	Units	Analyte	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Barium-133	105	99.5	84.1 - 109	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Cesium-134	48.2	49.1	39.5 - 54.0	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Cesium-137	128	125	112 - 140	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Cobalt-60	104	96.4	86.8 - 108	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Zinc-65	88.1	77.4	69.5 - 93.2	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	22.3	21.8	10.9 - 29.5	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	23.5	21.8	10.9 - 29.5	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Gross Beta	43.6	55.7	38.1 - 62.6	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Radium-226	6.47	7.37	5.55 - 8.72	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	3.99	4.28	2.48 - 5.89	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	4.48	4.28	2.48 - 5.89	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Uranium (Nat)	70	68.2	55.7 - 75.0	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	µg/L	Uranium (Nat) mass	99.3	99.5	81.3 - 109	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Tritium	2160	2110	1740 - 2340	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Tritium	1920	2110	1740 - 2340	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	78.5	66.9	54.4 - 75.0	Not Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	76.5	66.9	54.4 - 75.0	Not Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	40.1	41	30.2 - 47.1	Acceptable
ERA	1st / 2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	42.2	41	30.2 - 47.1	Acceptable
ERA	1st / 2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	27.4	25.9	21.5 - 30.6	Acceptable
ERA	1st / 2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	25.1	25.9	21.5 - 30.6	Acceptable

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TABLE 3

CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR190225-1192 ISO Documentation of PT Failures in RAD 116 for Strontium-89.	**Root Cause Analysis** **Strontium-89 in Drinking Water by EPA 905.0 and 905.0 Mod.** A review of the data as well as the preparation processes did not reveal any errors or possible contributors to the high bias. The Laboratory has concluded that this positive bias was an isolated occurrence and that our overall process is within control. In addition, the reported value is 117% of the reference value which is within the laboratory's standard acceptance criteria of +/- 25% for Laboratory Control Samples. **Permanent Corrective/Preventive Actions or Improvements** The laboratory must assume unidentified random errors caused the biases because all quality control criteria were met for the batches. The laboratory will continue to monitor

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To: **Distribution List**

From: **Robert L. Pullano, Director, Quality Systems, GEL Laboratories, LLC**

Date: **July 31, 2019**

Subject: **Environmental Laboratory Quarterly Quality Assurance Report for Environmental Analyses (April – June, 2019)**

Attached is GEL Laboratories, LLC (GEL) second quarter 2019 quality assurance report covering Environmental Analyses. This report includes internal quality assurance comparisons, analytical Performance Test (PT) sample cross check programs in support of client Radiological Environmental Monitoring Programs (REMP) and analysis of additional radionuclides in environmental samples that are typically outside the REMP scope.

A total of 174 individual PT analyses were evaluated during this period. GEL received performance evaluation samples from Eckert & Ziegler Analytics, U.S. Department of Energy Mixed Analyte Performance Evaluation Program, ERA's Mixed Rad Proficiency Testing Program, and ERA's RadChem Proficiency Testing Program,

Please do not hesitate to contact your project manager or me with any additional questions or comments about the report. I can be reached by email bob.pullano@gel.com, or by phone at 843-556-8171 ext. 4429.

Robert L. Pullano
Director, Quality Systems

Attachment

problem solved

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ENVIRONMENTAL LABORATORY QUALITY REPORT
2019 – SECOND QUARTER

In accordance with the U.S. Nuclear Regulatory Commission requirements, GEL Laboratories, LLC (GEL) participates in an Interlaboratory Comparison Program (ICP). This satisfies the requirements of both Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment", February 1979 and Regulatory Guide 4.15, Revision 2, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) - Effluent Streams and the Environment", July, 2007. Both guides indicate the ICP is to be conducted with the U.S. Environmental Protection Agency (EPA) Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program or an equivalent program, and the ICP should include all sample medium/radionuclide combinations that are offered by the EPA and included in the REMP.

Throughout the year, GEL receives performance evaluation samples from the U.S. Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP), ERA's Mixed Rad (MRAD) Proficiency Testing Program, ERA's RadChem Proficiency Testing Program (RAD), and ERA's Quik Response Proficiency Testing Program. Each provider has a documented Quality Assurance (QA) program and the capability to prepare Quality Control (QC) materials traceable to the National Institute of Standards and Technology. The ICP is a third party blind testing program which provides a means to ensure independent checks are performed on the accuracy and precision of the measurements of radioactive materials in environmental sample matrices. The providers supply the crosscheck samples to GEL. Upon receipt, the laboratory performs the analyses in a normal manner. Laboratory results are given to each provider for evaluation.

The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. (EZA) is measured by the ratio of GEL's result to the known value. Accuracy for all other results is based on statistically derived acceptance ranges calculated by the providers. An investigation is undertaken whenever the ratio or reported result falls outside of the acceptance range.

A summary of GEL's results received during second quarter 2019 is provided in Table 2 for the required sample matrix types and isotopic distribution. GEL's results met acceptance criteria for 168 of 174 reported analytes (96.5%). Investigation on the non-acceptable results were initiated as outlined in GEL's standard operating procedures for corrective action. Corrective action CARR190531-1211 was opened for unacceptable results in MRAD-30 and CARR190603-1212 was opened for unacceptable results in MAPEP-40. A summary of CARR190531-1211 is provided in Table 3. The summary of CARR190603-1212 will be provided in the next quarterly report as the investigation has not yet concluded.

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TABLE 1

INTERNAL LABORATORY QUALITY CONTROL RESULT SUMMARY

April through June 2019

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Second Quarter 2019	Bias Criteria (+ / - 25%) WITHIN CRITERIA	Bias Criteria (+ / - 25%) OUTSIDE CRITERIA	Precision Criteria (Note 1) WITHIN CRITERIA	Precision Criteria (Note 1) OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	7	0	8	0
Gas Flow Total Strontium	4	0	4	0
Gamma Spec Liquid RAD A-013 with Ba, La	6	0	19	0
SOLID				
Gamma Spec Solid RAD A-013	3	0	4	0
LSC Nickel 63	2	0	2	0
Gas Flow Sr 2nd count	2	0	2	0
Gas Flow Total Strontium	2	0	2	0
Gamma Spec Solid RAD A-013 with Iodine	5	0	10	0
FILTER				
Gross A & B	88	0	65	0
Gamma Spec Filter	7	0	19	0
LIQUID				
Alpha Spec Uranium	1	0	2	0
Tritium	51	0	63	0
LSC Iron-55	4	0	4	0
LSC Nickel 63	4	0	4	0
Gamma Iodine-131	5	0	5	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	2	0	2	0
Alpha Spec Am241 Curium	1	0	1	0
Gas Flow Total Strontium	3	0	3	0
Gross Alpha Non Vol Beta	9	0	18	0
Gamma Spec Liquid RAD A-013 with Ba, La	16	0	30	0
Gamma Spec Liquid RAD A-013 with Iodine	10	0	28	0
TISSUE				
Gamma Spec Solid RAD A-013	11	0	12	0
Gas Flow Sr 2nd count	3	0	3	0
Gas Flow Total Strontium	2	0	3	0
Gamma Spec Solid RAD A-013 with Iodine	4	0	5	0
VEGETATION				
Gamma Spec Solid RAD A-013 with Iodine	15	0	18	0
AIR CHARCOAL				
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	6	0	6	0
DRINKING WATER				
Tritium	5	0	4	0
LSC Iron-55	4	0	4	0

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LSC Nickel 63	4	0	4	0
Gamma Iodine-131	6	0	3	0
Gas Flow Sr 2nd count	3	0	3	0
Gas Flow Total Strontium	3	0	3	0
Gross Alpha Non Vol Beta	15	0	16	0
Gamma Spec Liquid RAD A-013 with Ba, La	6	0	15	0

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

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TABLE 2

GEL QUARTERLY INTERLABORATORY COMPARISON

April through June 2019

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PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st/2019	05/10/19	E12364	Cartridge	pCi	Iodine-131	7.80E+01	7.54E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cerium-141	1.23E+02	1.17E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-58	1.51E+02	1.43E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-60	3.12E+02	2.99E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Chromium-51	3.04E+02	2.93E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-134	1.53E+02	1.60E+02	0.96	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-137	2.04E+02	1.96E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Manganese-54	1.55E+02	1.43E+02	1.08	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Iron-59	1.78E+02	1.59E+02	1.12	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Zinc-65	2.42E+02	2.20E+02	1.1	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cerium-141	1.20E+02	1.13E+02	1.06	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-134	1.43E+02	1.55E+02	0.92	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-137	2.09E+02	1.91E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Chromium-51	3.55E+02	2.84E+02	1.25	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-58	1.43E+02	1.39E+02	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-60	3.18E+02	2.90E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iodine-131	8.89E+01	9.65E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iron-59	1.76E+02	1.54E+02	1.14	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Manganese-54	1.55E+02	1.39E+02	1.12	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Zinc-65	2.44E+02	2.14E+02	1.14	Acceptable
ERA	2nd/2019	05/23/19	RAD-117	Water	pCi/L	Strontium-89	35.9	33.3	24.5-40.1	Acceptable
ERA	2nd/2020	05/24/19	RAD-117	Water	pCi/L	Strontium-90	34.4	33.3	24.5-40.2	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Americium-241	52.8	49.9	34.9-64.9	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-134	2.25		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-137	1290.00	1164.0	815-1513	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-57	0.133		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-60	853	855	599-1112	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Iron-55	486	344	241-447	Not Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Manganese-54	1130	1027	719-1335	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Nickel-63	524.00	519	363-675	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-238	75.2	71.0	49.7-92.3	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-239/240	67.3	59.8	41.9-77.7	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Potassium-40	596	585	410-761	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Strontium-90	3.44		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Technetium-99	381	408	286-530	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium 234	54.7	56.0	39-73	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium-238	204	205	144-267	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaS40	Soil	Bq/Kg	Zinc-65	751	668	468-868	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-GrW40	Water	Bq/L	Gross alpha	0.819	0.840	0.25-1.43	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-GrW40	Water	Bq/L	Gross beta	2.390	2.330	1.17-3.50	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Americium-241	0.549	0.582	0.407-0.757	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Cesium-134	5.32	5.99	4.19-7.79	Acceptable

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MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Cesium-137	0.0		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Cobalt-57	9.840	10	7.0-13.0	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Cobalt-60	6.7	6.7	4.7-8.7	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Hydrogen-3	389.00	421	295-547	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Iron-55	0.0173		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Manganese-54	8.80	8.4	5.9-10.9	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Nickel-63	4.62	5.8	4.1-7.5	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Plutonium-238	0.419	0.451	0.316-0.586	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Plutonium-239/240	0.0158	0.0045	Sens. Eval.	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Potassium-40	-0.156		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Radium-226	0.593	0.672	0.470-0.874	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Strontium-90	5.86	6.350	4.45-8.26	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Technetium-99	3.66	3.3	2.34-4.34	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Uranium-234	0.81	0.8	0.56-1.04	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Uranium-238	0.802	0.81	0.57-1.05	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-MaW40	Water	Bq/L	Zinc-65	-0.0318		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-XaW40	Water	Bq/L	Iodine-129	0.64	0.62	0.431-0.801	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-GrF40	Filter	Bq/sample	Gross alpha	0.540	0.528	0.158-0.898	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-GrF41	Filter	Bq/sample	Gross beta	0.928	0.948	0.474-1.422	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	ug/sample	Uranium-235	0.0566	0.0640	0.0448-0.0832	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	ug/sample	Uranium-238	7.76	8.8	6.2-11.4	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	ug/sample	Uranium-Total	7.72	8.9	6.2-11.6	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Americium-241	0.0284	0.0294	0.0206-0.0382	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-134	0.251	0.216	0.151-0.281	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-137	0.313	0.290	0.203-0.377	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-57	0.424	0.411	0.288-0.534	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-60	0.373	0.34	0.238-0.442	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Manganese-54	0.576	0.547	0.383-0.711	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-238	0.0551	0.0526	0.0368-0.0684	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-239/240	0.0377	0.038	0.0265-0.0493	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Strontium-90	0.616	0.662	0.463-0.861	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-234	0.108	0.106	0.074-0.138	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-238	0.118	0.110	0.077-0.143	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdF40	Filter	Bq/sample	Zinc-65	0.0143		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Americium-241	0.000092		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-134	2.25	2.44	1.71-3.17	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-137	2.37	2.30	1.61-2.99	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-57	2.04	2.07	1.45-2.69	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-60	-0.0061		False Pos Test	Acceptable

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MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Manganese-54	0.00255		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-238	0.0247	0.0339	0.0237-0.0441	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-239/240	0.0425	0.0460	0.0322-0.0598	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Strontium-90	0.00951		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-234	0.20	0.217	0.152-0.282	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-238	0.216	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2019	05/31/18	MAPEP-19-RdV40	Vegetation	Bq/sample	Zinc-65	1.85	1.71	1.20-2.22	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Actinium-228	3060	3280	2160 - 4130	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Americium-241	346	474	256 - 671	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-212	3200	3400	973 - 5070	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-214	1160	1370	658 - 2040	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-134	6590	9280	6350 - 11100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-137	831	1030	779 - 1300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cobalt-60	4830	5680	4630 - 7260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-212	3360	3380	2360 - 4270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-214	1500	1450	609 - 2280	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Manganese-54	<25.4	<1000	<1000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-238	955	1220	608 - 1850	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-239	579	829	452 - 1190	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Potassium-40	25800	24300	16700 - 29000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Strontium-90	1220	1350	420 - 2100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Thorium-234	1050	1470	555 - 2520	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	1170	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	925	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	925	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	437	1030	565 - 1380	**Not Acceptable**
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	928	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	880	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	2090	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	1910	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	1360	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2780	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2630	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Zinc-65	1300	1460	1170 - 1990	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Americium-241	2090	1680	1040 - 2370	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-134	1590	1640	1090 - 2180	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-137	1510	1410	1080 - 1900	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cobalt-60	1200	1000	785 - 1310	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Curium-244	87.1	87.3	49.2 - 109	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Manganese-54	<35.9	<300	<300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-238	110	76	52.6 - 98.0	**Not Acceptable**

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ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-239	1150	941	650 - 1190	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Potassium-40	41500	34500	25900 - 43700	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Strontium-90	4670	3530	1990 - 4600	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-234	1210	961	675 - 1230	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-238	1230	953	673 - 1190	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-Total	2540	1940	1240 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	µg/kg	Uranium-Total (mass)	3720	2830	2170 - 3500	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Zinc-65	715	527	393 - 781	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Americium-241	18.7	18.7	13.3 - 24.9	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-134	639	721	468 - 884	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-137	627	634	521 - 832	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cobalt-60	103	93.8	79.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Iron-55	613	718	262 - 1150	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Manganese-54	<3.29	<50.0	<50.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-238	31.1	33.8	25.5 - 41.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-239	62	67	50.1 - 80.8	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Strontium-90	169	181	114 - 246	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	17.1	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	16.4	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16.9	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	33.1	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	34.7	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	50.9	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	48	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Zinc-65	1520	1380	1130 - 2110	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Alpha	43	50.3	26.3 - 82.9	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Beta	75.7	78.6	47.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Americium-241	180	168	115 - 215	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-134	116	123	92.9 - 135	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-137	126	125	107 - 142	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cobalt-60	1200	1100	949 - 1260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Iron-55	1310	1320	776 - 1920	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Manganese-54	<5.6	<100	<100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-238	41.2	42.8	25.7 - 55.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-239	117	123	76.1 - 152	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Strontium-90	365	315	227 - 389	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56.3	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	53.7	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	55.3	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51.8	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	107.3	112	87.4 - 128	Acceptable

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ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	113	112	87.4 - 128	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	166	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	153	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Zinc-65	1990	1780	1580 - 2250	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Alpha	79.8	68.5	25.0 - 94.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Beta	140	151	75.5 - 208	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Tritium	22200	23700	17900 - 28800	Acceptable

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TABLE 3

CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR190530-1211 **ISO Documentation of PT Failures in MRAD-30 for:** • **Uranium-238 by 6020 (in soil)** • **Sr-90 (in vegetation)** • **Pu-238 (in vegetation)** • **Uranium-238 (in vegetation)** • **Uranium-Total (in vegetation)**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. Additionally, trending of historical PT samples for these isotope/matrix/methods were conducted. Specific tendencies of failures were not observed. **Uranium-238 by 6020:** Per the method an acid leach is used instead of a more aggressive total dissolution that other methods use. This method is not the laboratory's standard method of choice for the analysis of Uranium-238. **Permanent Corrective/Preventive Actions or Improvements** The laboratory does not use this digestion method for this isotope and therefore will discontinue analyzing and reporting a PT by using this method. **Sr-90:** A reanalysis for Strontium for the Vegetation sample was performed using a larger aliquot. The reanalysis was performed using the same processes as the original reported analysis. The reanalysis result meets the acceptance range with 96% recovery.

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	Permanent Corrective/Preventive Actions or Improvements None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes **Pu-238:** A reanalysis for Plutonium for the Vegetation sample was performed using approximately the same size aliquot. Prior to the analysis, the sample was shaken and stirred vigorously to ensure homogenization. Reanalysis values fell within the acceptability range for all Plutonium isotopes. It is noted that the Pu-238 count rate is low (0.05 cpm) which results in an uncertainty of 32% at the 95% confidence interval, even with a long count time of 1000 minutes. The reported Pu-238 result is 116% of the study mean and the Z score is less than 1. Failure was potentially due to high uncertainty due to low count rates for the Pu-238, as well as a possible homogeneity issue **Permanent Corrective/Preventive Actions or Improvements** None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes **U-238/Total U mass:** A reanalysis for Uranium for the Vegetation sample was performed using approximately the same size aliquot. Prior to the analysis, the sample was shaken and stirred vigorously to ensure homogenization. Reanalysis values fell within the acceptability range for all Uranium isotopes. The original Uranium results were 126% (for U-234) and 129% (for U-238) of the assigned value, yet the Z-scores were both less than 1 and the results were 106% and 108% of the study mean. Additionally, the U-238 value fails, while the Total Uranium value in Activity units (which is simply a calculation) passes, and the Total Uranium in mass units (simply a conversion from the activity results) fails. Failures were potentially due to a possible homogeneity issue. **Permanent Corrective/Preventive Actions or Improvements** None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes.

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To: **Distribution List**

From: **Robert L. Pullano, Director, Quality Systems, GEL Laboratories, LLC**

Date: **October 30, 2019**

Subject: **Environmental Laboratory Quarterly Quality Assurance Report for Environmental Analyses (July through September, 2019)**

Attached is GEL Laboratories, LLC (GEL) third quarter 2019 quality assurance report covering Environmental Analyses. This report includes internal quality assurance comparisons, analytical Performance Test (PT) sample cross check programs in support of client Radiological Environmental Monitoring Programs (REMP) and analysis of additional radionuclides in environmental samples that are typically outside the REMP scope.

A total of 42 individual PT analyses were evaluated during this period. GEL received performance evaluation samples from Eckert & Ziegler Analytics, and ERA's RadChem Proficiency Testing Program.

Please do not hesitate to contact your project manager or me with any additional questions or comments about the report. I can be reached by email bob.pullano@gel.com, or by phone at 843-556-8171 ext. 4429.

Robert L. Pullano
Director, Quality Systems

Attachment

problem solved

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ENVIRONMENTAL LABORATORY QUALITY REPORT
2019 – THIRD QUARTER

In accordance with the U.S. Nuclear Regulatory Commission requirements, GEL Laboratories, LLC (GEL) participates in an Interlaboratory Comparison Program (ICP). This satisfies the requirements of both Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment", February 1979 and Regulatory Guide 4.15, Revision 2, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) - Effluent Streams and the Environment", July, 2007. Both guides indicate the ICP is to be conducted with the U.S. Environmental Protection Agency (EPA) Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program or an equivalent program, and the ICP should include all sample medium/radionuclide combinations that are offered by the EPA and included in the REMP.

Throughout the year, GEL receives performance evaluation samples from the U.S. Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP), ERA's Mixed Rad (MRAD) Proficiency Testing Program, ERA's RadChem Proficiency Testing Program (RAD), and ERA's Quik Response Proficiency Testing Program. Each provider has a documented Quality Assurance (QA) program and the capability to prepare Quality Control (QC) materials traceable to the National Institute of Standards and Technology. The ICP is a third party blind testing program which provides a means to ensure independent checks are performed on the accuracy and precision of the measurements of radioactive materials in environmental sample matrices. The providers supply the crosscheck samples to GEL. Upon receipt, the laboratory performs the analyses in a normal manner. Laboratory results are given to each provider for evaluation.

The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. (EZA) is measured by the ratio of GEL's result to the known value. Accuracy for all other results is based on statistically derived acceptance ranges calculated by the providers. An investigation is undertaken whenever the ratio or reported result falls outside of the acceptance range.

A summary of GEL's results received during third quarter 2019 is provided in Table 2 for the required sample matrix types and isotopic distribution. GEL's results met acceptance criteria for 40 of 42 reported analytes (95.2%). Investigation on the non-acceptable results were initiated as outlined in GEL's standard operating procedures for corrective action. Corrective action CARR 190826-1250 was opened for unacceptable results in RAD-118. A summary of CARR 190826-1250 is provided in Table 3. Additionally, a summary of CARR190603-1212 is provided from last quarter.

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TABLE 1

INTERNAL LABORATORY QUALITY CONTROL RESULT SUMMARY

July through September 2019

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Third Quarter 2019	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	8	0	9	0
Gas Flow Total Strontium	5	0	5	0
Gamma Spec Liquid RAD A-013 with Ba, La	5	0	21	0
SOLID				
Gamma Spec Solid RAD A-013	1	0	1	0
LSC Nickel 63	1	0	1	0
Gas Flow Sr 2nd count	0	0	3	0
Gas Flow Total Strontium	1	0	1	0
Gamma Spec Solid RAD A-013 with Iodine	2	0	10	0
FILTER				
Gross A & B	115	0	85	0
Gamma Spec Filter	8	0	17	0
LIQUID				
Alpha Spec Uranium	0	0	2	0
Tritium	41	0	53	0
LSC Iron-55	3	0	2	0
LSC Nickel 63	3	0	2	0
Gamma Iodine-131	3	0	3	0
Alpha Spec Plutonium	2	0	2	0
Alpha Spec Am241 Curium	2	0	2	0
Gas Flow Total Strontium	3	0	2	0
Gross Alpha Non Vol Beta	5	0	9	0
Gamma Spec Liquid RAD A-013 with Ba, La	11	0	24	0
Gamma Spec Liquid RAD A-013 with Iodine	5	0	21	0
TISSUE				
Gas Flow Sr 2nd count	1	0	1	0
Gas Flow Total Strontium	2	0	1	0
Gamma Spec Solid RAD A-013 with Iodine	3	0	3	0
VEGETATION				

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Gamma Spec Solid RAD A-013	3	0	3	0
Gas Flow Sr 2nd count	5	0	5	0
Gamma Spec Solid RAD A-013 with Iodine	23	0	32	0
AIR CHARCOAL				
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	7	0	7	0
DRINKING WATER				
Tritium	6	0	7	0
LSC Iron-55	3	0	4	0
LSC Nickel 63	3	0	4	0
Gamma Iodine-131	4	0	3	0
Gas Flow Sr 2nd count	2	0	2	0
Gas Flow Total Strontium	3	0	4	0
Gross Alpha Non Vol Beta	10	0	14	0
Gamma Spec Liquid RAD A-013 with Ba, La	4	0	13	0
Gamma Spec Liquid RAD A-013 with Iodine	0	0	1	0

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

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TABLE 2

GEL QUARTERLY INTERLABORATORY COMPARISON

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Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
2nd/2019	07/29/19	E12360	Cartridge	pCi	Iodine-131	8.40E+01	8.17E+01	1.03	Acceptable
2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-89	1.01E+02	8.29E+01	1.22	Acceptable
2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-90	1.21E+01	1.35E+01	0.90	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Cerium-141	1.39E+02	1.33E+02	1.04	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-58	1.17E+02	1.12E+02	1.05	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-60	2.05E+02	1.98E+02	1.04	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Chromium-51	3.41E+02	3.37E+02	1.01	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-134	1.30E+02	1.40E+02	0.93	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-137	1.78E+02	1.68E+02	1.06	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Iron-59	1.66E+02	1.41E+02	1.18	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Iodine-131	8.51E+01	8.14E+01	1.05	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Manganese-54	2.09E+02	1.90E+02	1.10	Acceptable
2nd/2019	07/29/19	E12362	Milk	pCi/L	Zinc-65	2.82E+02	2.47E+02	1.14	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Cerium-141	1.50E+02	1.45E+02	1.03	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-58	1.22E+02	1.22E+02	1.00	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-60	2.22E+02	2.16E+02	1.03	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Chromium-51	3.56E+02	3.68E+02	0.97	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-134	1.37E+02	1.53E+02	0.89	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-137	1.90E+02	1.84E+02	1.03	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Iron-59	1.73E+02	1.54E+02	1.12	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Iodine-131	8.92E+01	8.91E+01	1.00	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Manganese-54	2.27E+02	2.70E+00	1.10	Acceptable
2nd/2019	07/29/19	E12363	Water	pCi/L	Zinc-65	3.01E+02	2.70E+02	1.11	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Barium-133	68.2	66.9	55.8 - 73.6	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Cesium-134	30.4	32	25.1 - 35.2	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Cesium-137	22.7	21.4	17.6 - 26.7	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Cobalt-60	102	95.1	85.6 - 107	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Zinc-65	49.2	41.2	35.3 - 51.4	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Gross Alpha	88.7	70.6	37.1 - 87.1	Not Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Gross Alpha	80.7	70.6	37.1 - 87.1	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Gross Beta	57.7	63.9	44.2 - 70.5	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Radium-226	18.5	18.5	13.8 - 21.1	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Radium-228	7.97	8.16	5.21 - 10.3	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Radium-228	6.72	8.16	5.21 - 10.3	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Uranium (Nat)	67.8	68.3	55.8 - 75.1	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	µg/L	Uranium (Nat) mass	100.73	99.6	81.4 - 110	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Tritium	14700	16700	14600 - 18400	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Tritium	15000	16700	14600 - 18400	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-89	69.4	58.7	47.1 - 66.5	Not Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-89	62.1	58.7	47.1 - 66.5	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-90	34.3	38.5	28.3 - 44.3	Acceptable
3rd / 2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-90	33.4	38.5	28.3 - 44.3	Acceptable

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TABLE 3

CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR190603-12121 **ISO Documentation of PT Failures in MAPEP-19-MaS40:** • Fe-55	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. **Iron-55:** In reviewing the data, it was found that too small of an aliquot was used in the original analysis resulting in a high uncertainty in the result and variance or results between counts. A larger aliquot was used during reanalysis and the result was within the acceptance range and had a lower uncertainty. **Permanent Corrective/Preventive Actions or Improvements** None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes

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CARR190826-1250 **ISO Documentation of PT Failures in RAD-118** • Sr-89 • Gross Alpha	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. **Strontium-89:** A review of the data as well as the preparation processes did not reveal any errors or possible contributors to the high bias. In addition, the reported value is 118% of the reference value which is with the laboratory's standard acceptance criteria of +/- 25% for Laboratory Control Samples. In addition, the Sr-89 was also reported by a method using separation resin and the result was with the acceptance range. The results from the two methods compared with a relative percent difference (RPD) of 11.1% which meets the laboratory's duplicate acceptance criteria. **Gross Alpha:** The analysis data was reviewed and no errors were found. The investigation into the sample preparation did not result in any contributors to the high bias. This analysis was performed by Co-Precipitation. The laboratory also reported the gross alpha analysis by the evaporation method (EPA 900.0) and had an acceptable result. The laboratory's alpha results between the two methods compared with a relative percent difference (RPD) of 9.45% which meets the laboratory's duplicate acceptance criteria. **Permanent Corrective/Preventive Actions or Improvements** The Laboratory has concluded that these positive biases were isolated occurrences and that the overall process is within control. The lab will complete PT studies for these parameters as they become available to verify that these were isolated incidences.

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To: **Distribution List**

From: **Robert L. Pullano, Director, Quality Systems, GEL Laboratories, LLC**

Date: **February 7, 2020**

Subject: **Environmental Laboratory Quarterly Quality Assurance Report for Environmental Analyses (October 1, 2019 – December 31, 2019))**

Attached is GEL Laboratories, LLC (GEL) fourth quarter 2019 quality assurance report covering Environmental Analyses. This report includes internal quality assurance comparisons, analytical Performance Test (PT) sample cross check programs in support of client Radiological Environmental Monitoring Programs (REMP) and analysis of additional radionuclides in environmental samples that are typically outside the REMP scope.

A total of 188 individual PT analyses were evaluated during this period. GEL received performance evaluation samples from Eckert & Ziegler Analytics, U.S. DOE MAPEP, and ERA's MRAD Proficiency Testing Program.

Please do not hesitate to contact your project manager or me with any additional questions or comments about the report. I can be reached by email bob.pullano@gel.com, or by phone at 843-556-8171 ext. 4429.

Robert L. Pullano
Director, Quality Systems

Attachment

problem solved

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ENVIRONMENTAL LABORATORY QUALITY REPORT
2019 – FOURTH QUARTER

In accordance with the U.S. Nuclear Regulatory Commission requirements, GEL Laboratories, LLC (GEL) participates in an Interlaboratory Comparison Program (ICP). This satisfies the requirements of both Regulatory Guide 4.15, Revision 1, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment", February 1979 and Regulatory Guide 4.15, Revision 2, "Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) - Effluent Streams and the Environment", July, 2007. Both guides indicate the ICP is to be conducted with the U.S. Environmental Protection Agency (EPA) Environmental Radioactivity Laboratory Intercomparison Studies (Cross-check) Program or an equivalent program, and the ICP should include all sample medium/radionuclide combinations that are offered by the EPA and included in the REMP.

Throughout the year, GEL receives performance evaluation samples from the U.S. Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP), ERA's Mixed Rad (MRAD) Proficiency Testing Program, ERA's RadChem Proficiency Testing Program (RAD), and ERA's Quik Response Proficiency Testing Program. Each provider has a documented Quality Assurance (QA) program and the capability to prepare Quality Control (QC) materials traceable to the National Institute of Standards and Technology. The ICP is a third party blind testing program which provides a means to ensure independent checks are performed on the accuracy and precision of the measurements of radioactive materials in environmental sample matrices. The providers supply the crosscheck samples to GEL. Upon receipt, the laboratory performs the analyses in a normal manner. Laboratory results are given to each provider for evaluation.

The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. (EZA) is measured by the ratio of GEL's result to the known value. Accuracy for all other results is based on statistically derived acceptance ranges calculated by the providers. An investigation is undertaken whenever the ratio or reported result falls outside of the acceptance range.

A summary of GEL's results received during fourth quarter 2019 is provided in Table 2 for the required sample matrix types and isotopic distribution. GEL's results met acceptance criteria for 186 of 188 reported analytes (98.9%). Investigation on the non-acceptable results were initiated as outlined in GEL's standard operating procedures for corrective action. Corrective action CARR 191212-1262 was opened for unacceptable results in MRAD 31 and CARR 191213-1265 for unacceptable results for MAPEP-41. A summary of CARR 191212-1262 is provided in Table 3. CARR 191213-1265 for Ra-226 in water continues to be investigated and will be summarized in the annual report.

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TABLE 1

INTERNAL LABORATORY QUALITY CONTROL RESULT SUMMARY

October through December 2019

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Fourth Quarter 2019	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	10	0	11	0
Gas Flow Total Strontium	7	0	8	0
Gamma Spec Liquid RAD A-013 with Ba, La	4	0	17	0
SOLID				
Gamma Spec Solid RAD A-013	3	0	5	0
LSC Nickel 63	1	0	1	0
Gas Flow Sr 2nd count	2	0	2	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	13	0
FILTER				
Gross A & B	141	0	96	0
Gamma Spec Filter	12	0	23	0
LIQUID				
Alpha Spec Uranium	1	0	1	0
Tritium	40	0	52	0
LSC Iron-55	3	0	3	0
LSC Nickel 63	3	0	3	0
Gamma Iodine-131	5	0	5	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	1	0	0	0
Alpha Spec Am241 Curium	1	0	1	0
Gas Flow Total Strontium	2	0	2	0
Gross Alpha Non Vol Beta	6	0	15	0
Gamma Spec Liquid RAD A-013 with Ba, La	16	0	40	0
Gamma Spec Liquid RAD A-013 with Iodine	6	0	24	0
TISSUE				
Gas Flow Sr 2nd count	3	0	3	0
Gas Flow Total Strontium	4	0	4	0
Gamma Spec Solid RAD A-013 with Iodine	5	0	5	0
VEGETATION				

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Gamma Spec Solid RAD A-013	4	0	4	0
Gas Flow Sr 2nd count	3	0	3	0
Gamma Spec Solid RAD A-013 with Iodine	18	0	22	0
AIR CHARCOAL				
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	6	0	6	0
DRINKING WATER				
Tritium	5	0	8	0
LSC Iron-55	4	0	4	0
LSC Nickel 63	4	0	4	0
Gamma Iodine-131	8	0	6	0
Gas Flow Sr 2nd count	2	0	3	0
Gas Flow Total Strontium	4	0	4	0
Gross Alpha Non Vol Beta	15	0	16	0
Gamma Spec Liquid RAD A-013 with Ba, La	7	0	14	0
Gamma Spec Liquid RAD A-013 with Iodine	0	0	3	0

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

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TABLE 2

GEL QUARTERLY INTERLABORATORY COMPARISON

October through December 2019

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PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	3rd/2019	11/08/19	E12368	Cartridge	pCi	Iodine-131	9.93E+01	9.33E+01	1.06	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-89	8.71E+01	9.39E+01	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-90	7.02E+00	1.29E+01	0.54	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cerium-141	1.69E+02	1.67E+02	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-58	1.74E+02	1.75E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-60	2.08E+02	2.11E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Chromium-51	3.64E+02	3.31E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-134	1.93E+02	2.07E+02	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-137	1.49E+02	1.51E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iron-59	1.66E+02	1.48E+02	1.12	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iodine-131	9.28E+01	9.21E+01	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Manganese-54	1.69E+02	1.54E+02	1.09	Acceptable
EZA	3rd/2019	11/08/19	E12371	Milk	pCi/L	Zinc-65	3.21E+02	2.93E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cerium-141	1.41E+02	1.27E+02	1.11	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-58	1.36E+02	1.33E+02	1.03	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-60	1.68E+02	1.60E+02	1.036	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Chromium-51	2.45E+02	2.51E+02	0.98	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-134	1.50E+02	1.57E+02	0.96	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-137	1.22E+02	1.14E+02	1.07	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iron-59	1.27E+02	1.12E+02	1.13	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iodine-131	9.34E+01	8.94E+01	1.04	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Manganese-54	1.34E+02	1.17E+02	1.15	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Zinc-65	2.57E+02	2.22E+02	1.16	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Americium-241	86.1	74.7	52.3-97.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-134	896	1020	714-1326	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-137	865	789	552-1026	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-57	0.227		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-60	761	760	532-988	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Iron-55	-48.0		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Manganese-54	816	745	522-969	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Nickel-63	552	629	440-818	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-238	55.3	52.1	36.5-67.7	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-239/240	59.9	61.4	43.0-79.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Potassium-40	604	555	389-722	Acceptable

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MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Strontium-90	609	572	400-744	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Technetium-99	514	593	415-771	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	U-234/233	125	116	81-151	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Uranium-238	122	117	82-152	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Zinc-65	-0.650		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Americium-241	0.511	0.522	0.365-0.679	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-134	0.0266		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-137	19.70	18.4	12.9-23.9	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-57	16.2	15.6	10.9-20.3	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-60	9.01	8.8	6.2-11.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Hydrogen-3	166	175	123-228	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Iron-55	13.80	15.7	11.0-20.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Manganese-54	22.6	20.6	14.4-26.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Nickel-63	9.26	9.7	6.8-12.6	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-238	0.0164	0.0063	Sens. Evaluation	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-239/240	0.701	0.727	0.509-0.945	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Potassium-40	-0.121		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Radium-226	0.481	0.307	0.215-0.399	Not Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Strontium-90	9.34	10.60	7.4-13.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Technetium-99	0.119		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-234/233	1.09	1.07	0.75-1.39	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-238	1.12	1.05	0.74-1.37	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Zinc-65	23.1	20.3	5.27-9.79	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-XaW41	Alk. Water	Bq/L	Iodine-129	1.69	1.78	1.25-2.31	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-235	0.0565	0.0565	0.0396-0.0735	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-238	7.8	7.7	5.4-10.0	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-Total	7.9	7.8	5.5-10.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Americium-241	0.00106		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-134	0.00080		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-137	1.63	1.58	1.11-2.05	Acceptable

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MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-57	1.23	1.16	0.81-1.51	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-60	0.783	0.815	0.571-1.060	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Manganese-54	1.35	1.37	0.96-1.78	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-238	0.0755	0.0761	0.0533-0.0989	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-239/240	0.0485	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Strontium-90	0.442	0.498	0.349-0.647	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-234/233	0.0965	0.093	0.065-0.121	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-238	0.0935	0.096	0.067-0.125	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Zinc-65	1.09	1.06	0.74-1.38	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Americium-241	0.0958	0.090	0.063-0.117	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-134	0.0190		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-137	3.34	3.28	2.30-4.26	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-57	4.50	4.57	3.20-5.94	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-60	5.34	5.30	3.71-6.89	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Manganese-54	4.57	4.49	3.14-5.84	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-238	0.0882	0.081	0.057-0.105	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-239/240	0.00127		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Strontium-90	0.847	1.00	0.70-1.30	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-234/233	0.0656	0.0647	0.0453-0.0841	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-238	0.0660	0.0670	0.0469-0.871	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Zinc-65	2.89	2.85	2.00-3.71	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Actinium-228	3730	3170	2090 - 3990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Americium-241	1740	1920	1040 - 2720	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-212	4130	3280	939 - 4890	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-214	1370	1330	638 - 1980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-134	7600	7650	5230 - 9140	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-137	1350	1230	930 - 1560	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cobalt-60	3840	3710	2920 - 4580	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-212	4300	3350	2340 - 4240	Not Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-214	1740	1450	609 - 2280	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Manganese-54	<26.5	<1000	<1000	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-238	680	546	272 - 830	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-239	1010	1090	594 - 1570	Acceptable

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ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Potassium-40	26200	24700	17000 - 29500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Strontium-90	1660	1910	594 - 2980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Thorium-234	1580	1360	513 - 2330	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1140	1030	483 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1290	1030	483 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1080	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1070	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2290	1930	1070 - 2500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2409	1930	1070 - 2500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3250	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3200	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Zinc-65	3100	2690	2150 - 3670	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Americium-241	2070	2050	1270 - 2900	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-134	1910	2210	1470 - 2940	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-137	2500	2480	1910-3340	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cobalt-60	604	607	476 - 793	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Curium-244	2760	3010	1700 - 3740	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Manganese-54	<35.4	<300	<300	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-238	2120	1920	1330 - 2480	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-239	2860	2600	1800 - 3290	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Potassium-40	41600	39300	29500 - 49800	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Strontium-90	4010	3940	2220 - 5130	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-234	3510	3320	2330 - 4230	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-238	3620	3290	2320 - 4110	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total	7360	6670	4260 - 8990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total (mass)	10900	9730	7470 - 12100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Zinc-65	1860	1620	1210 - 2400	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Americium-241	34.5	32	22.8 - 42.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-134	55.6	59	38.3 - 72.3	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-137	443	437	359 - 573	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cobalt-60	63.7	58.4	49.6 - 74.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Iron-55	150	151	55.1 - 241	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Manganese-54	<1.96	<50.0	<50.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-238	23.8	21	15.9 - 25.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-239	19.9	19	14.2 - 22.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Strontium-90	34.8	34.5	21.8 - 47.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	27.1	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	30.4	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	28.4	27.3	20.6 - 32.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	25.2	27.3	20.6 - 32.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	57.3	56.1	41.0 - 66.5	Acceptable

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ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	55.6	56.1	41.0 - 66.5	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	85.4	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	75.6	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Zinc-65	412	364	298 - 556	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Alpha	71	59	30.8 - 97.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Beta	54.7	57.6	34.9 - 87.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Americium-241	67.6	64.2	44.1 - 82.1	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-134	1820	1960	1480 - 2160	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-137	1820	1840	1580 - 2090	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cobalt-60	1970	1870	1610 - 2150	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Iron-55	1410	1460	858 - 2120	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Manganese-54	<7.24	<100	<100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-238	41.2	47.8	28.7 - 61.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-239	36.9	46.8	29.0 - 57.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Strontium-90	508	481	346 - 595	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	135	139	106 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	138	139	106 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	141	137	106 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	118	137	106 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	285	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	261.3	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	424	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	353	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Zinc-65	1490	1370	1220 - 1730	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Alpha	147	124	45.3 - 171	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Beta	72.9	68	34.0 - 93.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Tritium	20900	22300	16800 - 27100	Acceptable
EZA	4th/2019	02/05/20	E12372	Cartridge	pCi	Iodine-131	9.07E+01	8.88E+01	1.02	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-89	6.60E+01	8.06E+01	0.82	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-90	1.11E+01	1.10E+01	1.00	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cerium-141	7.95E+01	8.30E+01	0.96	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-58	8.93E+01	8.99E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-60	1.17E+02	1.15E+02	1.02	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Chromium-51	2.67E+02	2.41E+02	1.11	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-134	9.79E+01	1.13E+02	0.87	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-137	1.01E+02	1.02E+02	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iron-59	1.01E+02	8.71E+01	1.16	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iodine-131	9.34E+01	9.45E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Manganese-54	1.34E+02	1.30E+02	1.03	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Zinc-65	1.17E+02	1.59E+02	1.08	Acceptable

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EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cerium-141	8.92E+01	8.41E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-58	9.54E+01	9.11E+01	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-60	1.22E+02	1.17E+02	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Chromium-51	2.64E+02	2.44E+02	1.08	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-134	1.06E+02	1.14E+02	0.93	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-137	1.09E+02	1.03E+02	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iron-59	9.32E+01	8.82E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iodine-131	1.04E+02	9.45E+01	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Manganese-54	1.44E+02	1.31E+02	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Zinc-65	1.91E+02	1.61E+02	1.19	Acceptable

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TABLE 3

CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR191212-1262 **ISO Documentation of PT Failures in MRAD-31** • **Pb-212**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. **Lead-212:** The data was reviewed and no anomalies noted. The Duplicate result of the original analysis met the acceptance criteria of the study and replication criteria of the laboratory. Laboratory processes were evaluated and no errors were found. The other reported analytes for the method were within the limits of the study. A definitive contributor to the slightly high bias could not be identified concluding that this was an isolated occurrence. **Permanent Corrective/Preventive Actions or Improvements** None at this time. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes

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PSEG
Nuclear LLC

August 29, 2019
NOD-19-018

GEL Laboratories
Mr. Robert Pullano,
Director, Quality Systems
2040 Savage Road
Charleston, SC 29407

Dear Mr. Pullano:

PSEG NUCLEAR, LLC NUPIC SUPPLIER AUDIT NUMBER: 24747 (NOV2019-069)

Attached is the audit report of the activities observed August 12th through August 14th at the GEL Lab facility located at 2040 Savage Road, Charleston, SC. The purpose of the audit was to evaluate the effectiveness and verify the implementation of GEL Labs Quality Assurance Program pertaining to the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis. The applicable sections of Revision 1 of the Nuclear Utilities Procurement Issues Committee (NUPIC) Radiological Checklist were utilized during this audit.

The audit team did not identify any Findings or Deficiencies that had any impact on the quality of products or services provided to the industry and this Radiological Audit is being issued as Closed.

As a result of this audit, the audit team finds that GEL Laboratories is effectively implementing their Quality Assurance Program, and GEL Labs remains on the PSEG Nuclear, LLC Approved Suppliers List.

The results of this audit will be made available to all NUPIC members. It is the responsibility of each member utility to determine the acceptability of the audit report relative to the requirements of their own Quality Assurance Program.

The audit team thanks you for the courtesy and cooperation extended to the team in support of the audit. If you have any questions regarding the audit, please contact Roger Mills at 856-339-5451.

Sincerely,

Roger Mills
Audit Team Lead
PSEG Nuclear, LLC

Jeff DeFebo
Nuclear Oversight Audit Manager
PSEG Nuclear, LLC

RM/JD
Attachments
Audit File (NOV2019-069)
4B.102

P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

PSEG
Nuclear LLC

PSEG Nuclear, LLC

Joint Utility Audit Report

of

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
843-766-1178

NUPIC Audit Number: 24747
PSEG Audit Number: NOV2019-069
Audit Dates: August 12 - 14, 2019

Prepared By: _____ **Date:** 8/29/2019

Roger Mills
Audit Team Lead
PSEG Nuclear, LLC

Approved By: _____ **Date:** 8/29/2019

Jeff DeFebo
NOS Audit Manager
PSEG Nuclear, LLC

PSEG NUCLEAR, LLC
Audit No. NOV2019-069

Organization:

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407

Audit Dates:

August 12 through August 14, 2019

Product/Services:

GEL Labs provides Radiation Monitoring Systems including supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis.

Purpose and Scope:

The purpose of this Audit was to evaluate the effectiveness and verify the implementation of the GEL Laboratories Quality Assurance Program for the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis. Revision 1 of the NUPIC Radiological Checklist was utilized during this audit.

The programs and processes were evaluated for compliance with NRC Reg. Guide 4.15, and GEL Labs Quality Assurance Program. Program implementation was evaluated at the Charleston, SC facility.

Applicable Quality Programs:

GEL Laboratories, LLC Quality Assurance Plan, Revision 33.

Executive Summary:

A joint utility audit led by PSEG Nuclear, LLC (PSE) with assistance by Entergy (ENT), Pacific Gas & Electric (PGE), Southern Nuclear (SNC), South Texas Project (STP), Talen Energy (TLN) and a Technical Specialist (PSE), using the NUPIC Radiological Audit Checklist, Revision 1, was conducted on August 12, 2019 through August 14, 2019 (Charleston, SC). The audit was completed using performance-based techniques including conducting interviews with facility personnel, performing observations of radiological activities, and reviewing company documentation. The audit evaluation concluded that GEL Laboratories, LLC Quality Assurance Program was effectively implemented and this Audit is being issued as Closed.

For those utilities considering classifying GEL Labs as a Class 1 Safety Related Supplier, this audit performed a cursory review of a few 10 CFR 50 Appendix B attributes that were not contained in the NUPIC Radiological Checklist that was

implemented during this audit. This cursory review identified gaps to 10 CFR 50 Appendix B criteria, some of which are as follows:

- A lack of a Commercial Grade Dedication Program,
- A lack of 17025 requirements being properly implemented into Purchase Orders,
- Annual Internal Audits of the QA Program being performed by personnel not qualified as Lead Auditors,
- Desk Audits being performed in lieu of Vendor Audits or Surveys.

These gaps to 10 CFR 50 Appendix B were not included in this audit report, since the NUPIC Radiological Checklist was utilized.

- GEL Labs does maintain an A2LA Certification that covers all aspects of their current testing process and PSEG will be dedicating GEL Labs services based on their A2LA Certification.

There were no Findings or Deficiencies issued as a result of this Radiological Audit.

Based on these results, it is recommended that GEL Labs be reclassified to "Survey" and that utilities consider accepting their A2LA Certification in lieu of a Survey for the performance of all testing.

The previous NUPIC audit identified two findings due to deficiencies to effectively implement procedure requirements. Both findings were reviewed to determine corrective action effectiveness. The follow up on the two findings was satisfactory. The two findings are described later in this report.

As a result of this audit, the Technical Specialist concluded that GEL Laboratories, LLC has the necessary controls for the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis, and their program effectiveness was satisfactory.

Program Effectiveness:

Based on the results of this audit, PSEG Nuclear, LLC has concluded that GEL Laboratories, LLC is effectively implementing their Quality Assurance Program consistent with Reg. Guide 4.15, and GEL Labs Quality Assurance Program applicable requirements. As a result, GEL Laboratories, LLC remains on the PSEG Nuclear, LLC Approved Suppliers List.

Corrective Action To Previous Audit Findings:

The previous Audit of GEL Laboratories, Audit number 24229 conducted in October 2016 identified two findings that were closed during the 2016 Audit. The 2016 Audit

included the Appendix B Checklist and the Radiological Audit Checklist. Both Findings were identified during the 10CFR50 Appendix B portion of the audit.

Finding VA16087-01 (GEL CARR 161020-1058):

Purchase Orders issued to two Calibration Service Suppliers did not contain all required quality specifications and the item description was identified as being incorrect. GEL procedure GL-RC-E-002 requires that Purchase Orders must include quality specifications for the service or materials being purchased.

Procurement documents were corrected and appropriate procedures were revised.

During this Audit, corrective actions were found to be effective to prevent recurrence of this issue and should be considered closed.

Finding VA16087-02 (GEL CARR 161020-1058):
A vendor performed calibration services on site without an appropriate Purchase Order being issued and/or approved by GEL QA.

GEL Procedure GL-RC-E-002 requires that purchases made for Type I supplier/vendor goods and services must be approved by the Director of Quality Systems prior to purchase.

The purchase order was in place; however, it was not processes through the electronic purchasing system and did not receive the appropriate review. Procedures were revised to include the requirement that all service purchase orders will use the on-line purchasing system for approval and payment to vendors.

During this Audit, corrective actions were found to be effective to prevent recurrence of this issue and should be considered closed.

Findings:

None

Deficiencies:

None

Recommendations/Observations:

None

Unique Order Entry Requirements:

No unique Order Entry requirements existed previous to this audit and no additional order entry requirements will be imposed as a result of this Audit. The approved point of services is the Charleston, SC facility.

Bulletins, Notices, Industry, and NUPIC Issues:

No Bulletins, Notices, Industry, or NUPIC issues were identified for follow up during the audit of GEL.

NRC Inspection:

No GEL Laboratories, LLC related NRC inspection reports were identified during preparation for this audit.

10 CFR Part 21:

No GEL Laboratories, LLC related 10 CFR Part 21 notifications were identified during preparation or the conduct of this audit.

PBSA and Utility Input:

PBSA input was provided by PSEG Nuclear, LLC Procurement Engineering. Additional PBSA input was received from Detroit Edison, Talen, PSEG, and PG&E prior to this Utility Audit and Incorporated.

Review of Industry Operating Experience (OE):

No vulnerabilities to services provided by GEL Laboratories, LLC were identified through operating experience review during the preparation or conduct of this audit.

Summary and Conclusion:

The audit team identified no Findings and no Deficiencies during the course of the audit. GEL Laboratories, LLC provided numerous documents for review and performed shop/laboratory activities that were observed by the audit team. GEL Laboratories, LLC is effectively implementing their QA Program for the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis and their program effectiveness was satisfactory to meet the requirements of Reg. Guide 4.15 and other applicable documents.

Technical Specialist Report:

A Technical Specialist from PSEG Nuclear – Environmental Engineering, supported this audit. The Technical Specialist provided the following report.

Purpose:

To evaluate the technical adequacy, implementation, and application of GEL Laboratories, LLC Quality Assurance Program, pertaining to the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis. GEL Laboratories, LLC Quality Assurance Program has been constructed to reflect a quality program that meets the requirements of Reg. Guide 4.15 and other applicable programs.

Technical Evaluation:

GEL Laboratories, LLC in Charleston, SC, is the Laboratory for conducting the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis.

Observed Activities:

During the audit of GEL Labs between 8/12/19 and 8/14/2019, several testing operations were observed and are documented below.

Sample Receipt Log in-Process/ Control

A review was conducted of contractually required quality data as reported in three lab reports (Talen 480314, PSEG 484411 and PGE 485085). GEL SOP GL-CS-E-002 requires that the package must follow the specifications listed in the individual contract and/or purchase order if and when they are given. Client POs do not typically specify the specific analyses or required limits to be achieved. The lab technician explained that in these cases the limits in the lab reports are typically GEL limits. The lab technician demonstrated how each client specific requirements (from historical contracts and/or ODCM) are incorporated into Client Setup which is later used in the Lab Information Management System (LIMS) for generating client reports. Once Client Setup is established / verified and samples are logged in, the analyses and required limits are pulled from the Client Setup. Paperwork displaying these analyses and limits are generated and then used in the lab. The Batch Pull Sheets were reviewed (1899980 for Iodine-131and 1901339 for Gross A & B) for the PSEG report and compared them to the Product Information in Client Setup and verified that the client requirements were being met. These actions were in accordance with the established Standard Operating Procedure (SOP) which also addressed the general requirements when deliverable criteria (data package) have not been specified by the contract.

The Calibration Data section of the report for Talen Lab Report 480314 was reviewed. In the Continuing Calibration Data section of the report (Review of Gamma Spectrometer QA results, Daily calibration and background checks) were the detector calibration results with run dates of June 2. A review of sample analysis documentation in the instrument log was found to be satisfactory in accordance with the requirements of GL-RAD-I-001, Standard Operating Procedure for Gamma Spectroscopy System Operation, Rev 21.

Laboratory Controls:

Observations were made of the processing of Tritium Batch 1904800 for SONGS ACRS. While demonstrating the batch processing process, the analyst determined that the tritium count data/recovery was negative and that something went wrong during the analysis. The Excel spreadsheet used did flag the values in red; and per GEL Procedure GL-RAD-D-003, *Data Review, Validation, and Data Package Assembly*, Rev 44, the Group Leader was contacted and the sample was rescheduled and sent back for re-analysis by the Group Leader. I observed in LIMS that the sample was sent back and noted as MS/LCS failed low.

An observation of the sample preparation for work order 485902, Batch 1906546 for Sr, a PCGE sample using SOP GL-RAD-A-004, was conducted. There were no exceptions. There were no samples ready / available for analysis or in progress during this audit.

QC Measures

There were no standards observed with expired expiration dates. Section 7.4.4 of this SOP addresses Expiration Dates for Standards Specifically, gamma standards used repeatedly as Laboratory Control Samples and efficiency verification standards will be given an expiration date equal to five half-lives of the shortest lived nuclides used, typically Co-60 (half-life=5.27 years), or until the control charts indicate a degradation of the standard.

A review of adherence to GL-QS-E-013, *Handling Proficiency Evaluation*, Rev 8 and GL-QS-E-019, *Trending of Proficiency Evaluation (PE) Samples*, Rev 3 was performed and is documented in the following examples.

- A review of the *RadCheM™ Study Report, Issued 02/25/19 for Rad-116*; and *RAD-9116 PE RadChem Proficiency Testing Report*, issued 3/14/19 was performed and there were exceptions in RAD-116 for Sr-89 (75 pCi/L above the acceptance limit of 54.4). As required by GEL Procedure GL-QS-E-002, *Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement*, Rev 11,

this issue was entered into the corrective action process as CARR No 190225-1192, dated 2/25/2019 and was closed 4/2/2019.

- *MRaD-30™ Study Report,* issued 05/21/19, had many "Not Acceptable" values or failures. Similarly, CARR No 1905530 was generated for this issue. However, it was entered as failures for MRAD-29. The specific failures listed for the corrective action were correct and aligned with those needed for MRAD-30. This CARR was closed out on 6/26/19. This issue was discussed with the QA Officer and identified as a typo. The CARR description was updated to indicate that the failures were for MRAD-30.

A review of the Proficiency Testing Plan in GL-QS-E-013, Rev 8, Appendix 1 was performed and the schedule was being adhered to.

Records

All records reviewed were complete. A QA Technician was interviewed and discussed the document retrieveability process IAW GL-QS-008, Rev 14. Specifically discussed was Section 5.2.1.5. A Quality Systems representative maintains a record that shows when record retrieval is requested, who made the request, when the records are provided, and when they are returned to document storage.
At the time of this audit and for this audit period there were no open requests or boxes available for inspection.

Technical Specialist Effectiveness Statement:

The technical specialist concluded that GEL Laboratories, LLC has the necessary controls for the supplying of Testing, General; Environmental Monitoring; REMP Services; and Radiochemical Analysis. GEL Laboratories is implementing their Quality Assurance Plan consistent with Reg. Guide 4.15, GEL Labs Quality Assurance Program, and other applicable programs and their program effectiveness was satisfactory.

Audit Team:

Roger Mills	(PSE) Audit Team Leader
Brian Vickery	(ENT) Audit Team Member
Mike Fussell	(PGE) Audit Team Member
Dennis Segres	(SNC) Audit Team Member
Dave Whiddon	(STP) Audit Team Member
Gerard Machalick	(TLN) Audit Team Member
Helen Gregory	(PSE) Technical Specialist

Persons Contacted During the Audit:

PSEG NUCLEAR, LLC
Audit No. NOV2019-069

NAME/TITLE	PRE-AUDIT MEETING	DURING AUDIT	POST-AUDIT MEETING
J. Westmoreland, Dir., Radiochemistry Labs	X	X	X
R. Pullano, Dir, Quality Systems	X	X	X
A. Fehr, QA Officer	X	X	X
A. Johnson, Document Control Officer	X	X	X
N. Mattern, Lead Auditor/QA Officer	X	X	X
B. Wills, Manager Nuclear Programs	X	X	
K. Cates, Project Manager		X	
D. Grunstra, Contracts/Pricing Manager		X	
G. Ramsay, Group Leader		X	
T. Winters, Group Leader		X	
T. Austin, Radiochemistry Group Leader		X	
T. Kraft, IT Group Leader		X	
A. Carlsten, Programmer II		X	
S. Kozlik, Data Reviewer		X	
S. Moreland, Group Leader		X	
R. Moser, New Product Dev and Support		X	
E. Trent, Project Manager		X	X
S. Gerideau, Analyst		X	
T. Winters, Group Leader Gamma Spec		X	
M. Hilton, Gamma Spectrometry		X	
K. Amweg, Liq. Sc. Technician		X	
N. Lang, Team Lead		X	

PSEG NUCLEAR, LLC
Audit No. NOV2019-069

Checklist Summary by Section:

Supplier QA Manual Name: Quality Assurance Plan	Revision Level: 33	Issue Date: March 2019

Audit Section	Section Description REG. GUIDE 4.15, REV 0 / 1 / 2	Implementation Status	Comments/Findings
1	Contract / Purchase Order Review	S	
2	Organizational Structure and Personnel Responsibilities	S	
3	Qualification of Personnel	S	
4	Operating Procedures and Instructions	S	
5	Records	S	
6	Quality Control in the Radioanalytical Laboratory	S	
7	Data and Computer Software Verification and Validation	S	
8	Assessments and Audits	S	
9	Preventive and Corrective Actions	S	

Implementation Key		
S – Satisfactory	U – Unsatisfactory	N/A – Not Applicable

Ref: **Reg. Guide 4.15, Rev 0, 1 & 2, "Quality Assurance for Radiological Monitoring Programs"**

Attachments:

1. Summary Sheets and NUPIC Radiological Audit Checklist (36 pages)
2. Technical Specialist Orientation and Qualification (4 pages)
3. Completed PBSA Worksheet (1 page)

4B.102

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2019 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

2019 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL

MONITORING PROGRAM (REMP)

Approved By  February 28, 2020

Robert L. Pullano
Director, Quality Systems

Date

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2019 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 2019. 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 2019.
- Inter-laboratory QC results analyzed during 2019 where known values are 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.

- TNI, The NELAC Institute, National Environmental Laboratory Accreditation Program
- DOECAP, 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 (19-RAD-001) was conducted in July and August, 2019. There were no findings or observations and four noteworthy improvements from this assessment.

4. Performance Evaluation Acceptance Criteria for Environmental Sample Analysis

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

5. Performance Evaluation Samples

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

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

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

6. Quality Control Program for Environmental Sample Analysis

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

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

GEL's Laboratory Control Standard (LCS) is an aliquot of reagent water or other blank matrix to which known quantities of the method analytes are added in the laboratory. The LCS is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate and precise measurements. Some methods may refer to these samples as Laboratory Fortified Blanks (LFB). The requirement for recovery is between 75% and 125% for radiological analyses excluding drinking water matrix.

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

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

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

If a sample duplicate is analyzed, it will be reported as Relative Percent Difference (RPD). The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100%

or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

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

7. Summary of Data Results

During 2019, forty-five (45) 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 2019. Of the four hundred twenty-five (425) total results, 97.2% (413 of 425) were found to be acceptable within the PT providers three sigma or other statistical criteria. The list below contains the type of matrix evaluated by GEL.

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

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

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

Eckert & Ziegler Analytics provided samples for eighty-nine (89) 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% within acceptance).

9. Summary of Participation in the MAPEP Monitoring Program

MAPEP Series 40 and 41 were analyzed by the laboratory. Of the one hundred twenty-eight (128) analyses, 98% (126 out of 128) fell within the PT provider's acceptance criteria.

10. Summary of Participation in the ERA MRaD PT Program

The ERA MRad program provided samples (MRAD-30 and MRAD-31) for one hundred sixty-six (166) individual environmental analyses. Of the 166 analyses, 96% (160 out of 166) fell within the PT provider's acceptance criteria.

11. Summary of Participation in the ERA PT Program

The ERA program provided samples (RAD-116, RAD-117, RAD-118, and 9116) for forty-two (42) individual environmental analyses. Of the 42 analyses, 90% (38 out of 42) fell within the PT provider's acceptance criteria.

All corrective actions are summarized in Table 8.

12. Corrective Action Request and Report (CARR)

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

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

Any employee at GEL can identify and report a nonconformance and request that corrective action be taken. Any GEL employee can participate on a corrective action team as requested by the QS team or Group Leaders. The steps for conducting corrective action are detailed in GL-QS-E-002. In the event that correctness or validity of the laboratory's test results in doubt, the laboratory will take corrective action. If investigations show that the results have been impacted, affected clients will be informed of the issue in writing within five (5) calendar days of the discovery.

- CARR190225-1192 documents the unacceptable result of Strontium-89 of ERA Study 116
- CARR190530-1211 documents the unacceptable results of Uranium-238, Uranium-238, Uranium-Mass and Plutonium-238 in vegetation and Uranium-238 in soil of ERA MRAD-30
- CARR 190603-1212 documents the unacceptable result of Iron-55 in soil of MAPEP-40, CARR 190826-1250 documents the unacceptable result of Strontium-89 and Gross Alpha of RAD-118
- CARR 191212-1262 documents the unacceptable result of Lead-212 of MRAD-31
- CARR 191213-1265 documents the unacceptable result of Radium-226 of MAPEP-41

Table 8 provides the status of CARRs for radiological performance testing during 2019. **It has been determined that causes of the unacceptable results did not impact any data reported to our clients.**

13. References

1. GEL Quality Assurance Plan, GL-QS-B-001
2. GEL Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001
3. GEL Standard Operating Procedure for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement, GL-QS-E-002
4. GEL Standard Operating Procedure for AlphaLIMS Documentation of Nonconformance Reporting and Dispositioning and Control of Nonconforming Items, GL-QS-E-004
5. GEL Standard Operating Procedure for Handling Proficiency Evaluation Samples, GL-QS-E-013
6. GEL Standard Operating Procedure for Quality Assurance Measurement Calculations and Processes, GL-QS-E-014
7. 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants
8. ISO/IEC 17025-2017, 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

2019 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

PT Provider	Quarter / Year	Report Closing / Received Date	Sample Number	Sample Media	Units	Analyte	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Barium-133	105	99.5	84.1 - 109	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Cesium-134	48.2	49.1	39.5 - 54.0	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Cesium-137	128	125	112 - 140	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Cobalt-60	104	96.4	86.8 - 108	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Zinc-65	88.1	77.4	69.5 - 93.2	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	22.3	21.8	10.9 - 29.5	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	23.5	21.8	10.9 - 29.5	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Gross Beta	43.8	55.7	38.1 - 62.6	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Radium-226	6.47	7.37	5.55 - 8.72	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	3.99	4.28	2.48 - 5.89	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	4.48	4.28	2.48 - 5.89	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Uranium (Nat)	70	68.2	55.7 - 75.0	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	µg/L	Uranium (Nat) mass	99.3	99.5	81.3 - 109	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Tritium	2160	2110	1740 - 2340	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Tritium	1920	2110	1740 - 2340	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	78.5	66.9	54.4 - 75.0	Not Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	76.5	66.9	54.4 - 75.0	Not Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	40.1	41	30.2 - 47.1	Acceptable
ERA	1st /2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	42.2	41	30.2 - 47.1	Acceptable
ERA	1st /2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	27.4	25.9	21.5 - 30.6	Acceptable
ERA	1st /2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	25.1	25.9	21.5 - 30.6	Acceptable
EZA	1st/2019	05/10/19	E12364	Cartridge	pCi	Iodine-131	7.80E+01	7.54E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cerium-141	1.23E+02	1.17E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-58	1.51E+02	1.43E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-60	3.12E+02	2.99E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Chromium-51	3.04E+02	2.93E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-134	1.53E+02	1.60E+02	0.96	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-137	2.04E+02	1.96E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Manganese-54	1.55E+02	1.43E+02	1.08	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Iron-59	1.78E+02	1.59E+02	1.12	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Zinc-65	2.42E+02	2.20E+02	1.1	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cerium-141	1.20E+02	1.13E+02	1.06	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-134	1.43E+02	1.55E+02	0.92	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-137	2.09E+02	1.91E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Chromium-51	3.55E+02	2.84E+02	1.25	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-58	1.43E+02	1.39E+02	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-60	3.18E+02	2.90E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iodine-131	8.89E+01	9.65E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iron-59	1.76E+02	1.54E+02	1.14	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Manganese-54	1.55E+02	1.39E+02	1.12	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Zinc-65	2.44E+02	2.14E+02	1.14	Acceptable
EZA	2nd/2019	07/29/19	E12360	Cartridge	pCi	Iodine-131	8.40E+01	8.17E+01	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-89	1.01E+02	8.29E+01	1.22	Acceptable

EZA	2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-90	1.21E+01	1.35E+01	0.90	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cerium-141	1.39E+02	1.33E+02	1.04	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-58	1.17E+02	1.12E+02	1.05	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-60	2.05E+02	1.98E+02	1.04	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Chromium-51	3.41E+02	3.37E+02	1.01	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-134	1.30E+02	1.40E+02	0.93	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-137	1.78E+02	1.68E+02	1.06	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Iron-59	1.66E+02	1.41E+02	1.18	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Iodine-131	8.51E+01	8.14E+01	1.05	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Manganese-54	2.09E+02	1.90E+02	1.10	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Zinc-65	2.82E+02	2.47E+02	1.14	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cerium-141	1.50E+02	1.45E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-58	1.22E+02	1.22E+02	1.00	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-60	2.22E+02	2.16E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Chromium-51	3.56E+02	3.68E+02	0.97	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-134	1.37E+02	1.53E+02	0.89	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-137	1.90E+02	1.84E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Iron-59	1.73E+02	1.54E+02	1.12	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Iodine-131	8.92E+01	8.91E+01	1.00	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Manganese-54	2.27E+02	2.70E+00	1.10	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Zinc-65	3.01E+02	2.70E+02	1.11	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrF40	Filter	Bq/sample	Gross alpha	0.540	0.528	0.158-0.898	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrF41	Filter	Bq/sample	Gross beta	0.928	0.948	0.474-1.422	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrW40	Water	Bq/L	Gross alpha	0.619	0.840	0.25-1.43	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrW40	Water	Bq/L	Gross beta	2.390	2.330	1.17-3.50	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Americium-241	52.6	49.9	34.9-64.9	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-134	2.25		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-137	1290.00	1164.0	815-1513	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-57	0.133		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-60	853	855	599-1112	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Iron-55	486	344	241-447	Not Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Manganese-54	1130	1027	719-1335	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Nickel-63	524.00	519	363-675	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-238	75.2	71.0	49.7-92.3	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-239/240	67.3	59.8	41.9-77.7	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Potassium-40	596	585	410-761	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Strontium-90	3.44		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Technetium-99	381	408	286-530	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium 234	54.7	56.0	39-73	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium-238	204	205	144-267	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Zinc-65	751	668	468-868	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Americium-241	0.549	0.582	0.407-0.757	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cesium-134	5.32	5.99	4.19-7.79	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cesium-137	0.0		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cobalt-57	9.840	10	7.0-13.0	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cobalt-60	6.7	6.7	4.7-8.7	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Hydrogen-3	389.00	421	295-547	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Iron-55	0.0173		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Manganese-54	8.60	8.4	5.9-10.9	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Nickel-63	4.62	5.8	4.1-7.5	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Plutonium-238	0.419	0.451	0.316-0.586	Acceptable

MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Plutonium-239/240	0.0158	0.0045	Sens. Eval.	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Potassium-40	-0.156		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Radium-226	0.593	0.672	0.470-0.874	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Strontium-90	5.86	6.350	4.45-8.26	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Technetium-99	3.66	3.3	2.34-4.34	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Uranium-234	0.81	0.8	0.56-1.04	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Uranium-238	0.802	0.81	0.57-1.05	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Zinc-65	-0.0318		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-235	0.0566	0.0640	0.0448-0.0832	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-238	7.76	8.8	6.2-11.4	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-Total	7.72	8.9	6.2-11.6	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Americium-241	0.0284	0.0294	0.0206-0.0382	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-134	0.251	0.216	0.151-0.281	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-137	0.313	0.290	0.203-0.377	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-57	0.424	0.411	0.288-0.534	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-60	0.373	0.34	0.238-0.442	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Manganese-54	0.576	0.547	0.383-0.711	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-238	0.0551	0.0526	0.0368-0.0684	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-239/240	0.0377	0.038	0.0265-0.0493	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Strontium-90	0.616	0.662	0.463-0.861	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-234	0.106	0.106	0.074-0.138	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-238	0.116	0.110	0.077-0.143	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Zinc-65	0.0143		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Americium-241	0.000092		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-134	2.25	2.44	1.71-3.17	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-137	2.37	2.30	1.61-2.99	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-57	2.04	2.07	1.45-2.69	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-60	-0.0061		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Manganese-54	0.00255		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-238	0.0247	0.0339	0.0237-0.0441	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-239/240	0.0425	0.0460	0.0322-0.0598	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Strontium-90	0.00951		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-234	0.20	0.217	0.152-0.282	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-238	0.216	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Zinc-65	1.85	1.71	1.20-2.22	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-XaW40	Water	Bq/L	Iodine-129	0.64	0.62	0.431-0.801	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Actinium-228	3060	3280	2160 - 4130	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Americium-241	346	474	256 - 671	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-212	3200	3400	973 - 5070	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-214	1160	1370	658 - 2040	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-134	6590	9280	6350 - 11100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-137	831	1030	779 - 1300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cobalt-60	4830	5860	4630 - 7260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-212	3360	3380	2360 - 4270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-214	1500	1450	609 - 2280	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Manganese-54	<25.4	<1000	<1000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-238	955	1220	608 - 1850	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-239	579	829	452 - 1190	Acceptable

ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Potassium-40	25800	24300	16700 - 29000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Strontium-90	1220	1350	420 - 2100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Thorium-234	1050	1470	555 - 2520	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	1170	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	926	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	925	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	437	1030	565 - 1380	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	928	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	880	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	2090	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	1910	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	1360	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2780	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2630	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Zinc-65	1300	1460	1170 - 1990	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Americium-241	2090	1680	1040 - 2370	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-134	1590	1640	1090 - 2180	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-137	1510	1410	1080 - 1900	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cobalt-60	1200	1000	785 - 1310	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Curium-244	87.1	87.3	49.2 - 109	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Manganese-54	<35.9	<300	<300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-238	110	76	52.6 - 98.0	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-239	1150	941	650 - 1190	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Potassium-40	41500	34500	25900 - 43700	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Strontium-90	4670	3530	1990 - 4600	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-234	1210	961	675 - 1230	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-238	1230	953	673 - 1190	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-Total	2540	1940	1240 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	µg/kg	Uranium-Total (mass)	3720	2830	2170 - 3600	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Zinc-65	715	527	393 - 781	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Americium-241	18.7	18.7	13.3 - 24.9	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-134	639	721	468 - 884	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-137	627	634	521 - 832	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cobalt-60	103	93.8	79.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Iron-55	613	718	262 - 1150	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Manganese-54	<3.29	<50.0	<50.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-238	31.1	33.8	25.5 - 41.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-239	62	67	50.1 - 80.8	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Strontium-90	169	181	114 - 246	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	17.1	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	16.4	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16.9	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	33.1	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	34.7	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	50.9	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	48	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Zinc-65	1520	1380	1130 - 2110	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Alpha	43	50.3	26.3 - 82.9	Acceptable

ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Beta	75.7	78.6	47.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Americium-241	180	168	115 - 215	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-134	116	123	92.9 - 135	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-137	126	125	107 - 142	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cobalt-60	1200	1100	949 - 1260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Iron-55	1310	1320	776 - 1920	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Manganese-54	<5.6	<100	<100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-238	41.2	42.8	25.7 - 55.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-239	117	123	76.1 - 152	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Strontium-90	365	315	227 - 389	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56.3	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	53.7	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	55.3	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51.8	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	107.3	112	87.4 - 128	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	113	112	87.4 - 128	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	166	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	153	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Zinc-65	1990	1780	1580 - 2250	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Alpha	79.8	68.5	25.0 - 94.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Beta	140	151	75.5 - 208	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Tritium	22200	23700	17900 - 28600	Acceptable
ERA	2nd/2019	05/23/19	RAD-117	Water	pCi/L	Strontium-89	35.9	33.3	24.5-40.1	Acceptable
ERA	2nd/2019	05/24/19	RAD-117	Water	pCi/L	Strontium-89	34.4	33.3	24.5-40.2	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Barium-133	68.2	66.9	55.8 - 73.6	Acceptable
ERA	3rd/2019	3rd/2019	RAD - 118	Water	pCi/L	Cesium-134	30.4	32	25.1 - 35.2	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Cesium-137	22.7	21.4	17.6 - 26.7	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Cobalt-60	102	95.1	85.6 - 107	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Zinc-65	49.2	41.2	35.3 - 51.4	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Gross Alpha	88.7	70.6	37.1 - 87.1	Not Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Gross Alpha	80.7	70.6	37.1 - 87.1	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Gross Beta	57.7	63.9	44.2 - 70.6	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Radium-226	18.5	18.5	13.8 - 21.1	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Radium-228	7.97	8.16	5.21 - 10.3	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Radium-228	6.72	8.16	5.21 - 10.3	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Uranium (Nat)	67.8	68.3	56.8 - 75.1	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	µg/L	Uranium (Nat) mass	100.73	99.6	81.4 - 110	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Tritium	14700	16700	14600 - 18400	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Tritium	15000	16700	14600 - 18400	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-89	69.4	58.7	47.1 - 66.5	Not Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-89	62.1	58.7	47.1 - 66.5	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-90	34.3	38.5	28.3 - 44.3	Acceptable
ERA	3rd/2019	08/26/19	RAD - 118	Water	pCi/L	Strontium-90	33.4	38.5	28.3 - 44.3	Acceptable
EZA	3rd/2019	11/08/19	E12368	Cartridge	pCi	Iodine-131	9.93E+01	9.33E+01	1.06	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-89	8.71E+01	9.39E+01	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-90	7.02E+00	1.29E+01	0.54	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cerium-141	1.69E+02	1.67E+02	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-58	1.74E+02	1.75E+02	0.99	Acceptable

EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-60	2.08E+02	2.11E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Chromium-51	3.64E+02	3.31E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-134	1.93E+02	2.07E+02	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-137	1.49E+02	1.51E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iron-59	1.66E+02	1.48E+02	1.12	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iodine-131	9.28E+01	9.21E+01	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Manganese-54	1.69E+02	1.54E+02	1.09	Acceptable
EZA	3rd/2019	11/08/19	E12371	Milk	pCi/L	Zinc-65	3.21E+02	2.93E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cerium-141	1.41E+02	1.27E+02	1.11	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-58	1.36E+02	1.33E+02	1.03	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-60	1.68E+02	1.60E+02	1.036	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Chromium-51	2.45E+02	2.51E+02	0.98	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-134	1.50E+02	1.57E+02	0.96	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-137	1.22E+02	1.14E+02	1.07	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iron-59	1.27E+02	1.12E+02	1.13	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iodine-131	9.34E+01	8.94E+01	1.04	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Manganese-54	1.34E+02	1.17E+02	1.15	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Zinc-65	2.57E+02	2.22E+02	1.16	Acceptable
EZA	4th/2019	02/05/20	E12372	Cartridge	pCi	Iodine-131	9.07E+01	8.88E+01	1.02	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-89	6.60E+01	8.06E+01	0.82	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-90	1.11E+01	1.10E+01	1.00	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cerium-141	7.95E+01	8.30E+01	0.96	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-58	8.93E+01	8.99E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-60	1.17E+02	1.15E+02	1.02	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Chromium-51	2.67E+02	2.41E+02	1.11	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-134	9.79E+01	1.13E+02	0.87	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-137	1.01E+02	1.02E+02	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iron-59	1.01E+02	8.71E+01	1.16	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iodine-131	9.34E+01	9.45E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Manganese-54	1.34E+02	1.30E+02	1.03	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Zinc-65	1.17E+02	1.59E+02	1.08	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cerium-141	8.92E+01	8.41E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-58	9.54E+01	9.11E+01	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-60	1.22E+02	1.17E+02	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Chromium-51	2.64E+02	2.44E+02	1.08	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-134	1.06E+02	1.14E+02	0.93	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-137	1.09E+02	1.03E+02	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iron-59	9.32E+01	8.82E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iodine-131	1.04E+02	9.45E+01	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Manganese-54	1.44E+02	1.31E+02	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Zinc-65	1.91E+02	1.61E+02	1.19	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Americium-241	86.1	74.7	52.3-97.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-134	896	1020	714-1326	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-137	865	789	552-1026	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-57	0.227		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-60	761	760	532-988	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Iron-55	-48.0		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Manganese-54	816	745	522-969	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Nickel-63	552	629	440-818	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-238	55.3	52.1	36.5-67.7	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-239/240	59.9	61.4	43.0-79.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Potassium-40	604	555	389-722	Acceptable

MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Strontium-90	609	572	400-744	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Technetium-99	514	593	415-771	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	U-234/233	125	116	81-151	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Uranium-238	122	117	82-152	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Zinc-65	-0.650		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Americium-241	0.511	0.522	0.365-0.679	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-134	0.0266		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-137	19.70	18.4	12.9-23.9	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-57	16.2	15.6	10.9-20.3	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-60	9.01	8.8	6.2-11.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Hydrogen-3	166	175	123-228	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Iron-55	13.80	15.7	11.0-20.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Manganese-54	22.6	20.6	14.4-26.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Nickel-63	9.26	9.7	6.8-12.6	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-238	0.0164	0.0063	Sens. Evaluation	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-239/240	0.701	0.727	0.509-0.945	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Potassium-40	-0.121		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Radium-226	0.481	0.307	Not 0.215-0.399	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Strontium-90	9.34	10.60	7.4-13.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Technetium-99	0.119		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-234/233	1.09	1.07	0.75-1.39	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-238	1.12	1.05	0.74-1.37	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Zinc-65	23.1	20.3	5.27-9.79	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-235	0.0565	0.0565	0.0396-0.0735	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-238	7.8	7.7	5.4-10.0	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-Total	7.9	7.8	5.6-10.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Americium-241	0.00106		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-134	0.00080		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-137	1.63	1.58	1.11-2.05	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-57	1.23	1.16	0.81-1.51	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-60	0.783	0.815	0.571-1.060	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Manganese-54	1.35	1.37	0.96-1.78	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-238	0.0755	0.0761	0.0533-0.0989	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-239/240	0.0485	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Strontium-90	0.442	0.498	0.349-0.647	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-234/233	0.0965	0.093	0.065-0.121	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-238	0.0935	0.096	0.067-0.125	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Zinc-65	1.09	1.06	0.74-1.38	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Americium-241	0.0958	0.090	0.063-0.117	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-134	0.0190		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-137	3.34	3.28	2.30-4.26	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-57	4.50	4.57	3.20-5.94	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-60	5.34	5.30	3.71-6.89	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Manganese-54	4.57	4.49	3.14-5.84	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-238	0.0882	0.081	0.057-0.105	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-239/240	0.00127		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Strontium-90	0.847	1.00	0.70-1.30	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-234/233	0.0656	0.0647	0.0453-0.0841	Acceptable

MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-238	0.0660	0.0670	0.0469-0.871	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Zinc-65	2.89	2.85	2.00-3.71	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-XaW41	Alk. Water	Bq/L	Iodine-129	1.69	1.78	1.25-2.31	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Actinium-228	3730	3170	2090 - 3990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Americium-241	1740	1920	1040 - 2720	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-212	4130	3280	939 - 4890	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-214	1370	1330	638 - 1980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-134	7600	7650	5230 - 9140	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-137	1350	1230	930 - 1560	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cobalt-60	3840	3710	2920 - 4580	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-212	4300	3350	2340 - 4240	Not Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-214	1740	1450	609 - 2280	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Manganese-54	<26.5	<1000	<1000	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-238	680	546	272 - 830	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-239	1010	1090	594 - 1570	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Potassium-40	26200	24700	17000 - 29500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Strontium-90	1660	1910	594 - 2980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Thorium-234	1580	1360	513 - 2330	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1140	1030	463 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1290	1030	463 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1080	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1070	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2290	1930	1070 - 2500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2409	1930	1070 - 2500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3250	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3200	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Zinc-65	3100	2690	2150 - 3670	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Americium-241	2070	2050	1270 - 2900	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-134	1910	2210	1470 - 2940	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-137	2500	2480	1910-3340	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cobalt-60	604	607	476 - 793	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Curium-244	2760	3010	1700 - 3740	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Manganese-54	<35.4	<300	<300	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-238	2120	1920	1330 - 2480	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-239	2860	2600	1800 - 3290	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Potassium-40	41600	39300	29500 - 49800	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Strontium-90	4010	3940	2220 - 5130	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-234	3510	3320	2330 - 4230	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-238	3620	3290	2320 - 4110	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total	7360	6670	4260 - 8990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total (mass)	10900	9730	7470 - 12100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Zinc-65	1860	1620	1210 - 2400	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Americium-241	34.5	32	22.8 - 42.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-134	55.6	59	38.3 - 72.3	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-137	443	437	359 - 573	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cobalt-60	63.7	58.4	49.6 - 74.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Iron-55	150	151	55.1 - 241	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Manganese-54	<1.96	<50.0	<50.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-238	23.8	21	15.9 - 25.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-239	19.9	19	14.2 - 22.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Strontium-90	34.8	34.5	21.8 - 47.0	Acceptable

ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	27.1	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	30.4	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	28.4	27.3	20.6 - 32.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	25.2	27.3	20.6 - 32.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	57.3	56.1	41.0 - 66.5	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	55.6	56.1	41.0 - 66.5	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	85.4	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	75.6	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Zinc-65	412	364	298 - 556	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Alpha	71	59	30.8 - 97.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Beta	54.7	57.6	34.9 - 87.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Americium-241	67.6	64.2	44.1 - 82.1	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-134	1820	1960	1480 - 2160	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-137	1820	1840	1580 - 2090	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cobalt-60	1970	1870	1610 - 2150	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Iron-55	1410	1460	858 - 2120	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Manganese-54	<7.24	<100	<100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-238	41.2	47.8	28.7 - 61.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-239	36.9	46.8	29.0 - 57.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Strontium-90	508	481	348 - 595	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	135	139	108 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	138	139	108 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	141	137	108 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	118	137	108 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	285	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	281.3	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	424	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	353	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Zinc-65	1490	1370	1220 - 1730	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Alpha	147	124	45.3 - 171	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Beta	72.9	68	34.0 - 93.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Tritium	20900	22300	16800 - 27100	Acceptable

TABLE 2
2019 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range / Ratio	Evaluation
EZA	2nd/2019	07/29/19	E12360	Cartridge	pCi	Iodine-131	8.40E+01	8.17E+01	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-89	1.01E+02	8.29E+01	1.22	Acceptable
EZA	2nd/2019	07/29/19	E12361	Milk	pCi/L	Strontium-90	1.21E+01	1.35E+01	0.90	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cerium-141	1.39E+02	1.33E+02	1.04	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-58	1.17E+02	1.12E+02	1.05	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cobalt-60	2.05E+02	1.98E+02	1.04	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Chromium-51	3.41E+02	3.37E+02	1.01	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-134	1.30E+02	1.40E+02	0.93	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Cesium-137	1.78E+02	1.68E+02	1.06	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Iron-59	1.66E+02	1.41E+02	1.18	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Iodine-131	8.51E+01	8.14E+01	1.05	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Manganese-54	2.09E+02	1.90E+02	1.10	Acceptable
EZA	2nd/2019	07/29/19	E12362	Milk	pCi/L	Zinc-65	2.82E+02	2.47E+02	1.14	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cerium-141	1.50E+02	1.45E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-58	1.22E+02	1.22E+02	1.00	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cobalt-60	2.22E+02	2.16E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Chromium-51	3.56E+02	3.68E+02	0.97	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-134	1.37E+02	1.53E+02	0.89	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Cesium-137	1.90E+02	1.84E+02	1.03	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Iron-59	1.73E+02	1.54E+02	1.12	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Iodine-131	8.92E+01	8.91E+01	1.00	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Manganese-54	2.27E+02	2.70E+00	1.10	Acceptable
EZA	2nd/2019	07/29/19	E12363	Water	pCi/L	Zinc-65	3.01E+02	2.70E+02	1.11	Acceptable
EZA	1st/2019	05/10/19	E12364	Cartridge	pCi	Iodine-131	7.80E+01	7.54E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cerium-141	1.23E+02	1.17E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-58	1.51E+02	1.43E+02	1.05	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cobalt-60	3.12E+02	2.99E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Chromium-51	3.04E+02	2.93E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-134	1.53E+02	1.60E+02	0.96	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Cesium-137	2.04E+02	1.96E+02	1.04	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Manganese-54	1.55E+02	1.43E+02	1.08	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Iron-59	1.78E+02	1.59E+02	1.12	Acceptable
EZA	1st/2019	05/10/19	E12366A	Milk	pCi/L	Zinc-65	2.42E+02	2.20E+02	1.1	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cerium-141	1.20E+02	1.13E+02	1.06	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-134	1.43E+02	1.55E+02	0.92	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cesium-137	2.09E+02	1.91E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Chromium-51	3.55E+02	2.84E+02	1.25	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-58	1.43E+02	1.39E+02	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Cobalt-60	3.18E+02	2.90E+02	1.10	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iodine-131	8.89E+01	9.65E+01	1.03	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Iron-59	1.76E+02	1.54E+02	1.14	Acceptable
EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Manganese-54	1.56E+02	1.39E+02	1.12	Acceptable

EZA	1st/2019	05/10/19	E12367	Water	pCi/L	Zinc-65	2.44E+02	2.14E+02	1.14	Acceptable
EZA	3rd/2019	11/08/19	E12368	Cartridge	pCi	Iodine-131	9.93E+01	9.33E+01	1.06	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-89	8.71E+01	9.39E+01	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12369	Milk	pCi/L	Strontium-90	7.02E+00	1.29E+01	0.54	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cerium-141	1.69E+02	1.67E+02	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-58	1.74E+02	1.75E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cobalt-60	2.08E+02	2.11E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Chromium-51	3.64E+02	3.31E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-134	1.93E+02	2.07E+02	0.93	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Cesium-137	1.49E+02	1.51E+02	0.99	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iron-59	1.66E+02	1.48E+02	1.12	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Iodine-131	9.28E+01	9.21E+01	1.01	Acceptable
EZA	3rd/2019	11/08/19	E12370	Milk	pCi/L	Manganese-54	1.69E+02	1.54E+02	1.09	Acceptable
EZA	3rd/2019	11/08/19	E12371	Milk	pCi/L	Zinc-65	3.21E+02	2.93E+02	1.1	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cerium-141	1.41E+02	1.27E+02	1.11	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-58	1.36E+02	1.33E+02	1.03	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cobalt-60	1.68E+02	1.60E+02	1.036	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Chromium-51	2.45E+02	2.51E+02	0.98	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-134	1.50E+02	1.57E+02	0.96	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Cesium-137	1.22E+02	1.14E+02	1.07	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iron-59	1.27E+02	1.12E+02	1.13	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Iodine-131	9.34E+01	8.94E+01	1.04	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Manganese-54	1.34E+02	1.17E+02	1.15	Acceptable
EZA	3rd/2019	11/08/19	E12371	Water	pCi/L	Zinc-65	2.57E+02	2.22E+02	1.16	Acceptable
EZA	4th/2019	02/05/20	E12372	Cartridge	pCi	Iodine-131	9.07E+01	8.88E+01	1.02	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-89	6.60E+01	8.06E+01	0.82	Acceptable
EZA	4th/2019	02/05/20	E12373	Milk	pCi/L	Strontium-90	1.11E+01	1.10E+01	1.00	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cerium-141	7.95E+01	8.30E+01	0.96	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-58	8.93E+01	8.99E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cobalt-60	1.17E+02	1.15E+02	1.02	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Chromium-51	2.67E+02	2.41E+02	1.11	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-134	9.79E+01	1.13E+02	0.87	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Cesium-137	1.01E+02	1.02E+02	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iron-59	1.01E+02	8.71E+01	1.16	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Iodine-131	9.34E+01	9.45E+01	0.99	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Manganese-54	1.34E+02	1.30E+02	1.03	Acceptable
EZA	4th/2019	02/05/20	E12374	Milk	pCi/L	Zinc-65	1.17E+02	1.69E+02	1.08	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cerium-141	8.92E+01	8.41E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-58	9.54E+01	9.11E+01	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cobalt-60	1.22E+02	1.17E+02	1.05	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Chromium-51	2.64E+02	2.44E+02	1.08	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-134	1.06E+02	1.14E+02	0.93	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Cesium-137	1.09E+02	1.03E+02	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iron-59	9.32E+01	8.82E+01	1.06	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Iodine-131	1.04E+02	9.45E+01	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Manganese-54	1.44E+02	1.31E+02	1.10	Acceptable
EZA	4th/2019	02/05/20	E12375	Water	pCi/L	Zinc-65	1.91E+02	1.61E+02	1.19	Acceptable

TABLE 3

2019 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known Value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrF40	Filter	Bq/sample	Gross alpha	0.540	0.528	0.158-0.898	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrF41	Filter	Bq/sample	Gross beta	0.928	0.948	0.474-1.422	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrW40	Water	Bq/L	Gross alpha	0.819	0.840	0.25-1.43	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-GrW40	Water	Bq/L	Gross beta	2.390	2.330	1.17-3.50	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Americium-241	52.8	49.9	34.9-64.9	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-134	2.25		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cesium-137	1290.00	1164.0	815-1513	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-57	0.133		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Cobalt-60	853	855	599-1112	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Iron-55	486	344	241-447	Not Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Manganese-54	1130	1027	719-1335	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Nickel-63	524.00	519	363-675	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-238	75.2	71.0	49.7-92.3	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Plutonium-239/240	67.3	59.8	41.9-77.7	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Potassium-40	596	585	410-761	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Strontium-90	3.44		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Technetium-99	381	408	286-530	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium 234	54.7	56.0	39-73	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Uranium-238	204	205	144-267	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaS40	Soil	Bq/Kg	Zinc-65	751	668	468-868	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Americium-241	0.549	0.582	0.407-0.757	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cesium-134	5.32	5.99	4.19-7.79	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cesium-137	0.0		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cobalt-57	9.840	10	7.0-13.0	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Cobalt-60	6.7	6.7	4.7-8.7	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Hydrogen-3	389.00	421	295-547	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Iron-55	0.0173		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Manganese-54	8.80	8.4	5.9-10.9	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Nickel-63	4.62	5.8	4.1-7.5	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Plutonium-238	0.419	0.451	0.316-0.586	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Plutonium-239/240	0.0158	0.0045	Sens. Eval.	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Potassium-40	-0.156		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Radium-226	0.593	0.672	0.470-0.874	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Strontium-90	5.86	6.350	4.45-8.26	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Technetium-99	3.66	3.3	2.34-4.34	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Uranium-234	0.81	0.8	0.56-1.04	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Uranium-238	0.802	0.81	0.57-1.05	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-MaW40	Water	Bq/L	Zinc-65	-0.0318		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-235	0.0566	0.0640	0.0448-0.0832	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-238	7.76	8.8	6.2-11.4	Acceptable

MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	ug/sample	Uranium-Total	7.72	8.9	6.2-11.6	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Americium-241	0.0284	0.0294	0.0206-0.0382	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-134	0.251	0.216	0.151-0.281	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cesium-137	0.313	0.290	0.203-0.377	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-57	0.424	0.411	0.288-0.534	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Cobalt-60	0.373	0.34	0.238-0.442	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Manganese-54	0.576	0.547	0.383-0.711	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-238	0.0551	0.0526	0.0368-0.0684	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Plutonium-239/240	0.0377	0.038	0.0265-0.0493	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Strontium-90	0.616	0.662	0.463-0.861	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-234	0.108	0.106	0.074-0.138	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Uranium-238	0.118	0.110	0.077-0.143	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdF40	Filter	Bq/sample	Zinc-65	0.0143		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Americium-241	0.000092		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-134	2.25	2.44	1.71-3.17	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cesium-137	2.37	2.30	1.61-2.99	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-57	2.04	2.07	1.45-2.69	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Cobalt-60	-0.0061		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Manganese-54	0.00255		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-238	0.0247	0.0339	0.0237-0.0441	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Plutonium-239/240	0.0425	0.0460	0.0322-0.0598	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Strontium-90	0.00951		False Pos Test	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-234	0.20	0.217	0.152-0.282	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Uranium-238	0.216	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-RdV40	Vegetation	Bq/sample	Zinc-65	1.85	1.71	1.20-2.22	Acceptable
MAPEP	2nd/2019	05/31/19	MAPEP-19-XaW40	Water	Bq/L	Iodine-129	0.64	0.62	0.431-0.801	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Americium-241	86.1	74.7	52.3-97.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-134	896	1020	714-1326	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cesium-137	865	789	552-1026	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-57	0.227		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Cobalt-60	761	760	532-988	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Iron-55	-48.0		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Manganese-54	816	745	522-969	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Nickel-63	552	629	440-818	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-238	55.3	52.1	36.5-67.7	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Plutonium-239/240	59.9	61.4	43.0-79.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Potassium-40	604	555	389-722	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Strontium-90	609	572	400-744	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Technetium-99	514	593	415-771	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	U-234/233	125	116	81-151	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Uranium-238	122	117	82-152	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaS41	Soil	Bq/Kg	Zinc-65	-0.650		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Americium-241	0.511	0.522	0.365-0.679	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-134	0.0266		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cesium-137	19.70	18.4	12.9-23.9	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-57	16.2	15.6	10.9-20.3	Acceptable

MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Cobalt-60	9.01	8.8	6.2-11.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Hydrogen-3	166	175	123-228	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Iron-55	13.80	15.7	11.0-20.4	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Manganese-54	22.6	20.6	14.4-26.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Nickel-63	9.26	9.7	6.8-12.6	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-238	0.0164	0.0063	Sens. Evaluation	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Plutonium-239/240	0.701	0.727	0.509-0.945	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Potassium-40	-0.121		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Radium-226	0.461	0.307	0.215-0.399	Not Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Strontium-90	9.34	10.60	7.4-13.8	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Technetium-99	0.119		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-234/233	1.09	1.07	0.75-1.39	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Uranium-238	1.12	1.05	0.74-1.37	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-MaW41	Water	Bq/L	Zinc-65	23.1	20.3	5.27-9.79	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-235	0.0565	0.0565	0.0396-0.0735	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-238	7.8	7.7	5.4-10.0	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	ug/sample	Uranium-Total	7.9	7.8	5.5-10.1	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Americium-241	0.00106		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-134	0.00080		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cesium-137	1.63	1.58	1.11-2.05	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-57	1.23	1.16	0.81-1.51	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Cobalt-60	0.783	0.815	0.571-1.060	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Manganese-54	1.35	1.37	0.96-1.78	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-238	0.0755	0.0761	0.0533-0.0989	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Plutonium-239/240	0.0485	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Strontium-90	0.442	0.498	0.349-0.647	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-234/233	0.0965	0.093	0.065-0.121	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Uranium-238	0.0935	0.096	0.067-0.125	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdF41	Filter	Bq/sample	Zinc-65	1.09	1.06	0.74-1.38	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Americium-241	0.0958	0.090	0.063-0.117	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-134	0.0190		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cesium-137	3.34	3.28	2.30-4.26	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-57	4.50	4.57	3.20-5.94	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Cobalt-60	5.34	5.30	3.71-6.89	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Manganese-54	4.57	4.49	3.14-5.84	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-238	0.0882	0.081	0.057-0.105	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Plutonium-239/240	0.00127		False Pos Test	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Strontium-90	0.847	1.00	0.70-1.30	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-234/233	0.0656	0.0647	0.0453-0.0841	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Uranium-238	0.0680	0.0670	0.0469-0.871	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-RdV41	Vegetation	Bq/sample	Zinc-65	2.89	2.85	2.00-3.71	Acceptable
MAPEP	4th/2019	12/13/19	MAPEP-19-XaW41	Alk. Water	Bq/L	Iodine-129	1.69	1.78	1.25-2.31	Acceptable

TABLE 4

2019 ERA PROGRAM PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range	Evaluation
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Barium-133	105	99.5	84.1 - 109	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Cesium-134	48.2	49.1	39.5 - 54.0	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Cesium-137	128	125	112 - 140	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Cobalt-60	104	96.4	86.8 - 106	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Zinc-65	88.1	77.4	69.5 - 93.2	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	22.3	21.8	10.9 - 29.5	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Gross Alpha	23.5	21.8	10.9 - 29.5	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Gross Beta	43.6	55.7	38.1 - 62.6	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Radium-226	6.47	7.37	5.55 - 8.72	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	3.99	4.28	2.48 - 5.89	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Radium-228	4.48	4.28	2.48 - 5.89	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Uranium (Nat)	70	68.2	55.7 - 75.0	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	µg/L	Uranium (Nat) mass	99.3	99.5	81.3 - 109	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Tritium	2160	2110	1740 - 2340	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Tritium	1920	2110	1740 - 2340	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	78.5	66.9	54.4 - 75.0	Not Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Strontium-89	76.5	66.9	54.4 - 75.0	Not Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	40.1	41	30.2 - 47.1	Acceptable
ERA	2nd/2019	2/25/19	RAD-116	Water	pCi/L	Strontium-90	42.2	41	30.2 - 47.1	Acceptable
ERA	2nd/2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	27.4	25.9	21.5 - 30.6	Acceptable
ERA	2nd/2019	3/14/19	RAD-9116	Water	pCi/L	Iodine-131	25.1	25.9	21.5 - 30.6	Acceptable
ERA	2nd/2019	05/23/19	RAD-117	Water	pCi/L	Strontium-89	35.9	33.3	24.5-40.1	Acceptable
ERA	2nd/2019	05/24/19	RAD-117	Water	pCi/L	Strontium-89	34.4	33.3	24.5-40.2	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Barium-133	68.2	66.9	55.8 - 73.6	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Cesium-134	30.4	32	25.1 - 35.2	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Cesium-137	22.7	21.4	17.6 - 26.7	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Cobalt-60	102	95.1	85.6 - 107	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Zinc-65	49.2	41.2	35.3 - 51.4	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Gross Alpha	88.7	70.6	37.1 - 87.1	Not Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Gross Alpha	80.7	70.6	37.1 - 87.1	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Gross Beta	57.7	63.9	44.2 - 70.5	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Radium-226	18.5	18.5	13.8 - 21.1	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Radium-228	7.97	8.16	5.21 - 10.3	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Radium-228	6.72	8.16	5.21 - 10.3	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Uranium (Nat)	67.8	68.3	55.8 - 75.1	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	µg/L	Uranium (Nat) mass	100.73	99.6	81.4 - 110	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Tritium	14700	16700	14600 - 18400	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Tritium	15000	16700	14600 - 18400	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Strontium-89	69.4	58.7	47.1 - 66.5	Not Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Strontium-89	62.1	58.7	47.1 - 66.5	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Strontium-90	34.3	38.5	28.3 - 44.3	Acceptable
ERA	3rd/2019	08/26/19	RAD-118	Water	pCi/L	Strontium-90	33.4	38.5	28.3 - 44.3	Acceptable

TABLE 5

2019 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known Value	Acceptance Range / Ratio	Evaluation
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Actinium-228	3060	3280	2160 - 4130	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Americium-241	346	474	256 - 671	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-212	3200	3400	973 - 5070	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Bismuth-214	1160	1370	658 - 2040	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-134	6590	9280	6350 - 11100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cesium-137	831	1030	779 - 1300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Cobalt-60	4830	5880	4630 - 7260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-212	3360	3380	2360 - 4270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Lead-214	1500	1450	609 - 2280	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Manganese-54	<25.4	<1000	<1000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-238	955	1220	608 - 1850	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Plutonium-239	579	829	452 - 1190	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Potassium-40	25800	24300	16700 - 29000	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Strontium-90	1220	1350	420 - 2100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Thorium-234	1050	1470	555 - 2520	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	1170	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	925	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-234	925	1050	492 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	437	1030	565 - 1380	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	928	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-238	880	1030	565 - 1380	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	2090	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Uranium-Total	1910	2030	1130 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	1360	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2780	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	µg/kg	Uranium-Total (mass)	2630	2420	1090 - 3270	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Soil	pCi/kg	Zinc-65	1300	1460	1170 - 1990	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Americium-241	2090	1680	1040 - 2370	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-134	1590	1640	1090 - 2180	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cesium-137	1510	1410	1080 - 1900	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Cobalt-60	1200	1000	785 - 1310	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Curium-244	87.1	87.3	49.2 - 109	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Manganese-54	<35.9	<300	<300	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-238	110	76	52.6 - 98.0	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Plutonium-239	1150	941	650 - 1190	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Potassium-40	41500	34500	25900 - 43700	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Strontium-90	4670	3530	1990 - 4600	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-234	1210	961	675 - 1230	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-238	1230	953	673 - 1190	Not Acceptable

ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Uranium-Total	2540	1940	1240 - 2620	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	µg/kg	Uranium-Total (mass)	3720	2830	2170 - 3500	Not Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Vegetation	pCi/kg	Zinc-65	715	527	393 - 781	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Americium-241	18.7	18.7	13.3 - 24.9	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-134	639	721	468 - 884	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cesium-137	627	634	521 - 832	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Cobalt-60	103	93.8	79.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Iron-55	613	718	262 - 1150	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Manganese-54	<3.29	<50.0	<50.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-238	31.1	33.8	25.5 - 41.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Plutonium-239	62	67	50.1 - 80.8	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Strontium-90	169	181	114 - 246	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	17.1	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-234	16.4	18.2	13.5 - 21.3	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16.9	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-238	16	18.1	13.7 - 21.6	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	33.1	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Uranium-Total	34.7	37.1	27.1 - 44.0	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	50.9	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	µg/Filter	Uranium-Total (mass)	48	54.1	43.4 - 63.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Zinc-65	1520	1380	1130 - 2110	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Alpha	43	50.3	28.3 - 82.9	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Filter	pCi/Filter	Gross Beta	75.7	78.6	47.7 - 119	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Americium-241	180	168	115 - 215	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-134	116	123	92.9 - 135	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cesium-137	126	125	107 - 142	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Cobalt-60	1200	1100	949 - 1260	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Iron-55	1310	1320	776 - 1920	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Manganese-54	<5.6	<100	<100	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-238	41.2	42.8	25.7 - 55.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Plutonium-239	117	123	76.1 - 152	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Strontium-90	365	315	227 - 389	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56.3	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	53.7	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-234	56	55.2	42.0 - 63.1	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	55.3	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51.8	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-238	51	54.7	42.4 - 64.4	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	107.3	112	87.4 - 128	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Uranium-Total	113	112	87.4 - 128	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	166	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	µg/L	Uranium-Total (mass)	153	163	132 - 185	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Zinc-65	1990	1780	1580 - 2250	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Alpha	79.8	68.5	25.0 - 94.5	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Gross Beta	140	151	75.5 - 208	Acceptable
ERA	2nd/2019	05/21/19	MRAD-30	Water	pCi/L	Tritium	22200	23700	17900 - 28800	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Actinium-228	3730	3170	2090 - 3990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Americium-241	1740	1920	1040 - 2720	Acceptable

ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-212	4130	3280	939 - 4890	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Bismuth-214	1370	1330	636 - 1980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-134	7600	7650	5230 - 9140	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cesium-137	1350	1230	930 - 1560	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Cobalt-60	3840	3710	2920 - 4580	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-212	4300	3350	2340 - 4240	Not Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Lead-214	1740	1450	609 - 2280	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Manganese-54	<26.5	<1000	<1000	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-238	680	546	272 - 830	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Plutonium-239	1010	1090	594 - 1570	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Potassium-40	26200	24700	17000 - 29500	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Strontium-90	1660	1910	594 - 2980	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Thorium-234	1580	1360	513 - 2330	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1140	1030	483 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-234	1290	1030	483 - 1350	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1080	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-238	1070	974	534 - 1310	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2290	1930	1070 - 2600	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	pCi/kg	Uranium-Total	2409	1930	1070 - 2600	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3250	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Uranium-Total (mass)	3200	2410	1090 - 3250	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Soil	µg/kg	Zinc-65	3100	2690	2150 - 3670	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Americium-241	2070	2050	1270 - 2900	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-134	1910	2210	1470 - 2940	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cesium-137	2500	2480	1910-3340	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Cobalt-60	604	607	476 - 793	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Curium-244	2760	3010	1700 - 3740	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Manganese-54	<35.4	<300	<300	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-238	2120	1920	1330 - 2480	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Plutonium-239	2660	2600	1800 - 3290	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Potassium-40	41600	39300	29500 - 49800	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Strontium-90	4010	3940	2220 - 5130	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-234	3510	3320	2330 - 4230	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-238	3620	3290	2320 - 4110	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total	7360	6670	4260 - 8990	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Uranium-Total (mass)	10900	9730	7470 - 12100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Vegetation	pCi/kg	Zinc-65	1860	1620	1210 - 2400	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Americium-241	34.5	32	22.8 - 42.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-134	55.6	59	38.3 - 72.3	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cesium-137	443	437	359 - 573	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Cobalt-60	63.7	58.4	49.6 - 74.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Iron-55	150	151	55.1 - 241	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Manganese-54	<1.96	<50.0	<50.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-238	23.8	21	15.9 - 25.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Plutonium-239	19.9	19	14.2 - 22.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Strontium-90	34.8	34.5	21.8 - 47.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	27.1	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-234	30.4	27.5	20.4 - 32.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	28.4	27.3	20.6 - 32.6	Acceptable

ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-238	25.2	27.3	20.6 - 32.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	57.3	56.1	41.0 - 66.5	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Uranium-Total	55.6	56.1	41.0 - 66.5	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	85.4	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	µg/Filter	Uranium-Total (mass)	75.6	81.8	65.6 - 95.8	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Zinc-65	412	364	298 - 556	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Alpha	71	59	30.8 - 97.2	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Filter	pCi/Filter	Gross Beta	54.7	57.6	34.9 - 87.0	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Americium-241	67.6	64.2	44.1 - 82.1	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-134	1820	1960	1480 - 2160	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cesium-137	1820	1840	1580 - 2090	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Cobalt-60	1970	1870	1610 - 2150	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Iron-55	1410	1460	858 - 2120	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Manganese-54	<7.24	<100	<100	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-238	41.2	47.8	28.7 - 61.9	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Plutonium-239	36.9	46.8	29.0 - 57.7	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Strontium-90	508	481	346 - 595	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	135	139	106 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-234	138	139	106 - 159	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	141	137	106 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-238	118	137	106 - 161	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	285	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Uranium-Total	261.3	282	220 - 321	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	424	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	µg/L	Uranium-Total (mass)	353	411	333 - 466	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Zinc-65	1490	1370	1220 - 1730	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Alpha	147	124	45.3 - 171	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Gross Beta	72.9	68	34.0 - 93.6	Acceptable
ERA	4th/2019	11/19/19	MRAD-31	Water	pCi/L	Tritium	20900	22300	16800 - 27100	Acceptable

FIGURE 1

COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

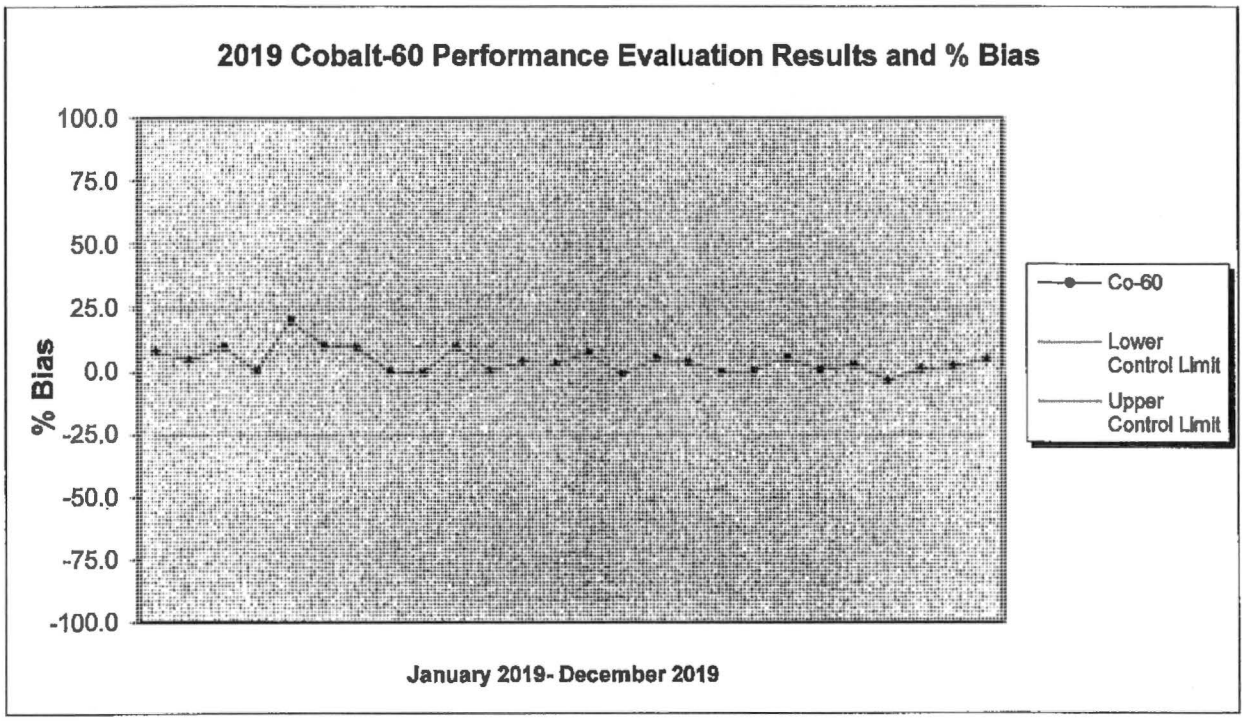

FIGURE 2

CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

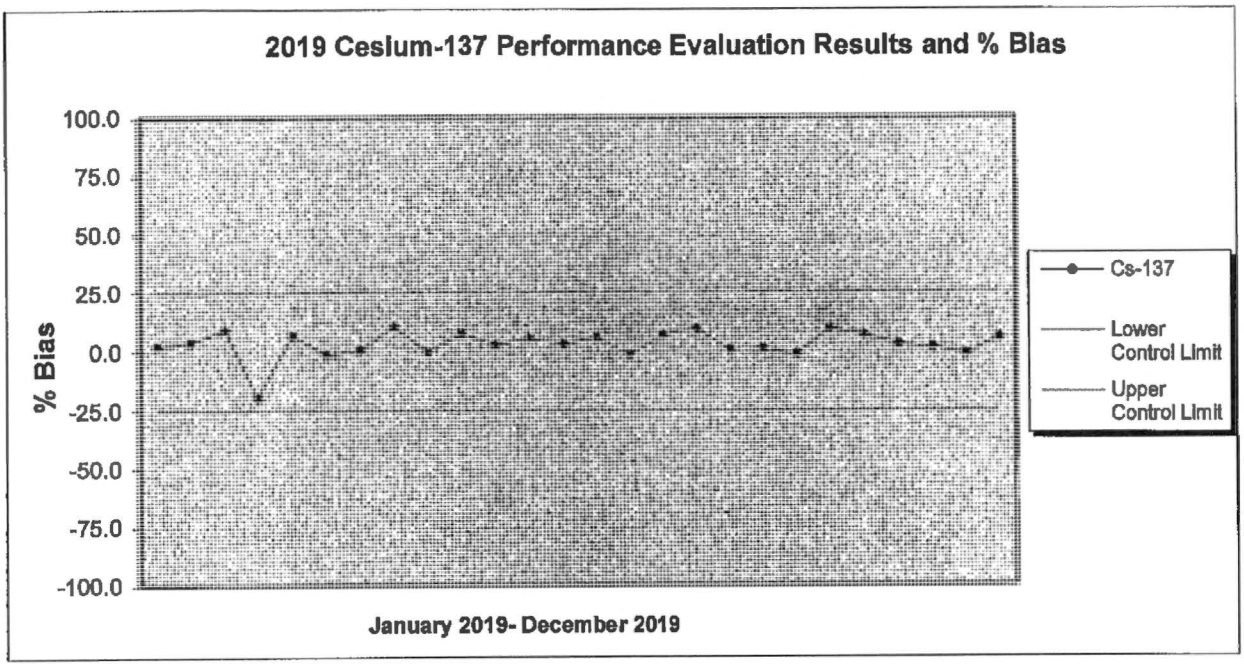

FIGURE 3

TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

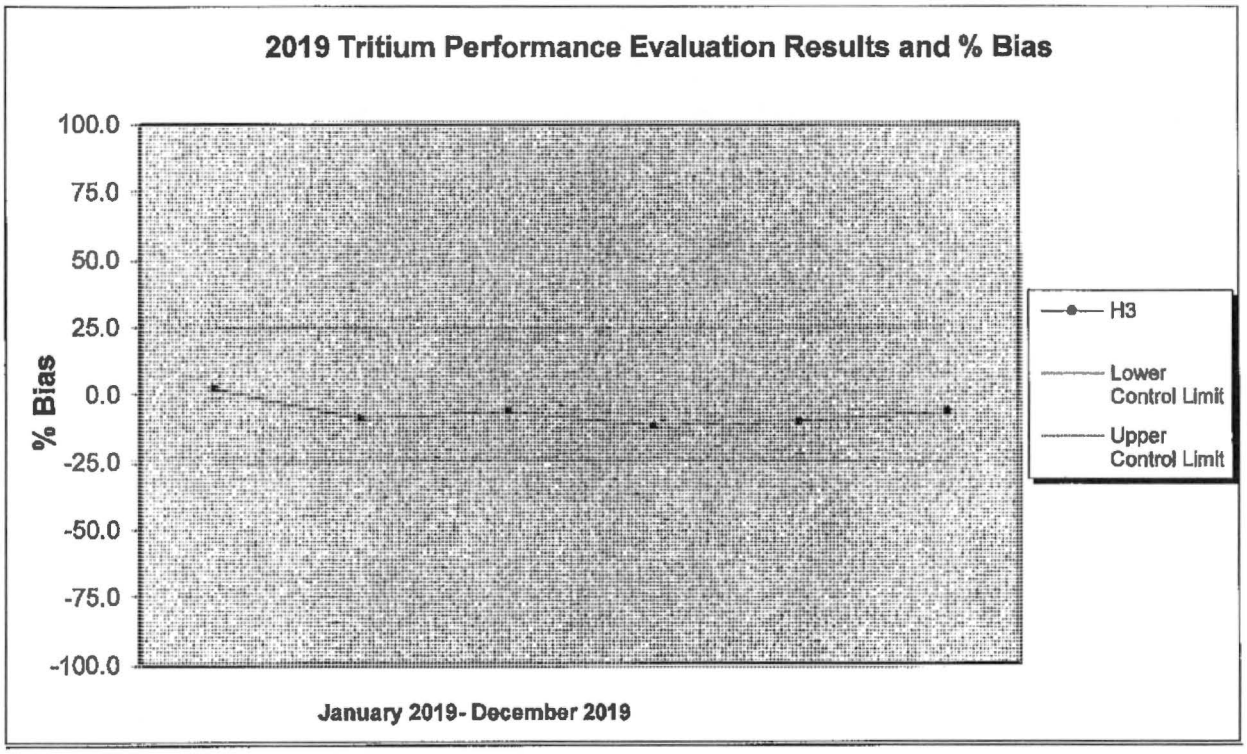

FIGURE 4

STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

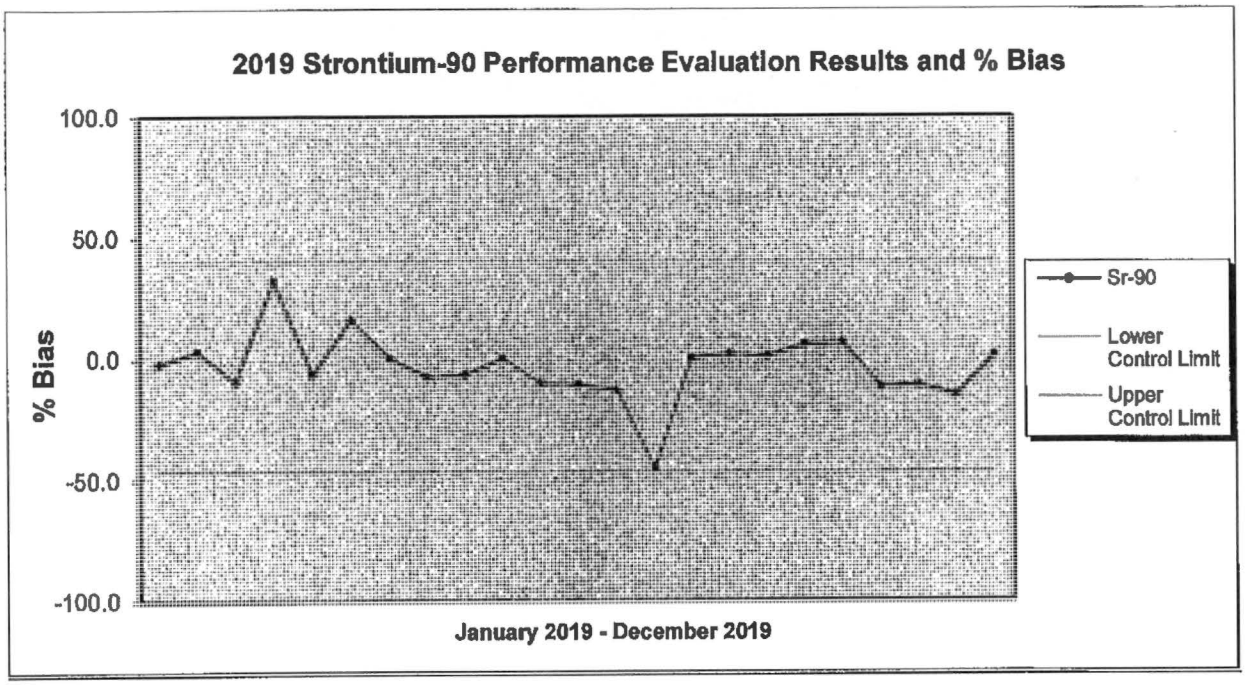

FIGURE 5

GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

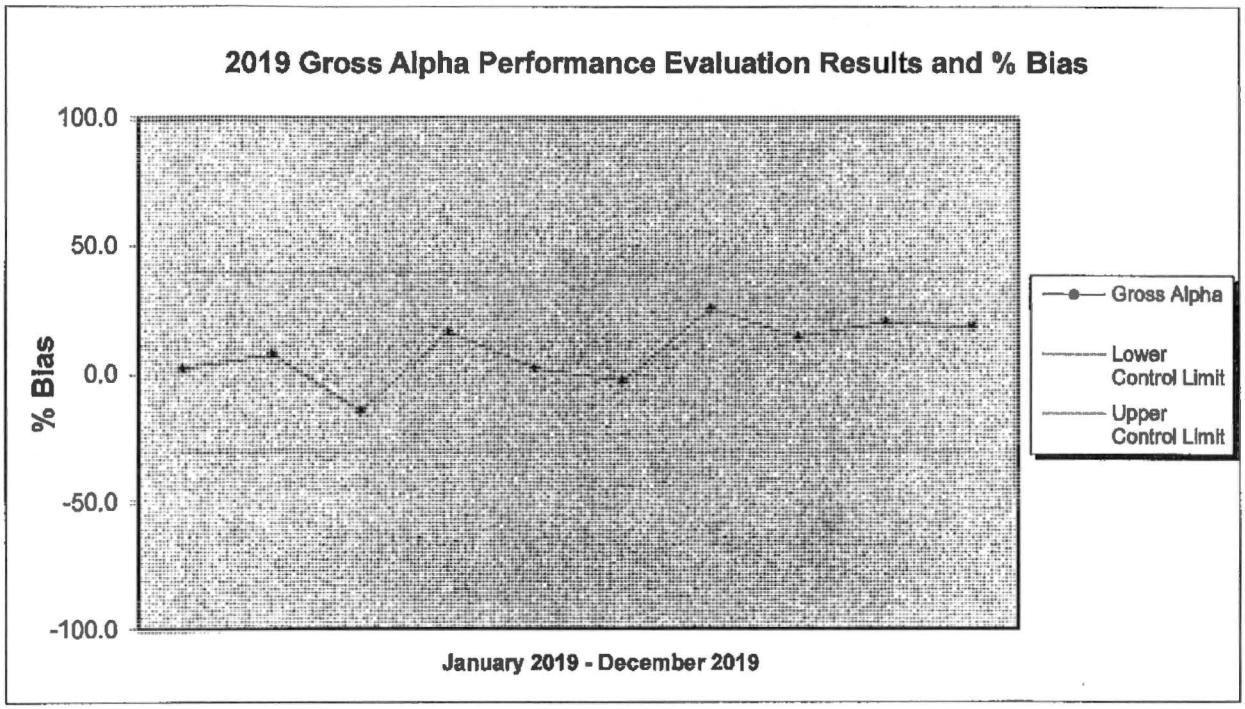

FIGURE 6

GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

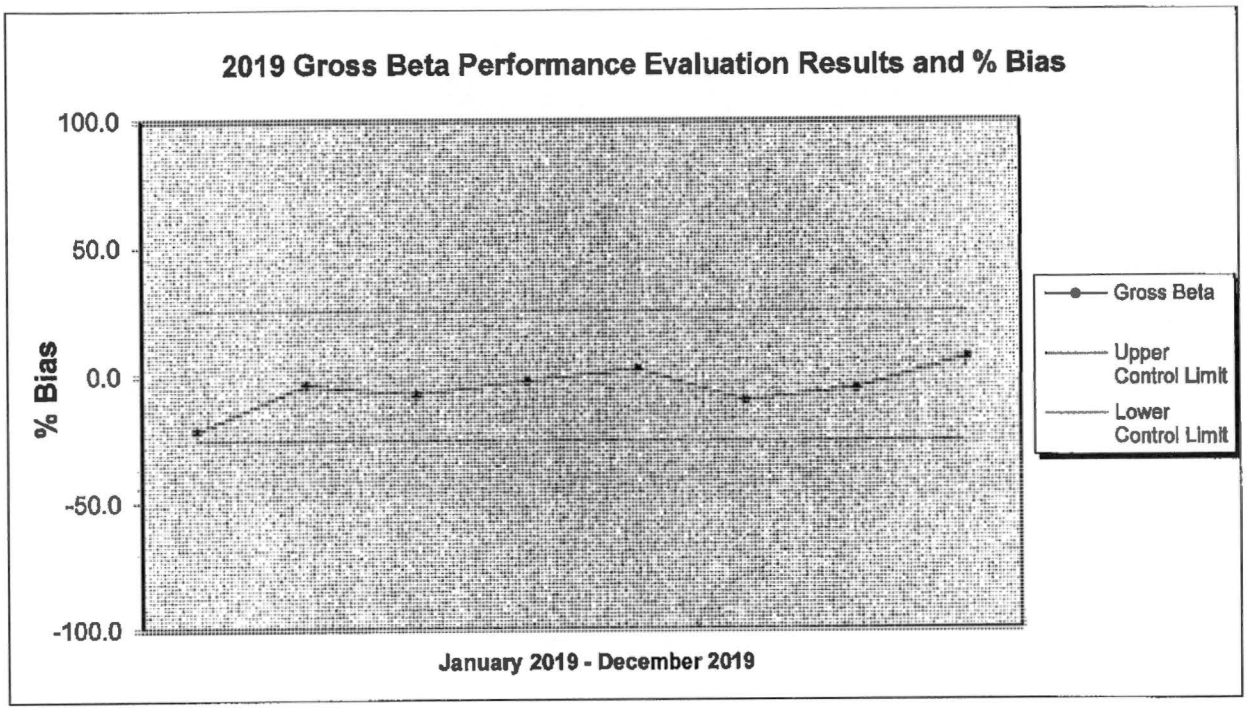

FIGURE 7

IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

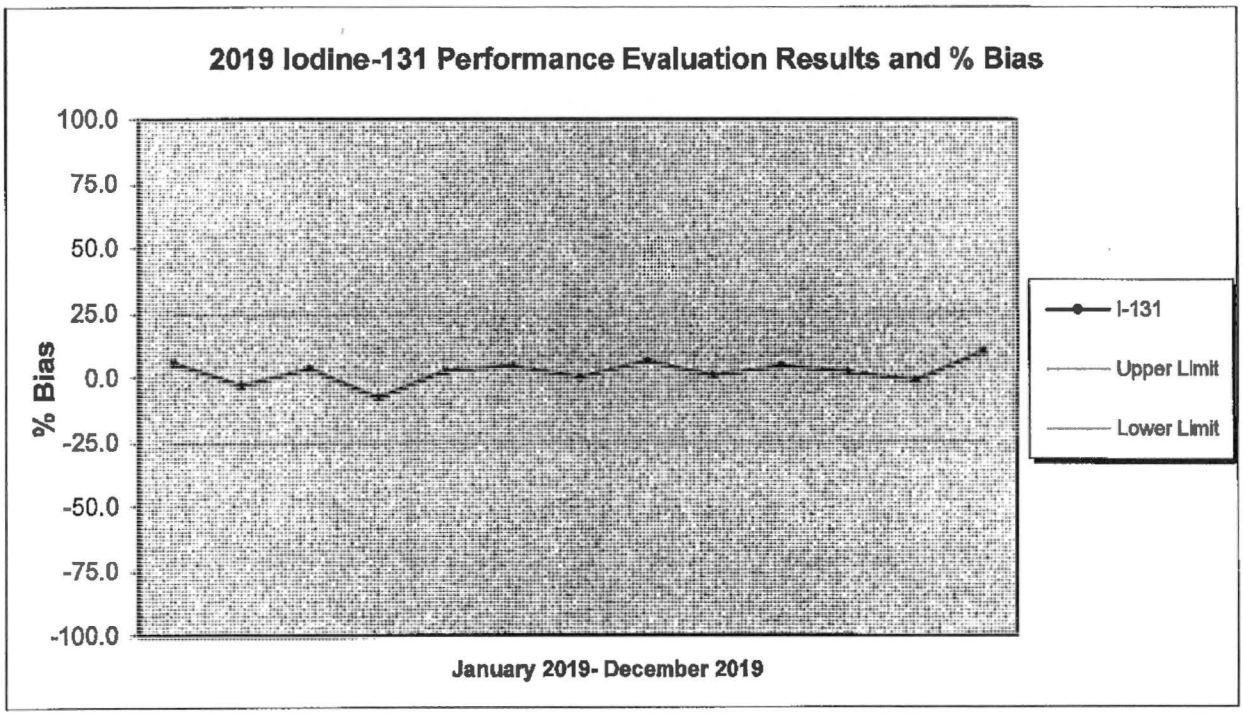

FIGURE 8

AMERICIUM-241 PERFORMANCE EVALUATION RESULTS AND % BIAS

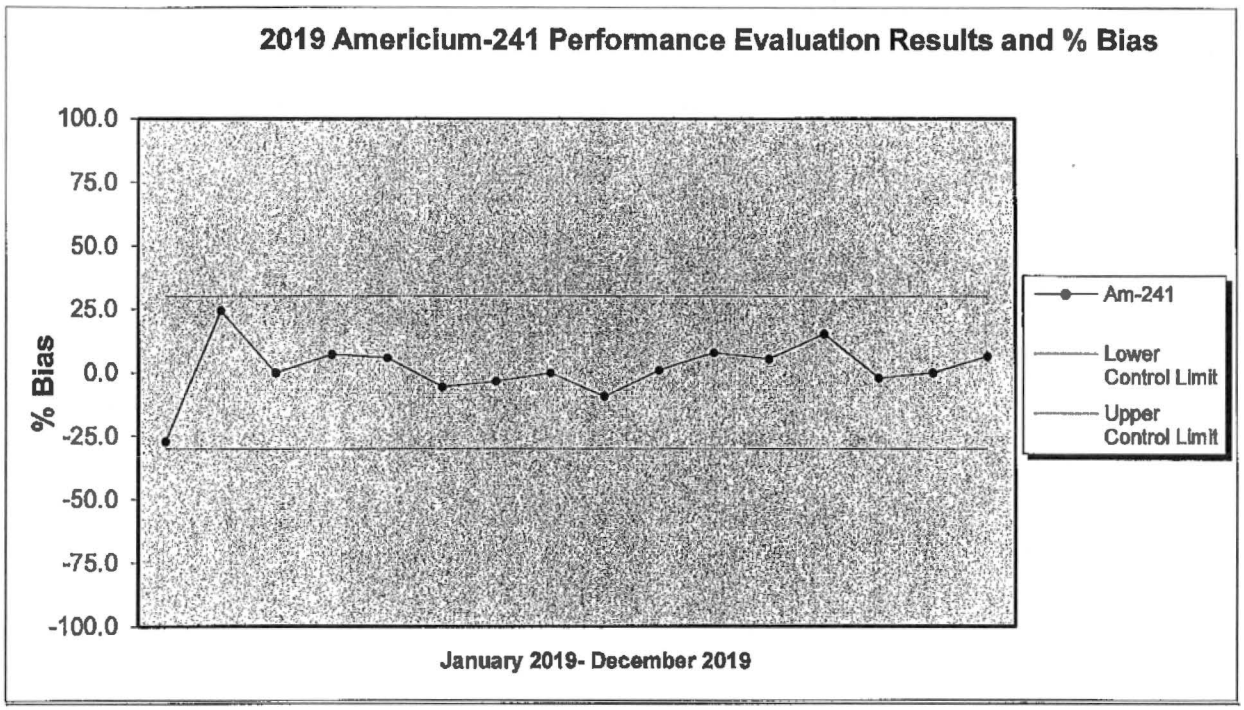

FIGURE 9

PLUTONIUM-238 PERFORMANCE EVALUATION RESULTS AND % BIAS

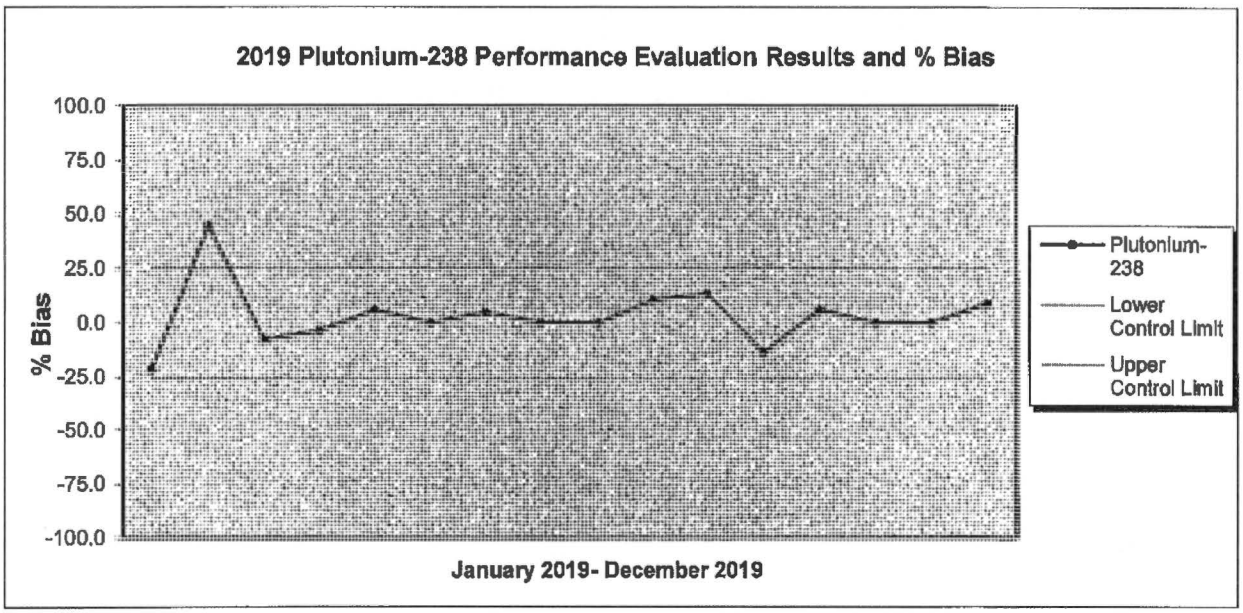

TABLE 6

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

2019 Total All REMP Intra-Laboratory Data	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	34	0	39	0
Gas Flow Total Strontium	20	0	21	0
Gamma Spec Liquid RAD A-013 with Ba, La	21	0	71	0
SOLID				
Gamma Spec Solid RAD A-013	9	0	13	0
LSC Nickel 63	5	0	5	0
Gas Flow Sr 2nd count	4	0	7	0
Gas Flow Total Strontium	4	0	4	0
Gamma Spec Solid RAD A-013 with Iodine	16	0	37	0
FILTER				
Gas Flow Sr 2nd Count	5	0	5	0
Gross A & B	462	0	333	0
Gas Flow Sr-90	1	0	1	0
Gamma Spec Filter	34	0	76	0
LIQUID				
Alpha Spec Uranium	7	0	10	0
Tritium	169	0	225	0
LSC Iron-55	17	0	15	0
LSC Nickel 63	18	0	16	0
Gamma Iodine-131	19	0	19	0
Alpha Spec Plutonium	9	0	9	0
Gas Flow Sr 2nd count	6	0	5	0
Alpha Spec Am241 Curium	9	0	9	0
Gas Flow Total Strontium	11	0	9	0
Gross Alpha Non Vol Beta	28	0	55	0
Gamma Spec Liquid RAD A-013 with Ba, La	51	0	116	0
Gamma Spec Liquid RAD A-013 with Iodine	25	0	98	0
TISSUE				
Gamma Spec Solid RAD A-013	31	0	37	0
Gas Flow Sr 2nd count	7	0	7	0
Gas Flow Total Strontium	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	13	0	14	0
VEGETATION				
Gamma Spec Solid RAD A-013	14	0	13	0
Gas Flow Sr 2nd count	8	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	63	0	79	0
AIR CHARCOAL				
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	25	0	25	0
DRINKING WATER				
Tritium	20	0	24	0
LSC Iron-55	14	0	16	0
LSC Nickel 63	14	0	16	0
Gamma Iodine-131	24	0	16	0

Gas Flow Sr 2nd count	10	0	11	0
Gas Flow Total Strontium	13	0	15	0
Gross Alpha Non Vol Beta	52	0	61	0
Gamma Spec Liquid RAD A-013 with Ba, La	21	0	53	0
Gamma Spec Liquid RAD A-013 with Iodine	0	0	6	0
Total	**1323**		**1609**	

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:

2019 Total All Intra-Laboratory Data	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gamma Spec Liquid RAD A-013	4	0	5	0
Gamma Iodine-129	4	0	4	0
Gamma Iodine-131	5	0	93	0
Gas Flow Sr 2nd count	34	0	39	0
Gas Flow Strontium 90	6	0	7	0
Gas Flow Total Strontium	20	0	21	0
Gamma Spec Liquid RAD A-013 with Ba, La	21	0	71	0
Gamma Spec Liquid RAD A-013 with Iodine	4	0	4	0
SOLID				
Gamma Percent Leach	2	0	0	0
Gas Flow Radium 228	72	0	76	0
Tritium	315	0	367	0
Tritium by Pyrolysis	2	0	3	0
Carbon-14	229	0	261	0
Carbon-14 by Pyrolysis	3	0	3	0
LSC Iron-55	132	0	145	0
Alpha Spec Polonium Solid	66	0	83	0
Gamma Nickel 59 RAD A-022	116	0	127	0
LSC Chlorine-36 in Solids	1	0	1	0
Gamma Spec Ra226 RAD A-013	15	0	17	0
Gamma Spec Solid RAD A-013	946	0	1312	0
LSC Nickel 63	226	0	239	0
LSC Plutonium	209	0	216	0
Technetium-99	526	0	561	0
Gross Alpha Beta Soil Leach	24	0	29	0
ICP-MS Technetium-99 in Soil	7	0	6	0
LSC Selenium 79	10	0	12	0
Total Activity,	9	0	10	0
Tritium	29	0	29	0
Alpha Spec Am243	87	0	94	0
Gamma Iodine-129	142	0	164	0
Gas Flow Lead 210	13	0	14	0
Alpha Spec Uranium	551	0	628	0
LSC Promethium 147	4	0	4	0
LSC, Rapid Strontium 89 and 90	51	0	58	0
Alpha Spec Thorium	429	0	491	0
ICP-MS Uranium-233, 234 in Solid	99	0	100	0
LSC Sulfur 35	5	0	5	0
Alpha Spec Plutonium	510	0	497	0
ICP-MS Technetium-99 Prep in Soil	7	0	6	0
LSC Calcium 45	0	0	2	0
Alpha Spec Neptunium	383	0	392	0

Alpha Spec Plutonium	129	0	145	0
Alpha Spec Radium 226	34	0	43	0
Gas Flow Sr 2nd count	31	0	36	0
Gas Flow Strontium 90	316	0	297	0
Lucas Cell Radium 226	165	0	193	0
Total Activity Screen	1	0	1	0
Alpha Spec Am241 Curium	395	0	400	0
LSC Phosphorus-32	1	0	1	0
Alpha Spec Total Uranium	11	0	12	0
Gas Flow Total Strontium	75	0	76	0
ICP-MS Uranium-233, 234 Prep in Solid	99	0	103	0
ICP-MS Uranium-235, 236, 238 in Solid	84	0	85	0
Alpha Spec Polonium Solid	5	0	5	0
Gamma Spec Solid RAD A-013 with Iodine	16	0	37	0
GFC Chlorine-36 in Solids	29	0	29	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	1	0	4	0
Tritium	5	0	5	0
Calculation for Percent Uranium and Ratios	2	0	0	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	189	0	182	0
ICP-MS Uranium-235, 236, 238 Prep in Solid	81	0	85	0
Gross Alpha/Beta (Am/Cs Calibration) Solid	5	0	6	0
Gross Alpha/Beta	445	0	597	0
Gross Alpha/Beta (Americium Calibration) Solid	3	0	3	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	107	0	106	0
Gross Alpha Beta (F,U)	37	0	45	0
FILTER				
Alpha Spec Uranium	4	0	22	0
Alpha Spec Polonium	3	0	4	0
Gamma I-131, filter	4	0	4	0
LSC Plutonium Filter	59	0	91	0
Tritium	31	0	265	0
Alpha Spec Californium	1	0	1	0
Carbon-14	6	0	70	0
ICP-MS Tc-99 in Filter	0	0	4	0
Nickel-63	1	0	47	0
LSC Iron-55	42	0	68	0
Gamma Nickel 59 RAD A-022	56	0	84	0
Alpha Spec Californium FPL	4	0	14	0
Gamma Iodine 131 RAD A-013	3	0	3	0
LSC Nickel 63	46	0	73	0
Technetium-99	7	0	86	0
Gamma Spec Filter RAD A-013	111	0	181	0
ICP-MS Tc-99 Prep in Filter	0	0	4	0
Alphaspec Np Filter per Liter	16	0	22	0
Alphaspec Pu Filter per Liter	24	0	29	0
Gamma Iodine-129	4	0	54	0
Gross Alpha/Beta	0	0	115	0
Alpha Spec Am243	8	0	15	0
Alpha Spec Uranium	56	0	88	0
LSC Promethium 147	1	0	3	0
LSC, Rapid Strontium 89 and 90	55	0	77	0

Alpha Spec Thorium	34	0	55	0
Gas Flow Radium 228	2	0	4	0
Alpha Spec Plutonium	70	0	123	0
ICP-MS Uranium-233, 234 in Filter	0	0	4	0
Alpha Spec Neptunium	43	0	69	0
Alpha Spec Plutonium	63	0	113	0
Alpha Spec Plutonium	12	0	12	0
Alpha Spec Polonium,(Filter/Liter)	0	0	3	0
Alpha Spec Radium 226	1	0	4	0
Alpha/Beta (Americium Calibration)	0	0	1	0
Carbon-14 (Soda Lime)	0	0	2	0
Gas Flow Sr 2nd Count	31	0	45	0
Gas Flow Strontium 90	67	0	101	0
Gas Flow Total Radium	2	0	2	0
LSC Plutonium 241 Filter per Liter	29	0	42	0
Lucas Cell Radium-226	1	0	1	0
Alpha Spec Am241Curium	100	0	158	0
Gas Flow Total Strontium	3	0	4	0
ICP-MS Uranium-233, 234 Prep in Filter	0	0	3	0
ICP-MS Uranium-235, 236, 238 in Filter	2	0	5	0
Total Activity in Filter,	0	0	6	0
Alphaspec Am241 Curium Filter per Liter	30	0	55	0
Tritium	79	0	105	0
GFC Chlorine-36 in Filters	0	0	3	0
Gamma Spec Filter RAD A-013 Direct Count	2	0	7	0
Carbon-14	24	0	40	0
GFC Chlorine-36 in Filters PL	3	0	3	0
Gross A & B (Americium Calibration) Liquid	5	0	31	0
Direct Count-Gross Alpha/Beta	78	0	0	0
Gross Alpha/Beta	26	0	39	0
ICP-MS Uranium-234, 235, 236, 238 in Filter	4	0	78	0
ICP-MS Uranium-235, 236, 238 Prep in Filter	2	0	7	0
Alpha Spec U	25	0	64	0
Gross A & B	514	0	388	0
LSC Iron-55	6	0	10	0
Technetium-99	24	0	41	0
Gas Flow Sr-90	28	0	47	0
LSC Nickel 63	29	0	37	0
Gamma Spec Charcoal	9	0	11	0
Gas Flow Pb-210	20	0	38	0
Gas Flow Ra-228	22	0	35	0
Gross Alpha Beta (Flame, Unflame)	9	0	9	0
Direct Count- Alpha/Beta (Americium Calibration)	20	0	0	0
Gamma Iodine 129	29	0	29	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Filter	2	0	39	0
Gamma Spec Filter	87	0	142	0
Lucas Cell Ra-226	16	0	25	0
Alpha Spec Thorium	18	0	31	0
LIQUID				
Alpha Spec Uranium	482	0	778	0
Alpha Spec Polonium	27	0	36	0

Tritium	1142	0	1267	0
Carbon-14	167	0	204	0
Plutonium	128	0	147	0
Chlorine-36 in Liquids	3	0	3	0
Iodine-131	2	0	2	0
LSC Iron-55	85	0	135	0
Gamma Nickel 59 RAD A-022	28	0	40	0
Gamma Iodine 131 RAD A-013	2	0	2	0
LSC Nickel 63	144	0	188	0
LSC Radon 222	17	0	16	0
Technetium-99	555	0	657	0
Direct Tritium	1	0	1	0
Gamma Spec Liquid RAD A-013	794	0	899	0
Alpha Spec Total U RAD A-011	17	0	17	0
LSC Selenium 79	31	0	33	0
Total Activity,	3	0	4	0
Alpha Spec Am243	14	0	28	0
Gamma Iodine-129	128	0	169	0
Gamma Iodine-131	19	0	19	0
ICP-MS Technetium-99 in Water	5	0	11	0
Gas Flow Lead 210	14	0	41	0
LSC Promethium 147	18	0	19	0
LSC, Rapid Strontium 89 and 90	8	0	10	0
Alpha Spec Polonium	2	0	2	0
Alpha Spec Thorium	190	0	287	0
Gas Flow Radium 228	387	0	474	0
Gas Flow Radium 228	9	0	9	0
Alpha Spec Plutonium	346	0	508	0
LSC Sulfur 35	11	0	12	0
Alpha Spec Neptunium	135	0	233	0
Alpha Spec Plutonium	25	0	29	0
Alpha Spec Radium 226	28	0	31	0
Gas Flow Sr 2nd count	73	0	108	0
Gas Flow Strontium 90	489	0	550	0
Gas Flow Strontium 90	2	0	2	0
Gas Flow Total Radium	183	0	156	0
ICP-MS Technetium-99 Prep in Water	6	0	12	0
ICP-MS Uranium-233, 234 In Liquid	6	0	21	0
LSC Calcium 45	11	0	12	0
Lucas Cell Radium 226	309	0	450	0
Lucas Cell Radium-226	10	0	10	0
Chlorine-36 in Liquids	17	0	27	0
Alpha Spec Am241 Curium	305	0	433	0
Gas Flow Total Strontium	77	0	88	0
Gross Alpha Non Vol Beta	830	0	1183	0
LSC Phosphorus-32	8	0	10	0
ICP-MS Uranium-233, 234 Prep in Liquid	10	0	24	0
Tritium in Drinking Water by EPA 906.0	5	0	3	0
Gamma Spec Liquid RAD A-013 with Ba, La	51	0	124	0
Gamma Spec Liquid RAD A-013 with Iodine	101	0	188	0
Gas Flow Strontium 89 & 90	5	0	3	0
ICP-MS Uranium-235, 236, 238 in Liquid	13	0	25	0
Gas Flow Total Alpha Radium	10	0	10	0

Gross Alpha Co-precipitation	4	0	7	0
ICP-MS Uranium-235, 236, 238 Prep in Liquid	9	0	24	0
Gross Alpha/Beta (Am/Cs Calibration) Liquid	2	0	2	0
Gross Alpha/Beta	0	0	3	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	170	0	172	0
Gross Alpha Beta (Flame, Unflame)	195	0	213	0
Gross Alpha Beta (Americium Calibration) Liquid	33	0	72	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	84	0	85	0
Alpha/Beta (Americium Calibration) Drinking Water	27	0	19	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	4	0	3	0
TISSUE				
Gamma Spec Solid RAD A-013	46	0	62	0
Alpha Spec Uranium	10	0	12	0
Alpha Spec Plutonium	6	0	6	0
Gas Flow Sr 2nd count	7	0	7	0
Gas Flow Strontium 90	9	0	11	0
Alpha Spec Am241 Curium	3	0	3	0
Gas Flow Total Strontium	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	13	0	14	0
Gross Alpha/Beta	1	0	2	0
VEGETATION				
Carbon-14	4	0	4	0
Gamma Spec Solid RAD A-013	42	0	30	0
Gas Flow Lead 210	1	0	3	0
Alpha Spec Uranium	29	0	21	0
Alpha Spec Thorium	5	0	6	0
Alpha Spec Plutonium	27	0	14	0
Gas Flow Sr 2nd count	8	0	8	0
Gas Flow Strontium 90	24	0	11	0
Gas Flow Total Radium	1	0	3	0
Lucas Cell Radium 226	1	0	1	0
Alpha Spec Am241 Curium	5	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	63	0	79	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	2	0	2	0
Alpha Spec Am241 (pCi/Sample)	1	0	2	0
Alpha Spec Uranium	1	0	2	0
Gross Alpha/Beta	3	0	3	0
Alpha Spec Plutonium	0	0	2	0
Gas Flow Strontium 90	4	0	2	0
AIR CHARCOAL				
Gamma Iodine-129	25	0	8	0
Carbon-14 (Soda Lime)	0	0	6	0
Carbon-14	12	0	12	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	28	0	29	0
Gamma Spec Charcoal	12	0	12	0
Gamma Iodine 129	12	0	12	0

DRINKING WATER				
Alpha Spec Uranium	2	0	2	0
Tritium	21	0	25	0
Iodine-131	0	0	1	0
LSC Iron-55	14	0	16	0
LSC Nickel 63	14	0	16	0
LSC Radon 222	31	0	39	0
Gamma Spec Liquid RAD A-013	7	0	6	0
Gamma Iodine-129	1	0	2	0
Gamma Iodine-131	24	0	16	0
Gas Flow Radium 228	35	0	33	0
Gas Flow Sr 2nd count	10	0	11	0
Gas Flow Strontium 90	17	0	16	0
Gas Flow Total Radium	1	0	1	0
Lucas Cell Radium 226	1	0	0	0
Lucas Cell Radium-226	36	0	37	0
Gamma Spec Drinking Water RAD A-013	29	0	36	0
Gas Flow Total Strontium	13	0	15	0
Gross Alpha Non Vol Beta	142	0	151	0
Tritium In Drinking Water by EPA 906.0	30	0	32	0
Gamma Spec Liquid RAD A-013 with Ba, La	21	0	53	0
Gamma Spec Liquid RAD A-013 with Iodine	0	0	6	0
Gas Flow Strontium 89 & 90	20	0	14	0
Gas Flow Total Alpha Radium	1	0	1	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	2	0	2	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	1	0	1	0
Alpha/Beta (Americium Calibration) Drinking Water	10	0	10	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	19	0	16	0
Total	**18630**		**23501**	

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

2019 CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR190225-1192 ISO Documentation of PT Failures in RAD 116 for Strontium-89.	**Root Cause Analysis** **Strontium-89 in Drinking Water by EPA 905.0 and 905.0 Mod.** A review of the data as well as the preparation processes did not reveal any errors or possible contributors to the high bias. The Laboratory has concluded that this positive bias was an isolated occurrence and that our overall process is within control. In addition, the reported value is 117% of the reference value which is within the laboratory's standard acceptance criteria of +/- 25% for Laboratory Control Samples. **Permanent Corrective/Preventive Actions or Improvements** The laboratory must assume unidentified random errors caused the biases because all quality control criteria were met for the batches. The laboratory will continue to monitor
CARR190530-1211 **ISO Documentation of PT Failures in MRAD-30 for:** • **Uranium-238 by 6020 (in soil)** • **Sr-90 (in vegetation)** • **Pu-238 (in vegetation)** • **Uranium-238 (in vegetation)** • **Uranium-Total (in vegetation)**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. Additionally, trending of historical PT samples for these isotope/matrix/methods were conducted. Specific tendencies of failures were not observed. **Uranium-238 by 6020:** Per the method an acid leach is used instead of a more aggressive total dissolution that other methods use. This method is not the laboratory's standard method of choice for the analysis of Uranium-238.

Permanent Corrective/Preventive Actions or Improvements

The laboratory does not use this digestion method for this isotope and therefore will discontinue analyzing and reporting a PT by using this method.

Sr-90: A reanalysis for Strontium for the Vegetation sample was performed using a larger aliquot. The reanalysis was performed using the same processes as the original reported analysis. The reanalysis result meets the acceptance range with 96% recovery.

Permanent Corrective/Preventive Actions or Improvements

None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes

Pu-238: A reanalysis for Plutonium for the Vegetation sample was performed using approximately the same size aliquot. Prior to the analysis, the sample was shaken and stirred vigorously to ensure homogenization. Reanalysis values fell within the acceptability range for all Plutonium isotopes. It is noted that the Pu-238 count rate is low (0.05 cpm) which results in an uncertainty of 32% at the 95% confidence interval, even with a long count time of 1000 minutes. The reported Pu-238 result is 116% of the study mean and the Z score is less than 1. Failure was potentially due to high uncertainty due to low count rates for the Pu-238, as well as a possible homogeneity issue

Permanent Corrective/Preventive Actions or Improvements

None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes

U-238/Total U mass: A reanalysis for Uranium for the Vegetation sample was performed using approximately the same size aliquot. Prior to the analysis, the sample was shaken and stirred vigorously to ensure homogenization. Reanalysis values fell within the acceptability range for all Uranium isotopes. The original Uranium results were 126% (for U-234) and 129% (for U-238) of the assigned value, yet the Z-scores were both less than 1 and the results were 106% and 108% of the study mean. Additionally, the U-238 value fails, while the Total Uranium value in Activity units (which is simply a calculation) passes, and the Total Uranium in mass units (simply a conversion from the activity results) fails. Failures were potentially due to a possible homogeneity issue.

Permanent Corrective/Preventive Actions or Improvements

None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes.

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR190603-1212 **ISO Documentation of PT Failures in MAPEP-19-MaS40:** • **Fe-55**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. **Iron-55:** In reviewing the data, it was found that too small of an aliquot was used in the original analysis resulting in a high uncertainty in the result and variance or results between counts. A larger aliquot was used during reanalysis and the result was within the acceptance range and had a lower uncertainty. **Permanent Corrective/Preventive Actions or Improvements** None at this time. A reanalysis was performed and results were within acceptance limits. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes.
CARR190826-1250 **ISO Documentation of PT Failures in RAD-118** • **Sr-89** • **Gross Alpha**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system.

	Strontium-89: A review of the data as well as the preparation processes did not reveal any errors or possible contributors to the high bias. In addition, the reported value is 118% of the reference value which is with the laboratory's standard acceptance criteria of +/- 25% for Laboratory Control Samples. In addition, the Sr-89 was also reported by a method using separation resin and the result was with the acceptance range. The results from the two methods compared with a relative percent difference (RPD) of 11.1% which meets the laboratory's duplicate acceptance criteria. **Gross Alpha:** The analysis data was reviewed and no errors were found. The investigation into the sample preparation did not result in any contributors to the high bias. This analysis was performed by Co-Precipitation. The laboratory also reported the gross alpha analysis by the evaporation method (EPA 900.0) and had an acceptable result. The laboratory's alpha results between the two methods compared with a relative percent difference (RPD) of 9.45% which meets the laboratory's duplicate acceptance criteria. **Permanent Corrective/Preventive Actions or Improvements** The Laboratory has concluded that these positive biases were isolated occurrences and that the overall process is within control. The lab will complete PT studies for these parameters as they become available to verify that these were isolated incidences.
CARR191212-1262 **ISO Documentation of PT Failures in MRAD-31** • **Pb-212**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, instruments used during analysis and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in the methods. Additionally, all internal procedures and processes were evaluated and found to have been performed as required. These failures were tracked through GEL's internal non-conformance system. **Lead-212:** The data was reviewed and no anomalies noted. The Duplicate result of the original analysis met the acceptance criteria of the study and replication criteria of the laboratory. Laboratory processes were evaluated and no errors were found. The other reported analytes for the method were within the limits of the study. A definitive contributor to the slightly high bias could not be identified concluding that this was an isolated occurrence.

	Permanent Corrective/Preventive Actions or Improvements None at this time. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes
CARR191212-1265 **ISO Documentation of PT Failures in MAPEP-19-MaW41** • **Ra-226**	**Root Cause Analysis** Upon receipt of the report, an investigation was initiated by our Quality Department and a Corrective Action (CARR) team assembled. The team consisted of representatives from the affected laboratory areas. The sample preparation and analytical processes were reviewed. This included review of reagents and standards used in the sample preparation steps, calibration records, process control samples, and interviews with the analysts. The investigation determined that the laboratory met all quality control criteria specified in each method. Additionally, all internal procedures and policies were performed as required. These failures were tracked through GEL's internal non-conformance system. The laboratory reviewed the data and no errors were found. The preparation and counting processes were reviewed and no anomalies were noted. It was noted that verification counts of the sample preparations were within limits and met laboratory replication criteria **Permanent Corrective/Preventive Actions or Improvements** None at this time. The laboratory will continue to monitor the recoveries of these parameters to ensure that there are no continued issues in the processes

Squaw Creek & Lake Granbury Surface Water Results

SW-2	N-9.9					
Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019 10:46	Barium-140	pCi/L	-5.85E+00	1.14E+01	1.50E+01	U
1/29/2019 10:46	Beryllium-7	pCi/L	-1.71E+00	1.24E+01		U
1/29/2019 10:46	Cesium-134	pCi/L	2.83E-01	1.38E+00	1.50E+01	U
1/29/2019 10:46	Cesium-137	pCi/L	3.79E-01	1.30E+00	1.80E+01	U
1/29/2019 10:46	Cobalt-58	pCi/L	-3.21E-01	1.37E+00	1.50E+01	U
1/29/2019 10:46	Cobalt-60	pCi/L	-5.10E-01	1.24E+00	1.50E+01	U
1/29/2019 10:46	Iodine-131	pCi/L	1.23E-01	7.67E+00		U
1/29/2019 10:46	Iron-59	pCi/L	-2.31E-01	2.91E+00	3.00E+01	U
1/29/2019 10:46	Lanthanum-140	pCi/L	-2.77E-01	4.30E+00	1.50E+01	U
1/29/2019 10:46	Manganese-54	pCi/L	1.89E-01	1.27E+00	1.50E+01	U
1/29/2019 10:46	Niobium-95	pCi/L	-1.08E+00	1.31E+00	1.50E+01	U
1/29/2019 10:46	Potassium-40	pCi/L	1.18E+01	1.32E+01		U
1/29/2019 10:46	Zinc-65	pCi/L	8.53E-01	2.53E+00	3.00E+01	U
1/29/2019 10:46	Zirconium-95	pCi/L	9.38E-01	2.50E+00	1.50E+01	U
1/29/2019 10:46	Iodine-131	pCi/L	-2.82E-01	7.18E-01	1.00E+00	U
2/26/2019 11:27	Barium-140	pCi/L	6.33E-02	1.04E+01	1.50E+01	U
2/26/2019 11:27	Beryllium-7	pCi/L	-7.56E+00	1.33E+01		U
2/26/2019 11:27	Cesium-134	pCi/L	7.84E-01	1.51E+00	1.50E+01	U
2/26/2019 11:27	Cesium-137	pCi/L	2.09E-02	1.36E+00	1.80E+01	U
2/26/2019 11:27	Cobalt-58	pCi/L	2.35E-01	1.35E+00	1.50E+01	U
2/26/2019 11:27	Cobalt-60	pCi/L	-3.22E-01	1.36E+00	1.50E+01	U
2/26/2019 11:27	Iodine-131	pCi/L	-2.64E+00	4.97E+00		U
2/26/2019 11:27	Iron-59	pCi/L	-5.82E-01	3.13E+00	3.00E+01	U
2/26/2019 11:27	Lanthanum-140	pCi/L	2.00E+00	3.99E+00	1.50E+01	U
2/26/2019 11:27	Manganese-54	pCi/L	3.62E-01	1.44E+00	1.50E+01	U
2/26/2019 11:27	Niobium-95	pCi/L	4.47E-01	1.49E+00	1.50E+01	U
2/26/2019 11:27	Potassium-40	pCi/L	2.43E+00	2.23E+01		U
2/26/2019 11:27	Zinc-65	pCi/L	9.01E-01	3.25E+00	3.00E+01	U
2/26/2019 11:27	Zirconium-95	pCi/L	1.27E+00	2.88E+00	1.50E+01	U
2/26/2019 11:27	Iodine-131	pCi/L	-3.62E-01	7.53E-01	1.00E+00	U
3/25/2019 11:19	Barium-140	pCi/L	3.13E+00	9.19E+00	1.50E+01	U
3/25/2019 11:19	Beryllium-7	pCi/L	-2.20E+00	1.18E+01		U
3/25/2019 11:19	Cesium-134	pCi/L	-1.42E-01	1.59E+00	1.50E+01	U
3/25/2019 11:19	Cesium-137	pCi/L	-1.22E-01	1.36E+00	1.80E+01	U
3/25/2019 11:19	Cobalt-58	pCi/L	4.03E-03	1.42E+00	1.50E+01	U
3/25/2019 11:19	Cobalt-60	pCi/L	-1.77E-01	1.44E+00	1.50E+01	U
3/25/2019 11:19	Iodine-131	pCi/L	-1.24E-01	3.61E+00		U
3/25/2019 11:19	Iron-59	pCi/L	1.56E+00	3.62E+00	3.00E+01	U
3/25/2019 11:19	Lanthanum-140	pCi/L	9.67E-01	3.33E+00	1.50E+01	U
3/25/2019 11:19	Manganese-54	pCi/L	8.25E-02	1.40E+00	1.50E+01	U
3/25/2019 11:19	Niobium-95	pCi/L	-7.29E-02	1.53E+00	1.50E+01	U
3/25/2019 11:19	Potassium-40	pCi/L	1.52E+01	1.53E+01		U
3/25/2019 11:19	Zinc-65	pCi/L	-7.13E-01	2.80E+00	3.00E+01	U

3/25/2019 11:19	Zirconium-95	pCi/L	-3.97E-03	2.68E+00	1.50E+01	U
3/25/2019 11:19	Iodine-131	pCi/L	-9.76E-02	7.11E-01	1.00E+00	U
4/30/2019 11:09	Barium-140	pCi/L	1.39E+00	7.82E+00	1.50E+01	U
4/30/2019 11:09	Beryllium-7	pCi/L	6.76E+00	1.49E+01		U
4/30/2019 11:09	Cesium-134	pCi/L	8.81E-01	1.88E+00	1.50E+01	U
4/30/2019 11:09	Cesium-137	pCi/L	-2.03E-02	1.64E+00	1.80E+01	U
4/30/2019 11:09	Cobalt-58	pCi/L	-3.64E-01	1.63E+00	1.50E+01	U
4/30/2019 11:09	Cobalt-60	pCi/L	4.86E-01	1.75E+00	1.50E+01	U
4/30/2019 11:09	Iodine-131	pCi/L	1.63E-01	3.02E+00		U
4/30/2019 11:09	Iron-59	pCi/L	-1.38E+00	3.27E+00	3.00E+01	U
4/30/2019 11:09	Lanthanum-140	pCi/L	-5.55E-01	2.67E+00	1.50E+01	U
4/30/2019 11:09	Manganese-54	pCi/L	-2.60E-01	1.55E+00	1.50E+01	U
4/30/2019 11:09	Niobium-95	pCi/L	-9.04E-01	1.62E+00	1.50E+01	U
4/30/2019 11:09	Potassium-40	pCi/L	-3.01E+01	2.19E+01		U
4/30/2019 11:09	Zinc-65	pCi/L	-1.81E+00	3.24E+00	3.00E+01	U
4/30/2019 11:09	Zirconium-95	pCi/L	7.57E-01	2.90E+00	1.50E+01	U
4/30/2019 11:09	Iodine-131	pCi/L	1.97E-01	9.07E-01	1.00E+00	U
2/11/2019 22:56	Tritium	pCi/L	3.56E+01	3.67E+02	2.00E+03	U
5/28/2019 11:28	Barium-140	pCi/L	1.75E+00	7.87E+00	1.50E+01	U
5/28/2019 11:28	Beryllium-7	pCi/L	1.82E+00	1.23E+01		U
5/28/2019 11:28	Cesium-134	pCi/L	9.40E-02	1.33E+00	1.50E+01	U
5/28/2019 11:28	Cesium-137	pCi/L	5.51E-01	1.40E+00	1.80E+01	U
5/28/2019 11:28	Cobalt-58	pCi/L	2.39E-01	1.34E+00	1.50E+01	U
5/28/2019 11:28	Cobalt-60	pCi/L	9.32E-02	1.49E+00	1.50E+01	U
5/28/2019 11:28	Iodine-131	pCi/L	-1.51E-01	2.72E+00		U
5/28/2019 11:28	Iron-59	pCi/L	-1.23E+00	2.85E+00	3.00E+01	U
5/28/2019 11:28	Lanthanum-140	pCi/L	1.14E+00	2.64E+00	1.50E+01	U
5/28/2019 11:28	Manganese-54	pCi/L	-3.32E-01	1.28E+00	1.50E+01	U
5/28/2019 11:28	Niobium-95	pCi/L	1.90E-01	1.42E+00	1.50E+01	U
5/28/2019 11:28	Potassium-40	pCi/L	3.07E+00	1.43E+01		U
5/28/2019 11:28	Zinc-65	pCi/L	1.26E-01	2.67E+00	3.00E+01	U
5/28/2019 11:28	Zirconium-95	pCi/L	1.17E+00	2.54E+00	1.50E+01	U
5/28/2019 11:28	Iodine-131	pCi/L	3.20E-02	8.92E-01	1.00E+00	U
6/25/2019 9:42	Barium-140	pCi/L	-9.26E-01	6.21E+00	1.50E+01	U
6/25/2019 9:42	Beryllium-7	pCi/L	8.06E-02	1.26E+01		U
6/25/2019 9:42	Cesium-134	pCi/L	-4.32E-01	1.62E+00	1.50E+01	U
6/25/2019 9:42	Cesium-137	pCi/L	-1.78E-01	1.58E+00	1.80E+01	U
6/25/2019 9:42	Cobalt-58	pCi/L	2.72E-01	1.54E+00	1.50E+01	U
6/25/2019 9:42	Cobalt-60	pCi/L	-4.21E-01	1.53E+00	1.50E+01	U
6/25/2019 9:42	Iodine-131	pCi/L	-1.32E-01	1.90E+00		U
6/25/2019 9:42	Iron-59	pCi/L	-8.46E-01	2.74E+00	3.00E+01	U
6/25/2019 9:42	Lanthanum-140	pCi/L	4.18E-01	2.13E+00	1.50E+01	U
6/25/2019 9:42	Manganese-54	pCi/L	5.69E-02	1.51E+00	1.50E+01	U
6/25/2019 9:42	Niobium-95	pCi/L	1.27E-01	1.65E+00	1.50E+01	U
6/25/2019 9:42	Potassium-40	pCi/L	-6.32E+00	2.28E+01		U
6/25/2019 9:42	Zinc-65	pCi/L	-1.48E+00	3.19E+00	3.00E+01	U
6/25/2019 9:42	Zirconium-95	pCi/L	-7.67E-01	2.60E+00	1.50E+01	U

6/25/2019 9:42	Iodine-131	pCi/L	2.80E-01	8.07E-01	1.00E+00	U
7/30/2019 11:24	Barium-140	pCi/L	-1.77E+00	8.37E+00	1.50E+01	U
7/30/2019 11:24	Beryllium-7	pCi/L	-3.34E+00	1.61E+01		U
7/30/2019 11:24	Cesium-134	pCi/L	2.72E-01	1.99E+00	1.50E+01	U
7/30/2019 11:24	Cesium-137	pCi/L	1.23E+00	2.13E+00	1.80E+01	U
7/30/2019 11:24	Cobalt-58	pCi/L	-1.72E-01	1.96E+00	1.50E+01	U
7/30/2019 11:24	Cobalt-60	pCi/L	3.22E-01	1.83E+00	1.50E+01	U
7/30/2019 11:24	Iodine-131	pCi/L	1.40E+00	2.98E+00		U
7/30/2019 11:24	Iron-59	pCi/L	6.10E-01	3.84E+00	3.00E+01	U
7/30/2019 11:24	Lanthanum-140	pCi/L	-1.66E-01	2.92E+00	1.50E+01	U
7/30/2019 11:24	Manganese-54	pCi/L	2.89E-02	1.61E+00	1.50E+01	U
7/30/2019 11:24	Niobium-95	pCi/L	1.70E-01	2.02E+00	1.50E+01	U
7/30/2019 11:24	Potassium-40	pCi/L	7.54E+00	1.80E+01		U
7/30/2019 11:24	Zinc-65	pCi/L	5.56E-01	4.16E+00	3.00E+01	U
7/30/2019 11:24	Zirconium-95	pCi/L	1.00E+00	3.25E+00	1.50E+01	U
7/30/2019 11:24	Iodine-131	pCi/L	6.57E-01	8.32E-01	1.00E+00	U
5/28/2019 10:25	Tritium	pCi/L	-1.26E+02	4.37E+02	2.00E+03	U
8/27/2019 13:02	Barium-140	pCi/L	2.34E+00	6.43E+00	1.50E+01	U
8/27/2019 13:02	Beryllium-7	pCi/L	1.99E+00	1.16E+01		U
8/27/2019 13:02	Cesium-134	pCi/L	-4.25E-01	1.41E+00	1.50E+01	U
8/27/2019 13:02	Cesium-137	pCi/L	9.03E-01	1.46E+00	1.80E+01	U
8/27/2019 13:02	Cobalt-58	pCi/L	1.61E-01	1.40E+00	1.50E+01	U
8/27/2019 13:02	Cobalt-60	pCi/L	2.98E-01	1.45E+00	1.50E+01	U
8/27/2019 13:02	Iodine-131	pCi/L	-7.12E-01	2.34E+00		U
8/27/2019 13:02	Iron-59	pCi/L	1.15E-01	2.81E+00	3.00E+01	U
8/27/2019 13:02	Lanthanum-140	pCi/L	-7.62E-01	2.08E+00	1.50E+01	U
8/27/2019 13:02	Manganese-54	pCi/L	1.30E-01	1.23E+00	1.50E+01	U
8/27/2019 13:02	Niobium-95	pCi/L	3.96E-01	1.42E+00	1.50E+01	U
8/27/2019 13:02	Potassium-40	pCi/L	2.08E+01	1.33E+01		
8/27/2019 13:02	Zinc-65	pCi/L	-1.16E+00	2.52E+00	3.00E+01	U
8/27/2019 13:02	Zirconium-95	pCi/L	-1.11E-01	2.51E+00	1.50E+01	U
8/27/2019 13:02	Iodine-131	pCi/L	1.29E-01	9.03E-01	1.00E+00	U
9/24/2019 10:47	Barium-140	pCi/L	2.87E+00	8.77E+00	1.50E+01	U
9/24/2019 10:47	Beryllium-7	pCi/L	5.01E+00	1.29E+01		U
9/24/2019 10:47	Cesium-134	pCi/L	3.63E-02	1.57E+00	1.50E+01	U
9/24/2019 10:47	Cesium-137	pCi/L	5.44E-01	1.53E+00	1.80E+01	U
9/24/2019 10:47	Cobalt-58	pCi/L	4.89E-01	1.54E+00	1.50E+01	U
9/24/2019 10:47	Cobalt-60	pCi/L	2.14E-01	1.42E+00	1.50E+01	U
9/24/2019 10:47	Iodine-131	pCi/L	3.49E-01	3.40E+00		U
9/24/2019 10:47	Iron-59	pCi/L	1.80E-01	2.77E+00	3.00E+01	U
9/24/2019 10:47	Lanthanum-140	pCi/L	1.90E+00	3.44E+00	1.50E+01	U
9/24/2019 10:47	Manganese-54	pCi/L	6.79E-02	1.36E+00	1.50E+01	U
9/24/2019 10:47	Niobium-95	pCi/L	1.57E-01	1.46E+00	1.50E+01	U
9/24/2019 10:47	Potassium-40	pCi/L	-9.10E+00	2.40E+01		U
9/24/2019 10:47	Zinc-65	pCi/L	-2.26E+00	2.96E+00	3.00E+01	U
9/24/2019 10:47	Zirconium-95	pCi/L	1.25E-01	2.62E+00	1.50E+01	U
9/24/2019 10:47	Iodine-131	pCi/L	-1.54E-01	6.92E-01	1.00E+00	U

10/29/2019 10:44	Barium-140	pCi/L	2.63E+00	7.76E+00	1.50E+01	U
10/29/2019 10:44	Beryllium-7	pCi/L	4.41E+00	1.23E+01		U
10/29/2019 10:44	Cesium-134	pCi/L	-1.58E+00	1.54E+00	1.50E+01	U
10/29/2019 10:44	Cesium-137	pCi/L	-1.99E-01	1.43E+00	1.80E+01	U
10/29/2019 10:44	Cobalt-58	pCi/L	3.63E-01	1.59E+00	1.50E+01	U
10/29/2019 10:44	Cobalt-60	pCi/L	-2.97E-01	1.63E+00	1.50E+01	U
10/29/2019 10:44	Iodine-131	pCi/L	2.11E+00	3.20E+00		U
10/29/2019 10:44	Iron-59	pCi/L	9.92E-01	3.15E+00	3.00E+01	U
10/29/2019 10:44	Lanthanum-140	pCi/L	7.15E-01	2.67E+00	1.50E+01	U
10/29/2019 10:44	Manganese-54	pCi/L	-4.23E-01	1.41E+00	1.50E+01	U
10/29/2019 10:44	Niobium-95	pCi/L	-1.54E+00	1.41E+00	1.50E+01	U
10/29/2019 10:44	Potassium-40	pCi/L	-1.88E+01	2.33E+01		U
10/29/2019 10:44	Zinc-65	pCi/L	4.30E-01	3.09E+00	3.00E+01	U
10/29/2019 10:44	Zirconium-95	pCi/L	5.09E-01	2.81E+00	1.50E+01	U
10/29/2019 10:44	Iodine-131	pCi/L	2.94E-01	6.02E-01	1.00E+00	U
8/27/2019 11:05	Tritium	pCi/L	2.73E+02	4.99E+02	2.00E+03	U
11/26/2019 13:30	Barium-140	pCi/L	2.18E+00	8.81E+00	1.50E+01	U
11/26/2019 13:30	Beryllium-7	pCi/L	3.58E-01	1.30E+01		U
11/26/2019 13:30	Cesium-134	pCi/L	7.79E-01	1.59E+00	1.50E+01	U
11/26/2019 13:30	Cesium-137	pCi/L	4.51E-01	1.57E+00	1.80E+01	U
11/26/2019 13:30	Cobalt-58	pCi/L	2.16E-01	1.51E+00	1.50E+01	U
11/26/2019 13:30	Cobalt-60	pCi/L	3.10E-01	1.59E+00	1.50E+01	U
11/26/2019 13:30	Iodine-131	pCi/L	-7.77E-01	3.54E+00		U
11/26/2019 13:30	Iron-59	pCi/L	1.03E-01	3.30E+00	3.00E+01	U
11/26/2019 13:30	Lanthanum-140	pCi/L	4.76E-01	3.03E+00	1.50E+01	U
11/26/2019 13:30	Manganese-54	pCi/L	8.51E-01	1.43E+00	1.50E+01	U
11/26/2019 13:30	Niobium-95	pCi/L	-2.42E-01	1.49E+00	1.50E+01	U
11/26/2019 13:30	Potassium-40	pCi/L	-9.26E+00	2.48E+01		U
11/26/2019 13:30	Zinc-65	pCi/L	5.76E-01	3.23E+00	3.00E+01	U
11/26/2019 13:30	Zirconium-95	pCi/L	-8.68E-02	2.51E+00	1.50E+01	U
11/26/2019 13:30	Iodine-131	pCi/L	-2.48E-01	6.27E-01	1.00E+00	U
12/31/2019 9:52	Barium-140	pCi/L	-2.55E+00	6.83E+00	1.50E+01	U
12/31/2019 9:52	Beryllium-7	pCi/L	-8.56E+00	1.55E+01		U
12/31/2019 9:52	Cesium-134	pCi/L	9.17E-01	2.00E+00	1.50E+01	U
12/31/2019 9:52	Cesium-137	pCi/L	5.76E-01	1.82E+00	1.80E+01	U
12/31/2019 9:52	Cobalt-58	pCi/L	8.01E-01	1.86E+00	1.50E+01	U
12/31/2019 9:52	Cobalt-60	pCi/L	2.26E-01	1.90E+00	1.50E+01	U
12/31/2019 9:52	Iodine-131	pCi/L	-7.70E-01	2.42E+00		U
12/31/2019 9:52	Iron-59	pCi/L	-1.51E+00	3.13E+00	3.00E+01	U
12/31/2019 9:52	Lanthanum-140	pCi/L	-7.96E-01	2.19E+00	1.50E+01	U
12/31/2019 9:52	Manganese-54	pCi/L	-3.52E-01	1.59E+00	1.50E+01	U
12/31/2019 9:52	Niobium-95	pCi/L	-1.22E+00	1.80E+00	1.50E+01	U
12/31/2019 9:52	Potassium-40	pCi/L	-1.14E+01	2.89E+01		U
12/31/2019 9:52	Zinc-65	pCi/L	-9.66E-01	3.04E+00	3.00E+01	U
12/31/2019 9:52	Zirconium-95	pCi/L	-1.57E-01	2.69E+00	1.50E+01	U
12/31/2019 9:52	Iodine-131	pCi/L	-7.87E-01	7.50E-01	1.00E+00	U
12/31/2019 9:52	Tritium	pCi/L	-2.93E+02	4.63E+02	2.00E+03	U

SW-6	NNW-0.1					
Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019 7:50	Barium-140	pCi/L	1.86E+00	1.29E+01	1.50E+01	U
1/29/2019 7:50	Beryllium-7	pCi/L	-7.85E-01	1.20E+01		U
1/29/2019 7:50	Cesium-134	pCi/L	-3.61E-01	1.30E+00	1.50E+01	U
1/29/2019 7:50	Cesium-137	pCi/L	-4.30E-01	1.66E+00	1.80E+01	U
1/29/2019 7:50	Cobalt-58	pCi/L	-6.15E-01	1.21E+00	1.50E+01	U
1/29/2019 7:50	Cobalt-60	pCi/L	5.80E-01	1.30E+00	1.50E+01	U
1/29/2019 7:50	Iodine-131	pCi/L	-1.31E-01	7.35E+00		U
1/29/2019 7:50	Iron-59	pCi/L	-2.31E+00	2.77E+00	3.00E+01	U
1/29/2019 7:50	Lanthanum-140	pCi/L	6.23E-01	4.35E+00	1.50E+01	U
1/29/2019 7:50	Manganese-54	pCi/L	-1.39E-01	1.20E+00	1.50E+01	U
1/29/2019 7:50	Niobium-95	pCi/L	6.93E-01	1.27E+00	1.50E+01	U
1/29/2019 7:50	Potassium-40	pCi/L	2.08E+01	1.14E+01		UI
1/29/2019 7:50	Zinc-65	pCi/L	1.03E+00	2.63E+00	3.00E+01	U
1/29/2019 7:50	Zirconium-95	pCi/L	-7.17E-01	2.32E+00	1.50E+01	U
1/29/2019 7:50	Iodine-131	pCi/L	-6.78E-01	1.85E+00	1.00E+00	DLU
2/26/2019 9:31	Barium-140	pCi/L	1.15E+01	1.12E+01	1.50E+01	UI
2/26/2019 9:31	Beryllium-7	pCi/L	-1.07E+00	1.39E+01		U
2/26/2019 9:31	Cesium-134	pCi/L	5.93E-01	1.71E+00	1.50E+01	U
2/26/2019 9:31	Cesium-137	pCi/L	2.82E-02	1.51E+00	1.80E+01	U
2/26/2019 9:31	Cobalt-58	pCi/L	4.90E-02	1.58E+00	1.50E+01	U
2/26/2019 9:31	Cobalt-60	pCi/L	-5.80E-02	1.48E+00	1.50E+01	U
2/26/2019 9:31	Iodine-131	pCi/L	2.79E-02	5.53E+00		U
2/26/2019 9:31	Iron-59	pCi/L	-4.21E+00	3.24E+00	3.00E+01	U
2/26/2019 9:31	Lanthanum-140	pCi/L	-1.94E+00	3.97E+00	1.50E+01	U
2/26/2019 9:31	Manganese-54	pCi/L	-1.63E-01	1.32E+00	1.50E+01	U
2/26/2019 9:31	Niobium-95	pCi/L	5.45E-01	1.80E+00	1.50E+01	U
2/26/2019 9:31	Potassium-40	pCi/L	1.21E+01	1.57E+01		U
2/26/2019 9:31	Zinc-65	pCi/L	9.83E-01	3.03E+00	3.00E+01	U
2/26/2019 9:31	Zirconium-95	pCi/L	-3.12E-01	2.87E+00	1.50E+01	U
2/26/2019 9:31	Iodine-131	pCi/L	-6.72E-02	9.51E-01	1.00E+00	U
3/25/2019 7:47	Barium-140	pCi/L	4.99E-01	8.12E+00	1.50E+01	U
3/25/2019 7:47	Beryllium-7	pCi/L	-2.25E+00	1.20E+01		U
3/25/2019 7:47	Cesium-134	pCi/L	1.29E-01	1.36E+00	1.50E+01	U
3/25/2019 7:47	Cesium-137	pCi/L	1.53E+00	1.54E+00	1.80E+01	U
3/25/2019 7:47	Cobalt-58	pCi/L	-4.85E-01	1.37E+00	1.50E+01	U
3/25/2019 7:47	Cobalt-60	pCi/L	7.25E-01	1.54E+00	1.50E+01	U
3/25/2019 7:47	Iodine-131	pCi/L	-7.51E-01	3.17E+00		U
3/25/2019 7:47	Iron-59	pCi/L	-3.13E-01	2.84E+00	3.00E+01	U
3/25/2019 7:47	Lanthanum-140	pCi/L	-1.56E+00	2.79E+00	1.50E+01	U
3/25/2019 7:47	Manganese-54	pCi/L	-1.13E+00	1.26E+00	1.50E+01	U
3/25/2019 7:47	Niobium-95	pCi/L	-6.69E-01	1.35E+00	1.50E+01	U
3/25/2019 7:47	Potassium-40	pCi/L	2.55E+01	1.53E+01		
3/25/2019 7:47	Zinc-65	pCi/L	6.70E-01	2.94E+00	3.00E+01	U
3/25/2019 7:47	Zirconium-95	pCi/L	5.41E-02	2.39E+00	1.50E+01	U

3/25/2019 7:47	Iodine-131	pCi/L	4.32E-01	7.85E-01	1.00E+00	U
4/30/2019 8:20	Barium-140	pCi/L	1.98E+00	8.74E+00	1.50E+01	U
4/30/2019 8:20	Beryllium-7	pCi/L	-2.40E+00	1.47E+01		U
4/30/2019 8:20	Cesium-134	pCi/L	-2.35E-01	1.79E+00	1.50E+01	U
4/30/2019 8:20	Cesium-137	pCi/L	1.99E+00	1.73E+00	1.80E+01	UI
4/30/2019 8:20	Cobalt-58	pCi/L	-9.14E-02	1.60E+00	1.50E+01	U
4/30/2019 8:20	Cobalt-60	pCi/L	1.43E-02	1.99E+00	1.50E+01	U
4/30/2019 8:20	Iodine-131	pCi/L	-3.86E-01	3.01E+00		U
4/30/2019 8:20	Iron-59	pCi/L	-9.72E-01	3.37E+00	3.00E+01	U
4/30/2019 8:20	Lanthanum-140	pCi/L	-8.49E-01	2.70E+00	1.50E+01	U
4/30/2019 8:20	Manganese-54	pCi/L	7.25E-01	1.48E+00	1.50E+01	U
4/30/2019 8:20	Niobium-95	pCi/L	5.83E-01	1.76E+00	1.50E+01	U
4/30/2019 8:20	Potassium-40	pCi/L	1.95E+01	1.78E+01		UI
4/30/2019 8:20	Zinc-65	pCi/L	-1.43E+00	3.31E+00	3.00E+01	U
4/30/2019 8:20	Zirconium-95	pCi/L	-8.52E-01	2.75E+00	1.50E+01	U
4/30/2019 8:20	Iodine-131	pCi/L	-8.21E-02	7.71E-01	1.00E+00	U
2/11/2019 19:36	Tritium	pCi/L	1.35E+04	3.67E+02	2.00E+03	
5/28/2019 8:11	Barium-140	pCi/L	1.75E+00	7.67E+00	1.50E+01	U
5/28/2019 8:11	Beryllium-7	pCi/L	8.56E-01	1.21E+01		U
5/28/2019 8:11	Cesium-134	pCi/L	-2.92E-01	1.44E+00	1.50E+01	U
5/28/2019 8:11	Cesium-137	pCi/L	7.40E-01	1.57E+00	1.80E+01	U
5/28/2019 8:11	Cobalt-58	pCi/L	7.32E-01	1.51E+00	1.50E+01	U
5/28/2019 8:11	Cobalt-60	pCi/L	4.27E-01	1.63E+00	1.50E+01	U
5/28/2019 8:11	Iodine-131	pCi/L	1.99E-01	3.09E+00		U
5/28/2019 8:11	Iron-59	pCi/L	-1.06E-01	3.09E+00	3.00E+01	U
5/28/2019 8:11	Lanthanum-140	pCi/L	-1.35E+00	2.06E+00	1.50E+01	U
5/28/2019 8:11	Manganese-54	pCi/L	-1.05E-01	1.42E+00	1.50E+01	U
5/28/2019 8:11	Niobium-95	pCi/L	9.10E-01	1.43E+00	1.50E+01	U
5/28/2019 8:11	Potassium-40	pCi/L	5.61E+00	1.25E+01		U
5/28/2019 8:11	Zinc-65	pCi/L	-1.30E+00	2.87E+00	3.00E+01	U
5/28/2019 8:11	Zirconium-95	pCi/L	1.09E-01	2.60E+00	1.50E+01	U
5/28/2019 8:11	Iodine-131	pCi/L	3.46E-02	8.54E-01	1.00E+00	U
6/25/2019 6:45	Barium-140	pCi/L	1.72E+00	7.47E+00	1.50E+01	U
6/25/2019 6:45	Beryllium-7	pCi/L	1.73E+01	1.43E+01		UI
6/25/2019 6:45	Cesium-134	pCi/L	1.77E-01	2.01E+00	1.50E+01	U
6/25/2019 6:45	Cesium-137	pCi/L	3.51E-01	1.94E+00	1.80E+01	U
6/25/2019 6:45	Cobalt-58	pCi/L	-4.02E-01	1.80E+00	1.50E+01	U
6/25/2019 6:45	Cobalt-60	pCi/L	-6.11E-01	1.86E+00	1.50E+01	U
6/25/2019 6:45	Iodine-131	pCi/L	-3.44E-02	2.09E+00		U
6/25/2019 6:45	Iron-59	pCi/L	4.73E-01	3.88E+00	3.00E+01	U
6/25/2019 6:45	Lanthanum-140	pCi/L	6.22E-01	2.75E+00	1.50E+01	U
6/25/2019 6:45	Manganese-54	pCi/L	-2.05E-02	1.72E+00	1.50E+01	U
6/25/2019 6:45	Niobium-95	pCi/L	-1.01E+00	1.93E+00	1.50E+01	U
6/25/2019 6:45	Potassium-40	pCi/L	1.19E+01	1.65E+01		U
6/25/2019 6:45	Zinc-65	pCi/L	7.03E-01	4.07E+00	3.00E+01	U
6/25/2019 6:45	Zirconium-95	pCi/L	-1.36E+00	2.94E+00	1.50E+01	U
6/25/2019 6:45	Iodine-131	pCi/L	-2.64E-01	8.39E-01	1.00E+00	U

7/30/2019 8:32	Barium-140	pCi/L	1.56E+00	7.88E+00	1.50E+01	U
7/30/2019 8:32	Beryllium-7	pCi/L	-5.58E+00	1.39E+01		U
7/30/2019 8:32	Cesium-134	pCi/L	-4.62E-02	1.67E+00	1.50E+01	U
7/30/2019 8:32	Cesium-137	pCi/L	2.66E-01	1.58E+00	1.80E+01	U
7/30/2019 8:32	Cobalt-58	pCi/L	-9.73E-02	1.53E+00	1.50E+01	U
7/30/2019 8:32	Cobalt-60	pCi/L	2.70E-01	1.77E+00	1.50E+01	U
7/30/2019 8:32	Iodine-131	pCi/L	5.12E-02	2.84E+00		U
7/30/2019 8:32	Iron-59	pCi/L	4.19E-01	3.22E+00	3.00E+01	U
7/30/2019 8:32	Lanthanum-140	pCi/L	-6.69E-01	2.49E+00	1.50E+01	U
7/30/2019 8:32	Manganese-54	pCi/L	-1.91E-01	1.62E+00	1.50E+01	U
7/30/2019 8:32	Niobium-95	pCi/L	-1.37E+00	1.46E+00	1.50E+01	U
7/30/2019 8:32	Potassium-40	pCi/L	9.22E+00	1.71E+01		U
7/30/2019 8:32	Zinc-65	pCi/L	1.26E+00	3.50E+00	3.00E+01	U
7/30/2019 8:32	Zirconium-95	pCi/L	-6.55E-01	2.63E+00	1.50E+01	U
7/30/2019 8:32	Iodine-131	pCi/L	6.45E-01	9.24E-01	1.00E+00	U
5/28/2019 7:32	Tritium	pCi/L	1.34E+04	4.38E+02	2.00E+03	
8/27/2019 9:51	Barium-140	pCi/L	-2.57E+00	6.73E+00	1.50E+01	U
8/27/2019 9:51	Beryllium-7	pCi/L	2.89E+00	1.23E+01		U
8/27/2019 9:51	Cesium-134	pCi/L	1.21E+00	1.68E+00	1.50E+01	U
8/27/2019 9:51	Cesium-137	pCi/L	5.72E-01	1.51E+00	1.80E+01	U
8/27/2019 9:51	Cobalt-58	pCi/L	-9.93E-01	1.39E+00	1.50E+01	U
8/27/2019 9:51	Cobalt-60	pCi/L	-4.97E-01	1.36E+00	1.50E+01	U
8/27/2019 9:51	Iodine-131	pCi/L	5.78E-01	2.52E+00		U
8/27/2019 9:51	Iron-59	pCi/L	-1.29E-01	2.88E+00	3.00E+01	U
8/27/2019 9:51	Lanthanum-140	pCi/L	-1.36E+00	2.10E+00	1.50E+01	U
8/27/2019 9:51	Manganese-54	pCi/L	-6.88E-01	1.21E+00	1.50E+01	U
8/27/2019 9:51	Niobium-95	pCi/L	1.76E-01	1.49E+00	1.50E+01	U
8/27/2019 9:51	Potassium-40	pCi/L	2.47E+01	1.36E+01		UI
8/27/2019 9:51	Zinc-65	pCi/L	-5.87E-02	2.75E+00	3.00E+01	U
8/27/2019 9:51	Zirconium-95	pCi/L	-1.79E-01	2.55E+00	1.50E+01	U
8/27/2019 9:51	Iodine-131	pCi/L	6.73E-01	9.00E-01	1.00E+00	U
9/24/2019 7:19	Barium-140	pCi/L	7.92E-01	8.37E+00	1.50E+01	U
9/24/2019 7:19	Beryllium-7	pCi/L	-2.24E-01	1.22E+01		U
9/24/2019 7:19	Cesium-134	pCi/L	-2.38E-01	1.43E+00	1.50E+01	U
9/24/2019 7:19	Cesium-137	pCi/L	3.01E-01	1.37E+00	1.80E+01	U
9/24/2019 7:19	Cobalt-58	pCi/L	-4.77E-01	1.46E+00	1.50E+01	U
9/24/2019 7:19	Cobalt-60	pCi/L	4.94E-01	1.51E+00	1.50E+01	U
9/24/2019 7:19	Iodine-131	pCi/L	8.64E-01	3.35E+00		U
9/24/2019 7:19	Iron-59	pCi/L	-1.41E+00	2.70E+00	3.00E+01	U
9/24/2019 7:19	Lanthanum-140	pCi/L	8.74E-01	2.84E+00	1.50E+01	U
9/24/2019 7:19	Manganese-54	pCi/L	1.24E-01	1.32E+00	1.50E+01	U
9/24/2019 7:19	Niobium-95	pCi/L	1.32E+00	1.50E+00	1.50E+01	U
9/24/2019 7:19	Potassium-40	pCi/L	1.78E+01	1.36E+01		UI
9/24/2019 7:19	Zinc-65	pCi/L	4.39E-01	2.86E+00	3.00E+01	U
9/24/2019 7:19	Zirconium-95	pCi/L	-7.80E-01	2.41E+00	1.50E+01	U
9/24/2019 7:19	Iodine-131	pCi/L	-4.11E-01	8.00E-01	1.00E+00	U
10/29/2019 8:13	Barium-140	pCi/L	2.94E+00	7.11E+00	1.50E+01	U

10/29/2019 8:13	Beryllium-7	pCi/L	-1.18E+00	1.11E+01		U
10/29/2019 8:13	Cesium-134	pCi/L	-8.47E-02	1.45E+00	1.50E+01	U
10/29/2019 8:13	Cesium-137	pCi/L	3.84E-01	1.43E+00	1.80E+01	U
10/29/2019 8:13	Cobalt-58	pCi/L	-1.81E-01	1.34E+00	1.50E+01	U
10/29/2019 8:13	Cobalt-60	pCi/L	4.24E-01	1.60E+00	1.50E+01	U
10/29/2019 8:13	Iodine-131	pCi/L	1.70E-01	2.91E+00		U
10/29/2019 8:13	Iron-59	pCi/L	1.03E+00	2.75E+00	3.00E+01	U
10/29/2019 8:13	Lanthanum-140	pCi/L	2.53E+00	2.74E+00	1.50E+01	U
10/29/2019 8:13	Manganese-54	pCi/L	-8.87E-02	1.25E+00	1.50E+01	U
10/29/2019 8:13	Niobium-95	pCi/L	2.93E-01	1.52E+00	1.50E+01	U
10/29/2019 8:13	Potassium-40	pCi/L	2.26E+01	1.35E+01		UI
10/29/2019 8:13	Zinc-65	pCi/L	-5.64E-01	2.78E+00	3.00E+01	U
10/29/2019 8:13	Zirconium-95	pCi/L	-2.92E-01	2.35E+00	1.50E+01	U
10/29/2019 8:13	Iodine-131	pCi/L	2.17E-01	7.40E-01	1.00E+00	U
8/27/2019 7:55	Tritium	pCi/L	8.47E+03	4.80E+02	2.00E+03	
11/26/2019 9:40	Barium-140	pCi/L	3.07E+00	9.23E+00	1.50E+01	U
11/26/2019 9:40	Beryllium-7	pCi/L	-5.72E+00	1.31E+01		U
11/26/2019 9:40	Cesium-134	pCi/L	1.64E-01	1.78E+00	1.50E+01	U
11/26/2019 9:40	Cesium-137	pCi/L	5.57E-01	1.69E+00	1.80E+01	U
11/26/2019 9:40	Cobalt-58	pCi/L	-2.30E-02	1.67E+00	1.50E+01	U
11/26/2019 9:40	Cobalt-60	pCi/L	1.32E+00	2.05E+00	1.50E+01	U
11/26/2019 9:40	Iodine-131	pCi/L	-5.22E-01	3.40E+00		U
11/26/2019 9:40	Iron-59	pCi/L	-1.51E-01	3.92E+00	3.00E+01	U
11/26/2019 9:40	Lanthanum-140	pCi/L	-1.14E-01	3.46E+00	1.50E+01	U
11/26/2019 9:40	Manganese-54	pCi/L	3.46E-01	1.67E+00	1.50E+01	U
11/26/2019 9:40	Niobium-95	pCi/L	-4.86E-02	1.62E+00	1.50E+01	U
11/26/2019 9:40	Potassium-40	pCi/L	5.20E+00	1.55E+01		U
11/26/2019 9:40	Zinc-65	pCi/L	-1.85E-01	3.68E+00	3.00E+01	U
11/26/2019 9:40	Zirconium-95	pCi/L	-1.31E+00	2.82E+00	1.50E+01	U
11/26/2019 9:40	Iodine-131	pCi/L	-1.44E-01	8.42E-01	1.00E+00	U
12/31/2019 6:58	Barium-140	pCi/L	1.43E+00	7.40E+00	1.50E+01	U
12/31/2019 6:58	Beryllium-7	pCi/L	3.99E+00	1.52E+01		U
12/31/2019 6:58	Cesium-134	pCi/L	2.80E-01	2.04E+00	1.50E+01	U
12/31/2019 6:58	Cesium-137	pCi/L	-1.00E+00	1.93E+00	1.80E+01	U
12/31/2019 6:58	Cobalt-58	pCi/L	8.88E-01	2.11E+00	1.50E+01	U
12/31/2019 6:58	Cobalt-60	pCi/L	-2.79E+00	1.76E+00	1.50E+01	U
12/31/2019 6:58	Iodine-131	pCi/L	7.98E-01	2.36E+00		U
12/31/2019 6:58	Iron-59	pCi/L	-1.01E-01	3.92E+00	3.00E+01	U
12/31/2019 6:58	Lanthanum-140	pCi/L	4.77E-01	2.52E+00	1.50E+01	U
12/31/2019 6:58	Manganese-54	pCi/L	-1.34E+00	1.69E+00	1.50E+01	U
12/31/2019 6:58	Niobium-95	pCi/L	5.90E-01	2.02E+00	1.50E+01	U
12/31/2019 6:58	Potassium-40	pCi/L	-2.03E+01	2.72E+01		U
12/31/2019 6:58	Zinc-65	pCi/L	-1.71E+00	3.48E+00	3.00E+01	U
12/31/2019 6:58	Zirconium-95	pCi/L	1.44E-01	3.46E+00	1.50E+01	U
12/31/2019 6:58	Iodine-131	pCi/L	-3.76E-01	9.06E-01	1.00E+00	U
12/31/2019 6:58	Tritium	pCi/L	7.34E+03	4.47E+02	2.00E+03	

Discharge Pathway Surface Water Results

SW-1 N-1.5

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019	Barium-140	pCi/L	1.29E+00	1.36E+01	1.50E+01	U
1/15/2019	Beryllium-7	pCi/L	-4.63E+00	1.24E+01		U
1/15/2019	Cesium-134	pCi/L	-3.15E-01	1.34E+00	1.50E+01	U
1/15/2019	Cobalt-58	pCi/L	-6.93E-01	1.38E+00	1.50E+01	U
1/15/2019	Cobalt-60	pCi/L	1.17E-01	1.29E+00	1.50E+01	U
1/15/2019	Iodine-131	pCi/L	-9.71E-01	7.67E+00		U
1/15/2019	Iron-59	pCi/L	-8.92E-01	3.33E+00	3.00E+01	U
1/15/2019	Lanthanum-140	pCi/L	-1.67E+00	4.45E+00	1.50E+01	U
1/15/2019	Manganese-54	pCi/L	1.49E+00	1.19E+00	1.50E+01	UI
1/15/2019	Niobium-95	pCi/L	-6.76E-01	1.46E+00	1.50E+01	U
1/15/2019	Potassium-40	pCi/L	1.71E+01	1.40E+01		UI
1/15/2019	Zinc-65	pCi/L	1.05E+00	2.57E+00	3.00E+01	U
1/15/2019	Zirconium-95	pCi/L	1.96E+00	2.63E+00	1.50E+01	U
2/13/2019	Barium-140	pCi/L	-1.05E+00	1.10E+01	1.50E+01	U
2/13/2019	Beryllium-7	pCi/L	3.56E+00	1.42E+01		U
2/13/2019	Cesium-134	pCi/L	2.36E-01	1.55E+00	1.50E+01	U
2/13/2019	Cobalt-58	pCi/L	1.16E-01	1.55E+00	1.50E+01	U
2/13/2019	Cobalt-60	pCi/L	-1.51E-01	1.43E+00	1.50E+01	U
2/13/2019	Iodine-131	pCi/L	2.74E+00	5.56E+00		U
2/13/2019	Iron-59	pCi/L	5.36E-01	3.25E+00	3.00E+01	U
2/13/2019	Lanthanum-140	pCi/L	-2.26E+00	3.10E+00	1.50E+01	U
2/13/2019	Manganese-54	pCi/L	3.74E-01	1.47E+00	1.50E+01	U
2/13/2019	Niobium-95	pCi/L	-1.57E+00	1.58E+00	1.50E+01	U
2/13/2019	Potassium-40	pCi/L	3.07E+00	1.48E+01		U
2/13/2019	Zinc-65	pCi/L	2.56E-01	2.86E+00	3.00E+01	U
2/13/2019	Zirconium-95	pCi/L	-1.42E+00	2.65E+00	1.50E+01	U
3/25/2019	Barium-140	pCi/L	-6.87E-01	8.17E+00	1.50E+01	U
3/25/2019	Beryllium-7	pCi/L	2.06E-01	1.21E+01		U
3/25/2019	Cesium-134	pCi/L	-4.12E-02	1.51E+00	1.50E+01	U
3/25/2019	Cobalt-58	pCi/L	6.59E-02	1.35E+00	1.50E+01	U
3/25/2019	Cobalt-60	pCi/L	3.35E+00	1.76E+00	1.50E+01	UI
3/25/2019	Iodine-131	pCi/L	2.13E-01	3.31E+00		U
3/25/2019	Iron-59	pCi/L	3.06E+00	3.52E+00	3.00E+01	U
3/25/2019	Lanthanum-140	pCi/L	-4.38E-01	2.73E+00	1.50E+01	U
3/25/2019	Manganese-54	pCi/L	-3.29E-01	1.35E+00	1.50E+01	U
3/25/2019	Niobium-95	pCi/L	1.29E-01	1.52E+00	1.50E+01	U
3/25/2019	Potassium-40	pCi/L	2.13E+01	1.25E+01		UI
3/25/2019	Zinc-65	pCi/L	-1.91E-02	2.83E+00	3.00E+01	U
3/25/2019	Zirconium-95	pCi/L	4.60E-01	2.60E+00	1.50E+01	U
4/30/2019	Barium-140	pCi/L	-7.92E-01	7.51E+00	1.50E+01	U
4/30/2019	Beryllium-7	pCi/L	-6.28E+00	1.28E+01		U
4/30/2019	Cesium-134	pCi/L	-2.67E-01	1.71E+00	1.50E+01	U

4/30/2019	Cobalt-58	pCi/L	4.02E-01	1.55E+00	1.50E+01	U
4/30/2019	Cobalt-60	pCi/L	-9.30E-03	1.56E+00	1.50E+01	U
4/30/2019	Iodine-131	pCi/L	-9.02E-01	2.76E+00		U
4/30/2019	Iron-59	pCi/L	-4.76E-01	3.55E+00	3.00E+01	U
4/30/2019	Lanthanum-140	pCi/L	-4.95E-01	2.62E+00	1.50E+01	U
4/30/2019	Manganese-54	pCi/L	1.69E-01	1.59E+00	1.50E+01	U
4/30/2019	Niobium-95	pCi/L	-3.60E-01	1.56E+00	1.50E+01	U
4/30/2019	Potassium-40	pCi/L	1.76E+01	1.66E+01		UI
4/30/2019	Zinc-65	pCi/L	-7.03E-01	3.39E+00	3.00E+01	U
4/30/2019	Zirconium-95	pCi/L	-8.20E-01	2.60E+00	1.50E+01	U
2/11/2019	Tritium	pCi/L	1.41E+04	4.78E+02	2.00E+03	
5/28/2019	Barium-140	pCi/L	3.52E+00	7.06E+00	1.50E+01	U
5/28/2019	Beryllium-7	pCi/L	3.77E+00	1.14E+01		U
5/28/2019	Cesium-134	pCi/L	-1.83E-01	1.37E+00	1.50E+01	U
5/28/2019	Cobalt-58	pCi/L	-1.52E-01	1.10E+00	1.50E+01	U
5/28/2019	Cobalt-60	pCi/L	-2.56E-01	1.29E+00	1.50E+01	U
5/28/2019	Iodine-131	pCi/L	-1.55E+00	2.51E+00		U
5/28/2019	Iron-59	pCi/L	-2.13E+00	2.38E+00	3.00E+01	U
5/28/2019	Lanthanum-140	pCi/L	1.11E+00	2.64E+00	1.50E+01	U
5/28/2019	Manganese-54	pCi/L	2.76E-01	1.28E+00	1.50E+01	U
5/28/2019	Niobium-95	pCi/L	1.07E-01	1.26E+00	1.50E+01	U
5/28/2019	Potassium-40	pCi/L	2.33E+00	2.20E+01		U
5/28/2019	Zinc-65	pCi/L	6.44E-01	2.56E+00	3.00E+01	U
5/28/2019	Zirconium-95	pCi/L	-1.61E-01	2.18E+00	1.50E+01	U
6/25/2019	Barium-140	pCi/L	4.63E-01	5.91E+00	1.50E+01	U
6/25/2019	Beryllium-7	pCi/L	-2.42E+00	1.10E+01		U
6/25/2019	Cesium-134	pCi/L	1.25E-01	1.62E+00	1.50E+01	U
6/25/2019	Cobalt-58	pCi/L	2.35E-02	1.35E+00	1.50E+01	U
6/25/2019	Cobalt-60	pCi/L	-2.06E-01	1.54E+00	1.50E+01	U
6/25/2019	Iodine-131	pCi/L	3.92E-01	1.94E+00		U
6/25/2019	Iron-59	pCi/L	-2.56E-02	2.81E+00	3.00E+01	U
6/25/2019	Lanthanum-140	pCi/L	-1.57E+00	1.94E+00	1.50E+01	U
6/25/2019	Manganese-54	pCi/L	2.97E-01	1.40E+00	1.50E+01	U
6/25/2019	Niobium-95	pCi/L	6.69E-01	1.50E+00	1.50E+01	U
6/25/2019	Potassium-40	pCi/L	3.79E+00	1.37E+01		U
6/25/2019	Zinc-65	pCi/L	-2.18E+00	2.78E+00	3.00E+01	U
6/25/2019	Zirconium-95	pCi/L	9.85E-02	2.36E+00	1.50E+01	U
7/30/2019	Barium-140	pCi/L	-5.91E-01	7.57E+00	1.50E+01	U
7/30/2019	Beryllium-7	pCi/L	-5.41E-01	1.27E+01		U
7/30/2019	Cesium-134	pCi/L	2.63E-01	1.64E+00	1.50E+01	U
7/30/2019	Cobalt-58	pCi/L	-9.62E-01	1.40E+00	1.50E+01	U
7/30/2019	Cobalt-60	pCi/L	-1.03E+00	1.58E+00	1.50E+01	U
7/30/2019	Iodine-131	pCi/L	-8.05E-01	2.58E+00		U
7/30/2019	Iron-59	pCi/L	8.87E-01	3.37E+00	3.00E+01	U
7/30/2019	Lanthanum-140	pCi/L	-1.90E+00	2.26E+00	1.50E+01	U
7/30/2019	Manganese-54	pCi/L	-2.36E-01	1.34E+00	1.50E+01	U
7/30/2019	Niobium-95	pCi/L	1.02E+00	1.97E+00	1.50E+01	U

7/30/2019	Potassium-40	pCi/L	1.90E+00	1.63E+01		U
7/30/2019	Zinc-65	pCi/L	1.67E+00	3.18E+00	3.00E+01	U
7/30/2019	Zirconium-95	pCi/L	-2.05E+00	2.52E+00	1.50E+01	U
5/28/2019	Tritium	pCi/L	1.17E+04	4.30E+02	2.00E+03	
8/27/2019	Barium-140	pCi/L	-2.64E+00	5.97E+00	1.50E+01	U
8/27/2019	Beryllium-7	pCi/L	-6.70E+00	1.03E+01		U
8/27/2019	Cesium-134	pCi/L	8.54E-01	1.37E+00	1.50E+01	U
8/27/2019	Cobalt-58	pCi/L	7.52E-03	1.16E+00	1.50E+01	U
8/27/2019	Cobalt-60	pCi/L	2.30E-01	1.37E+00	1.50E+01	U
8/27/2019	Iodine-131	pCi/L	-1.18E+00	2.33E+00		U
8/27/2019	Iron-59	pCi/L	3.51E-01	2.84E+00	3.00E+01	U
8/27/2019	Lanthanum-140	pCi/L	-4.19E-01	1.81E+00	1.50E+01	U
8/27/2019	Manganese-54	pCi/L	-2.54E-01	1.15E+00	1.50E+01	U
8/27/2019	Niobium-95	pCi/L	1.01E+00	1.21E+00	1.50E+01	U
8/27/2019	Potassium-40	pCi/L	-2.54E+00	2.23E+01		U
8/27/2019	Zinc-65	pCi/L	2.20E+00	2.79E+00	3.00E+01	U
8/27/2019	Zirconium-95	pCi/L	8.47E-01	2.20E+00	1.50E+01	U
9/24/2019	Barium-140	pCi/L	-9.66E-01	8.10E+00	1.50E+01	U
9/24/2019	Beryllium-7	pCi/L	3.39E-02	1.20E+01		U
9/24/2019	Cesium-134	pCi/L	4.12E-01	1.47E+00	1.50E+01	U
9/24/2019	Cobalt-58	pCi/L	7.95E-02	1.46E+00	1.50E+01	U
9/24/2019	Cobalt-60	pCi/L	-1.02E-01	1.29E+00	1.50E+01	U
9/24/2019	Iodine-131	pCi/L	-9.03E-01	3.32E+00		U
9/24/2019	Iron-59	pCi/L	-6.11E-01	2.65E+00	3.00E+01	U
9/24/2019	Lanthanum-140	pCi/L	1.07E-01	2.58E+00	1.50E+01	U
9/24/2019	Manganese-54	pCi/L	-4.01E-02	1.30E+00	1.50E+01	U
9/24/2019	Niobium-95	pCi/L	-1.74E-01	1.40E+00	1.50E+01	U
9/24/2019	Potassium-40	pCi/L	2.62E+00	1.26E+01		U
9/24/2019	Zinc-65	pCi/L	2.35E-01	2.84E+00	3.00E+01	U
9/24/2019	Zirconium-95	pCi/L	-4.56E-01	2.50E+00	1.50E+01	U
10/29/2019	Barium-140	pCi/L	4.54E+00	1.37E+01	1.50E+01	U
10/29/2019	Beryllium-7	pCi/L	-8.82E+00	1.82E+01		U
10/29/2019	Cesium-134	pCi/L	4.69E-02	2.23E+00	1.50E+01	U
10/29/2019	Cobalt-58	pCi/L	-6.62E-02	2.41E+00	1.50E+01	U
10/29/2019	Cobalt-60	pCi/L	1.87E-01	2.71E+00	1.50E+01	U
10/29/2019	Iodine-131	pCi/L	3.30E-01	4.70E+00		U
10/29/2019	Iron-59	pCi/L	-1.73E-01	4.96E+00	3.00E+01	U
10/29/2019	Lanthanum-140	pCi/L	7.56E-01	4.67E+00	1.50E+01	U
10/29/2019	Manganese-54	pCi/L	-3.46E+00	1.96E+00	1.50E+01	U
10/29/2019	Niobium-95	pCi/L	-2.76E+00	2.24E+00	1.50E+01	U
10/29/2019	Potassium-40	pCi/L	-1.02E+01	4.09E+01		U
10/29/2019	Zinc-65	pCi/L	-8.35E-01	5.02E+00	3.00E+01	U
10/29/2019	Zirconium-95	pCi/L	7.96E-01	4.06E+00	1.50E+01	U
8/27/2019	Tritium	pCi/L	8.38E+03	4.94E+02	2.00E+03	
11/26/2019	Barium-140	pCi/L	2.52E+00	1.03E+01	1.50E+01	U
11/26/2019	Beryllium-7	pCi/L	1.99E+00	1.50E+01		U
11/26/2019	Cesium-134	pCi/L	2.03E-01	1.80E+00	1.50E+01	U

11/26/2019	Cobalt-58	pCi/L	-4.39E-01	1.64E+00	1.50E+01	U
11/26/2019	Cobalt-60	pCi/L	-7.43E-01	1.65E+00	1.50E+01	U
11/26/2019	Iodine-131	pCi/L	1.24E+00	4.00E+00		U
11/26/2019	Iron-59	pCi/L	9.55E-01	3.55E+00	3.00E+01	U
11/26/2019	Lanthanum-140	pCi/L	8.87E-02	3.55E+00	1.50E+01	U
11/26/2019	Manganese-54	pCi/L	-1.69E-01	1.54E+00	1.50E+01	U
11/26/2019	Niobium-95	pCi/L	-2.19E+00	1.60E+00	1.50E+01	U
11/26/2019	Potassium-40	pCi/L	7.22E+00	1.72E+01		U
11/26/2019	Zinc-65	pCi/L	-2.43E+00	3.34E+00	3.00E+01	U
11/26/2019	Zirconium-95	pCi/L	3.42E-01	3.02E+00	1.50E+01	U
12/31/2019	Barium-140	pCi/L	3.42E+00	5.88E+00	1.50E+01	U
12/31/2019	Beryllium-7	pCi/L	-3.72E+00	1.08E+01		U
12/31/2019	Cesium-134	pCi/L	8.70E-01	1.60E+00	1.50E+01	U
12/31/2019	Cobalt-58	pCi/L	-8.84E-01	1.20E+00	1.50E+01	U
12/31/2019	Cobalt-60	pCi/L	2.10E-01	1.36E+00	1.50E+01	U
12/31/2019	Iodine-131	pCi/L	9.95E-01	1.93E+00		U
12/31/2019	Iron-59	pCi/L	-2.28E-01	2.45E+00	3.00E+01	U
12/31/2019	Lanthanum-140	pCi/L	-4.24E-01	1.54E+00	1.50E+01	U
12/31/2019	Manganese-54	pCi/L	4.41E-01	1.32E+00	1.50E+01	U
12/31/2019	Niobium-95	pCi/L	-2.17E-01	1.40E+00	1.50E+01	U
12/31/2019	Potassium-40	pCi/L	3.41E+00	1.53E+01		U
12/31/2019	Zinc-65	pCi/L	-1.30E+00	2.65E+00	3.00E+01	U
12/31/2019	Zirconium-95	pCi/L	-1.16E-01	2.28E+00	1.50E+01	U
12/31/2019	Tritium	pCi/L	7.22E+03	4.65E+02	2.00E+03	

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Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019	Barium-140	pCi/L	2.74E-01	8.21E+00	1.50E+01	U
1/29/2019	Beryllium-7	pCi/L	-3.20E-01	1.39E+01		U
1/29/2019	Cesium-134	pCi/L	-3.43E-01	1.63E+00	1.50E+01	U
1/29/2019	Cobalt-58	pCi/L	-3.96E-01	1.65E+00	1.50E+01	U
1/29/2019	Cobalt-60	pCi/L	-5.96E-01	1.68E+00	1.50E+01	U
1/29/2019	Iodine-131	pCi/L	1.29E+00	2.97E+00		U
1/29/2019	Iron-59	pCi/L	-1.06E-01	3.51E+00	3.00E+01	U
1/29/2019	Lanthanum-140	pCi/L	1.39E-01	2.68E+00	1.50E+01	U
1/29/2019	Manganese-54	pCi/L	1.52E-01	1.52E+00	1.50E+01	U
1/29/2019	Niobium-95	pCi/L	5.63E-01	1.73E+00	1.50E+01	U
1/29/2019	Potassium-40	pCi/L	2.35E+01	1.69E+01		UI
1/29/2019	Zinc-65	pCi/L	-2.52E-02	3.57E+00	3.00E+01	U
1/29/2019	Zirconium-95	pCi/L	1.39E-01	3.01E+00	1.50E+01	U
2/26/2019	Barium-140	pCi/L	1.30E+00	5.88E+00	1.50E+01	U
2/26/2019	Beryllium-7	pCi/L	-4.86E+00	1.15E+01		U
2/26/2019	Cesium-134	pCi/L	-2.37E-02	1.46E+00	1.50E+01	U
2/26/2019	Cobalt-58	pCi/L	1.15E-01	1.33E+00	1.50E+01	U
2/26/2019	Cobalt-60	pCi/L	-1.63E-01	1.46E+00	1.50E+01	U
2/26/2019	Iodine-131	pCi/L	1.28E+00	2.11E+00		U

2/26/2019	Iron-59	pCi/L	-4.39E-01	2.79E+00	3.00E+01	U
2/26/2019	Lanthanum-140	pCi/L	-1.70E-01	2.15E+00	1.50E+01	U
2/26/2019	Manganese-54	pCi/L	1.35E-01	1.48E+00	1.50E+01	U
2/26/2019	Niobium-95	pCi/L	-7.97E-01	1.47E+00	1.50E+01	U
2/26/2019	Potassium-40	pCi/L	8.50E+00	1.47E+01		U
2/26/2019	Zinc-65	pCi/L	1.05E+00	3.18E+00	3.00E+01	U
2/26/2019	Zirconium-95	pCi/L	-1.22E+00	2.06E+00	1.50E+01	U
3/25/2019	Barium-140	pCi/L	-5.02E-01	7.41E+00	1.50E+01	U
3/25/2019	Beryllium-7	pCi/L	3.39E+00	1.12E+01		U
3/25/2019	Cesium-134	pCi/L	-5.26E-01	1.31E+00	1.50E+01	U
3/25/2019	Cobalt-58	pCi/L	1.37E-01	1.21E+00	1.50E+01	U
3/25/2019	Cobalt-60	pCi/L	5.06E-02	1.42E+00	1.50E+01	U
3/25/2019	Iodine-131	pCi/L	-6.15E-01	2.62E+00		U
3/25/2019	Iron-59	pCi/L	-2.14E+00	2.46E+00	3.00E+01	U
3/25/2019	Lanthanum-140	pCi/L	-6.84E-01	2.70E+00	1.50E+01	U
3/25/2019	Manganese-54	pCi/L	-8.14E-01	1.18E+00	1.50E+01	U
3/25/2019	Niobium-95	pCi/L	-5.76E-02	1.30E+00	1.50E+01	U
3/25/2019	Potassium-40	pCi/L	-1.28E+01	1.90E+01		U
3/25/2019	Zinc-65	pCi/L	-1.54E+00	2.54E+00	3.00E+01	U
3/25/2019	Zirconium-95	pCi/L	1.09E+00	2.28E+00	1.50E+01	U
4/30/2019	Barium-140	pCi/L	4.45E+00	9.09E+00	1.50E+01	U
4/30/2019	Beryllium-7	pCi/L	-9.59E-01	1.36E+01		U
4/30/2019	Cesium-134	pCi/L	-3.71E-01	1.67E+00	1.50E+01	U
4/30/2019	Cobalt-58	pCi/L	2.63E-02	1.72E+00	1.50E+01	U
4/30/2019	Cobalt-60	pCi/L	1.47E+00	1.88E+00	1.50E+01	U
4/30/2019	Iodine-131	pCi/L	-9.49E-01	2.92E+00		U
4/30/2019	Iron-59	pCi/L	2.60E-01	3.34E+00	3.00E+01	U
4/30/2019	Lanthanum-140	pCi/L	-3.36E-02	2.80E+00	1.50E+01	U
4/30/2019	Manganese-54	pCi/L	2.03E-01	1.70E+00	1.50E+01	U
4/30/2019	Niobium-95	pCi/L	-8.17E-02	1.62E+00	1.50E+01	U
4/30/2019	Potassium-40	pCi/L	9.95E+00	1.60E+01		U
4/30/2019	Zinc-65	pCi/L	-1.83E+00	3.00E+00	3.00E+01	U
4/30/2019	Zirconium-95	pCi/L	6.26E-01	3.10E+00	1.50E+01	U
2/25/2019	Tritium	pCi/L	1.66E+02	3.65E+02	2.00E+03	U
5/28/2019	Barium-140	pCi/L	2.07E+00	8.54E+00	1.50E+01	U
5/28/2019	Beryllium-7	pCi/L	4.00E+00	1.30E+01		U
5/28/2019	Cesium-134	pCi/L	-4.55E-01	1.59E+00	1.50E+01	U
5/28/2019	Cobalt-58	pCi/L	3.45E-02	1.50E+00	1.50E+01	U
5/28/2019	Cobalt-60	pCi/L	8.24E-01	1.56E+00	1.50E+01	U
5/28/2019	Iodine-131	pCi/L	5.28E-01	3.12E+00		U
5/28/2019	Iron-59	pCi/L	9.06E-01	3.41E+00	3.00E+01	U
5/28/2019	Lanthanum-140	pCi/L	-4.11E-01	2.46E+00	1.50E+01	U
5/28/2019	Manganese-54	pCi/L	-8.96E-02	1.40E+00	1.50E+01	U
5/28/2019	Niobium-95	pCi/L	-8.82E-01	1.62E+00	1.50E+01	U
5/28/2019	Potassium-40	pCi/L	1.59E+01	1.47E+01		UI
5/28/2019	Zinc-65	pCi/L	8.43E-02	2.80E+00	3.00E+01	U
5/28/2019	Zirconium-95	pCi/L	2.88E+00	2.52E+00	1.50E+01	UI

6/25/2019	Barium-140	pCi/L	3.31E+00	5.86E+00	1.50E+01	U
6/25/2019	Beryllium-7	pCi/L	1.44E+00	1.21E+01		U
6/25/2019	Cesium-134	pCi/L	1.40E+00	1.70E+00	1.50E+01	U
6/25/2019	Cobalt-58	pCi/L	-8.22E-01	1.29E+00	1.50E+01	U
6/25/2019	Cobalt-60	pCi/L	9.75E-01	1.66E+00	1.50E+01	U
6/25/2019	Iodine-131	pCi/L	4.77E-01	1.96E+00		U
6/25/2019	Iron-59	pCi/L	-1.07E+00	2.69E+00	3.00E+01	U
6/25/2019	Lanthanum-140	pCi/L	3.35E-01	2.00E+00	1.50E+01	U
6/25/2019	Manganese-54	pCi/L	2.78E-01	1.40E+00	1.50E+01	U
6/25/2019	Niobium-95	pCi/L	9.62E-01	1.40E+00	1.50E+01	U
6/25/2019	Potassium-40	pCi/L	4.54E+00	1.46E+01		U
6/25/2019	Zinc-65	pCi/L	5.46E-01	2.89E+00	3.00E+01	U
6/25/2019	Zirconium-95	pCi/L	-8.09E-01	2.26E+00	1.50E+01	U
7/30/2019	Barium-140	pCi/L	-1.57E+00	8.20E+00	1.50E+01	U
7/30/2019	Beryllium-7	pCi/L	-2.46E+00	1.61E+01		U
7/30/2019	Cesium-134	pCi/L	-4.65E-01	1.96E+00	1.50E+01	U
7/30/2019	Cobalt-58	pCi/L	-6.87E-02	1.87E+00	1.50E+01	U
7/30/2019	Cobalt-60	pCi/L	5.44E-01	2.01E+00	1.50E+01	U
7/30/2019	Iodine-131	pCi/L	1.28E+00	3.06E+00		U
7/30/2019	Iron-59	pCi/L	9.80E-02	4.31E+00	3.00E+01	U
7/30/2019	Lanthanum-140	pCi/L	-1.31E+00	3.15E+00	1.50E+01	U
7/30/2019	Manganese-54	pCi/L	-6.09E-01	1.92E+00	1.50E+01	U
7/30/2019	Niobium-95	pCi/L	1.03E-01	2.08E+00	1.50E+01	U
7/30/2019	Potassium-40	pCi/L	-1.10E+01	2.85E+01		U
7/30/2019	Zinc-65	pCi/L	-2.18E+00	3.54E+00	3.00E+01	U
7/30/2019	Zirconium-95	pCi/L	-1.62E+00	3.05E+00	1.50E+01	U
5/28/2019	Tritium	pCi/L	-2.27E+02	4.36E+02	2.00E+03	U
8/27/2019	Barium-140	pCi/L	-5.22E+00	8.09E+00	1.50E+01	U
8/27/2019	Beryllium-7	pCi/L	1.07E+00	1.48E+01		U
8/27/2019	Cesium-134	pCi/L	-3.17E-01	1.89E+00	1.50E+01	U
8/27/2019	Cobalt-58	pCi/L	4.19E-01	2.03E+00	1.50E+01	U
8/27/2019	Cobalt-60	pCi/L	5.63E-01	2.00E+00	1.50E+01	U
8/27/2019	Iodine-131	pCi/L	1.58E+00	2.96E+00		U
8/27/2019	Iron-59	pCi/L	-2.92E-01	4.04E+00	3.00E+01	U
8/27/2019	Lanthanum-140	pCi/L	-1.20E+00	2.78E+00	1.50E+01	U
8/27/2019	Manganese-54	pCi/L	-5.80E-01	1.83E+00	1.50E+01	U
8/27/2019	Niobium-95	pCi/L	5.00E-01	2.07E+00	1.50E+01	U
8/27/2019	Potassium-40	pCi/L	8.01E+00	2.82E+01		U
8/27/2019	Zinc-65	pCi/L	2.16E+00	4.14E+00	3.00E+01	U
8/27/2019	Zirconium-95	pCi/L	1.05E+00	3.45E+00	1.50E+01	U
9/24/2019	Barium-140	pCi/L	-7.73E-01	8.58E+00	1.50E+01	U
9/24/2019	Beryllium-7	pCi/L	3.23E+00	1.34E+01		U
9/24/2019	Cesium-134	pCi/L	6.13E-01	1.68E+00	1.50E+01	U
9/24/2019	Cobalt-58	pCi/L	-7.34E-01	1.49E+00	1.50E+01	U
9/24/2019	Cobalt-60	pCi/L	5.05E-01	1.55E+00	1.50E+01	U
9/24/2019	Iodine-131	pCi/L	-3.58E-01	3.39E+00		U
9/24/2019	Iron-59	pCi/L	5.18E-02	3.12E+00	3.00E+01	U

9/24/2019	Lanthanum-140	pCi/L	-3.21E-01	3.15E+00	1.50E+01	U
9/24/2019	Manganese-54	pCi/L	-2.23E-01	1.29E+00	1.50E+01	U
9/24/2019	Niobium-95	pCi/L	-1.48E+00	1.76E+00	1.50E+01	U
9/24/2019	Potassium-40	pCi/L	3.63E+00	1.17E+01		U
9/24/2019	Zinc-65	pCi/L	1.40E+00	3.03E+00	3.00E+01	U
9/24/2019	Zirconium-95	pCi/L	-9.89E-01	2.38E+00	1.50E+01	U
10/29/2019	Barium-140	pCi/L	8.54E-01	7.04E+00	1.50E+01	U
10/29/2019	Beryllium-7	pCi/L	-1.50E+00	1.10E+01		U
10/29/2019	Cesium-134	pCi/L	4.58E-01	1.46E+00	1.50E+01	U
10/29/2019	Cobalt-58	pCi/L	-7.14E-02	1.19E+00	1.50E+01	U
10/29/2019	Cobalt-60	pCi/L	-8.50E-02	1.15E+00	1.50E+01	U
10/29/2019	Iodine-131	pCi/L	7.61E-01	2.91E+00		U
10/29/2019	Iron-59	pCi/L	7.79E-02	2.63E+00	3.00E+01	U
10/29/2019	Lanthanum-140	pCi/L	7.86E-01	2.47E+00	1.50E+01	U
10/29/2019	Manganese-54	pCi/L	-6.35E-02	1.20E+00	1.50E+01	U
10/29/2019	Niobium-95	pCi/L	3.46E-01	1.37E+00	1.50E+01	U
10/29/2019	Potassium-40	pCi/L	5.00E+01	1.08E+01		
10/29/2019	Zinc-65	pCi/L	1.20E+00	2.80E+00	3.00E+01	U
10/29/2019	Zirconium-95	pCi/L	-1.05E-01	2.24E+00	1.50E+01	U
8/27/2019	Tritium	pCi/L	1.49E+02	4.97E+02	2.00E+03	U
11/26/2019	Barium-140	pCi/L	-4.81E-01	7.64E+00	1.50E+01	U
11/26/2019	Beryllium-7	pCi/L	7.57E+00	1.27E+01		U
11/26/2019	Cesium-134	pCi/L	-9.38E-01	1.34E+00	1.50E+01	U
11/26/2019	Cobalt-58	pCi/L	-5.59E-02	1.19E+00	1.50E+01	U
11/26/2019	Cobalt-60	pCi/L	3.58E-01	1.57E+00	1.50E+01	U
11/26/2019	Iodine-131	pCi/L	-5.88E-01	3.20E+00		U
11/26/2019	Iron-59	pCi/L	-8.77E-01	2.69E+00	3.00E+01	U
11/26/2019	Lanthanum-140	pCi/L	-1.38E+00	2.35E+00	1.50E+01	U
11/26/2019	Manganese-54	pCi/L	1.16E-01	1.33E+00	1.50E+01	U
11/26/2019	Niobium-95	pCi/L	5.37E-01	1.52E+00	1.50E+01	U
11/26/2019	Potassium-40	pCi/L	1.03E+00	1.41E+01		U
11/26/2019	Zinc-65	pCi/L	1.48E+00	2.80E+00	3.00E+01	U
11/26/2019	Zirconium-95	pCi/L	-2.65E-01	2.28E+00	1.50E+01	U
12/31/2019	Barium-140	pCi/L	-8.49E-01	6.31E+00	1.50E+01	U
12/31/2019	Beryllium-7	pCi/L	5.75E+00	1.35E+01		U
12/31/2019	Cesium-134	pCi/L	6.38E-01	1.66E+00	1.50E+01	U
12/31/2019	Cobalt-58	pCi/L	-2.41E-01	1.38E+00	1.50E+01	U
12/31/2019	Cobalt-60	pCi/L	1.59E-01	1.49E+00	1.50E+01	U
12/31/2019	Iodine-131	pCi/L	-6.83E-01	2.14E+00		U
12/31/2019	Iron-59	pCi/L	-1.57E-01	2.91E+00	3.00E+01	U
12/31/2019	Lanthanum-140	pCi/L	1.48E-01	2.13E+00	1.50E+01	U
12/31/2019	Manganese-54	pCi/L	5.97E-01	1.60E+00	1.50E+01	U
12/31/2019	Niobium-95	pCi/L	-9.17E-04	1.47E+00	1.50E+01	U
12/31/2019	Potassium-40	pCi/L	1.43E+01	1.30E+01		UI
12/31/2019	Zinc-65	pCi/L	-1.72E+00	3.20E+00	3.00E+01	U
12/31/2019	Zirconium-95	pCi/L	9.18E-01	2.76E+00	1.50E+01	U
12/31/2019	Tritium	pCi/L	-1.45E+02	4.57E+02	2.00E+03	U

SW-4 NE-7.4

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019	Barium-140	pCi/L	-3.73E-01	8.14E+00	1.50E+01	U
1/29/2019	Beryllium-7	pCi/L	-3.71E+00	1.39E+01		U
1/29/2019	Cesium-134	pCi/L	5.72E-01	1.91E+00	1.50E+01	U
1/29/2019	Cobalt-58	pCi/L	-1.06E-02	1.55E+00	1.50E+01	U
1/29/2019	Cobalt-60	pCi/L	-9.84E-01	1.77E+00	1.50E+01	U
1/29/2019	Iodine-131	pCi/L	-5.46E-01	3.09E+00		U
1/29/2019	Iron-59	pCi/L	9.12E-02	3.37E+00	3.00E+01	U
1/29/2019	Lanthanum-140	pCi/L	-2.52E+00	2.76E+00	1.50E+01	U
1/29/2019	Manganese-54	pCi/L	-1.38E-01	1.71E+00	1.50E+01	U
1/29/2019	Niobium-95	pCi/L	-1.09E+00	1.81E+00	1.50E+01	U
1/29/2019	Potassium-40	pCi/L	-2.24E+01	2.88E+01		U
1/29/2019	Zinc-65	pCi/L	-7.01E-01	3.59E+00	3.00E+01	U
1/29/2019	Zirconium-95	pCi/L	-1.12E+00	2.69E+00	1.50E+01	U
2/26/2019	Barium-140	pCi/L	-1.56E+00	5.72E+00	1.50E+01	U
2/26/2019	Beryllium-7	pCi/L	7.08E+00	1.11E+01		U
2/26/2019	Cesium-134	pCi/L	-1.47E-02	1.45E+00	1.50E+01	U
2/26/2019	Cobalt-58	pCi/L	-6.64E-01	1.23E+00	1.50E+01	U
2/26/2019	Cobalt-60	pCi/L	-7.27E-04	1.35E+00	1.50E+01	U
2/26/2019	Iodine-131	pCi/L	2.24E-02	1.88E+00		U
2/26/2019	Iron-59	pCi/L	8.52E-01	2.83E+00	3.00E+01	U
2/26/2019	Lanthanum-140	pCi/L	-8.51E-01	2.16E+00	1.50E+01	U
2/26/2019	Manganese-54	pCi/L	2.10E-01	1.34E+00	1.50E+01	U
2/26/2019	Niobium-95	pCi/L	-2.61E-01	1.17E+00	1.50E+01	U
2/26/2019	Potassium-40	pCi/L	-6.30E+00	2.21E+01		U
2/26/2019	Zinc-65	pCi/L	9.82E-01	3.07E+00	3.00E+01	U
2/26/2019	Zirconium-95	pCi/L	-1.37E-01	2.38E+00	1.50E+01	U
3/25/2019	Barium-140	pCi/L	-3.03E+00	7.43E+00	1.50E+01	U
3/25/2019	Beryllium-7	pCi/L	3.06E+00	1.20E+01		U
3/25/2019	Cesium-134	pCi/L	4.87E-02	1.44E+00	1.50E+01	U
3/25/2019	Cobalt-58	pCi/L	-1.91E-01	1.37E+00	1.50E+01	U
3/25/2019	Cobalt-60	pCi/L	2.94E-01	1.53E+00	1.50E+01	U
3/25/2019	Iodine-131	pCi/L	-5.67E-01	3.03E+00		U
3/25/2019	Iron-59	pCi/L	2.40E-01	2.62E+00	3.00E+01	U
3/25/2019	Lanthanum-140	pCi/L	-1.05E-01	2.58E+00	1.50E+01	U
3/25/2019	Manganese-54	pCi/L	4.76E-02	1.35E+00	1.50E+01	U
3/25/2019	Niobium-95	pCi/L	5.62E-01	1.51E+00	1.50E+01	U
3/25/2019	Potassium-40	pCi/L	-4.29E-01	2.12E+01		U
3/25/2019	Zinc-65	pCi/L	7.92E-01	2.75E+00	3.00E+01	U
3/25/2019	Zirconium-95	pCi/L	-1.13E+00	2.39E+00	1.50E+01	U
4/30/2019	Barium-140	pCi/L	2.09E+00	7.13E+00	1.50E+01	U
4/30/2019	Beryllium-7	pCi/L	7.33E+00	1.10E+01		U
4/30/2019	Cesium-134	pCi/L	2.88E-01	1.53E+00	1.50E+01	U
4/30/2019	Cobalt-58	pCi/L	3.59E-01	1.39E+00	1.50E+01	U

4/30/2019	Cobalt-60	pCi/L	2.86E-01	1.51E+00	1.50E+01	U
4/30/2019	Iodine-131	pCi/L	7.99E-01	2.51E+00		U
4/30/2019	Iron-59	pCi/L	2.16E-01	2.95E+00	3.00E+01	U
4/30/2019	Lanthanum-140	pCi/L	-4.18E-01	2.24E+00	1.50E+01	U
4/30/2019	Manganese-54	pCi/L	3.42E-01	1.39E+00	1.50E+01	U
4/30/2019	Niobium-95	pCi/L	-8.88E-02	1.24E+00	1.50E+01	U
4/30/2019	Potassium-40	pCi/L	3.02E+00	1.17E+01		U
4/30/2019	Zinc-65	pCi/L	-1.50E-01	2.88E+00	3.00E+01	U
4/30/2019	Zirconium-95	pCi/L	4.75E+00	2.64E+00	1.50E+01	UI
2/25/2019	Tritium	pCi/L	1.24E+02	3.65E+02	2.00E+03	U
5/28/2019	Barium-140	pCi/L	-5.91E+00	8.89E+00	1.50E+01	U
5/28/2019	Beryllium-7	pCi/L	9.99E-01	1.55E+01		U
5/28/2019	Cesium-134	pCi/L	6.07E-01	1.88E+00	1.50E+01	U
5/28/2019	Cobalt-58	pCi/L	-1.07E-01	1.68E+00	1.50E+01	U
5/28/2019	Cobalt-60	pCi/L	2.25E-01	1.74E+00	1.50E+01	U
5/28/2019	Iodine-131	pCi/L	8.82E-01	3.94E+00		U
5/28/2019	Iron-59	pCi/L	-1.95E-01	3.19E+00	3.00E+01	U
5/28/2019	Lanthanum-140	pCi/L	4.85E-01	2.70E+00	1.50E+01	U
5/28/2019	Manganese-54	pCi/L	-1.55E+00	1.60E+00	1.50E+01	U
5/28/2019	Niobium-95	pCi/L	2.81E-01	1.85E+00	1.50E+01	U
5/28/2019	Potassium-40	pCi/L	5.05E+00	1.66E+01		U
5/28/2019	Zinc-65	pCi/L	2.21E-01	3.30E+00	3.00E+01	U
5/28/2019	Zirconium-95	pCi/L	1.60E-01	3.20E+00	1.50E+01	U
6/25/2019	Barium-140	pCi/L	1.56E+00	7.15E+00	1.50E+01	U
6/25/2019	Beryllium-7	pCi/L	-1.34E-01	1.46E+01		U
6/25/2019	Cesium-134	pCi/L	3.43E-01	1.85E+00	1.50E+01	U
6/25/2019	Cobalt-58	pCi/L	8.51E-01	1.74E+00	1.50E+01	U
6/25/2019	Cobalt-60	pCi/L	-4.11E-01	1.68E+00	1.50E+01	U
6/25/2019	Iodine-131	pCi/L	1.47E+00	2.28E+00		U
6/25/2019	Iron-59	pCi/L	1.56E+00	3.44E+00	3.00E+01	U
6/25/2019	Lanthanum-140	pCi/L	-5.04E-01	2.12E+00	1.50E+01	U
6/25/2019	Manganese-54	pCi/L	-5.54E-01	1.71E+00	1.50E+01	U
6/25/2019	Niobium-95	pCi/L	1.43E+00	1.88E+00	1.50E+01	U
6/25/2019	Potassium-40	pCi/L	4.96E+00	1.98E+01		U
6/25/2019	Zinc-65	pCi/L	-1.54E+00	3.52E+00	3.00E+01	U
6/25/2019	Zirconium-95	pCi/L	7.01E-01	2.99E+00	1.50E+01	U
7/30/2019	Barium-140	pCi/L	3.72E-01	7.90E+00	1.50E+01	U
7/30/2019	Beryllium-7	pCi/L	-2.21E-02	1.34E+01		U
7/30/2019	Cesium-134	pCi/L	1.11E-01	1.83E+00	1.50E+01	U
7/30/2019	Cobalt-58	pCi/L	3.38E-01	1.66E+00	1.50E+01	U
7/30/2019	Cobalt-60	pCi/L	1.83E-01	1.74E+00	1.50E+01	U
7/30/2019	Iodine-131	pCi/L	3.37E-01	2.53E+00		U
7/30/2019	Iron-59	pCi/L	-1.56E+00	2.92E+00	3.00E+01	U
7/30/2019	Lanthanum-140	pCi/L	-8.68E-01	2.92E+00	1.50E+01	U
7/30/2019	Manganese-54	pCi/L	-4.09E-02	1.61E+00	1.50E+01	U
7/30/2019	Niobium-95	pCi/L	7.38E-01	1.77E+00	1.50E+01	U
7/30/2019	Potassium-40	pCi/L	1.88E+00	1.80E+01		U

7/30/2019	Zinc-65	pCi/L	-1.58E+00	2.86E+00	3.00E+01	U
7/30/2019	Zirconium-95	pCi/L	-6.09E-01	2.81E+00	1.50E+01	U
5/28/2019	Tritium	pCi/L	-2.30E+02	4.13E+02	2.00E+03	U
8/27/2019	Barium-140	pCi/L	-9.71E-01	7.94E+00	1.50E+01	U
8/27/2019	Beryllium-7	pCi/L	1.58E-01	1.37E+01		U
8/27/2019	Cesium-134	pCi/L	9.37E-01	1.73E+00	1.50E+01	U
8/27/2019	Cobalt-58	pCi/L	1.53E+00	1.26E+00	1.50E+01	UI
8/27/2019	Cobalt-60	pCi/L	1.94E-01	1.45E+00	1.50E+01	U
8/27/2019	Iodine-131	pCi/L	4.80E-01	3.04E+00		U
8/27/2019	Iron-59	pCi/L	1.72E+00	3.06E+00	3.00E+01	U
8/27/2019	Lanthanum-140	pCi/L	-2.64E+00	2.15E+00	1.50E+01	U
8/27/2019	Manganese-54	pCi/L	5.34E-01	1.49E+00	1.50E+01	U
8/27/2019	Niobium-95	pCi/L	-8.91E-01	1.48E+00	1.50E+01	U
8/27/2019	Potassium-40	pCi/L	1.65E+01	1.61E+01		UI
8/27/2019	Zinc-65	pCi/L	-1.98E+00	2.73E+00	3.00E+01	U
8/27/2019	Zirconium-95	pCi/L	-9.84E-01	2.61E+00	1.50E+01	U
9/24/2019	Barium-140	pCi/L	3.58E+00	9.42E+00	1.50E+01	U
9/24/2019	Beryllium-7	pCi/L	6.41E+00	1.48E+01		U
9/24/2019	Cesium-134	pCi/L	3.08E-02	1.59E+00	1.50E+01	U
9/24/2019	Cobalt-58	pCi/L	-4.24E-02	1.49E+00	1.50E+01	U
9/24/2019	Cobalt-60	pCi/L	1.12E+00	1.78E+00	1.50E+01	U
9/24/2019	Iodine-131	pCi/L	3.19E+00	4.12E+00		U
9/24/2019	Iron-59	pCi/L	-1.45E+00	3.01E+00	3.00E+01	U
9/24/2019	Lanthanum-140	pCi/L	3.17E-01	3.34E+00	1.50E+01	U
9/24/2019	Manganese-54	pCi/L	-1.56E-01	1.54E+00	1.50E+01	U
9/24/2019	Niobium-95	pCi/L	5.28E-02	1.64E+00	1.50E+01	U
9/24/2019	Potassium-40	pCi/L	3.32E+00	1.55E+01		U
9/24/2019	Zinc-65	pCi/L	1.60E-01	3.21E+00	3.00E+01	U
9/24/2019	Zirconium-95	pCi/L	-1.39E+00	2.33E+00	1.50E+01	U
10/29/2019	Barium-140	pCi/L	-5.98E-01	7.36E+00	1.50E+01	U
10/29/2019	Beryllium-7	pCi/L	5.79E+00	1.27E+01		U
10/29/2019	Cesium-134	pCi/L	-2.04E+00	1.42E+00	1.50E+01	U
10/29/2019	Cobalt-58	pCi/L	-5.93E-01	1.31E+00	1.50E+01	U
10/29/2019	Cobalt-60	pCi/L	6.22E-01	1.50E+00	1.50E+01	U
10/29/2019	Iodine-131	pCi/L	-1.51E+00	2.91E+00		U
10/29/2019	Iron-59	pCi/L	-1.35E+00	2.73E+00	3.00E+01	U
10/29/2019	Lanthanum-140	pCi/L	-1.28E+00	2.32E+00	1.50E+01	U
10/29/2019	Manganese-54	pCi/L	-1.12E-01	1.32E+00	1.50E+01	U
10/29/2019	Niobium-95	pCi/L	6.61E-01	1.51E+00	1.50E+01	U
10/29/2019	Potassium-40	pCi/L	-1.65E+01	2.09E+01		U
10/29/2019	Zinc-65	pCi/L	-6.43E-01	2.82E+00	3.00E+01	U
10/29/2019	Zirconium-95	pCi/L	-7.59E-01	2.24E+00	1.50E+01	U
8/27/2019	Tritium	pCi/L	1.22E+02	4.95E+02	2.00E+03	U
11/26/2019	Barium-140	pCi/L	-1.04E+00	7.78E+00	1.50E+01	U
11/26/2019	Beryllium-7	pCi/L	4.70E-02	1.23E+01		U
11/26/2019	Cesium-134	pCi/L	5.47E-01	1.49E+00	1.50E+01	U
11/26/2019	Cobalt-58	pCi/L	3.59E-01	1.44E+00	1.50E+01	U

11/26/2019	Cobalt-60	pCi/L	-5.64E-01	1.51E+00	1.50E+01	U
11/26/2019	Iodine-131	pCi/L	-2.81E+00	3.30E+00		U
11/26/2019	Iron-59	pCi/L	-7.64E-01	2.83E+00	3.00E+01	U
11/26/2019	Lanthanum-140	pCi/L	-3.09E-01	2.87E+00	1.50E+01	U
11/26/2019	Manganese-54	pCi/L	2.45E-01	1.42E+00	1.50E+01	U
11/26/2019	Niobium-95	pCi/L	3.84E-01	1.44E+00	1.50E+01	U
11/26/2019	Potassium-40	pCi/L	5.86E+00	1.33E+01		U
11/26/2019	Zinc-65	pCi/L	3.87E-01	2.82E+00	3.00E+01	U
11/26/2019	Zirconium-95	pCi/L	9.81E-01	2.73E+00	1.50E+01	U
12/31/2019	Barium-140	pCi/L	-7.92E-01	4.87E+00	1.50E+01	U
12/31/2019	Beryllium-7	pCi/L	2.94E+00	9.61E+00		U
12/31/2019	Cesium-134	pCi/L	-1.29E+00	1.39E+00	1.50E+01	U
12/31/2019	Cobalt-58	pCi/L	-1.22E-01	1.18E+00	1.50E+01	U
12/31/2019	Cobalt-60	pCi/L	2.10E-01	1.19E+00	1.50E+01	U
12/31/2019	Iodine-131	pCi/L	-1.03E-01	1.59E+00		U
12/31/2019	Iron-59	pCi/L	-1.62E-01	2.43E+00	3.00E+01	U
12/31/2019	Lanthanum-140	pCi/L	6.71E-01	1.99E+00	1.50E+01	U
12/31/2019	Manganese-54	pCi/L	-2.76E-01	1.18E+00	1.50E+01	U
12/31/2019	Niobium-95	pCi/L	5.89E-01	1.22E+00	1.50E+01	U
12/31/2019	Potassium-40	pCi/L	-1.65E+01	2.01E+01		U
12/31/2019	Zinc-65	pCi/L	-1.71E-01	2.57E+00	3.00E+01	U
12/31/2019	Zirconium-95	pCi/L	3.46E-01	2.18E+00	1.50E+01	U
12/31/2019	Tritium	pCi/L	-1.95E+02	4.60E+02	2.00E+03	U

SW-5 ESE-1.4

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019	Barium-140	pCi/L	-4.03E+00	1.42E+01	1.50E+01	U
1/15/2019	Beryllium-7	pCi/L	3.32E-01	1.41E+01		U
1/15/2019	Cesium-134	pCi/L	1.24E-01	1.56E+00	1.50E+01	U
1/15/2019	Cobalt-58	pCi/L	-9.16E-01	1.43E+00	1.50E+01	U
1/15/2019	Cobalt-60	pCi/L	7.49E-01	1.71E+00	1.50E+01	U
1/15/2019	Iodine-131	pCi/L	-1.99E+00	7.90E+00		U
1/15/2019	Iron-59	pCi/L	-4.43E-01	3.55E+00	3.00E+01	U
1/15/2019	Lanthanum-140	pCi/L	-1.12E+00	5.00E+00	1.50E+01	U
1/15/2019	Manganese-54	pCi/L	-2.21E-01	1.35E+00	1.50E+01	U
1/15/2019	Niobium-95	pCi/L	-5.88E-03	1.59E+00	1.50E+01	U
1/15/2019	Potassium-40	pCi/L	2.41E+01	1.39E+01		UI
1/15/2019	Zinc-65	pCi/L	-2.51E+00	2.37E+00	3.00E+01	U
1/15/2019	Zirconium-95	pCi/L	-1.33E+00	2.57E+00	1.50E+01	U
2/13/2019	Barium-140	pCi/L	-1.13E+00	1.05E+01	1.50E+01	U
2/13/2019	Beryllium-7	pCi/L	-2.55E+00	1.23E+01		U
2/13/2019	Cesium-134	pCi/L	4.13E-02	1.46E+00	1.50E+01	U
2/13/2019	Cobalt-58	pCi/L	-2.03E-01	1.42E+00	1.50E+01	U
2/13/2019	Cobalt-60	pCi/L	5.34E-01	1.48E+00	1.50E+01	U
2/13/2019	Iodine-131	pCi/L	-1.96E+00	4.85E+00		U
2/13/2019	Iron-59	pCi/L	-9.19E-01	3.08E+00	3.00E+01	U

2/13/2019	Lanthanum-140	pCi/L	-2.75E+00	3.93E+00	1.50E+01	U
2/13/2019	Manganese-54	pCi/L	-2.37E-02	1.33E+00	1.50E+01	U
2/13/2019	Niobium-95	pCi/L	1.06E+00	1.67E+00	1.50E+01	U
2/13/2019	Potassium-40	pCi/L	1.55E+01	1.29E+01		UI
2/13/2019	Zinc-65	pCi/L	-8.41E-01	2.75E+00	3.00E+01	U
2/13/2019	Zirconium-95	pCi/L	1.30E-01	2.52E+00	1.50E+01	U
3/25/2019	Barium-140	pCi/L	-4.68E-01	8.45E+00	1.50E+01	U
3/25/2019	Beryllium-7	pCi/L	5.09E+00	1.32E+01		U
3/25/2019	Cesium-134	pCi/L	7.54E-01	1.53E+00	1.50E+01	U
3/25/2019	Cobalt-58	pCi/L	-5.84E-01	1.24E+00	1.50E+01	U
3/25/2019	Cobalt-60	pCi/L	5.16E-01	1.63E+00	1.50E+01	U
3/25/2019	Iodine-131	pCi/L	4.84E-01	3.19E+00		U
3/25/2019	Iron-59	pCi/L	1.88E-01	2.83E+00	3.00E+01	U
3/25/2019	Lanthanum-140	pCi/L	-1.71E+00	2.45E+00	1.50E+01	U
3/25/2019	Manganese-54	pCi/L	-2.48E-01	1.24E+00	1.50E+01	U
3/25/2019	Niobium-95	pCi/L	9.81E-01	6.54E-01	1.50E+01	UI
3/25/2019	Potassium-40	pCi/L	5.40E-01	2.47E+01		U
3/25/2019	Zinc-65	pCi/L	-1.75E-02	2.80E+00	3.00E+01	U
3/25/2019	Zirconium-95	pCi/L	-6.91E-01	2.42E+00	1.50E+01	U
4/30/2019	Barium-140	pCi/L	1.85E-01	8.93E+00	1.50E+01	U
4/30/2019	Beryllium-7	pCi/L	-1.21E+00	1.45E+01		U
4/30/2019	Cesium-134	pCi/L	6.96E-01	1.95E+00	1.50E+01	U
4/30/2019	Cobalt-58	pCi/L	9.77E-01	1.82E+00	1.50E+01	U
4/30/2019	Cobalt-60	pCi/L	-5.71E-01	1.69E+00	1.50E+01	U
4/30/2019	Iodine-131	pCi/L	-6.75E-01	3.22E+00		U
4/30/2019	Iron-59	pCi/L	-1.98E+00	3.33E+00	3.00E+01	U
4/30/2019	Lanthanum-140	pCi/L	8.32E-01	2.83E+00	1.50E+01	U
4/30/2019	Manganese-54	pCi/L	3.65E-01	1.75E+00	1.50E+01	U
4/30/2019	Niobium-95	pCi/L	-5.17E-01	1.63E+00	1.50E+01	U
4/30/2019	Potassium-40	pCi/L	3.47E+01	1.62E+01		
4/30/2019	Zinc-65	pCi/L	1.68E+00	3.89E+00	3.00E+01	U
4/30/2019	Zirconium-95	pCi/L	2.17E-01	2.99E+00	1.50E+01	U
2/11/2019	Tritium	pCi/L	1.28E+04	4.78E+02	2.00E+03	
5/28/2019	Barium-140	pCi/L	-2.05E+00	7.22E+00	1.50E+01	U
5/28/2019	Beryllium-7	pCi/L	-1.38E+01	1.17E+01		U
5/28/2019	Cesium-134	pCi/L	9.81E-01	1.61E+00	1.50E+01	U
5/28/2019	Cobalt-58	pCi/L	-2.27E-01	1.21E+00	1.50E+01	U
5/28/2019	Cobalt-60	pCi/L	-2.52E-01	1.57E+00	1.50E+01	U
5/28/2019	Iodine-131	pCi/L	1.48E+00	3.22E+00		U
5/28/2019	Iron-59	pCi/L	3.49E-01	2.77E+00	3.00E+01	U
5/28/2019	Lanthanum-140	pCi/L	-7.72E-01	2.30E+00	1.50E+01	U
5/28/2019	Manganese-54	pCi/L	-8.72E-02	1.27E+00	1.50E+01	U
5/28/2019	Niobium-95	pCi/L	-7.53E-02	1.52E+00	1.50E+01	U
5/28/2019	Potassium-40	pCi/L	1.92E+01	1.34E+01		UI
5/28/2019	Zinc-65	pCi/L	-1.64E+00	2.53E+00	3.00E+01	U
5/28/2019	Zirconium-95	pCi/L	4.79E-01	2.53E+00	1.50E+01	U
6/25/2019	Barium-140	pCi/L	-1.92E+00	5.44E+00	1.50E+01	U

6/25/2019	Beryllium-7	pCi/L	3.25E+00	1.31E+01		U
6/25/2019	Cesium-134	pCi/L	5.40E-02	1.57E+00	1.50E+01	U
6/25/2019	Cobalt-58	pCi/L	5.82E-02	1.27E+00	1.50E+01	U
6/25/2019	Cobalt-60	pCi/L	-2.06E-01	1.57E+00	1.50E+01	U
6/25/2019	Iodine-131	pCi/L	6.85E-01	1.81E+00		U
6/25/2019	Iron-59	pCi/L	-1.47E+00	2.61E+00	3.00E+01	U
6/25/2019	Lanthanum-140	pCi/L	-4.24E-01	2.13E+00	1.50E+01	U
6/25/2019	Manganese-54	pCi/L	1.24E-01	1.27E+00	1.50E+01	U
6/25/2019	Niobium-95	pCi/L	8.78E-02	1.47E+00	1.50E+01	U
6/25/2019	Potassium-40	pCi/L	-1.65E+01	2.68E+01		U
6/25/2019	Zinc-65	pCi/L	1.44E+00	3.14E+00	3.00E+01	U
6/25/2019	Zirconium-95	pCi/L	-8.01E-01	2.23E+00	1.50E+01	U
7/30/2019	Barium-140	pCi/L	1.12E+00	6.54E+00	1.50E+01	U
7/30/2019	Beryllium-7	pCi/L	-9.69E-01	1.08E+01		U
7/30/2019	Cesium-134	pCi/L	-2.11E-01	1.34E+00	1.50E+01	U
7/30/2019	Cobalt-58	pCi/L	1.35E-01	1.39E+00	1.50E+01	U
7/30/2019	Cobalt-60	pCi/L	1.83E-01	1.45E+00	1.50E+01	U
7/30/2019	Iodine-131	pCi/L	-1.33E+00	2.22E+00		U
7/30/2019	Iron-59	pCi/L	-5.76E-01	2.41E+00	3.00E+01	U
7/30/2019	Lanthanum-140	pCi/L	3.12E-01	2.15E+00	1.50E+01	U
7/30/2019	Manganese-54	pCi/L	-2.27E-01	1.33E+00	1.50E+01	U
7/30/2019	Niobium-95	pCi/L	-4.42E-01	1.37E+00	1.50E+01	U
7/30/2019	Potassium-40	pCi/L	1.32E+01	1.44E+01		U
7/30/2019	Zinc-65	pCi/L	5.58E-01	2.76E+00	3.00E+01	U
7/30/2019	Zirconium-95	pCi/L	2.25E-01	2.43E+00	1.50E+01	U
5/28/2019	Tritium	pCi/L	1.24E+04	4.37E+02	2.00E+03	
8/27/2019	Barium-140	pCi/L	4.37E-01	6.32E+00	1.50E+01	U
8/27/2019	Beryllium-7	pCi/L	7.03E-01	1.20E+01		U
8/27/2019	Cesium-134	pCi/L	2.62E-01	1.45E+00	1.50E+01	U
8/27/2019	Cobalt-58	pCi/L	-9.38E-02	1.32E+00	1.50E+01	U
8/27/2019	Cobalt-60	pCi/L	4.33E-01	1.48E+00	1.50E+01	U
8/27/2019	Iodine-131	pCi/L	-2.38E+00	2.44E+00		U
8/27/2019	Iron-59	pCi/L	-1.97E+00	2.69E+00	3.00E+01	U
8/27/2019	Lanthanum-140	pCi/L	-3.09E-01	2.24E+00	1.50E+01	U
8/27/2019	Manganese-54	pCi/L	-6.16E-02	1.17E+00	1.50E+01	U
8/27/2019	Niobium-95	pCi/L	6.36E-01	1.50E+00	1.50E+01	U
8/27/2019	Potassium-40	pCi/L	1.91E+01	1.34E+01		UI
8/27/2019	Zinc-65	pCi/L	-1.38E+00	2.48E+00	3.00E+01	U
8/27/2019	Zirconium-95	pCi/L	8.57E-01	2.48E+00	1.50E+01	U
9/24/2019	Barium-140	pCi/L	4.51E-01	7.81E+00	1.50E+01	U
9/24/2019	Beryllium-7	pCi/L	3.30E+00	1.16E+01		U
9/24/2019	Cesium-134	pCi/L	-2.54E-01	1.47E+00	1.50E+01	U
9/24/2019	Cobalt-58	pCi/L	3.86E-01	1.40E+00	1.50E+01	U
9/24/2019	Cobalt-60	pCi/L	-3.53E-01	1.47E+00	1.50E+01	U
9/24/2019	Iodine-131	pCi/L	2.91E+00	3.03E+00		U
9/24/2019	Iron-59	pCi/L	-3.27E-01	2.91E+00	3.00E+01	U
9/24/2019	Lanthanum-140	pCi/L	-1.05E+00	2.53E+00	1.50E+01	U

9/24/2019	Manganese-54	pCi/L	-3.05E-01	1.24E+00	1.50E+01	U
9/24/2019	Niobium-95	pCi/L	-3.64E-01	1.44E+00	1.50E+01	U
9/24/2019	Potassium-40	pCi/L	-1.33E+00	2.29E+01		U
9/24/2019	Zinc-65	pCi/L	-2.88E-01	2.53E+00	3.00E+01	U
9/24/2019	Zirconium-95	pCi/L	-8.62E-03	2.42E+00	1.50E+01	U
10/29/2019	Barium-140	pCi/L	-1.41E+00	8.34E+00	1.50E+01	U
10/29/2019	Beryllium-7	pCi/L	-1.40E+00	1.29E+01		U
10/29/2019	Cesium-134	pCi/L	1.10E+00	1.63E+00	1.50E+01	U
10/29/2019	Cobalt-58	pCi/L	3.91E-01	1.49E+00	1.50E+01	U
10/29/2019	Cobalt-60	pCi/L	1.05E+00	1.76E+00	1.50E+01	U
10/29/2019	Iodine-131	pCi/L	-1.74E+00	3.18E+00		U
10/29/2019	Iron-59	pCi/L	-5.04E-01	2.91E+00	3.00E+01	U
10/29/2019	Lanthanum-140	pCi/L	-1.00E+00	2.68E+00	1.50E+01	U
10/29/2019	Manganese-54	pCi/L	1.30E+00	1.17E+00	1.50E+01	UI
10/29/2019	Niobium-95	pCi/L	1.41E+00	1.40E+00	1.50E+01	UI
10/29/2019	Potassium-40	pCi/L	-5.70E+00	2.55E+01		U
10/29/2019	Zinc-65	pCi/L	-1.33E-01	2.91E+00	3.00E+01	U
10/29/2019	Zirconium-95	pCi/L	-1.03E+00	2.74E+00	1.50E+01	U
8/27/2019	Tritium	pCi/L	7.77E+03	4.88E+02	2.00E+03	
11/26/2019	Barium-140	pCi/L	-1.75E+00	9.47E+00	1.50E+01	U
11/26/2019	Beryllium-7	pCi/L	-1.15E+00	1.51E+01		U
11/26/2019	Cesium-134	pCi/L	7.67E-01	1.94E+00	1.50E+01	U
11/26/2019	Cobalt-58	pCi/L	3.53E-02	1.67E+00	1.50E+01	U
11/26/2019	Cobalt-60	pCi/L	5.14E-02	1.72E+00	1.50E+01	U
11/26/2019	Iodine-131	pCi/L	1.49E+00	3.65E+00		U
11/26/2019	Iron-59	pCi/L	1.50E+00	4.00E+00	3.00E+01	U
11/26/2019	Lanthanum-140	pCi/L	1.36E+00	3.77E+00	1.50E+01	U
11/26/2019	Manganese-54	pCi/L	8.34E-01	1.74E+00	1.50E+01	U
11/26/2019	Niobium-95	pCi/L	6.05E-01	1.85E+00	1.50E+01	U
11/26/2019	Potassium-40	pCi/L	1.29E+01	1.69E+01		U
11/26/2019	Zinc-65	pCi/L	1.96E+00	3.78E+00	3.00E+01	U
11/26/2019	Zirconium-95	pCi/L	-1.60E+00	2.72E+00	1.50E+01	U
12/31/2019	Barium-140	pCi/L	2.02E+00	5.83E+00	1.50E+01	U
12/31/2019	Beryllium-7	pCi/L	4.77E+00	1.19E+01		U
12/31/2019	Cesium-134	pCi/L	3.92E-01	1.51E+00	1.50E+01	U
12/31/2019	Cobalt-58	pCi/L	-5.86E-01	1.15E+00	1.50E+01	U
12/31/2019	Cobalt-60	pCi/L	-6.41E-02	1.46E+00	1.50E+01	U
12/31/2019	Iodine-131	pCi/L	4.47E-01	1.87E+00		U
12/31/2019	Iron-59	pCi/L	8.88E-01	2.73E+00	3.00E+01	U
12/31/2019	Lanthanum-140	pCi/L	-4.14E-01	1.85E+00	1.50E+01	U
12/31/2019	Manganese-54	pCi/L	-3.01E-01	1.29E+00	1.50E+01	U
12/31/2019	Niobium-95	pCi/L	3.14E-01	1.27E+00	1.50E+01	U
12/31/2019	Potassium-40	pCi/L	2.37E+01	1.43E+01		
12/31/2019	Zinc-65	pCi/L	9.16E-01	3.02E+00	3.00E+01	U
12/31/2019	Zirconium-95	pCi/L	5.32E-02	2.17E+00	1.50E+01	U
12/31/2019	Tritium	pCi/L	7.95E+03	4.40E+02	2.00E+03	

Ground Water Results

GW-1 W-1.2

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
3/25/2019 8:41	Barium-140	pCi/L	5.29E+00	1.03E+01	1.50E+01	U
3/25/2019 8:41	Beryllium-7	pCi/L	2.26E+00	1.31E+01		U
3/25/2019 8:41	Cesium-134	pCi/L	-2.32E-01	1.66E+00	1.50E+01	U
3/25/2019 8:41	Cesium-137	pCi/L	-5.52E-01	1.55E+00	1.80E+01	U
3/25/2019 8:41	Cobalt-58	pCi/L	2.49E-01	1.74E+00	1.50E+01	U
3/25/2019 8:41	Cobalt-60	pCi/L	8.96E-01	2.09E+00	1.50E+01	U
3/25/2019 8:41	Iodine-131	pCi/L	-1.50E+00	3.65E+00		U
3/25/2019 8:41	Iron-59	pCi/L	-8.68E-01	3.64E+00	3.00E+01	U
3/25/2019 8:41	Lanthanum-140	pCi/L	1.71E-01	3.47E+00	1.50E+01	U
3/25/2019 8:41	Manganese-54	pCi/L	7.98E-03	1.74E+00	1.50E+01	U
3/25/2019 8:41	Niobium-95	pCi/L	-1.27E+00	1.77E+00	1.50E+01	U
3/25/2019 8:41	Potassium-40	pCi/L	-1.11E+01	2.75E+01		U
3/25/2019 8:41	Zinc-65	pCi/L	-1.01E+00	3.91E+00	3.00E+01	U
3/25/2019 8:41	Zirconium-95	pCi/L	-1.86E-01	2.94E+00	1.50E+01	U
3/25/2019 8:41	Tritium	pCi/L	7.95E+01	4.46E+02	2.00E+03	U
6/25/2019 6:56	Barium-140	pCi/L	7.79E-01	5.81E+00	1.50E+01	U
6/25/2019 6:56	Beryllium-7	pCi/L	8.88E+00	1.22E+01		U
6/25/2019 6:56	Cesium-134	pCi/L	7.00E-01	1.43E+00	1.50E+01	U
6/25/2019 6:56	Cesium-137	pCi/L	-2.90E-01	1.89E+00	1.80E+01	U
6/25/2019 6:56	Cobalt-58	pCi/L	-1.79E-01	1.24E+00	1.50E+01	U
6/25/2019 6:56	Cobalt-60	pCi/L	6.10E-01	1.63E+00	1.50E+01	U
6/25/2019 6:56	Iodine-131	pCi/L	-1.14E+00	1.77E+00		U
6/25/2019 6:56	Iron-59	pCi/L	-7.65E-02	2.43E+00	3.00E+01	U
6/25/2019 6:56	Lanthanum-140	pCi/L	1.11E-01	1.97E+00	1.50E+01	U
6/25/2019 6:56	Manganese-54	pCi/L	-4.05E-01	1.32E+00	1.50E+01	U
6/25/2019 6:56	Niobium-95	pCi/L	-5.83E-01	1.42E+00	1.50E+01	U
6/25/2019 6:56	Potassium-40	pCi/L	-3.59E+00	1.97E+01		U
6/25/2019 6:56	Zinc-65	pCi/L	-6.77E-01	2.82E+00	3.00E+01	U
6/25/2019 6:56	Zirconium-95	pCi/L	-3.85E-01	2.25E+00	1.50E+01	U
6/25/2019 6:56	Tritium	pCi/L	2.09E+02	4.42E+02	2.00E+03	U
9/24/2019 7:27	Barium-140	pCi/L	-4.58E+00	8.46E+00	1.50E+01	U
9/24/2019 7:27	Beryllium-7	pCi/L	-8.45E+00	1.26E+01		U
9/24/2019 7:27	Cesium-134	pCi/L	8.57E-01	1.70E+00	1.50E+01	U
9/24/2019 7:27	Cesium-137	pCi/L	1.66E-01	1.55E+00	1.80E+01	U
9/24/2019 7:27	Cobalt-58	pCi/L	-3.54E-01	1.41E+00	1.50E+01	U
9/24/2019 7:27	Cobalt-60	pCi/L	3.74E-01	1.38E+00	1.50E+01	U
9/24/2019 7:27	Iodine-131	pCi/L	-7.47E-01	3.40E+00		U
9/24/2019 7:27	Iron-59	pCi/L	-1.77E+00	2.86E+00	3.00E+01	U
9/24/2019 7:27	Lanthanum-140	pCi/L	-6.47E-01	2.78E+00	1.50E+01	U
9/24/2019 7:27	Manganese-54	pCi/L	1.24E-01	1.39E+00	1.50E+01	U
9/24/2019 7:27	Niobium-95	pCi/L	-1.77E+00	1.42E+00	1.50E+01	U
9/24/2019 7:27	Potassium-40	pCi/L	2.93E+00	1.75E+01		U

9/24/2019 7:27	Zinc-65	pCi/L	8.17E-01	3.13E+00	3.00E+01	U
9/24/2019 7:27	Zirconium-95	pCi/L	-5.60E-01	2.70E+00	1.50E+01	U
9/24/2019 7:27	Tritium	pCi/L	-1.02E+02	4.16E+02	2.00E+03	U
12/31/2019 7:53	Barium-140	pCi/L	-1.67E+00	5.28E+00	1.50E+01	U
12/31/2019 7:53	Beryllium-7	pCi/L	1.51E+00	1.16E+01		U
12/31/2019 7:53	Cesium-134	pCi/L	7.08E-01	1.61E+00	1.50E+01	U
12/31/2019 7:53	Cesium-137	pCi/L	2.82E-01	1.47E+00	1.80E+01	U
12/31/2019 7:53	Cobalt-58	pCi/L	-1.73E-01	1.28E+00	1.50E+01	U
12/31/2019 7:53	Cobalt-60	pCi/L	5.55E-01	1.45E+00	1.50E+01	U
12/31/2019 7:53	Iodine-131	pCi/L	-5.07E-01	1.74E+00		U
12/31/2019 7:53	Iron-59	pCi/L	-3.66E-01	2.37E+00	3.00E+01	U
12/31/2019 7:53	Lanthanum-140	pCi/L	-3.96E-01	1.72E+00	1.50E+01	U
12/31/2019 7:53	Manganese-54	pCi/L	-1.10E-01	1.34E+00	1.50E+01	U
12/31/2019 7:53	Niobium-95	pCi/L	1.04E+00	1.38E+00	1.50E+01	U
12/31/2019 7:53	Potassium-40	pCi/L	1.23E+01	1.33E+01		U
12/31/2019 7:53	Zinc-65	pCi/L	8.95E-01	2.87E+00	3.00E+01	U
12/31/2019 7:53	Zirconium-95	pCi/L	-5.50E-01	2.25E+00	1.50E+01	U
12/31/2019 7:53	Tritium	pCi/L	9.41E+00	5.44E+02	2.00E+03	U

GW-2 WSW-.01

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
3/25/2019 8:02	Barium-140	pCi/L	1.40E+00	1.05E+01	1.50E+01	U
3/25/2019 8:02	Beryllium-7	pCi/L	-3.82E+00	1.39E+01		U
3/25/2019 8:02	Cesium-134	pCi/L	5.55E-01	2.01E+00	1.50E+01	U
3/25/2019 8:02	Cesium-137	pCi/L	-6.29E-01	1.82E+00	1.80E+01	U
3/25/2019 8:02	Cobalt-58	pCi/L	3.14E-01	1.78E+00	1.50E+01	U
3/25/2019 8:02	Cobalt-60	pCi/L	1.26E+00	2.07E+00	1.50E+01	U
3/25/2019 8:02	Iodine-131	pCi/L	2.08E+00	3.97E+00		U
3/25/2019 8:02	Iron-59	pCi/L	2.77E-01	3.61E+00	3.00E+01	U
3/25/2019 8:02	Lanthanum-140	pCi/L	5.86E-01	3.92E+00	1.50E+01	U
3/25/2019 8:02	Manganese-54	pCi/L	2.20E-02	1.64E+00	1.50E+01	U
3/25/2019 8:02	Niobium-95	pCi/L	2.65E-01	1.82E+00	1.50E+01	U
3/25/2019 8:02	Potassium-40	pCi/L	8.47E-01	1.52E+01		U
3/25/2019 8:02	Zinc-65	pCi/L	-5.12E-01	3.43E+00	3.00E+01	U
3/25/2019 8:02	Zirconium-95	pCi/L	2.51E+00	3.59E+00	1.50E+01	U
3/25/2019 8:02	Tritium	pCi/L	1.58E+00	4.49E+02	2.00E+03	U
6/25/2019 6:50	Barium-140	pCi/L	-5.22E-01	6.48E+00	1.50E+01	U
6/25/2019 6:50	Beryllium-7	pCi/L	1.39E+00	1.36E+01		U
6/25/2019 6:50	Cesium-134	pCi/L	4.10E-01	1.74E+00	1.50E+01	U
6/25/2019 6:50	Cesium-137	pCi/L	-4.78E-01	1.82E+00	1.80E+01	U
6/25/2019 6:50	Cobalt-58	pCi/L	2.58E-01	1.67E+00	1.50E+01	U
6/25/2019 6:50	Cobalt-60	pCi/L	-6.83E-01	1.58E+00	1.50E+01	U
6/25/2019 6:50	Iodine-131	pCi/L	1.00E+00	2.27E+00		U
6/25/2019 6:50	Iron-59	pCi/L	-1.03E+00	2.80E+00	3.00E+01	U
6/25/2019 6:50	Lanthanum-140	pCi/L	-1.27E+00	2.05E+00	1.50E+01	U
6/25/2019 6:50	Manganese-54	pCi/L	-1.98E-01	1.63E+00	1.50E+01	U

6/25/2019 6:50	Niobium-95	pCi/L	7.40E-01	1.65E+00	1.50E+01	U
6/25/2019 6:50	Potassium-40	pCi/L	2.27E+00	1.60E+01		U
6/25/2019 6:50	Zinc-65	pCi/L	7.50E-01	3.58E+00	3.00E+01	U
6/25/2019 6:50	Zirconium-95	pCi/L	-1.09E+00	2.79E+00	1.50E+01	U
6/25/2019 6:50	Tritium	pCi/L	1.51E+02	4.35E+02	2.00E+03	U
9/24/2019 8:05	Barium-140	pCi/L	-3.87E+00	8.38E+00	1.50E+01	U
9/24/2019 8:05	Beryllium-7	pCi/L	1.25E+01	1.31E+01		U
9/24/2019 8:05	Cesium-134	pCi/L	6.15E-02	1.73E+00	1.50E+01	U
9/24/2019 8:05	Cesium-137	pCi/L	-1.01E-01	1.38E+00	1.80E+01	U
9/24/2019 8:05	Cobalt-58	pCi/L	-5.48E-02	1.43E+00	1.50E+01	U
9/24/2019 8:05	Cobalt-60	pCi/L	-2.80E-01	1.46E+00	1.50E+01	U
9/24/2019 8:05	Iodine-131	pCi/L	9.26E-01	3.49E+00		U
9/24/2019 8:05	Iron-59	pCi/L	9.45E-01	3.47E+00	3.00E+01	U
9/24/2019 8:05	Lanthanum-140	pCi/L	-2.40E+00	2.99E+00	1.50E+01	U
9/24/2019 8:05	Manganese-54	pCi/L	1.08E-01	1.51E+00	1.50E+01	U
9/24/2019 8:05	Niobium-95	pCi/L	5.44E-01	1.61E+00	1.50E+01	U
9/24/2019 8:05	Potassium-40	pCi/L	1.96E+01	1.39E+01		UI
9/24/2019 8:05	Zinc-65	pCi/L	-2.10E-01	2.98E+00	3.00E+01	U
9/24/2019 8:05	Zirconium-95	pCi/L	1.38E+00	2.67E+00	1.50E+01	U
9/24/2019 8:05	Tritium	pCi/L	-5.57E+01	4.23E+02	2.00E+03	U
12/31/2019 7:11	Barium-140	pCi/L	-7.36E-01	5.46E+00	1.50E+01	U
12/31/2019 7:11	Beryllium-7	pCi/L	7.29E+00	1.22E+01		U
12/31/2019 7:11	Cesium-134	pCi/L	2.14E-01	1.50E+00	1.50E+01	U
12/31/2019 7:11	Cesium-137	pCi/L	5.29E-01	1.46E+00	1.80E+01	U
12/31/2019 7:11	Cobalt-58	pCi/L	-4.05E-01	1.38E+00	1.50E+01	U
12/31/2019 7:11	Cobalt-60	pCi/L	1.56E-01	1.48E+00	1.50E+01	U
12/31/2019 7:11	Iodine-131	pCi/L	-6.02E-02	1.84E+00		U
12/31/2019 7:11	Iron-59	pCi/L	7.14E-01	2.83E+00	3.00E+01	U
12/31/2019 7:11	Lanthanum-140	pCi/L	-8.61E-01	1.86E+00	1.50E+01	U
12/31/2019 7:11	Manganese-54	pCi/L	2.40E-01	1.51E+00	1.50E+01	U
12/31/2019 7:11	Niobium-95	pCi/L	-8.65E-01	1.44E+00	1.50E+01	U
12/31/2019 7:11	Potassium-40	pCi/L	3.00E+00	1.47E+01		U
12/31/2019 7:11	Zinc-65	pCi/L	1.14E+00	2.38E+00	3.00E+01	U
12/31/2019 7:11	Zirconium-95	pCi/L	-9.35E-01	2.36E+00	1.50E+01	U
12/31/2019 7:11	Tritium	pCi/L	6.93E+01	5.55E+02	2.00E+03	U

GW-3 SSE-4.6

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
3/25/2019 9:41	Barium-140	pCi/L	-6.13E+00	9.90E+00	1.50E+01	U
3/25/2019 9:41	Beryllium-7	pCi/L	8.01E+00	1.59E+01		U
3/25/2019 9:41	Cesium-134	pCi/L	2.02E+00	2.19E+00	1.50E+01	U
3/25/2019 9:41	Cesium-137	pCi/L	-1.70E-01	2.06E+00	1.80E+01	U
3/25/2019 9:41	Cobalt-58	pCi/L	2.28E-01	1.87E+00	1.50E+01	U
3/25/2019 9:41	Cobalt-60	pCi/L	2.90E-01	1.90E+00	1.50E+01	U
3/25/2019 9:41	Iodine-131	pCi/L	1.15E+00	3.98E+00		U
3/25/2019 9:41	Iron-59	pCi/L	1.66E+00	4.43E+00	3.00E+01	U

3/25/2019 9:41	Lanthanum-140	pCi/L	7.73E-01	3.86E+00	1.50E+01	U
3/25/2019 9:41	Manganese-54	pCi/L	-4.57E-01	1.80E+00	1.50E+01	U
3/25/2019 9:41	Niobium-95	pCi/L	5.39E-01	2.12E+00	1.50E+01	U
3/25/2019 9:41	Potassium-40	pCi/L	6.94E+00	2.05E+01		U
3/25/2019 9:41	Zinc-65	pCi/L	-8.15E-01	3.89E+00	3.00E+01	U
3/25/2019 9:41	Zirconium-95	pCi/L	-1.21E+00	3.14E+00	1.50E+01	U
3/25/2019 9:41	Tritium	pCi/L	4.27E+01	4.39E+02	2.00E+03	U
6/25/2019 8:19	Barium-140	pCi/L	6.13E-01	6.23E+00	1.50E+01	U
6/25/2019 8:19	Beryllium-7	pCi/L	-1.95E+00	1.23E+01		U
6/25/2019 8:19	Cesium-134	pCi/L	-2.20E-01	1.63E+00	1.50E+01	U
6/25/2019 8:19	Cesium-137	pCi/L	4.04E-01	1.76E+00	1.80E+01	U
6/25/2019 8:19	Cobalt-58	pCi/L	2.64E-01	1.62E+00	1.50E+01	U
6/25/2019 8:19	Cobalt-60	pCi/L	-7.29E-01	1.46E+00	1.50E+01	U
6/25/2019 8:19	Iodine-131	pCi/L	-7.24E-01	2.03E+00		U
6/25/2019 8:19	Iron-59	pCi/L	1.40E+00	3.38E+00	3.00E+01	U
6/25/2019 8:19	Lanthanum-140	pCi/L	4.76E-02	2.09E+00	1.50E+01	U
6/25/2019 8:19	Manganese-54	pCi/L	2.80E-01	1.66E+00	1.50E+01	U
6/25/2019 8:19	Niobium-95	pCi/L	3.69E+00	1.49E+00	1.50E+01	UI
6/25/2019 8:19	Potassium-40	pCi/L	-1.16E+01	2.48E+01		U
6/25/2019 8:19	Zinc-65	pCi/L	-1.54E+00	2.92E+00	3.00E+01	U
6/25/2019 8:19	Zirconium-95	pCi/L	1.28E+00	2.92E+00	1.50E+01	U
6/25/2019 8:19	Tritium	pCi/L	1.62E+02	4.19E+02	2.00E+03	U
9/24/2019 9:22	Barium-140	pCi/L	-6.96E+00	8.64E+00	1.50E+01	U
9/24/2019 9:22	Beryllium-7	pCi/L	-1.88E+00	1.29E+01		U
9/24/2019 9:22	Cesium-134	pCi/L	-6.55E-01	1.45E+00	1.50E+01	U
9/24/2019 9:22	Cesium-137	pCi/L	7.39E-02	1.45E+00	1.80E+01	U
9/24/2019 9:22	Cobalt-58	pCi/L	-6.66E-02	1.51E+00	1.50E+01	U
9/24/2019 9:22	Cobalt-60	pCi/L	-1.42E-01	1.54E+00	1.50E+01	U
9/24/2019 9:22	Iodine-131	pCi/L	-8.05E-01	3.55E+00		U
9/24/2019 9:22	Iron-59	pCi/L	-2.57E-01	3.05E+00	3.00E+01	U
9/24/2019 9:22	Lanthanum-140	pCi/L	-3.17E+00	2.57E+00	1.50E+01	U
9/24/2019 9:22	Manganese-54	pCi/L	6.75E-01	1.53E+00	1.50E+01	U
9/24/2019 9:22	Niobium-95	pCi/L	3.30E-01	1.57E+00	1.50E+01	U
9/24/2019 9:22	Potassium-40	pCi/L	2.65E+00	2.63E+01		U
9/24/2019 9:22	Zinc-65	pCi/L	2.15E-01	3.17E+00	3.00E+01	U
9/24/2019 9:22	Zirconium-95	pCi/L	6.24E-01	2.68E+00	1.50E+01	U
9/24/2019 9:22	Tritium	pCi/L	-1.04E+02	4.23E+02	2.00E+03	U
12/31/2019 8:40	Barium-140	pCi/L	2.48E+00	6.89E+00	1.50E+01	U
12/31/2019 8:40	Beryllium-7	pCi/L	-6.34E-01	1.34E+01		U
12/31/2019 8:40	Cesium-134	pCi/L	8.99E-01	2.01E+00	1.50E+01	U
12/31/2019 8:40	Cesium-137	pCi/L	4.46E-01	1.76E+00	1.80E+01	U
12/31/2019 8:40	Cobalt-58	pCi/L	2.76E-01	1.68E+00	1.50E+01	U
12/31/2019 8:40	Cobalt-60	pCi/L	-8.69E-01	1.78E+00	1.50E+01	U
12/31/2019 8:40	Iodine-131	pCi/L	1.18E-02	2.26E+00		U
12/31/2019 8:40	Iron-59	pCi/L	4.50E-01	3.67E+00	3.00E+01	U
12/31/2019 8:40	Lanthanum-140	pCi/L	-4.34E-01	2.43E+00	1.50E+01	U
12/31/2019 8:40	Manganese-54	pCi/L	1.66E-01	1.73E+00	1.50E+01	U

12/31/2019 8:40	Niobium-95	pCi/L	2.82E-01	1.74E+00	1.50E+01	U
12/31/2019 8:40	Potassium-40	pCi/L	-1.82E+01	2.67E+01		U
12/31/2019 8:40	Zinc-65	pCi/L	-2.24E+00	3.49E+00	3.00E+01	U
12/31/2019 8:40	Zirconium-95	pCi/L	-6.16E-01	3.01E+00	1.50E+01	U
12/31/2019 8:40	Tritium	pCi/L	-2.58E+02	5.66E+02	2.00E+03	U

GW-4 N-9.8

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
3/25/2019 11:31	Barium-140	pCi/L	4.82E+00	9.49E+00	1.50E+01	U
3/25/2019 11:31	Beryllium-7	pCi/L	-4.80E+00	1.28E+01		U
3/25/2019 11:31	Cesium-134	pCi/L	1.95E-01	1.71E+00	1.50E+01	U
3/25/2019 11:31	Cesium-137	pCi/L	-3.15E-01	1.63E+00	1.80E+01	U
3/25/2019 11:31	Cobalt-58	pCi/L	2.28E-01	1.62E+00	1.50E+01	U
3/25/2019 11:31	Cobalt-60	pCi/L	4.50E-01	1.65E+00	1.50E+01	U
3/25/2019 11:31	Iodine-131	pCi/L	-2.66E-01	3.34E+00		U
3/25/2019 11:31	Iron-59	pCi/L	1.20E+00	3.32E+00	3.00E+01	U
3/25/2019 11:31	Lanthanum-140	pCi/L	-3.79E-01	2.99E+00	1.50E+01	U
3/25/2019 11:31	Manganese-54	pCi/L	-1.53E+00	1.67E+00	1.50E+01	U
3/25/2019 11:31	Niobium-95	pCi/L	6.88E-01	1.89E+00	1.50E+01	U
3/25/2019 11:31	Potassium-40	pCi/L	3.80E+01	1.55E+01		
3/25/2019 11:31	Zinc-65	pCi/L	3.95E-01	3.61E+00	3.00E+01	U
3/25/2019 11:31	Zirconium-95	pCi/L	-1.19E-01	2.88E+00	1.50E+01	U
3/25/2019 11:31	Tritium	pCi/L	9.66E+01	4.50E+02	2.00E+03	U
6/25/2019 9:37	Barium-140	pCi/L	3.08E+00	6.99E+00	1.50E+01	U
6/25/2019 9:37	Beryllium-7	pCi/L	-4.00E+00	1.28E+01		U
6/25/2019 9:37	Cesium-134	pCi/L	-3.58E-01	1.69E+00	1.50E+01	U
6/25/2019 9:37	Cesium-137	pCi/L	-2.55E-01	1.72E+00	1.80E+01	U
6/25/2019 9:37	Cobalt-58	pCi/L	-6.85E-02	1.49E+00	1.50E+01	U
6/25/2019 9:37	Cobalt-60	pCi/L	2.16E-01	1.81E+00	1.50E+01	U
6/25/2019 9:37	Iodine-131	pCi/L	1.97E-02	2.25E+00		U
6/25/2019 9:37	Iron-59	pCi/L	4.12E-01	3.57E+00	3.00E+01	U
6/25/2019 9:37	Lanthanum-140	pCi/L	-3.46E-01	2.17E+00	1.50E+01	U
6/25/2019 9:37	Manganese-54	pCi/L	-1.49E+00	1.50E+00	1.50E+01	U
6/25/2019 9:37	Niobium-95	pCi/L	5.19E-01	1.76E+00	1.50E+01	U
6/25/2019 9:37	Potassium-40	pCi/L	9.28E+00	1.76E+01		U
6/25/2019 9:37	Zinc-65	pCi/L	-1.76E+00	2.96E+00	3.00E+01	U
6/25/2019 9:37	Zirconium-95	pCi/L	-3.95E-01	2.58E+00	1.50E+01	U
6/25/2019 9:37	Tritium	pCi/L	2.57E+02	4.53E+02	2.00E+03	U
9/24/2019 10:52	Barium-140	pCi/L	1.67E+00	9.92E+00	1.50E+01	U
9/24/2019 10:52	Beryllium-7	pCi/L	-9.42E-01	1.46E+01		U
9/24/2019 10:52	Cesium-134	pCi/L	5.08E-02	1.81E+00	1.50E+01	U
9/24/2019 10:52	Cesium-137	pCi/L	-2.28E-02	1.72E+00	1.80E+01	U
9/24/2019 10:52	Cobalt-58	pCi/L	1.33E-01	1.68E+00	1.50E+01	U
9/24/2019 10:52	Cobalt-60	pCi/L	1.33E-01	1.71E+00	1.50E+01	U
9/24/2019 10:52	Iodine-131	pCi/L	3.20E-01	3.91E+00		U
9/24/2019 10:52	Iron-59	pCi/L	7.49E-01	3.64E+00	3.00E+01	U

9/24/2019 10:52	Lanthanum-140	pCi/L	-1.32E-01	3.34E+00	1.50E+01	U
9/24/2019 10:52	Manganese-54	pCi/L	-6.93E-02	1.59E+00	1.50E+01	U
9/24/2019 10:52	Niobium-95	pCi/L	1.05E+00	1.80E+00	1.50E+01	U
9/24/2019 10:52	Potassium-40	pCi/L	-4.88E+00	2.18E+01		U
9/24/2019 10:52	Zinc-65	pCi/L	5.51E-01	3.22E+00	3.00E+01	U
9/24/2019 10:52	Zirconium-95	pCi/L	2.31E+00	3.20E+00	1.50E+01	U
9/24/2019 10:52	Tritium	pCi/L	-3.91E+01	4.28E+02	2.00E+03	U
12/31/2019 10:00	Barium-140	pCi/L	-6.51E-01	5.82E+00	1.50E+01	U
12/31/2019 10:00	Beryllium-7	pCi/L	6.90E+00	1.32E+01		U
12/31/2019 10:00	Cesium-134	pCi/L	-8.66E-01	1.61E+00	1.50E+01	U
12/31/2019 10:00	Cesium-137	pCi/L	3.64E-01	1.51E+00	1.80E+01	U
12/31/2019 10:00	Cobalt-58	pCi/L	-3.78E-01	1.37E+00	1.50E+01	U
12/31/2019 10:00	Cobalt-60	pCi/L	3.93E-01	1.56E+00	1.50E+01	U
12/31/2019 10:00	Iodine-131	pCi/L	4.77E-01	2.02E+00		U
12/31/2019 10:00	Iron-59	pCi/L	-3.79E-01	2.88E+00	3.00E+01	U
12/31/2019 10:00	Lanthanum-140	pCi/L	-3.37E-01	1.87E+00	1.50E+01	U
12/31/2019 10:00	Manganese-54	pCi/L	3.55E-01	1.36E+00	1.50E+01	U
12/31/2019 10:00	Niobium-95	pCi/L	-2.38E-01	1.41E+00	1.50E+01	U
12/31/2019 10:00	Potassium-40	pCi/L	-4.63E+00	2.21E+01		U
12/31/2019 10:00	Zinc-65	pCi/L	-1.37E+00	2.84E+00	3.00E+01	U
12/31/2019 10:00	Zirconium-95	pCi/L	1.37E+00	2.28E+00	1.50E+01	U
12/31/2019 10:00	Tritium	pCi/L	1.16E+02	5.59E+02	2.00E+03	U

GW-5 N-1.45

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
3/25/2019 10:31	Barium-140	pCi/L	-2.47E+00	9.47E+00	1.50E+01	U
3/25/2019 10:31	Beryllium-7	pCi/L	-4.58E+00	1.48E+01		U
3/25/2019 10:31	Cesium-134	pCi/L	2.62E-01	1.77E+00	1.50E+01	U
3/25/2019 10:31	Cesium-137	pCi/L	-1.08E-01	1.64E+00	1.80E+01	U
3/25/2019 10:31	Cobalt-58	pCi/L	-4.13E-01	1.61E+00	1.50E+01	U
3/25/2019 10:31	Cobalt-60	pCi/L	3.75E-01	2.07E+00	1.50E+01	U
3/25/2019 10:31	Iodine-131	pCi/L	-3.66E+00	4.21E+00		U
3/25/2019 10:31	Iron-59	pCi/L	3.05E-01	3.78E+00	3.00E+01	U
3/25/2019 10:31	Lanthanum-140	pCi/L	-2.60E+00	3.13E+00	1.50E+01	U
3/25/2019 10:31	Manganese-54	pCi/L	2.08E-01	1.73E+00	1.50E+01	U
3/25/2019 10:31	Niobium-95	pCi/L	-5.42E-01	1.73E+00	1.50E+01	U
3/25/2019 10:31	Potassium-40	pCi/L	1.47E+01	1.70E+01		U
3/25/2019 10:31	Zinc-65	pCi/L	1.50E+00	3.67E+00	3.00E+01	U
3/25/2019 10:31	Zirconium-95	pCi/L	-1.50E+00	3.00E+00	1.50E+01	U
3/25/2019 10:31	Tritium	pCi/L	6.55E+01	4.49E+02	2.00E+03	U
6/25/2019 8:49	Barium-140	pCi/L	-1.80E+00	6.06E+00	1.50E+01	U
6/25/2019 8:49	Beryllium-7	pCi/L	2.71E+00	1.35E+01		U
6/25/2019 8:49	Cesium-134	pCi/L	5.68E-01	1.66E+00	1.50E+01	U
6/25/2019 8:49	Cesium-137	pCi/L	-1.99E+00	1.57E+00	1.80E+01	U
6/25/2019 8:49	Cobalt-58	pCi/L	-1.05E+00	1.31E+00	1.50E+01	U
6/25/2019 8:49	Cobalt-60	pCi/L	-3.98E-01	1.46E+00	1.50E+01	U

6/25/2019 8:49	Iodine-131	pCi/L	5.80E-01	2.10E+00		U
6/25/2019 8:49	Iron-59	pCi/L	-9.15E-01	3.19E+00	3.00E+01	U
6/25/2019 8:49	Lanthanum-140	pCi/L	6.14E-01	2.75E+00	1.50E+01	U
6/25/2019 8:49	Manganese-54	pCi/L	-3.03E-01	1.58E+00	1.50E+01	U
6/25/2019 8:49	Niobium-95	pCi/L	-4.65E-01	1.56E+00	1.50E+01	U
6/25/2019 8:49	Potassium-40	pCi/L	1.40E+01	2.63E+01		U
6/25/2019 8:49	Zinc-65	pCi/L	8.56E-02	3.20E+00	3.00E+01	U
6/25/2019 8:49	Zirconium-95	pCi/L	5.31E-01	2.79E+00	1.50E+01	U
6/25/2019 8:49	Tritium	pCi/L	2.09E+02	4.41E+02	2.00E+03	U
9/24/2019 9:52	Barium-140	pCi/L	4.44E+00	9.08E+00	1.50E+01	U
9/24/2019 9:52	Beryllium-7	pCi/L	-2.91E+00	1.19E+01		U
9/24/2019 9:52	Cesium-134	pCi/L	-4.28E-01	1.59E+00	1.50E+01	U
9/24/2019 9:52	Cesium-137	pCi/L	7.20E-01	1.40E+00	1.80E+01	U
9/24/2019 9:52	Cobalt-58	pCi/L	-3.45E-02	1.46E+00	1.50E+01	U
9/24/2019 9:52	Cobalt-60	pCi/L	9.33E-02	1.48E+00	1.50E+01	U
9/24/2019 9:52	Iodine-131	pCi/L	7.06E-01	3.47E+00		U
9/24/2019 9:52	Iron-59	pCi/L	1.87E-02	2.90E+00	3.00E+01	U
9/24/2019 9:52	Lanthanum-140	pCi/L	-1.34E+00	2.62E+00	1.50E+01	U
9/24/2019 9:52	Manganese-54	pCi/L	-8.47E-01	1.21E+00	1.50E+01	U
9/24/2019 9:52	Niobium-95	pCi/L	-6.27E-01	1.40E+00	1.50E+01	U
9/24/2019 9:52	Potassium-40	pCi/L	9.41E+00	1.44E+01		U
9/24/2019 9:52	Zinc-65	pCi/L	-1.77E-03	2.83E+00	3.00E+01	U
9/24/2019 9:52	Zirconium-95	pCi/L	3.09E-01	2.43E+00	1.50E+01	U
9/24/2019 9:52	Tritium	pCi/L	-5.59E+01	4.25E+02	2.00E+03	U
12/31/2019 9:06	Barium-140	pCi/L	1.99E+00	7.06E+00	1.50E+01	U
12/31/2019 9:06	Beryllium-7	pCi/L	6.90E+00	1.31E+01		U
12/31/2019 9:06	Cesium-134	pCi/L	-3.43E-01	1.80E+00	1.50E+01	U
12/31/2019 9:06	Cesium-137	pCi/L	4.37E-01	1.76E+00	1.80E+01	U
12/31/2019 9:06	Cobalt-58	pCi/L	1.91E-01	1.59E+00	1.50E+01	U
12/31/2019 9:06	Cobalt-60	pCi/L	1.78E-01	1.79E+00	1.50E+01	U
12/31/2019 9:06	Iodine-131	pCi/L	2.15E+00	2.27E+00		U
12/31/2019 9:06	Iron-59	pCi/L	2.23E+00	3.21E+00	3.00E+01	U
12/31/2019 9:06	Lanthanum-140	pCi/L	-4.82E-01	2.54E+00	1.50E+01	U
12/31/2019 9:06	Manganese-54	pCi/L	-1.95E-01	1.69E+00	1.50E+01	U
12/31/2019 9:06	Niobium-95	pCi/L	-4.62E-01	1.55E+00	1.50E+01	U
12/31/2019 9:06	Potassium-40	pCi/L	7.69E+00	1.66E+01		U
12/31/2019 9:06	Zinc-65	pCi/L	-1.32E+00	3.20E+00	3.00E+01	U
12/31/2019 9:06	Zirconium-95	pCi/L	-7.02E-02	2.81E+00	1.50E+01	U
12/31/2019 9:06	Tritium	pCi/L	-2.59E+02	5.46E+02	2.00E+03	U

Broad Leaf Results

BL-1

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019	Barium-140	pCi/kg	9.71E+01	1.83E+02		U
1/29/2019	Beryllium-7	pCi/kg	1.30E+04	3.09E+02		
1/29/2019	Cesium-134	pCi/kg	1.80E+01	4.35E+01	6.00E+01	U
1/29/2019	Cesium-137	pCi/kg	-6.57E+00	4.21E+01	8.00E+01	U
1/29/2019	Cobalt-57	pCi/kg	1.05E+01	2.70E+01		U
1/29/2019	Cobalt-58	pCi/kg	-4.58E+00	3.52E+01		U
1/29/2019	Cobalt-60	pCi/kg	-6.69E+00	3.82E+01		U
1/29/2019	Iodine-131	pCi/kg	-1.45E+01	6.07E+01	6.00E+01	DLU
1/29/2019	Iron-59	pCi/kg	1.95E+01	7.82E+01		U
1/29/2019	Lanthanum-140	pCi/kg	1.34E+02	6.47E+01		UI
1/29/2019	Manganese-54	pCi/kg	-1.11E+01	3.70E+01		U
1/29/2019	Niobium-95	pCi/kg	-2.25E-01	3.96E+01		U
1/29/2019	Potassium-40	pCi/kg	2.40E+03	3.55E+02		
1/29/2019	Zinc-65	pCi/kg	4.94E+00	7.23E+01		U
1/29/2019	Zirconium-95	pCi/kg	-9.54E+00	6.15E+01		U
2/26/2019	Barium-140	pCi/kg	1.36E+00	1.56E+02		U
2/26/2019	Beryllium-7	pCi/kg	1.19E+04	3.01E+02		
2/26/2019	Cesium-134	pCi/kg	-3.50E+00	4.31E+01	6.00E+01	U
2/26/2019	Cesium-137	pCi/kg	2.67E+00	3.96E+01	8.00E+01	U
2/26/2019	Cobalt-57	pCi/kg	-1.95E+00	2.72E+01		U
2/26/2019	Cobalt-58	pCi/kg	7.90E+00	3.79E+01		U
2/26/2019	Cobalt-60	pCi/kg	-4.53E+00	3.79E+01		U
2/26/2019	Iodine-131	pCi/kg	-3.25E+00	5.05E+01	6.00E+01	U
2/26/2019	Iron-59	pCi/kg	-4.03E+00	6.40E+01		U
2/26/2019	Lanthanum-140	pCi/kg	-7.79E+00	4.57E+01		U
2/26/2019	Manganese-54	pCi/kg	1.08E+01	4.06E+01		U
2/26/2019	Niobium-95	pCi/kg	3.94E+00	3.80E+01		U
2/26/2019	Potassium-40	pCi/kg	1.89E+03	4.23E+02		
2/26/2019	Zinc-65	pCi/kg	-3.97E+01	6.42E+01		U
2/26/2019	Zirconium-95	pCi/kg	-2.57E+01	6.10E+01		U
3/25/2019	Barium-140	pCi/kg	-5.55E+01	1.44E+02		U
3/25/2019	Beryllium-7	pCi/kg	4.02E+03	2.94E+02		
3/25/2019	Cesium-134	pCi/kg	2.91E+01	3.96E+01	6.00E+01	U
3/25/2019	Cesium-137	pCi/kg	2.69E+01	3.49E+01	8.00E+01	U
3/25/2019	Cobalt-57	pCi/kg	6.77E-01	2.42E+01		U
3/25/2019	Cobalt-58	pCi/kg	-3.14E+00	3.59E+01		U
3/25/2019	Cobalt-60	pCi/kg	4.41E+00	3.45E+01		U
3/25/2019	Iodine-131	pCi/kg	-8.98E+00	4.74E+01	6.00E+01	U
3/25/2019	Iron-59	pCi/kg	-7.68E+00	5.53E+01		U
3/25/2019	Lanthanum-140	pCi/kg	-4.02E+01	3.74E+01		U
3/25/2019	Manganese-54	pCi/kg	-4.42E+01	3.67E+01		U
3/25/2019	Niobium-95	pCi/kg	-1.63E+00	3.44E+01		U

3/25/2019	Potassium-40	pCi/kg	5.09E+03	2.64E+02		
3/25/2019	Zinc-65	pCi/kg	1.57E+01	6.75E+01		U
3/25/2019	Zirconium-95	pCi/kg	1.46E+01	6.28E+01		U
4/30/2019	Barium-140	pCi/kg	1.03E+01	6.64E+01		U
4/30/2019	Beryllium-7	pCi/kg	1.58E+03	1.33E+02		
4/30/2019	Cesium-134	pCi/kg	-4.67E+00	1.77E+01	6.00E+01	U
4/30/2019	Cesium-137	pCi/kg	1.10E+01	1.90E+01	8.00E+01	U
4/30/2019	Cobalt-57	pCi/kg	-2.77E+00	1.16E+01		U
4/30/2019	Cobalt-58	pCi/kg	-1.91E+00	1.59E+01		U
4/30/2019	Cobalt-60	pCi/kg	5.68E+01	1.78E+01		
4/30/2019	Iodine-131	pCi/kg	3.92E+00	2.19E+01	6.00E+01	U
4/30/2019	Iron-59	pCi/kg	-4.61E+00	3.13E+01		U
4/30/2019	Lanthanum-140	pCi/kg	-9.37E+00	2.31E+01		U
4/30/2019	Manganese-54	pCi/kg	1.56E+00	1.70E+01		U
4/30/2019	Niobium-95	pCi/kg	7.73E+00	1.66E+01		U
4/30/2019	Potassium-40	pCi/kg	5.55E+03	1.38E+02		
4/30/2019	Zinc-65	pCi/kg	7.88E+00	3.95E+01		U
4/30/2019	Zirconium-95	pCi/kg	7.16E+00	2.87E+01		U
5/14/2019	Barium-140	pCi/kg	2.24E+01	9.57E+01		U
5/14/2019	Beryllium-7	pCi/kg	2.85E+03	1.38E+02		
5/14/2019	Cesium-134	pCi/kg	-3.95E+00	2.05E+01	6.00E+01	U
5/14/2019	Cesium-137	pCi/kg	8.05E+00	1.93E+01	8.00E+01	U
5/14/2019	Cobalt-57	pCi/kg	2.06E+00	1.38E+01		U
5/14/2019	Cobalt-58	pCi/kg	8.55E+00	1.80E+01		U
5/14/2019	Cobalt-60	pCi/kg	-1.73E+01	1.47E+01		U
5/14/2019	Iodine-131	pCi/kg	-1.42E+01	2.58E+01	6.00E+01	U
5/14/2019	Iron-59	pCi/kg	1.98E+01	4.32E+01		U
5/14/2019	Lanthanum-140	pCi/kg	-1.81E+01	1.92E+01		U
5/14/2019	Manganese-54	pCi/kg	9.94E-01	1.81E+01		U
5/14/2019	Niobium-95	pCi/kg	-7.50E-01	2.02E+01		U
5/14/2019	Potassium-40	pCi/kg	5.66E+03	1.53E+02		
5/14/2019	Zinc-65	pCi/kg	-1.18E+01	3.93E+01		U
5/14/2019	Zirconium-95	pCi/kg	4.93E+00	2.89E+01		U
5/14/2019	Barium-140	pCi/kg	5.35E+01	1.30E+02		U
5/14/2019	Beryllium-7	pCi/kg	2.51E+03	1.69E+02		
5/14/2019	Cesium-134	pCi/kg	5.62E+00	2.72E+01	6.00E+01	U
5/14/2019	Cesium-137	pCi/kg	5.80E+00	2.54E+01	8.00E+01	U
5/14/2019	Cobalt-57	pCi/kg	-4.16E+00	1.53E+01		U
5/14/2019	Cobalt-58	pCi/kg	-7.93E+00	1.73E+01		U
5/14/2019	Cobalt-60	pCi/kg	-1.07E+01	2.41E+01		U
5/14/2019	Iodine-131	pCi/kg	-1.96E+01	3.54E+01	6.00E+01	U
5/14/2019	Iron-59	pCi/kg	2.61E+01	5.98E+01		U
5/14/2019	Lanthanum-140	pCi/kg	-1.87E+01	2.76E+01		U
5/14/2019	Manganese-54	pCi/kg	-2.09E+00	2.06E+01		U
5/14/2019	Niobium-95	pCi/kg	-1.29E+00	2.31E+01		U
5/14/2019	Potassium-40	pCi/kg	4.86E+03	1.53E+02		
5/14/2019	Zinc-65	pCi/kg	3.43E-01	4.40E+01		U

5/14/2019	Zirconium-95	pCi/kg	6.04E+01	3.50E+01		UI
5/14/2019	Barium-140	pCi/kg	-2.89E+01	1.30E+02		U
5/14/2019	Beryllium-7	pCi/kg	3.18E+03	2.23E+02		
5/14/2019	Cesium-134	pCi/kg	7.53E+00	2.98E+01	6.00E+01	U
5/14/2019	Cesium-137	pCi/kg	-9.23E+00	2.99E+01	8.00E+01	U
5/14/2019	Cobalt-57	pCi/kg	7.17E+00	2.03E+01		U
5/14/2019	Cobalt-58	pCi/kg	8.80E+00	3.35E+01		U
5/14/2019	Cobalt-60	pCi/kg	2.30E+00	2.79E+01		U
5/14/2019	Iodine-131	pCi/kg	2.33E+01	5.52E+01	6.00E+01	U
5/14/2019	Iron-59	pCi/kg	1.13E+01	6.06E+01		U
5/14/2019	Lanthanum-140	pCi/kg	-6.24E+00	3.55E+01		U
5/14/2019	Manganese-54	pCi/kg	8.27E+00	3.21E+01		U
5/14/2019	Niobium-95	pCi/kg	-4.08E+00	3.03E+01		U
5/14/2019	Potassium-40	pCi/kg	4.77E+03	2.57E+02		
5/14/2019	Zinc-65	pCi/kg	-8.12E+00	6.89E+01		U
5/14/2019	Zirconium-95	pCi/kg	-2.12E+00	5.03E+01		U
5/28/2019	Barium-140	pCi/kg	-6.45E+01	8.31E+01		U
5/28/2019	Beryllium-7	pCi/kg	4.78E+03	1.91E+02		
5/28/2019	Cesium-134	pCi/kg	-8.37E+00	2.35E+01	6.00E+01	U
5/28/2019	Cesium-137	pCi/kg	-1.64E+00	2.33E+01	8.00E+01	U
5/28/2019	Cobalt-57	pCi/kg	4.27E+00	1.73E+01		U
5/28/2019	Cobalt-58	pCi/kg	8.09E+00	2.23E+01		U
5/28/2019	Cobalt-60	pCi/kg	-1.73E+01	1.97E+01		U
5/28/2019	Iodine-131	pCi/kg	-9.36E+00	2.66E+01	6.00E+01	U
5/28/2019	Iron-59	pCi/kg	4.66E+00	4.95E+01		U
5/28/2019	Lanthanum-140	pCi/kg	-2.18E+01	2.79E+01		U
5/28/2019	Manganese-54	pCi/kg	-3.00E+01	2.26E+01		U
5/28/2019	Niobium-95	pCi/kg	6.71E+00	2.38E+01		U
5/28/2019	Potassium-40	pCi/kg	7.65E+03	2.59E+02		
5/28/2019	Zinc-65	pCi/kg	1.89E+01	5.74E+01		U
5/28/2019	Zirconium-95	pCi/kg	5.53E+00	4.06E+01		U
6/25/2019	Barium-140	pCi/kg	3.97E+01	1.14E+02		U
6/25/2019	Beryllium-7	pCi/kg	5.10E+03	2.38E+02		
6/25/2019	Cesium-134	pCi/kg	6.77E+00	3.29E+01	6.00E+01	U
6/25/2019	Cesium-137	pCi/kg	-2.36E+00	2.65E+01	8.00E+01	U
6/25/2019	Cobalt-57	pCi/kg	1.18E+01	2.10E+01		U
6/25/2019	Cobalt-58	pCi/kg	4.89E+00	2.86E+01		U
6/25/2019	Cobalt-60	pCi/kg	-1.69E+01	2.64E+01		U
6/25/2019	Iodine-131	pCi/kg	-1.48E+00	3.79E+01	6.00E+01	U
6/25/2019	Iron-59	pCi/kg	-2.81E+00	5.12E+01		U
6/25/2019	Lanthanum-140	pCi/kg	-1.21E+00	4.05E+01		U
6/25/2019	Manganese-54	pCi/kg	1.32E+00	3.14E+01		U
6/25/2019	Niobium-95	pCi/kg	1.70E+00	2.94E+01		U
6/25/2019	Potassium-40	pCi/kg	4.77E+03	2.56E+02		
6/25/2019	Zinc-65	pCi/kg	1.76E+01	6.03E+01		U
6/25/2019	Zirconium-95	pCi/kg	9.82E+00	5.25E+01		U
7/30/2019	Barium-140	pCi/kg	3.93E+01	1.14E+02		U

7/30/2019	Beryllium-7	pCi/kg	5.83E+03	2.02E+02		
7/30/2019	Cesium-134	pCi/kg	8.80E+00	2.59E+01	6.00E+01	U
7/30/2019	Cesium-137	pCi/kg	5.41E+00	2.38E+01	8.00E+01	U
7/30/2019	Cobalt-57	pCi/kg	2.75E+00	1.62E+01		U
7/30/2019	Cobalt-58	pCi/kg	-1.21E+01	2.31E+01		U
7/30/2019	Cobalt-60	pCi/kg	2.02E+00	2.56E+01		U
7/30/2019	Iodine-131	pCi/kg	6.44E+00	3.64E+01	6.00E+01	U
7/30/2019	Iron-59	pCi/kg	-3.80E+00	5.17E+01		U
7/30/2019	Lanthanum-140	pCi/kg	3.93E+00	3.83E+01		U
7/30/2019	Manganese-54	pCi/kg	-6.27E+00	2.36E+01		U
7/30/2019	Niobium-95	pCi/kg	2.01E+01	2.60E+01		U
7/30/2019	Potassium-40	pCi/kg	8.72E+03	2.28E+02		
7/30/2019	Zinc-65	pCi/kg	8.82E+00	5.46E+01		U
7/30/2019	Zirconium-95	pCi/kg	3.50E+00	4.20E+01		U
8/27/2019	Barium-140	pCi/kg	-2.50E+01	7.00E+01		U
8/27/2019	Beryllium-7	pCi/kg	2.32E+03	1.50E+02		
8/27/2019	Cesium-134	pCi/kg	-6.60E+00	1.53E+01	6.00E+01	U
8/27/2019	Cesium-137	pCi/kg	5.65E+00	2.39E+01	8.00E+01	U
8/27/2019	Cobalt-57	pCi/kg	1.05E+01	1.34E+01		U
8/27/2019	Cobalt-58	pCi/kg	4.58E+00	1.67E+01		U
8/27/2019	Cobalt-60	pCi/kg	5.10E+00	2.09E+01		U
8/27/2019	Iodine-131	pCi/kg	6.57E+00	2.56E+01	6.00E+01	U
8/27/2019	Iron-59	pCi/kg	-2.35E-02	3.19E+01		U
8/27/2019	Lanthanum-140	pCi/kg	1.01E+01	3.26E+01		U
8/27/2019	Manganese-54	pCi/kg	4.21E+00	2.09E+01		U
8/27/2019	Niobium-95	pCi/kg	1.36E+00	2.14E+01		U
8/27/2019	Potassium-40	pCi/kg	5.86E+02	2.29E+02		
8/27/2019	Zinc-65	pCi/kg	8.93E+00	3.71E+01		U
8/27/2019	Zirconium-95	pCi/kg	5.20E+00	3.11E+01		U
9/24/2019	Barium-140	pCi/kg	3.64E+01	1.50E+02		U
9/24/2019	Beryllium-7	pCi/kg	6.98E+03	2.47E+02		
9/24/2019	Cesium-134	pCi/kg	1.29E+01	3.22E+01	6.00E+01	U
9/24/2019	Cesium-137	pCi/kg	-3.18E+00	3.06E+01	8.00E+01	U
9/24/2019	Cobalt-57	pCi/kg	-5.39E+00	2.01E+01		U
9/24/2019	Cobalt-58	pCi/kg	5.88E-01	2.94E+01		U
9/24/2019	Cobalt-60	pCi/kg	9.16E+00	3.31E+01		U
9/24/2019	Iodine-131	pCi/kg	2.04E+01	5.26E+01	6.00E+01	U
9/24/2019	Iron-59	pCi/kg	-1.91E+01	5.58E+01		U
9/24/2019	Lanthanum-140	pCi/kg	-3.53E+01	4.53E+01		U
9/24/2019	Manganese-54	pCi/kg	4.82E+00	3.19E+01		U
9/24/2019	Niobium-95	pCi/kg	2.57E+01	2.95E+01		U
9/24/2019	Potassium-40	pCi/kg	2.42E+03	2.54E+02		
9/24/2019	Zinc-65	pCi/kg	1.28E+01	6.19E+01		U
9/24/2019	Zirconium-95	pCi/kg	2.33E+00	5.20E+01		U
10/29/2019	Barium-140	pCi/kg	1.42E+01	1.49E+02		U
10/29/2019	Beryllium-7	pCi/kg	2.29E+03	2.94E+02		
10/29/2019	Cesium-134	pCi/kg	1.40E+01	3.83E+01	6.00E+01	U

10/29/2019	Cesium-137	pCi/kg	3.80E+01	2.05E+01	8.00E+01	UI
10/29/2019	Cobalt-57	pCi/kg	9.31E+00	2.23E+01		U
10/29/2019	Cobalt-58	pCi/kg	1.38E+01	3.50E+01		U
10/29/2019	Cobalt-60	pCi/kg	5.99E+00	3.06E+01		U
10/29/2019	Iodine-131	pCi/kg	7.84E+00	5.72E+01	6.00E+01	U
10/29/2019	Iron-59	pCi/kg	-2.26E+01	4.97E+01		U
10/29/2019	Lanthanum-140	pCi/kg	-1.98E+01	4.01E+01		U
10/29/2019	Manganese-54	pCi/kg	-2.11E+01	2.62E+01		U
10/29/2019	Niobium-95	pCi/kg	-2.06E+00	3.50E+01		U
10/29/2019	Potassium-40	pCi/kg	3.19E+03	2.39E+02		
10/29/2019	Zinc-65	pCi/kg	1.18E+01	6.70E+01		U
10/29/2019	Zirconium-95	pCi/kg	2.36E+01	5.93E+01		U
11/26/2019	Barium-140	pCi/kg	2.16E+00	1.74E+02		U
11/26/2019	Beryllium-7	pCi/kg	5.45E+03	2.86E+02		
11/26/2019	Cesium-134	pCi/kg	1.72E+01	4.00E+01	6.00E+01	U
11/26/2019	Cesium-137	pCi/kg	-1.07E+01	3.57E+01	8.00E+01	U
11/26/2019	Cobalt-57	pCi/kg	3.97E+00	2.49E+01		U
11/26/2019	Cobalt-58	pCi/kg	6.77E+00	3.59E+01		U
11/26/2019	Cobalt-60	pCi/kg	4.71E+00	3.81E+01		U
11/26/2019	Iodine-131	pCi/kg	-1.60E+01	5.74E+01	6.00E+01	U
11/26/2019	Iron-59	pCi/kg	-2.40E+01	6.78E+01		U
11/26/2019	Lanthanum-140	pCi/kg	2.03E+01	6.59E+01		U
11/26/2019	Manganese-54	pCi/kg	4.45E+00	3.75E+01		U
11/26/2019	Niobium-95	pCi/kg	-2.03E+01	3.87E+01		U
11/26/2019	Potassium-40	pCi/kg	4.31E+03	3.65E+02		
11/26/2019	Zinc-65	pCi/kg	2.20E+01	8.62E+01		U
11/26/2019	Zirconium-95	pCi/kg	-2.93E+00	6.13E+01		U
12/31/2019	Barium-140	pCi/kg	-1.56E+01	1.10E+02		U
12/31/2019	Beryllium-7	pCi/kg	6.20E+03	2.20E+02		
12/31/2019	Cesium-134	pCi/kg	-5.83E-01	2.94E+01	6.00E+01	U
12/31/2019	Cesium-137	pCi/kg	-9.39E+00	3.00E+01	8.00E+01	U
12/31/2019	Cobalt-57	pCi/kg	-9.35E+00	1.85E+01		U
12/31/2019	Cobalt-58	pCi/kg	1.60E+01	2.84E+01		U
12/31/2019	Cobalt-60	pCi/kg	1.80E+00	2.69E+01		U
12/31/2019	Iodine-131	pCi/kg	-4.29E+00	3.51E+01	6.00E+01	U
12/31/2019	Iron-59	pCi/kg	-1.45E-01	4.35E+01		U
12/31/2019	Lanthanum-140	pCi/kg	5.54E+00	3.29E+01		U
12/31/2019	Manganese-54	pCi/kg	2.08E+01	2.66E+01		U
12/31/2019	Niobium-95	pCi/kg	8.29E-01	2.52E+01		U
12/31/2019	Potassium-40	pCi/kg	2.00E+03	2.27E+02		
12/31/2019	Zinc-65	pCi/kg	1.61E+01	5.37E+01		U
12/31/2019	Zirconium-95	pCi/kg	-2.03E+01	4.25E+01		U

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Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019	Barium-140	pCi/kg	-7.31E+01	1.97E+02		U

1/29/2019	Beryllium-7	pCi/kg	1.02E+04	3.76E+02		
1/29/2019	Cesium-134	pCi/kg	1.60E+01	4.96E+01	6.00E+01	U
1/29/2019	Cesium-137	pCi/kg	1.38E+01	4.85E+01	8.00E+01	U
1/29/2019	Cobalt-57	pCi/kg	-8.08E+00	3.07E+01		U
1/29/2019	Cobalt-58	pCi/kg	1.62E+01	4.43E+01		U
1/29/2019	Cobalt-60	pCi/kg	1.77E+01	4.94E+01		U
1/29/2019	Iodine-131	pCi/kg	-8.12E+00	7.19E+01	6.00E+01	DLU
1/29/2019	Iron-59	pCi/kg	-4.63E+01	7.64E+01		U
1/29/2019	Lanthanum-140	pCi/kg	3.00E+01	7.29E+01		U
1/29/2019	Manganese-54	pCi/kg	2.03E+01	4.72E+01		U
1/29/2019	Niobium-95	pCi/kg	1.45E+01	4.47E+01		U
1/29/2019	Potassium-40	pCi/kg	1.90E+03	4.42E+02		
1/29/2019	Zinc-65	pCi/kg	-7.21E+00	9.86E+01		U
1/29/2019	Zirconium-95	pCi/kg	-5.62E+00	7.89E+01		U
2/26/2019	Barium-140	pCi/kg	5.39E+01	1.30E+02		U
2/26/2019	Beryllium-7	pCi/kg	1.15E+04	2.48E+02		
2/26/2019	Cesium-134	pCi/kg	1.40E+01	3.42E+01	6.00E+01	U
2/26/2019	Cesium-137	pCi/kg	-1.41E+01	3.06E+01	8.00E+01	U
2/26/2019	Cobalt-57	pCi/kg	1.31E+01	2.33E+01		U
2/26/2019	Cobalt-58	pCi/kg	-8.97E+00	2.94E+01		U
2/26/2019	Cobalt-60	pCi/kg	-1.31E+01	2.81E+01		U
2/26/2019	Iodine-131	pCi/kg	5.93E+00	4.20E+01	6.00E+01	U
2/26/2019	Iron-59	pCi/kg	1.49E-01	5.74E+01		U
2/26/2019	Lanthanum-140	pCi/kg	-2.43E+01	4.39E+01		U
2/26/2019	Manganese-54	pCi/kg	-4.93E-01	3.01E+01		U
2/26/2019	Niobium-95	pCi/kg	-4.65E+01	3.11E+01		U
2/26/2019	Potassium-40	pCi/kg	2.78E+03	3.12E+02		
2/26/2019	Zinc-65	pCi/kg	-1.63E+01	6.48E+01		U
2/26/2019	Zirconium-95	pCi/kg	9.17E-01	5.41E+01		U
3/25/2019	Barium-140	pCi/kg	7.07E-02	5.61E+01		U
3/25/2019	Beryllium-7	pCi/kg	7.48E+03	1.05E+02		
3/25/2019	Cesium-134	pCi/kg	-6.48E+00	1.28E+01	6.00E+01	U
3/25/2019	Cesium-137	pCi/kg	-9.07E-01	1.29E+01	8.00E+01	U
3/25/2019	Cobalt-57	pCi/kg	-2.38E+00	9.58E+00		U
3/25/2019	Cobalt-58	pCi/kg	-8.69E-01	1.18E+01		U
3/25/2019	Cobalt-60	pCi/kg	7.59E+00	1.50E+01		U
3/25/2019	Iodine-131	pCi/kg	-3.37E+00	1.74E+01	6.00E+01	U
3/25/2019	Iron-59	pCi/kg	2.87E+00	2.43E+01		U
3/25/2019	Lanthanum-140	pCi/kg	5.53E-01	1.66E+01		U
3/25/2019	Manganese-54	pCi/kg	4.39E-01	1.24E+01		U
3/25/2019	Niobium-95	pCi/kg	2.41E+00	1.29E+01		U
3/25/2019	Potassium-40	pCi/kg	3.24E+03	1.37E+02		
3/25/2019	Zinc-65	pCi/kg	9.72E+00	2.85E+01		U
3/25/2019	Zirconium-95	pCi/kg	-8.57E+00	2.07E+01		U
4/30/2019	Barium-140	pCi/kg	7.22E+00	5.33E+01		U
4/30/2019	Beryllium-7	pCi/kg	1.37E+03	1.01E+02		
4/30/2019	Cesium-134	pCi/kg	4.36E+00	1.58E+01	6.00E+01	U

4/30/2019	Cesium-137	pCi/kg	9.40E+00	1.38E+01	8.00E+01	U
4/30/2019	Cobalt-57	pCi/kg	3.79E+00	9.42E+00		U
4/30/2019	Cobalt-58	pCi/kg	3.17E+00	1.29E+01		U
4/30/2019	Cobalt-60	pCi/kg	3.11E+02	1.36E+01		
4/30/2019	Iodine-131	pCi/kg	3.93E+00	1.54E+01	6.00E+01	U
4/30/2019	Iron-59	pCi/kg	-1.55E+01	2.87E+01		U
4/30/2019	Lanthanum-140	pCi/kg	7.14E+00	1.66E+01		U
4/30/2019	Manganese-54	pCi/kg	-2.69E+00	1.29E+01		U
4/30/2019	Niobium-95	pCi/kg	3.46E+00	1.33E+01		U
4/30/2019	Potassium-40	pCi/kg	3.88E+03	1.26E+02		
4/30/2019	Zinc-65	pCi/kg	-2.14E+00	3.32E+01		U
4/30/2019	Zirconium-95	pCi/kg	-1.34E+01	2.34E+01		U
5/28/2019	Barium-140	pCi/kg	1.94E+00	5.81E+01		U
5/28/2019	Beryllium-7	pCi/kg	3.42E+03	1.22E+02		
5/28/2019	Cesium-134	pCi/kg	1.22E+00	1.72E+01	6.00E+01	U
5/28/2019	Cesium-137	pCi/kg	-1.36E+00	1.51E+01	8.00E+01	U
5/28/2019	Cobalt-57	pCi/kg	3.10E+00	1.20E+01		U
5/28/2019	Cobalt-58	pCi/kg	1.47E+01	1.49E+01		U
5/28/2019	Cobalt-60	pCi/kg	-7.48E+00	1.84E+01		U
5/28/2019	Iodine-131	pCi/kg	-3.62E-01	2.09E+01	6.00E+01	U
5/28/2019	Iron-59	pCi/kg	-2.33E+00	3.31E+01		U
5/28/2019	Lanthanum-140	pCi/kg	2.35E+01	1.70E+01		UI
5/28/2019	Manganese-54	pCi/kg	-5.54E-01	1.54E+01		U
5/28/2019	Niobium-95	pCi/kg	-1.14E+00	1.54E+01		U
5/28/2019	Potassium-40	pCi/kg	5.48E+03	1.40E+02		
5/28/2019	Zinc-65	pCi/kg	2.77E+01	3.47E+01		U
5/28/2019	Zirconium-95	pCi/kg	3.27E+00	2.59E+01		U
6/25/2019	Barium-140	pCi/kg	3.55E+01	7.79E+01		U
6/25/2019	Beryllium-7	pCi/kg	1.76E+03	1.37E+02		
6/25/2019	Cesium-134	pCi/kg	1.30E+01	2.12E+01	6.00E+01	U
6/25/2019	Cesium-137	pCi/kg	-9.24E+00	2.11E+01	8.00E+01	U
6/25/2019	Cobalt-57	pCi/kg	1.79E+00	1.13E+01		U
6/25/2019	Cobalt-58	pCi/kg	-5.04E+00	1.55E+01		U
6/25/2019	Cobalt-60	pCi/kg	4.61E+00	2.05E+01		U
6/25/2019	Iodine-131	pCi/kg	3.72E+00	2.31E+01	6.00E+01	U
6/25/2019	Iron-59	pCi/kg	-1.94E+01	3.58E+01		U
6/25/2019	Lanthanum-140	pCi/kg	-8.14E+00	1.90E+01		U
6/25/2019	Manganese-54	pCi/kg	-8.86E+00	1.66E+01		U
6/25/2019	Niobium-95	pCi/kg	-6.01E+00	1.95E+01		U
6/25/2019	Potassium-40	pCi/kg	4.80E+03	1.87E+02		
6/25/2019	Zinc-65	pCi/kg	2.11E+00	3.82E+01		U
6/25/2019	Zirconium-95	pCi/kg	5.07E+00	3.29E+01		U
7/30/2019	Barium-140	pCi/kg	7.75E+00	4.89E+01		U
7/30/2019	Beryllium-7	pCi/kg	2.40E+03	9.38E+01		
7/30/2019	Cesium-134	pCi/kg	-9.53E+00	1.23E+01	6.00E+01	U
7/30/2019	Cesium-137	pCi/kg	1.12E+01	1.06E+01	8.00E+01	UI
7/30/2019	Cobalt-57	pCi/kg	1.73E+00	8.06E+00		U

7/30/2019	Cobalt-58	pCi/kg	-2.83E+00	1.09E+01		U
7/30/2019	Cobalt-60	pCi/kg	-6.79E-01	1.25E+01		U
7/30/2019	Iodine-131	pCi/kg	-1.81E+00	1.78E+01	6.00E+01	U
7/30/2019	Iron-59	pCi/kg	-1.15E+01	2.26E+01		U
7/30/2019	Lanthanum-140	pCi/kg	-7.69E+00	1.46E+01		U
7/30/2019	Manganese-54	pCi/kg	3.01E+00	1.17E+01		U
7/30/2019	Niobium-95	pCi/kg	5.00E+00	1.12E+01		U
7/30/2019	Potassium-40	pCi/kg	4.88E+03	1.05E+02		
7/30/2019	Zinc-65	pCi/kg	-9.28E+00	2.67E+01		U
7/30/2019	Zirconium-95	pCi/kg	-2.48E+00	1.90E+01		U
8/27/2019	Barium-140	pCi/kg	7.67E+00	8.50E+01		U
8/27/2019	Beryllium-7	pCi/kg	2.81E+03	1.20E+02		
8/27/2019	Cesium-134	pCi/kg	1.49E-01	3.18E+01	6.00E+01	U
8/27/2019	Cesium-137	pCi/kg	6.10E+00	2.97E+01	8.00E+01	U
8/27/2019	Cobalt-57	pCi/kg	3.33E+00	1.53E+01		U
8/27/2019	Cobalt-58	pCi/kg	6.16E+00	3.04E+01		U
8/27/2019	Cobalt-60	pCi/kg	1.72E+01	3.54E+01		U
8/27/2019	Iodine-131	pCi/kg	1.15E+00	2.93E+01	6.00E+01	U
8/27/2019	Iron-59	pCi/kg	-1.01E+01	4.94E+01		U
8/27/2019	Lanthanum-140	pCi/kg	-5.13E+00	3.12E+01		U
8/27/2019	Manganese-54	pCi/kg	-3.10E+00	1.94E+01		U
8/27/2019	Niobium-95	pCi/kg	3.74E-01	3.02E+01		U
8/27/2019	Potassium-40	pCi/kg	1.85E+03	3.28E+02		
8/27/2019	Zinc-65	pCi/kg	4.33E+00	6.76E+01		U
8/27/2019	Zirconium-95	pCi/kg	7.36E-01	3.60E+01		U
9/24/2019	Barium-140	pCi/kg	-3.16E+01	6.43E+01		U
9/24/2019	Beryllium-7	pCi/kg	6.92E+02	1.07E+02		
9/24/2019	Cesium-134	pCi/kg	8.71E+00	1.51E+01	6.00E+01	U
9/24/2019	Cesium-137	pCi/kg	-5.03E+00	1.38E+01	8.00E+01	U
9/24/2019	Cobalt-57	pCi/kg	9.65E-01	9.29E+00		U
9/24/2019	Cobalt-58	pCi/kg	-3.30E+00	1.31E+01		U
9/24/2019	Cobalt-60	pCi/kg	1.63E+00	1.44E+01		U
9/24/2019	Iodine-131	pCi/kg	1.92E+00	2.50E+01	6.00E+01	U
9/24/2019	Iron-59	pCi/kg	-1.56E+01	2.85E+01		U
9/24/2019	Lanthanum-140	pCi/kg	6.67E-01	1.97E+01		U
9/24/2019	Manganese-54	pCi/kg	3.25E+00	1.27E+01		U
9/24/2019	Niobium-95	pCi/kg	2.58E+00	1.50E+01		U
9/24/2019	Potassium-40	pCi/kg	6.09E+03	1.22E+02		
9/24/2019	Zinc-65	pCi/kg	9.99E-01	2.82E+01		U
9/24/2019	Zirconium-95	pCi/kg	-1.09E+01	2.17E+01		U
10/29/2019	Barium-140	pCi/kg	-1.38E+01	1.07E+02		U
10/29/2019	Beryllium-7	pCi/kg	1.38E+03	2.35E+02		
10/29/2019	Cesium-134	pCi/kg	-6.88E+00	2.73E+01	6.00E+01	U
10/29/2019	Cesium-137	pCi/kg	2.63E+01	3.27E+01	8.00E+01	U
10/29/2019	Cobalt-57	pCi/kg	4.45E+00	1.94E+01		U
10/29/2019	Cobalt-58	pCi/kg	7.93E+00	2.73E+01		U
10/29/2019	Cobalt-60	pCi/kg	5.73E+00	2.45E+01		U

10/29/2019	Iodine-131	pCi/kg	1.36E+01	4.05E+01	6.00E+01	U
10/29/2019	Iron-59	pCi/kg	2.24E+01	5.73E+01		U
10/29/2019	Lanthanum-140	pCi/kg	-8.86E+00	3.25E+01		U
10/29/2019	Manganese-54	pCi/kg	5.94E+00	2.54E+01		U
10/29/2019	Niobium-95	pCi/kg	3.97E+00	2.40E+01		U
10/29/2019	Potassium-40	pCi/kg	2.46E+03	3.20E+02		
10/29/2019	Zinc-65	pCi/kg	-1.41E+01	5.07E+01		U
10/29/2019	Zirconium-95	pCi/kg	1.44E+01	5.38E+01		U
11/26/2019	Barium-140	pCi/kg	7.84E+01	1.60E+02		U
11/26/2019	Beryllium-7	pCi/kg	5.30E+03	2.61E+02		
11/26/2019	Cesium-134	pCi/kg	-2.83E+00	3.52E+01	6.00E+01	U
11/26/2019	Cesium-137	pCi/kg	2.92E+01	3.50E+01	8.00E+01	U
11/26/2019	Cobalt-57	pCi/kg	6.89E+00	2.15E+01		U
11/26/2019	Cobalt-58	pCi/kg	-2.63E+00	3.17E+01		U
11/26/2019	Cobalt-60	pCi/kg	1.75E+01	3.23E+01		U
11/26/2019	Iodine-131	pCi/kg	2.54E+00	5.77E+01	6.00E+01	U
11/26/2019	Iron-59	pCi/kg	4.02E+00	5.12E+01		U
11/26/2019	Lanthanum-140	pCi/kg	-2.85E+01	4.20E+01		U
11/26/2019	Manganese-54	pCi/kg	1.13E+01	3.37E+01		U
11/26/2019	Niobium-95	pCi/kg	4.52E+00	3.49E+01		U
11/26/2019	Potassium-40	pCi/kg	2.72E+03	2.72E+02		
11/26/2019	Zinc-65	pCi/kg	4.31E+00	6.38E+01		U
11/26/2019	Zirconium-95	pCi/kg	1.33E+01	5.57E+01		U
12/31/2019	Barium-140	pCi/kg	-6.78E+00	9.56E+01		U
12/31/2019	Beryllium-7	pCi/kg	4.45E+03	1.81E+02		
12/31/2019	Cesium-134	pCi/kg	9.93E+00	3.07E+01	6.00E+01	U
12/31/2019	Cesium-137	pCi/kg	9.88E+00	2.57E+01	8.00E+01	U
12/31/2019	Cobalt-57	pCi/kg	1.11E+01	1.53E+01		U
12/31/2019	Cobalt-58	pCi/kg	-1.90E+01	2.36E+01		U
12/31/2019	Cobalt-60	pCi/kg	6.07E+00	2.91E+01		U
12/31/2019	Iodine-131	pCi/kg	1.66E+01	3.05E+01	6.00E+01	U
12/31/2019	Iron-59	pCi/kg	-2.73E+00	4.84E+01		U
12/31/2019	Lanthanum-140	pCi/kg	7.33E+00	3.92E+01		U
12/31/2019	Manganese-54	pCi/kg	1.16E+01	2.47E+01		U
12/31/2019	Niobium-95	pCi/kg	6.07E+00	2.00E+01		U
12/31/2019	Potassium-40	pCi/kg	1.41E+03	2.56E+02		
12/31/2019	Zinc-65	pCi/kg	-6.90E+00	5.71E+01		U
12/31/2019	Zirconium-95	pCi/kg	3.17E-01	4.39E+01		U

BL-3

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/29/2019	Barium-140	pCi/kg	6.63E+01	2.36E+02		U
1/29/2019	Beryllium-7	pCi/kg	1.48E+04	3.85E+02		
1/29/2019	Cesium-134	pCi/kg	4.32E+01	5.41E+01	6.00E+01	U
1/29/2019	Cesium-137	pCi/kg	-3.30E+00	5.16E+01	8.00E+01	U
1/29/2019	Cobalt-57	pCi/kg	-2.23E+00	3.33E+01		U

1/29/2019	Cobalt-58	pCi/kg	-1.93E+01	4.51E+01		U
1/29/2019	Cobalt-60	pCi/kg	-2.01E+01	4.57E+01		U
1/29/2019	Iodine-131	pCi/kg	6.05E+00	7.70E+01	6.00E+01	DLU
1/29/2019	Iron-59	pCi/kg	4.65E+01	7.64E+01		U
1/29/2019	Lanthanum-140	pCi/kg	-1.99E+01	6.83E+01		U
1/29/2019	Manganese-54	pCi/kg	7.35E-01	4.95E+01		U
1/29/2019	Niobium-95	pCi/kg	5.01E+00	5.05E+01		U
1/29/2019	Potassium-40	pCi/kg	7.65E+02	4.20E+02		UI
1/29/2019	Zinc-65	pCi/kg	9.01E+00	9.34E+01		U
1/29/2019	Zirconium-95	pCi/kg	-2.06E-01	8.67E+01		U
2/26/2019	Barium-140	pCi/kg	2.45E+01	1.16E+02		U
2/26/2019	Beryllium-7	pCi/kg	1.34E+04	2.25E+02		
2/26/2019	Cesium-134	pCi/kg	5.90E+00	3.19E+01	6.00E+01	U
2/26/2019	Cesium-137	pCi/kg	1.86E+01	3.23E+01	8.00E+01	U
2/26/2019	Cobalt-57	pCi/kg	-3.88E+00	1.95E+01		U
2/26/2019	Cobalt-58	pCi/kg	2.02E+00	2.69E+01		U
2/26/2019	Cobalt-60	pCi/kg	1.42E+01	3.20E+01		U
2/26/2019	Iodine-131	pCi/kg	5.42E+00	3.51E+01	6.00E+01	U
2/26/2019	Iron-59	pCi/kg	2.15E+01	5.54E+01		U
2/26/2019	Lanthanum-140	pCi/kg	9.26E-01	3.68E+01		U
2/26/2019	Manganese-54	pCi/kg	1.74E+01	2.82E+01		U
2/26/2019	Niobium-95	pCi/kg	-1.24E+01	2.89E+01		U
2/26/2019	Potassium-40	pCi/kg	9.51E+02	2.86E+02		
2/26/2019	Zinc-65	pCi/kg	4.16E+01	6.71E+01		U
2/26/2019	Zirconium-95	pCi/kg	-3.20E+01	4.56E+01		U
3/25/2019	Barium-140	pCi/kg	3.16E+01	1.20E+02		U
3/25/2019	Beryllium-7	pCi/kg	1.75E+04	2.30E+02		
3/25/2019	Cesium-134	pCi/kg	1.27E+01	3.15E+01	6.00E+01	U
3/25/2019	Cesium-137	pCi/kg	-9.52E+00	2.90E+01	8.00E+01	U
3/25/2019	Cobalt-57	pCi/kg	1.93E+00	2.05E+01		U
3/25/2019	Cobalt-58	pCi/kg	6.55E+00	2.78E+01		U
3/25/2019	Cobalt-60	pCi/kg	-1.56E+01	2.91E+01		U
3/25/2019	Iodine-131	pCi/kg	-5.60E-01	3.84E+01	6.00E+01	U
3/25/2019	Iron-59	pCi/kg	4.02E+00	5.26E+01		U
3/25/2019	Lanthanum-140	pCi/kg	-4.31E+00	3.67E+01		U
3/25/2019	Manganese-54	pCi/kg	1.39E+01	2.90E+01		U
3/25/2019	Niobium-95	pCi/kg	2.62E+01	2.72E+01		U
3/25/2019	Potassium-40	pCi/kg	5.44E+02	2.82E+02		UI
3/25/2019	Zinc-65	pCi/kg	-3.31E+01	5.14E+01		U
3/25/2019	Zirconium-95	pCi/kg	-1.99E+01	4.78E+01		U
4/30/2019	Barium-140	pCi/kg	1.48E+01	6.80E+01		U
4/30/2019	Beryllium-7	pCi/kg	6.43E+03	1.45E+02		
4/30/2019	Cesium-134	pCi/kg	1.25E+01	2.05E+01	6.00E+01	U
4/30/2019	Cesium-137	pCi/kg	3.02E+01	1.79E+01	8.00E+01	UI
4/30/2019	Cobalt-57	pCi/kg	5.98E+00	1.34E+01		U
4/30/2019	Cobalt-58	pCi/kg	-8.93E-01	1.73E+01		U
4/30/2019	Cobalt-60	pCi/kg	1.32E+02	2.07E+01		

4/30/2019	Iodine-131	pCi/kg	8.18E+00	2.39E+01	6.00E+01	U
4/30/2019	Iron-59	pCi/kg	-5.78E+00	3.56E+01		U
4/30/2019	Lanthanum-140	pCi/kg	4.39E+00	2.40E+01		U
4/30/2019	Manganese-54	pCi/kg	6.67E-01	1.79E+01		U
4/30/2019	Niobium-95	pCi/kg	-2.81E+00	1.92E+01		U
4/30/2019	Potassium-40	pCi/kg	3.24E+03	1.66E+02		
4/30/2019	Zinc-65	pCi/kg	1.32E+01	4.27E+01		U
4/30/2019	Zirconium-95	pCi/kg	1.13E+01	3.36E+01		U
5/28/2019	Barium-140	pCi/kg	1.11E+01	6.06E+01		U
5/28/2019	Beryllium-7	pCi/kg	2.09E+03	1.26E+02		
5/28/2019	Cesium-134	pCi/kg	-1.87E+00	1.72E+01	6.00E+01	U
5/28/2019	Cesium-137	pCi/kg	5.94E+00	1.72E+01	8.00E+01	U
5/28/2019	Cobalt-57	pCi/kg	-2.99E+00	9.74E+00		U
5/28/2019	Cobalt-58	pCi/kg	3.50E+00	1.52E+01		U
5/28/2019	Cobalt-60	pCi/kg	4.50E+00	1.84E+01		U
5/28/2019	Iodine-131	pCi/kg	3.21E+00	1.89E+01	6.00E+01	U
5/28/2019	Iron-59	pCi/kg	-3.22E+00	3.48E+01		U
5/28/2019	Lanthanum-140	pCi/kg	-3.16E+00	1.84E+01		U
5/28/2019	Manganese-54	pCi/kg	4.83E+00	1.49E+01		U
5/28/2019	Niobium-95	pCi/kg	8.52E+00	1.66E+01		U
5/28/2019	Potassium-40	pCi/kg	4.86E+03	1.81E+02		
5/28/2019	Zinc-65	pCi/kg	-2.34E+01	3.76E+01		U
5/28/2019	Zirconium-95	pCi/kg	1.31E+01	3.02E+01		U
6/25/2019	Barium-140	pCi/kg	3.02E+01	1.14E+02		U
6/25/2019	Beryllium-7	pCi/kg	3.53E+03	2.07E+02		
6/25/2019	Cesium-134	pCi/kg	-2.19E+00	2.65E+01	6.00E+01	U
6/25/2019	Cesium-137	pCi/kg	-1.51E+01	2.26E+01	8.00E+01	U
6/25/2019	Cobalt-57	pCi/kg	-1.42E+01	1.64E+01		U
6/25/2019	Cobalt-58	pCi/kg	1.10E+01	2.86E+01		U
6/25/2019	Cobalt-60	pCi/kg	1.12E+01	3.12E+01		U
6/25/2019	Iodine-131	pCi/kg	2.26E+01	3.79E+01	6.00E+01	U
6/25/2019	Iron-59	pCi/kg	9.88E-01	4.85E+01		U
6/25/2019	Lanthanum-140	pCi/kg	-9.31E+00	2.98E+01		U
6/25/2019	Manganese-54	pCi/kg	1.07E+01	2.80E+01		U
6/25/2019	Niobium-95	pCi/kg	-4.18E+00	2.66E+01		U
6/25/2019	Potassium-40	pCi/kg	3.56E+03	2.54E+02		
6/25/2019	Zinc-65	pCi/kg	1.47E+01	6.37E+01		U
6/25/2019	Zirconium-95	pCi/kg	-3.50E+01	3.75E+01		U
7/30/2019	Barium-140	pCi/kg	2.20E+01	1.23E+02		U
7/30/2019	Beryllium-7	pCi/kg	7.26E+03	2.09E+02		
7/30/2019	Cesium-134	pCi/kg	-4.83E+00	2.67E+01	6.00E+01	U
7/30/2019	Cesium-137	pCi/kg	-2.42E+00	2.54E+01	8.00E+01	U
7/30/2019	Cobalt-57	pCi/kg	9.46E+00	1.83E+01		U
7/30/2019	Cobalt-58	pCi/kg	-1.02E+01	2.33E+01		U
7/30/2019	Cobalt-60	pCi/kg	3.50E-01	2.85E+01		U
7/30/2019	Iodine-131	pCi/kg	-9.49E+00	3.72E+01	6.00E+01	U
7/30/2019	Iron-59	pCi/kg	7.26E+00	5.69E+01		U

7/30/2019	Lanthanum-140	pCi/kg	-8.51E+00	3.85E+01		U
7/30/2019	Manganese-54	pCi/kg	-7.89E+00	2.60E+01		U
7/30/2019	Niobium-95	pCi/kg	9.85E+00	2.57E+01		U
7/30/2019	Potassium-40	pCi/kg	7.58E+03	3.13E+02		
7/30/2019	Zinc-65	pCi/kg	1.13E+01	5.94E+01		U
7/30/2019	Zirconium-95	pCi/kg	-6.19E+00	4.25E+01		U
8/27/2019	Barium-140	pCi/kg	4.53E+00	1.15E+02		U
8/27/2019	Beryllium-7	pCi/kg	4.21E+03	2.73E+02		
8/27/2019	Cesium-134	pCi/kg	4.59E-03	3.35E+01	6.00E+01	U
8/27/2019	Cesium-137	pCi/kg	8.75E-01	3.21E+01	8.00E+01	U
8/27/2019	Cobalt-57	pCi/kg	-1.34E+01	2.06E+01		U
8/27/2019	Cobalt-58	pCi/kg	8.55E+00	2.91E+01		U
8/27/2019	Cobalt-60	pCi/kg	-1.37E+01	3.35E+01		U
8/27/2019	Iodine-131	pCi/kg	2.68E+00	4.05E+01	6.00E+01	U
8/27/2019	Iron-59	pCi/kg	1.28E+01	6.23E+01		U
8/27/2019	Lanthanum-140	pCi/kg	-5.46E-01	4.12E+01		U
8/27/2019	Manganese-54	pCi/kg	-1.87E-01	3.52E+01		U
8/27/2019	Niobium-95	pCi/kg	-9.03E+00	2.97E+01		U
8/27/2019	Potassium-40	pCi/kg	1.10E+03	2.93E+02		
8/27/2019	Zinc-65	pCi/kg	2.03E+01	8.14E+01		U
8/27/2019	Zirconium-95	pCi/kg	-1.05E+00	4.03E+01		U
9/24/2019	Barium-140	pCi/kg	8.15E+00	1.67E+02		U
9/24/2019	Beryllium-7	pCi/kg	7.16E+03	2.79E+02		
9/24/2019	Cesium-134	pCi/kg	5.39E+00	3.34E+01	6.00E+01	U
9/24/2019	Cesium-137	pCi/kg	2.31E+00	3.35E+01	8.00E+01	U
9/24/2019	Cobalt-57	pCi/kg	6.38E+00	2.24E+01		U
9/24/2019	Cobalt-58	pCi/kg	1.11E+01	3.35E+01		U
9/24/2019	Cobalt-60	pCi/kg	9.32E+00	3.27E+01		U
9/24/2019	Iodine-131	pCi/kg	7.31E+00	6.60E+01	6.00E+01	DLU
9/24/2019	Iron-59	pCi/kg	-3.17E-01	5.84E+01		U
9/24/2019	Lanthanum-140	pCi/kg	-1.27E+01	5.28E+01		U
9/24/2019	Manganese-54	pCi/kg	-4.67E+00	3.22E+01		U
9/24/2019	Niobium-95	pCi/kg	1.77E+00	3.43E+01		U
9/24/2019	Potassium-40	pCi/kg	2.86E+03	2.80E+02		
9/24/2019	Zinc-65	pCi/kg	3.16E+01	5.74E+01		U
9/24/2019	Zirconium-95	pCi/kg	-1.69E+00	5.90E+01		U
10/29/2019	Barium-140	pCi/kg	-2.29E+01	1.89E+02		U
10/29/2019	Beryllium-7	pCi/kg	5.37E+03	3.38E+02		
10/29/2019	Cesium-134	pCi/kg	-9.47E+00	4.08E+01	6.00E+01	U
10/29/2019	Cesium-137	pCi/kg	6.09E+01	3.53E+01	8.00E+01	UI
10/29/2019	Cobalt-57	pCi/kg	4.35E+00	2.45E+01		U
10/29/2019	Cobalt-58	pCi/kg	-1.28E+01	3.67E+01		U
10/29/2019	Cobalt-60	pCi/kg	4.90E+00	4.45E+01		U
10/29/2019	Iodine-131	pCi/kg	-2.67E+01	4.87E+01	6.00E+01	U
10/29/2019	Iron-59	pCi/kg	8.47E+00	7.38E+01		U
10/29/2019	Lanthanum-140	pCi/kg	-1.40E+01	5.97E+01		U
10/29/2019	Manganese-54	pCi/kg	-1.36E+01	3.18E+01		U

10/29/2019	Niobium-95	pCi/kg	-3.12E+00	3.87E+01		U
10/29/2019	Potassium-40	pCi/kg	5.97E+02	3.80E+02		UI
10/29/2019	Zinc-65	pCi/kg	3.09E+01	9.03E+01		U
10/29/2019	Zirconium-95	pCi/kg	1.29E+00	7.98E+01		U
11/26/2019	Barium-140	pCi/kg	4.81E+01	1.88E+02		U
11/26/2019	Beryllium-7	pCi/kg	6.73E+03	2.84E+02		
11/26/2019	Cesium-134	pCi/kg	-2.78E+00	3.65E+01	6.00E+01	U
11/26/2019	Cesium-137	pCi/kg	1.48E+01	3.69E+01	8.00E+01	U
11/26/2019	Cobalt-57	pCi/kg	4.57E+00	2.60E+01		U
11/26/2019	Cobalt-58	pCi/kg	4.88E+00	3.66E+01		U
11/26/2019	Cobalt-60	pCi/kg	-1.04E+00	3.66E+01		U
11/26/2019	Iodine-131	pCi/kg	2.58E+01	6.83E+01	6.00E+01	DLU
11/26/2019	Iron-59	pCi/kg	-4.15E+01	6.49E+01		U
11/26/2019	Lanthanum-140	pCi/kg	-3.10E+01	6.03E+01		U
11/26/2019	Manganese-54	pCi/kg	-3.11E+00	3.79E+01		U
11/26/2019	Niobium-95	pCi/kg	3.15E+01	4.09E+01		U
11/26/2019	Potassium-40	pCi/kg	3.22E+03	3.14E+02		
11/26/2019	Zinc-65	pCi/kg	-1.62E+01	7.52E+01		U
11/26/2019	Zirconium-95	pCi/kg	-1.29E+01	6.28E+01		U
12/31/2019	Barium-140	pCi/kg	4.51E+00	7.99E+01		U
12/31/2019	Beryllium-7	pCi/kg	7.49E+03	1.55E+02		
12/31/2019	Cesium-134	pCi/kg	1.49E+01	2.28E+01	6.00E+01	U
12/31/2019	Cesium-137	pCi/kg	1.85E+00	2.07E+01	8.00E+01	U
12/31/2019	Cobalt-57	pCi/kg	2.78E+00	1.39E+01		U
12/31/2019	Cobalt-58	pCi/kg	5.23E+00	1.85E+01		U
12/31/2019	Cobalt-60	pCi/kg	1.21E+01	2.30E+01		U
12/31/2019	Iodine-131	pCi/kg	2.54E+00	2.47E+01	6.00E+01	U
12/31/2019	Iron-59	pCi/kg	-8.76E+00	3.56E+01		U
12/31/2019	Lanthanum-140	pCi/kg	-1.02E+01	2.40E+01		U
12/31/2019	Manganese-54	pCi/kg	-4.23E+00	1.92E+01		U
12/31/2019	Niobium-95	pCi/kg	5.14E+00	2.00E+01		U
12/31/2019	Potassium-40	pCi/kg	1.47E+03	1.91E+02		
12/31/2019	Zinc-65	pCi/kg	-4.08E+00	4.05E+01		U
12/31/2019	Zirconium-95	pCi/kg	1.71E+01	3.42E+01		U
1/28/2020	Barium-140	pCi/kg	6.39E+00	8.69E+01		U
1/28/2020	Beryllium-7	pCi/kg	1.21E+03	1.62E+02		
1/28/2020	Cesium-134	pCi/kg	3.95E+00	2.13E+01	6.00E+01	U
1/28/2020	Cesium-137	pCi/kg	-7.08E+00	2.10E+01	8.00E+01	U
1/28/2020	Cobalt-57	pCi/kg	-4.37E-01	1.31E+01		U
1/28/2020	Cobalt-58	pCi/kg	1.22E+01	1.20E+01		UI
1/28/2020	Cobalt-60	pCi/kg	3.69E+00	2.54E+01		U
1/28/2020	Iodine-131	pCi/kg	1.83E+01	3.37E+01	6.00E+01	U
1/28/2020	Iron-59	pCi/kg	1.96E+01	5.01E+01		U
1/28/2020	Lanthanum-140	pCi/kg	-2.89E+00	3.80E+01		U
1/28/2020	Manganese-54	pCi/kg	-1.36E+00	2.27E+01		U
1/28/2020	Niobium-95	pCi/kg	-2.28E+00	2.29E+01		U
1/28/2020	Potassium-40	pCi/kg	5.20E+03	1.74E+02		

1/28/2020	Zinc-65	pCi/kg	-1.43E+01	4.94E+01	U
1/28/2020	Zirconium-95	pCi/kg	3.82E+00	4.10E+01	U

Food Product Results

FP-1

Collect Date	Parmname	Units	Result	Uncertainty	MDC	LLD	Qualifier
11/12/2019	Barium-140	pCi/kg	1.26E+01	1.53E+01	5.12E+01		U
11/12/2019	Beryllium-7	pCi/kg	1.04E+01	2.75E+01	9.05E+01		U
11/12/2019	Cesium-134	pCi/kg	9.17E+00	3.83E+00	1.37E+01	6.00E+01	U
11/12/2019	Cesium-137	pCi/kg	4.13E+00	3.31E+00	1.19E+01	8.00E+01	U
11/12/2019	Cobalt-57	pCi/kg	7.38E-01	2.28E+00	7.31E+00		U
11/12/2019	Cobalt-58	pCi/kg	-2.92E+00	3.28E+00	1.04E+01		U
11/12/2019	Cobalt-60	pCi/kg	-1.93E+00	3.83E+00	1.18E+01		U
11/12/2019	Iodine-131	pCi/kg	-1.20E+00	4.69E+00	1.53E+01	6.00E+01	U
11/12/2019	Iron-59	pCi/kg	-3.20E+00	7.76E+00	2.46E+01		U
11/12/2019	Lanthanum-140	pCi/kg	-1.81E+00	4.35E+00	1.39E+01		U
11/12/2019	Manganese-54	pCi/kg	2.64E+00	3.42E+00	1.19E+01		U
11/12/2019	Niobium-95	pCi/kg	-1.15E+01	4.39E+00	1.06E+01		U
11/12/2019	Potassium-40	pCi/kg	5.37E+03	1.93E+02	1.17E+02		
11/12/2019	Zinc-65	pCi/kg	9.87E+00	8.98E+00	2.81E+01		U
11/12/2019	Zirconium-95	pCi/kg	-4.24E+00	6.68E+00	1.88E+01		U

FP-2

Collect Date	Parmname	Units	Result	Uncertainty	MDC	LLD	Qualifier
6/18/2019	Barium-140	pCi/kg	-1.07E+01	1.10E+01	3.33E+01		U
6/18/2019	Beryllium-7	pCi/kg	2.40E+01	1.65E+01	5.98E+01		U
6/18/2019	Cesium-134	pCi/kg	3.27E+00	2.41E+00	8.98E+00	6.00E+01	U
6/18/2019	Cesium-137	pCi/kg	-9.71E-02	2.21E+00	7.05E+00	8.00E+01	U
6/18/2019	Cobalt-57	pCi/kg	-9.36E-01	1.62E+00	5.08E+00		U
6/18/2019	Cobalt-58	pCi/kg	6.41E-01	2.04E+00	7.08E+00		U
6/18/2019	Cobalt-60	pCi/kg	1.11E+00	2.53E+00	8.64E+00		U
6/18/2019	Iodine-131	pCi/kg	2.28E+00	3.55E+00	1.23E+01	6.00E+01	U
6/18/2019	Iron-59	pCi/kg	4.28E+00	5.17E+00	1.83E+01		U
6/18/2019	Lanthanum-140	pCi/kg	-7.49E+00	4.44E+00	9.81E+00		U
6/18/2019	Manganese-54	pCi/kg	5.78E-02	2.05E+00	6.94E+00		U
6/18/2019	Niobium-95	pCi/kg	9.13E-01	2.32E+00	7.58E+00		U
6/18/2019	Potassium-40	pCi/kg	1.87E+03	1.17E+02	7.07E+01		
6/18/2019	Zinc-65	pCi/kg	4.60E+00	5.38E+00	1.90E+01		U
6/18/2019	Zirconium-95	pCi/kg	1.09E+00	4.76E+00	1.46E+01		U

Fish Results

F-1 Squaw Creek

Matrix	Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
Catfish	6/4/2019	Barium-140	pCi/g	-7.30E-03	3.60E-02		U
Catfish	6/4/2019	Beryllium-7	pCi/g	7.74E-03	6.39E-02		U
Catfish	6/4/2019	Cesium-134	pCi/g	4.70E-03	1.09E-02	1.30E+02	U
Catfish	6/4/2019	Cesium-137	pCi/g	-9.15E-04	7.62E-03	1.50E+02	U
Catfish	6/4/2019	Cobalt-57	pCi/g	2.59E-03	4.05E-03		U
Catfish	6/4/2019	Cobalt-58	pCi/g	-2.99E-03	7.51E-03	1.30E+02	U
Catfish	6/4/2019	Cobalt-60	pCi/g	-7.93E-04	9.04E-03	1.30E+02	U
Catfish	6/4/2019	Iodine-131	pCi/g	3.76E-03	1.16E-02		U
Catfish	6/4/2019	Iron-59	pCi/g	-2.79E-03	1.58E-02	2.60E+02	U
Catfish	6/4/2019	Lanthanum-140	pCi/g	-1.12E-03	1.13E-02		U
Catfish	6/4/2019	Manganese-54	pCi/g	-5.78E-04	7.45E-03	1.30E+02	U
Catfish	6/4/2019	Niobium-95	pCi/g	-9.67E-04	8.30E-03		U
Catfish	6/4/2019	Potassium-40	pCi/g	3.01E+00	6.91E-02		
Catfish	6/4/2019	Zinc-65	pCi/g	3.05E-03	2.23E-02	2.60E+02	U
Catfish	6/4/2019	Zirconium-95	pCi/g	6.19E-04	1.53E-02		U
Bass	6/4/2019	Barium-140	pCi/g	-4.65E-04	4.20E-02		U
Bass	6/4/2019	Beryllium-7	pCi/g	-2.25E-02	7.58E-02		U
Bass	6/4/2019	Cesium-134	pCi/g	1.18E-03	1.08E-02	1.30E+02	U
Bass	6/4/2019	Cesium-137	pCi/g	9.98E-04	1.09E-02	1.50E+02	U
Bass	6/4/2019	Cobalt-57	pCi/g	-2.01E-03	5.71E-03		U
Bass	6/4/2019	Cobalt-58	pCi/g	1.93E-03	1.03E-02	1.30E+02	U
Bass	6/4/2019	Cobalt-60	pCi/g	3.27E-05	1.33E-02	1.30E+02	U
Bass	6/4/2019	Iodine-131	pCi/g	5.47E-03	1.65E-02		U
Bass	6/4/2019	Iron-59	pCi/g	-1.62E-03	2.67E-02	2.60E+02	U
Bass	6/4/2019	Lanthanum-140	pCi/g	-6.67E-04	1.44E-02		U
Bass	6/4/2019	Manganese-54	pCi/g	1.76E-03	1.03E-02	1.30E+02	U
Bass	6/4/2019	Niobium-95	pCi/g	2.07E-03	1.23E-02		U
Bass	6/4/2019	Potassium-40	pCi/g	2.37E+00	1.09E-01		
Bass	6/4/2019	Zinc-65	pCi/g	-6.53E-03	2.45E-02	2.60E+02	U
Bass	6/4/2019	Zirconium-95	pCi/g	-4.55E-04	2.01E-02		U
Catfish	12/23/2019	Barium-140	pCi/kg	0.00E+00	4.43E+01		U
Catfish	12/23/2019	Beryllium-7	pCi/kg	-2.68E+01	9.57E+01		U
Catfish	12/23/2019	Cesium-134	pCi/kg	2.10E+00	1.28E+01	1.30E+02	U
Catfish	12/23/2019	Cesium-137	pCi/kg	2.15E+00	1.43E+01	1.50E+02	U
Catfish	12/23/2019	Cobalt-57	pCi/kg	2.72E-02	9.06E+00		U
Catfish	12/23/2019	Cobalt-58	pCi/kg	-1.05E+00	6.44E+00	1.30E+02	U
Catfish	12/23/2019	Cobalt-60	pCi/kg	-5.01E-01	1.15E+01	1.30E+02	U
Catfish	12/23/2019	Iodine-131	pCi/kg	2.19E+00	2.15E+01		U
Catfish	12/23/2019	Iron-59	pCi/kg	5.83E+00	3.10E+01	2.60E+02	U
Catfish	12/23/2019	Lanthanum-140	pCi/kg	-6.36E+00	1.72E+01		U
Catfish	12/23/2019	Manganese-54	pCi/kg	4.21E+00	1.27E+01	1.30E+02	U
Catfish	12/23/2019	Niobium-95	pCi/kg	-3.94E+00	9.68E+00		U

Catfish	12/23/2019	Potassium-40	pCi/kg	2.74E+03	1.38E+02		
Catfish	12/23/2019	Zinc-65	pCi/kg	-6.16E-01	3.08E+01	2.60E+02	U
Catfish	12/23/2019	Zirconium-95	pCi/kg	7.46E+00	2.53E+01		U
Bass	12/23/2019	Barium-140	pCi/kg	-5.18E+00	4.44E+01		U
Bass	12/23/2019	Beryllium-7	pCi/kg	-6.32E+00	1.01E+02		U
Bass	12/23/2019	Cesium-134	pCi/kg	3.59E+00	1.35E+01	1.30E+02	U
Bass	12/23/2019	Cesium-137	pCi/kg	1.33E-01	1.29E+01	1.50E+02	U
Bass	12/23/2019	Cobalt-57	pCi/kg	-1.78E+00	8.03E+00		U
Bass	12/23/2019	Cobalt-58	pCi/kg	3.30E+00	1.42E+01	1.30E+02	U
Bass	12/23/2019	Cobalt-60	pCi/kg	4.60E-03	1.45E+01	1.30E+02	U
Bass	12/23/2019	Iodine-131	pCi/kg	-3.51E+00	1.74E+01		U
Bass	12/23/2019	Iron-59	pCi/kg	1.38E+00	2.70E+01	2.60E+02	U
Bass	12/23/2019	Lanthanum-140	pCi/kg	4.25E+00	1.76E+01		U
Bass	12/23/2019	Manganese-54	pCi/kg	-8.07E+00	8.06E+00	1.30E+02	U
Bass	12/23/2019	Niobium-95	pCi/kg	-3.43E+00	1.19E+01		U
Bass	12/23/2019	Potassium-40	pCi/kg	3.08E+03	9.68E+01		
Bass	12/23/2019	Zinc-65	pCi/kg	0.00E+00	2.65E+01	2.60E+02	U
Bass	12/23/2019	Zirconium-95	pCi/kg	-2.28E+00	2.07E+01		U

F-2 Lake Granbury

Matrix	Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
Catfish	6/4/2019	Barium-140	pCi/g	9.91E-03	3.33E-02		U
Catfish	6/4/2019	Beryllium-7	pCi/g	2.15E-02	6.39E-02		U
Catfish	6/4/2019	Cesium-134	pCi/g	-3.82E-03	7.06E-03	1.30E+02	U
Catfish	6/4/2019	Cesium-137	pCi/g	2.25E-03	6.92E-03	1.50E+02	U
Catfish	6/4/2019	Cobalt-57	pCi/g	-1.68E-03	4.55E-03		U
Catfish	6/4/2019	Cobalt-58	pCi/g	-5.80E-03	5.25E-03	1.30E+02	U
Catfish	6/4/2019	Cobalt-60	pCi/g	-3.10E-03	8.05E-03	1.30E+02	U
Catfish	6/4/2019	Iodine-131	pCi/g	-7.88E-03	1.14E-02		U
Catfish	6/4/2019	Iron-59	pCi/g	-2.54E-03	1.80E-02	2.60E+02	U
Catfish	6/4/2019	Lanthanum-140	pCi/g	2.57E-04	8.62E-03		U
Catfish	6/4/2019	Manganese-54	pCi/g	-1.27E-03	6.52E-03	1.30E+02	U
Catfish	6/4/2019	Niobium-95	pCi/g	-4.22E-05	7.22E-03		U
Catfish	6/4/2019	Potassium-40	pCi/g	3.22E+00	6.83E-02		
Catfish	6/4/2019	Zinc-65	pCi/g	7.49E-03	1.79E-02	2.60E+02	U
Catfish	6/4/2019	Zirconium-95	pCi/g	-3.62E-03	1.16E-02		U
Bass	6/4/2019	Barium-140	pCi/g	1.22E-03	5.60E-02		U
Bass	6/4/2019	Beryllium-7	pCi/g	9.33E-03	9.48E-02		U
Bass	6/4/2019	Cesium-134	pCi/g	4.95E-03	1.49E-02	1.30E+02	U
Bass	6/4/2019	Cesium-137	pCi/g	2.29E-03	1.20E-02	1.50E+02	U
Bass	6/4/2019	Cobalt-57	pCi/g	2.69E-04	5.94E-03		U
Bass	6/4/2019	Cobalt-58	pCi/g	6.96E-04	1.39E-02	1.30E+02	U
Bass	6/4/2019	Cobalt-60	pCi/g	1.43E-03	1.25E-02	1.30E+02	U
Bass	6/4/2019	Iodine-131	pCi/g	6.86E-03	1.85E-02		U
Bass	6/4/2019	Iron-59	pCi/g	1.46E-02	3.19E-02	2.60E+02	U
Bass	6/4/2019	Lanthanum-140	pCi/g	5.42E-03	1.64E-02		U

Bass	6/4/2019	Manganese-54	pCi/g	-2.07E-03	1.05E-02	1.30E+02	U
Bass	6/4/2019	Niobium-95	pCi/g	3.83E-03	1.36E-02		U
Bass	6/4/2019	Potassium-40	pCi/g	3.81E+00	1.15E-01		
Bass	6/4/2019	Zinc-65	pCi/g	5.43E-03	3.38E-02	2.60E+02	U
Bass	6/4/2019	Zirconium-95	pCi/g	-4.59E-03	1.71E-02		U
Bass	12/23/2019	Barium-140	pCi/kg	6.94E+00	4.53E+01		U
Bass	12/23/2019	Beryllium-7	pCi/kg	-1.45E+00	7.39E+01		U
Bass	12/23/2019	Cesium-134	pCi/kg	-1.56E+00	1.01E+01	1.30E+02	U
Bass	12/23/2019	Cesium-137	pCi/kg	-4.16E+00	8.58E+00	1.50E+02	U
Bass	12/23/2019	Cobalt-57	pCi/kg	-1.62E+00	6.27E+00		U
Bass	12/23/2019	Cobalt-58	pCi/kg	-3.32E+00	1.01E+01	1.30E+02	U
Bass	12/23/2019	Cobalt-60	pCi/kg	4.52E-01	1.02E+01	1.30E+02	U
Bass	12/23/2019	Iodine-131	pCi/kg	-1.58E+00	1.46E+01		U
Bass	12/23/2019	Iron-59	pCi/kg	1.40E+01	1.94E+01	2.60E+02	U
Bass	12/23/2019	Lanthanum-140	pCi/kg	1.27E+00	1.46E+01		U
Bass	12/23/2019	Manganese-54	pCi/kg	-5.48E+00	7.87E+00	1.30E+02	U
Bass	12/23/2019	Niobium-95	pCi/kg	4.07E+00	1.11E+01		U
Bass	12/23/2019	Potassium-40	pCi/kg	4.08E+03	8.13E+01		
Bass	12/23/2019	Zinc-65	pCi/kg	-3.68E-01	2.53E+01	2.60E+02	U
Bass	12/23/2019	Zirconium-95	pCi/kg	9.95E+00	1.94E+01		U

F-3 Squaw Creek

Matrix	Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
Catfish	6/4/2019	Tritium	pCi/g	6.82E+00	1.08E+00	2.00E+00	

Sediment Results

SS-1 NNE-1.0

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019 10:21	Barium-140	pCi/kg	-1.60E+01	1.19E+02		U
1/15/2019 10:21	Beryllium-7	pCi/kg	1.24E+02	3.38E+02		U
1/15/2019 10:21	Cesium-134	pCi/kg	6.99E+01	5.39E+01	1.50E+02	UI
1/15/2019 10:21	Cesium-137	pCi/kg	3.05E+01	4.23E+01	1.80E+02	U
1/15/2019 10:21	Cobalt-58	pCi/kg	-6.06E+00	3.65E+01		U
1/15/2019 10:21	Cobalt-60	pCi/kg	7.68E+00	4.18E+01		U
1/15/2019 10:21	Iodine-131	pCi/kg	-1.25E+01	3.83E+01		U
1/15/2019 10:21	Iron-59	pCi/kg	-1.47E+01	7.56E+01		U
1/15/2019 10:21	Lanthanum-140	pCi/kg	-1.92E+00	4.27E+01		U
1/15/2019 10:21	Manganese-54	pCi/kg	4.43E+01	3.96E+01		UI
1/15/2019 10:21	Niobium-95	pCi/kg	4.98E+01	3.95E+01		UI
1/15/2019 10:21	Potassium-40	pCi/kg	1.17E+04	2.59E+02		
1/15/2019 10:21	Zinc-65	pCi/kg	-1.91E+01	9.29E+01		U
1/15/2019 10:21	Zirconium-95	pCi/kg	-3.36E+01	5.51E+01		U
8/13/2019 9:36	Barium-140	pCi/kg	-3.58E+01	2.92E+02		U
8/13/2019 9:36	Beryllium-7	pCi/kg	2.57E+02	3.70E+02		U
8/13/2019 9:36	Cesium-134	pCi/kg	4.28E+01	5.38E+01	1.50E+02	U
8/13/2019 9:36	Cesium-137	pCi/kg	6.65E+00	4.57E+01	1.80E+02	U
8/13/2019 9:36	Cobalt-58	pCi/kg	-2.18E+01	3.27E+01		U
8/13/2019 9:36	Cobalt-60	pCi/kg	-5.90E+00	3.94E+01		U
8/13/2019 9:36	Iodine-131	pCi/kg	-6.04E+01	1.29E+02		U
8/13/2019 9:36	Iron-59	pCi/kg	-3.65E+01	6.80E+01		U
8/13/2019 9:36	Lanthanum-140	pCi/kg	1.39E+01	8.81E+01		U
8/13/2019 9:36	Manganese-54	pCi/kg	3.41E+00	4.50E+01		U
8/13/2019 9:36	Niobium-95	pCi/kg	3.03E+01	5.44E+01		U
8/13/2019 9:36	Potassium-40	pCi/kg	5.07E+03	2.88E+02		
8/13/2019 9:36	Zinc-65	pCi/kg	-5.74E+00	7.96E+01		U
8/13/2019 9:36	Zirconium-95	pCi/kg	3.69E+01	7.59E+01		U

SS-2 N-9.9

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019 10:51	Barium-140	pCi/kg	3.04E+01	9.70E+01		U
1/15/2019 10:51	Beryllium-7	pCi/kg	1.91E+02	2.33E+02		U
1/15/2019 10:51	Cesium-134	pCi/kg	1.11E+00	2.52E+01	1.50E+02	U
1/15/2019 10:51	Cesium-137	pCi/kg	7.89E+00	2.46E+01	1.80E+02	U
1/15/2019 10:51	Cobalt-58	pCi/kg	9.23E+00	2.48E+01		U
1/15/2019 10:51	Cobalt-60	pCi/kg	-1.39E+00	2.10E+01		U
1/15/2019 10:51	Iodine-131	pCi/kg	1.43E+01	3.19E+01		U
1/15/2019 10:51	Iron-59	pCi/kg	1.60E+00	4.51E+01		U
1/15/2019 10:51	Lanthanum-140	pCi/kg	-6.04E-01	2.97E+01		U
1/15/2019 10:51	Manganese-54	pCi/kg	1.56E+01	2.09E+01		U

1/15/2019 10:51	Niobium-95	pCi/kg	6.24E+00	2.29E+01		U
1/15/2019 10:51	Potassium-40	pCi/kg	2.64E+03	2.28E+02		
1/15/2019 10:51	Zinc-65	pCi/kg	2.63E+01	5.34E+01		U
1/15/2019 10:51	Zirconium-95	pCi/kg	-4.90E+00	3.22E+01		U
8/13/2019 10:01	Barium-140	pCi/kg	1.15E+02	4.08E+02		U
8/13/2019 10:01	Beryllium-7	pCi/kg	1.50E+02	4.73E+02		U
8/13/2019 10:01	Cesium-134	pCi/kg	-1.50E+01	4.61E+01	1.50E+02	U
8/13/2019 10:01	Cesium-137	pCi/kg	8.74E+00	4.54E+01	1.80E+02	U
8/13/2019 10:01	Cobalt-58	pCi/kg	6.93E+00	4.72E+01		U
8/13/2019 10:01	Cobalt-60	pCi/kg	-6.75E+00	4.30E+01		U
8/13/2019 10:01	Iodine-131	pCi/kg	-3.25E+01	1.16E+02		U
8/13/2019 10:01	Iron-59	pCi/kg	1.40E+01	8.61E+01		U
8/13/2019 10:01	Lanthanum-140	pCi/kg	-5.12E+00	1.31E+02		U
8/13/2019 10:01	Manganese-54	pCi/kg	-1.31E+01	3.15E+01		U
8/13/2019 10:01	Niobium-95	pCi/kg	-6.59E+00	5.90E+01		U
8/13/2019 10:01	Potassium-40	pCi/kg	2.05E+03	3.32E+02		
8/13/2019 10:01	Zinc-65	pCi/kg	-6.00E+01	1.09E+02		U
8/13/2019 10:01	Zirconium-95	pCi/kg	3.93E+01	9.23E+01		U

SS-3 NE-7.4

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019 10:40	Barium-140	pCi/kg	-9.82E+00	7.88E+01		U
1/15/2019 10:40	Beryllium-7	pCi/kg	6.66E+01	2.07E+02		U
1/15/2019 10:40	Cesium-134	pCi/kg	7.71E+00	2.97E+01	1.50E+02	U
1/15/2019 10:40	Cesium-137	pCi/kg	2.00E+00	3.37E+01	1.80E+02	U
1/15/2019 10:40	Cobalt-58	pCi/kg	9.81E-01	2.18E+01		U
1/15/2019 10:40	Cobalt-60	pCi/kg	-1.85E+01	2.12E+01		U
1/15/2019 10:40	Iodine-131	pCi/kg	-5.03E+00	2.01E+01		U
1/15/2019 10:40	Iron-59	pCi/kg	1.05E+01	4.60E+01		U
1/15/2019 10:40	Lanthanum-140	pCi/kg	-9.00E+00	2.70E+01		U
1/15/2019 10:40	Manganese-54	pCi/kg	5.31E+00	2.42E+01		U
1/15/2019 10:40	Niobium-95	pCi/kg	-6.67E+00	2.10E+01		U
1/15/2019 10:40	Potassium-40	pCi/kg	2.17E+03	2.34E+02		
1/15/2019 10:40	Zinc-65	pCi/kg	-3.42E+01	3.13E+01		U
1/15/2019 10:40	Zirconium-95	pCi/kg	-1.20E+01	3.52E+01		U
8/13/2019 9:52	Barium-140	pCi/kg	-1.38E+02	2.63E+02		U
8/13/2019 9:52	Beryllium-7	pCi/kg	1.06E+02	4.06E+02		U
8/13/2019 9:52	Cesium-134	pCi/kg	1.59E+01	4.02E+01	1.50E+02	U
8/13/2019 9:52	Cesium-137	pCi/kg	1.36E+00	3.76E+01	1.80E+02	U
8/13/2019 9:52	Cobalt-58	pCi/kg	6.27E+00	3.86E+01		U
8/13/2019 9:52	Cobalt-60	pCi/kg	2.40E+00	4.08E+01		U
8/13/2019 9:52	Iodine-131	pCi/kg	6.25E+01	1.46E+02		U
8/13/2019 9:52	Iron-59	pCi/kg	-5.43E+00	7.74E+01		U
8/13/2019 9:52	Lanthanum-140	pCi/kg	-1.60E+01	8.41E+01		U
8/13/2019 9:52	Manganese-54	pCi/kg	-1.05E+01	3.57E+01		U
8/13/2019 9:52	Niobium-95	pCi/kg	1.38E+01	4.71E+01		U

8/13/2019 9:52	Potassium-40	pCi/kg	2.08E+03	3.48E+02		
8/13/2019 9:52	Zinc-65	pCi/kg	-4.42E+01	7.91E+01		U
8/13/2019 9:52	Zirconium-95	pCi/kg	1.52E+01	8.52E+01		U

SS-4 SE-5.3

Collect Date	Parmname	Units	Result	MDC	LLD	Qualifier
1/15/2019 9:42	Barium-140	pCi/kg	2.80E+01	1.05E+02		U
1/15/2019 9:42	Beryllium-7	pCi/kg	5.99E+02	2.10E+02		
1/15/2019 9:42	Cesium-134	pCi/kg	5.17E+00	2.85E+01	1.50E+02	U
1/15/2019 9:42	Cesium-137	pCi/kg	5.99E+01	2.61E+01	1.80E+02	UI
1/15/2019 9:42	Cobalt-58	pCi/kg	-1.10E+01	2.48E+01		U
1/15/2019 9:42	Cobalt-60	pCi/kg	4.41E+00	3.40E+01		U
1/15/2019 9:42	Iodine-131	pCi/kg	-1.06E+01	2.28E+01		U
1/15/2019 9:42	Iron-59	pCi/kg	-8.54E-01	5.42E+01		U
1/15/2019 9:42	Lanthanum-140	pCi/kg	6.22E+00	3.27E+01		U
1/15/2019 9:42	Manganese-54	pCi/kg	6.02E+00	2.95E+01		U
1/15/2019 9:42	Niobium-95	pCi/kg	-4.42E+00	2.54E+01		U
1/15/2019 9:42	Potassium-40	pCi/kg	7.99E+03	2.97E+02		
1/15/2019 9:42	Zinc-65	pCi/kg	2.03E+01	6.02E+01		U
1/15/2019 9:42	Zirconium-95	pCi/kg	-5.38E+00	4.60E+01		U
8/13/2019 9:06	Barium-140	pCi/kg	-1.11E+02	2.48E+02		U
8/13/2019 9:06	Beryllium-7	pCi/kg	3.06E+02	4.62E+02		U
8/13/2019 9:06	Cesium-134	pCi/kg	1.91E+00	4.48E+01	1.50E+02	U
8/13/2019 9:06	Cesium-137	pCi/kg	3.96E+00	4.29E+01	1.80E+02	U
8/13/2019 9:06	Cobalt-58	pCi/kg	-1.48E+00	3.92E+01		U
8/13/2019 9:06	Cobalt-60	pCi/kg	9.73E+00	3.88E+01		U
8/13/2019 9:06	Iodine-131	pCi/kg	-2.45E+01	1.13E+02		U
8/13/2019 9:06	Iron-59	pCi/kg	-2.33E+01	6.58E+01		U
8/13/2019 9:06	Lanthanum-140	pCi/kg	4.12E+01	8.51E+01		U
8/13/2019 9:06	Manganese-54	pCi/kg	8.18E+00	4.34E+01		U
8/13/2019 9:06	Niobium-95	pCi/kg	-4.94E+00	4.46E+01		U
8/13/2019 9:06	Potassium-40	pCi/kg	5.45E+03	3.99E+02		
8/13/2019 9:06	Zinc-65	pCi/kg	-8.42E+00	8.54E+01		U
8/13/2019 9:06	Zirconium-95	pCi/kg	2.74E+00	7.31E+01		U

Appendix B

Comanche Peak Nuclear Power Plant
Land Use Census
2019

COPY

LAND USE CENSUS 2019

The Land Use Census identified receptors within a five (5) mile radius of the plant in each of the sixteen (16) meteorological sectors. The Land Use Census was conducted June 17-20, 2019 and includes the following items:

1. Evaluation of the 2019 Land Use Census
2. Nearest Resident by Sector, Distance, X/Q and D/Q
3. Nearest Garden by Sector, Distance and D/Q
4. Nearest Milk Animal by Sector, Distance and D/Q
5. Population by Sector and Distance
6. Environmental Sample Locations Table
7. Environmental Monitoring Locations Map – 2 Mile Radius
8. 5 Mile Sector and Road Map with Field Data*
9. Environmental Monitoring Locations Map – all sample locations*

*These maps are vaulted along with this census. Copies of this census will not contain a copy of these maps unless specifically requested.

Evaluation of the 2019 Land Use Census

The results of the 2019 Land Use Census were reviewed for impact on the Radiological Environmental Monitoring Program (REMP). The specific areas reviewed, that could be affected by changes found in the land use census, were the sampling requirements for milk, broadleaf vegetation and food products.

Reviewing the milk sampling requirements from the ODCM Table 3.12-1 requires that samples are to be obtained from milking animals in three locations within a 5 km distance having the highest potential dose. If none are available, samples are acceptable from milking animals in locations 5 to 8 km distance where doses are calculated to be greater than 1 mRem per year. A sample is also required at a control location. There are currently no identified milking animals (cow or goat) within the specified distances therefore; there are no current milk samples during the year 2019.

If no milk samples are available, the broadleaf vegetation sampling specified in ODCM Table 3.12-1 will be performed. Broadleaf sample requirements are such that samples of broadleaf vegetation are to be collected from each of two offsite locations of the highest predicted annual average D/Q if milk sampling is not performed at all the required locations. Currently, broadleaf vegetation samples are collected at two indicator locations (N - 1.45 and SW - 1.0) and one control location (SW - 13.5). These indicator locations are near the site boundary in sectors where broadleaf vegetation is available and D/Q is high. Therefore, no change to the broadleaf sampling program is required.

Food product sample requirements of ODCM Table 3.12-1 requires that one sample of each principal class of food product be collected from any area that is irrigated with water in which liquid plant waste has been discharged. Of the gardens identified in the land use census, no gardens are located in any area that irrigates with water in which liquid plant wastes are discharged. Currently, food products are sampled from two locations (ENE - 9.0) and (E-4.2) when in season. The location ENE-9.0 is for pecans at time of harvest and location E-4.2 will continue to be a major source of food products sold to the public.

The location E-4.2 had cucumbers which were collected from this location as a conservative measure. This garden does not meet the ODCM Table 3.12-1 requirements because the products are not irrigated by water in which liquid plant wastes have been discharged.

Calculated values for the associated X/Q and D/Q values for each controlling receptor location and pathway are included along with the receptor distances in the data tables of this land use census. The values used to determine potential dose due to radioactive effluent discharges are the highest calculated values based on annual average values. The following values are based on the original pre-operational and subsequent Comanche Peak 3 and 4 new build calculations which identified predominant wind direction, structures affecting potential release patterns, and area population. The annual average X/Q used for dose calculations is 3.30E-6, tritium X/Q is 4.36E-6, and the D/Q value is 3.34 E-8. All these values are conservative based on the 2017 Land Use Census data and therefore no changes are required in the dose calculation parameters as verified by the field data.

* X/Q units are Sec/cubic meter * D/Q units are inverse square meters

Nearest Resident by Sector, Distance, X/Q and D/Q

Sector	Distance (Miles)	X/Q	D/Q
N	2.6	6.39E-07	3.50E-09
NNE	2.5	4.20E-07	2.00E-09
NE	2.5	2.90E-07	1.00E-09
ENE	2.6	2.20E-07	5.77E-10
E	2.5	2.70E-07	5.80E-10
ESE	2.2	4.02E-07	9.00E-10
SE	2.0	7.1E-07	2.80E-09
SSE	1.5	1.10E-06	6.60E-09
S	1.5	8.50E-07	5.20E-09
SSW	1.8	5.04 E-7	2.42 E-9
SW	0.8	3.56E-06	1.85E-08
WSW	0.8	3.92E-06	1.63E-08
W	1.6	7.64E-07	2.50E-09
WNW	2.5	4.70E-07	1.40E-09
NW	4.8	2.52E-07	6.20E-10
NNW	2.2	1.12E-06	5.16E-09

Note: The Annual Average X/Q used for dose calculations is 3.30E-06 sec/cubic meter.
The Tritium value X/Q used for dose calculations is 4.36E-06 sec/cubic meter.
The Annual Average D/Q used for dose calculations is 3.34E-08 inverse square meters.

Nearest Garden by Sector, Distance and D/Q

Sector	Distance (Miles)*	D/Q
N	None	None
NNE	None	None
NE	None	None
ENE	None	None
E	4.2	2.00E-10
ESE	None	None
SE	None	None
SSE	None	None
S	None	None
SSW	None	None
SW	None	None
WSW	None	None
W	None	None
WNW	None	None
NW	None	None
NNW	None	None

Nearest Milk Animal by Sector, Distance and D/Q

Sector	Distance (Miles)*	D/Q
N	None	None
NNE	None	None
NE	None	None
ENE	None	None
E	None	None
ESE	None	None
SE	None	None
SSE	None	None
S	None	None
SSW	None	None
SW	None	None
WSW	None	None
W	None	None
WNW	None	None
NW	None	None
NNW	None	None

*No Milk samples are currently being collected.

Population by Sector and Distance

Sector	0-1	1-2	2-3	3-4	4-5	Total
N	-	-	12	71	107	190
NNE	-	-	8	71	62	141
NE	-	-	173	169	303	645
ENE	-	-	107	30	20	157
E	-	-	180	198	40	418
ESE	-	-	93	107	147	347
SE	-	-	205	407	138	750
SSE	-	96	133	123	2646	2998
S	-	30	126	64	302	522
SSW	-	6	8	11	72	97
SW	8	133	11	96	59	307
WSW	36	157	8	6	-	207
W	-	108	10	22	12	152
WNW	-	-	13	57	141	211
NW	-	-	-	-	7	7
NNW	-	-	5	44	49	98
TOTAL	44	530	1092	1476	4105	7247

The average number of residents per house was obtained from North Central Texas Council of Governments for Hood and Somervell Counties. The number of residents per house is 2.46 and 2.58, respectively. (http://www.indexmundi.com/facts/united-states/quick-facts/texas/average-household-size#table)

Hood County, Texas/ Somervell County, Texas

Age

- Persons under 5 years 5.8% / 5.0%
- Persons under 18 years 21.3% / 22.6%
- Persons 65 years and older 24.5% / 18.7%

(Population estimates as of July,1 2017)

Environmental Sample Locations Table

Sampling Point	Location	Sample Type*
A1	N-1.45 (Squaw Creek Park)	A
A2	N-9.4 (Granbury)	A
A3	E-3.5 (Children's Home)	A
A4	SSE-4.5 (Glen Rose)	A
A5	S/SSW-1.2	A
A6	SW-12.3 (CONTROL)	A
A7	SW/WSW-0.95	A
A8	NW-1.0	A
R1	N-1.45 (Squaw Creek Park)	R
R2	N-4.4	R
R3	N-6.5	R
R4	N-9.4 (Granbury)	R
R5	NNE-1.1	R
R6	NNE-5.65	R
R7	NE-1.7	R
R8	NE-4.8	R
R9	ENE-2.5	R
R10	ENE-5.0	R
R11	E-0.5	R
R12	E-1.9	R
R13	E-3.5 (Children's Home)	R
R14	E-4.2	R
R15	ESE-1.4	R
R16	ESE-4.7	R
R17	SE-1.3	R
R18	SE-3.85	R

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
R19	SE-4.6	R
R20	SSE-1.3	R
R21	SSE-4.4 (Glen Rose)	R
R22	SSE-4.5 (Glen Rose)	R
R23	S-1.5	R
R24	S-4.2	R
R25	S/SSW-1.2	R
R26	SSW-4.4 (State Park)	R
R27	SW-0.9	R
R28	SW-4.8 (Girl Scout Camp)	R
R29	SW-12.3 (CONTROL)	R
R30	WSW-1.0	R
R31	WSW-5.35	R
R32	WSW-7.0 (CONTROL)	R
R33	W-1.0	R
R34	W-2.0	R
R35	W-5.5	R
R36	WNW-1.0	R
R37	WNW-5.0	R
R38	WNW-6.7	R
R39	NW-1.0	R
R40	NW-5.7	R
R41	NW-9.9 (Tolar)	R
R42	NNW-1.35	R
R43	NNW-4.6	R
R44	SE-0.6	R
R45	SE-0.6	R
R46	SE-0.6	R
R47	SE-0.6	R

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
SW1	N-1.5 (Squaw Creek Reservoir Marina)	SW
SW2	N-9.9 (Lake Granbury)	SW/DW[1]
SW3	N-19.3 (CONTROL-Brazos River)	SW
SW4	NE-7.4 (Lake Granbury)	SW
SW5	ESE-1.4 (Squaw Creek Reservoir)	SW[2]
SW6	NNW-0.1 (Squaw Creek Reservoir)	SW/DW[2, 3]
GW1	W-1.2 (Security Rifle Range)	GW[7]
GW2	WSW-0.1 (Somerville Water district)	GW[3, 4,6]
GW3	SSE-4.6 (Glen Rose – Somerville Water District)	GW[4]
GW4	N-9.8 (Granbury)	GW[1, 4,6]
GW5	N-1.45 (Squaw Creek Park)	GW[4]
SS1	NNE-1.0 (Squaw Creek Reservoir)	SS
SS2	N-9.9 (Lake Granbury)	SS
SS3	NE-7.4 (Lake Granbury)	SS
SS4	SE-5.3 (Squaw Creek)	SS
F1	SE-0.1 (Squaw Creek Reservoir)	F
F2	NNE-8.0 (Lake Granbury)	F
FP1	ENE-9.0 (Leonard Bros. Pecan Farm)	FP
FP2	E-4.2 (Hornick's Produce Farm)	FP

Environmental Sample Locations Table (cont.)

Sampling Point	Location	Sample Type*
BL1	N-1.45	BL
BL2	SW-1.0	BL[5]
BL3	SW-13.5 (CONTROL)	BL[5]

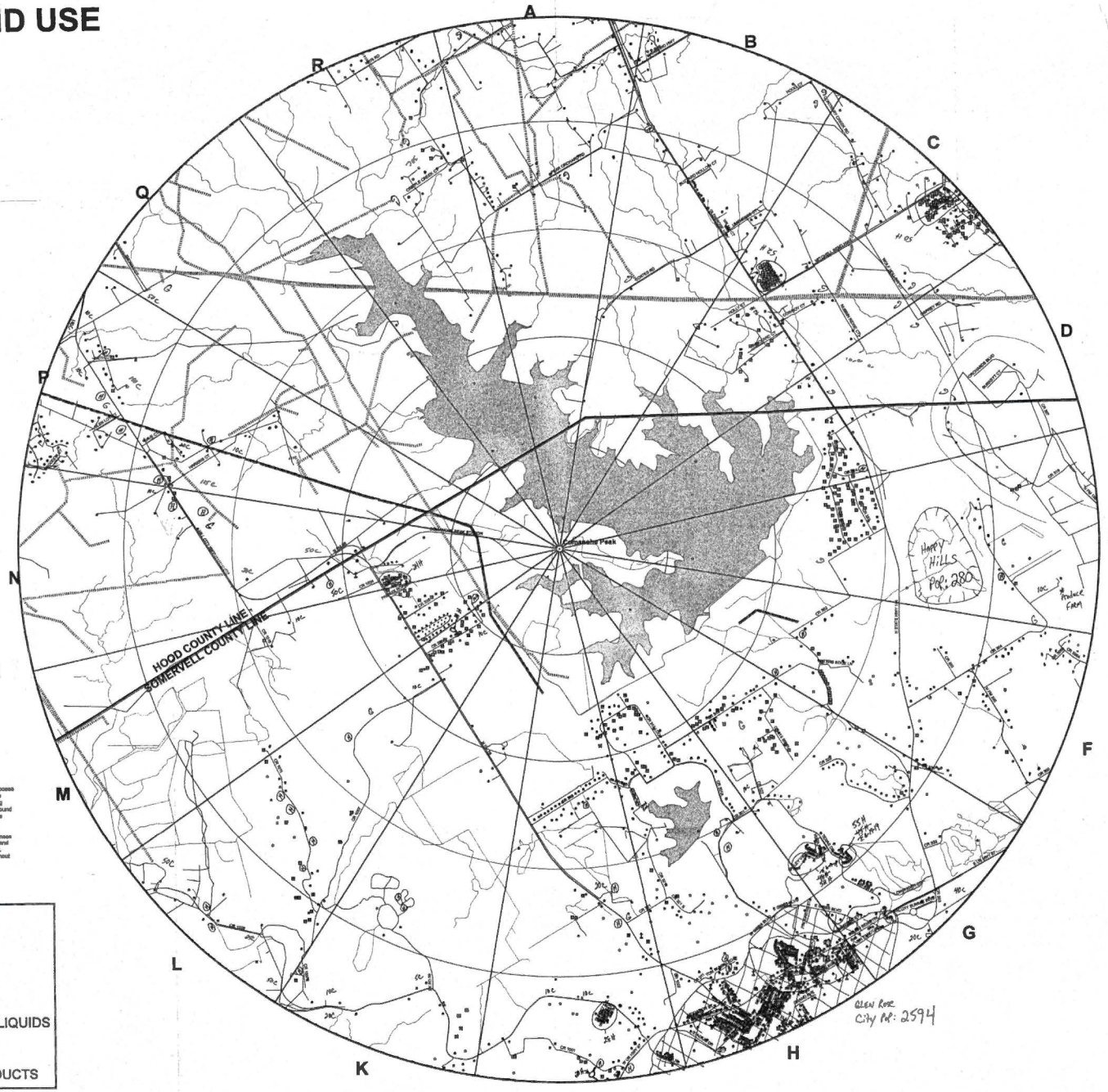
*Sample Type: A - Air Sample; R - Direct Radiation; SW - Surface Water; DW - Drinking Water GW - Ground Water; SS - Shoreline Sediments; M - Milk; F - Fish; FP - Food Products; BL - Broadleaf Vegetation

NOTES:

1. The municipal water system for the City of Granbury is supplied by surface water from Lake Granbury (location SW2) and ground water (location GW4). Each of these supplies is sampled. These samples are not required for compliance with Radiological Effluent Control 3/4.12.1, Table 3.12-1, because they are not affected by plant discharges.
2. This sample (location SW6) is representative of discharges from Squaw Creek Reservoir both down Squaw Creek and to Lake Granbury via the return line to Lake Granbury if used.
3. Plant potable water could be supplied by surface water from Squaw Creek Reservoir (location SW6) or ground water from onsite wells (location GW2) but is currently supplied by the Somerville County Water District from the Wheeler Branch Reservoir. Each of these possible sources of water were sampled.
4. Ground water supplies in the plant site area are not affected by plant liquid effluents as discussed in CPSES FSAR Section 2.4.13. However, they are monitored for radioactivity IAW the requirements of the Radiological Effluent Control 3/4.12.1, Table 3.12-1.
5. Broadleaf sampling will be performed at the specified locations if milk samples are unavailable from any location.
6. Plant Potable Water (GW2) and Glen Rose (GW3) are supplied from surface water by the Somerville Water District from the Wheeler Branch Reservoir.
7. CPNPP Security Rifle Range (GW1) is supplied by a local Well.

2019

CPNPP LAND USE



N
W E
S

Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

Hood County does not guarantee the correctness or accuracy of any features on this product and assumes no responsibility for the content. This product may be revised at any time without notification to any user.

Pipelines_5_Mile
CMDTY_DESC
- CRUDE OIL
- NATURAL GAS
- NATURAL GAS LIQUIDS
- RAW LPG
- REFINED PRODUCTS

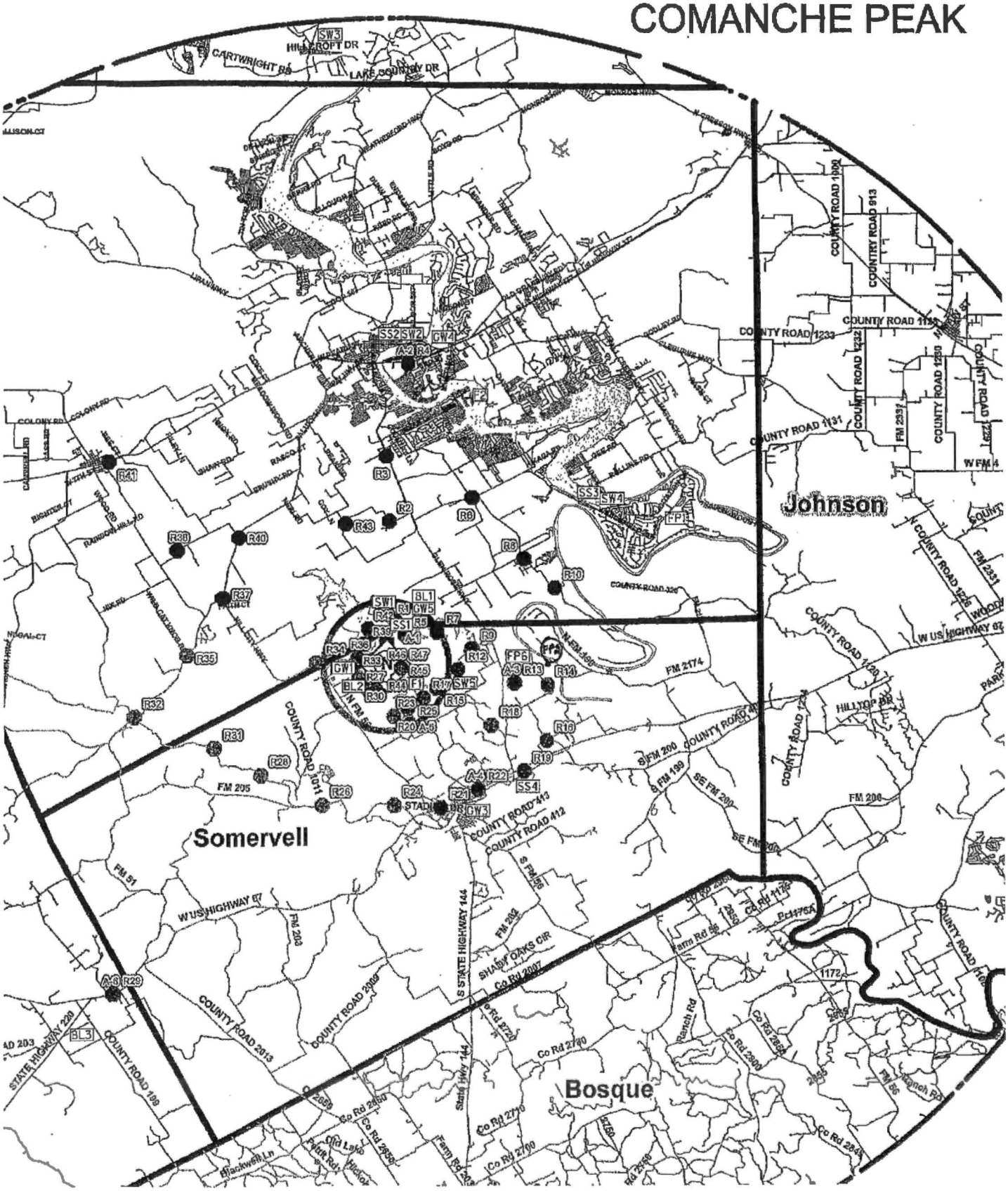
Date: 9/6/2014

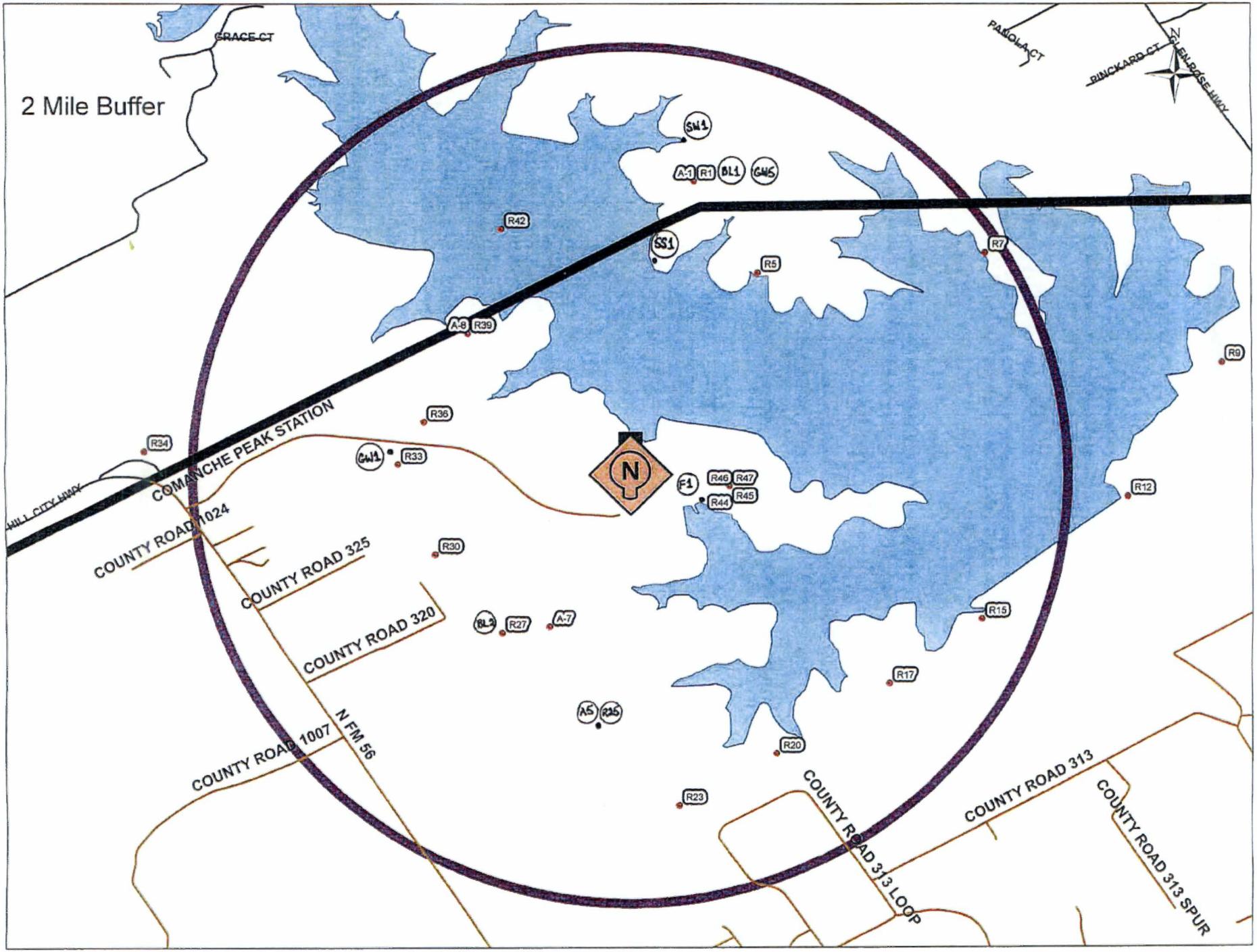
[redacted]

Ⓗ = New House
#C = Cows
G = N.Gas Pump

ENVIRONMENTAL SAMPLE LOCATIONS MAP - 20 MILE RADIUS

COMANCHE PEAK




2 Mile Buffer
GRACE CT
PANOLA CT
PINCKARD CT
GLEN ROSE HWY
SW1
A-1
R1
BL1
GW5
R42
SS1
R7
R5
A-8
R39
R9
R36
R34
GW2
R33
COMANCHE PEAK STATION
HILL CITY HWY
F1
R46
R47
R45
R44
R12
COUNTY ROAD 1024
COUNTY ROAD 325
R30
COUNTY ROAD 320
BL2
R27
A-7
R15
R17
A5
R26
R20
COUNTY ROAD 1007
N FM 56
R23
COUNTY ROAD 313
COUNTY ROAD 313 LOOP
COUNTY ROAD 313 SPUR