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

PSEG
Nuclear LLC

APR 2 5 2019

TS 6.9.1.7 (Salem)
TS 6.9.1.6 (Hope Creek)

LR-N19-0041

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: 2018 Annual Radiological Environmental Operating Report (AREOR)

As required with Section 6.9.1.7 of Appendix A to Renewed Facility Operating License Nos. DPR-70 (Unit 1) and DPR-75 (Unit 2) for Salem Generating Stations (SGS), and Section 6.9.1.6 of Appendix A to Renewed Facility Operating License NPF-57 for Hope Creek Generating Station (HCGS), PSEG Nuclear hereby transmits one (1) copy of the combined 2018 Annual Radiological Environmental Operating Report (Enclosure 1). This report summarizes the results of the Radiological Environmental Surveillance Program for 2018 in the vicinity of the Salem and Hope Creek Generating Stations. The result of this program for 2018 was specifically compared to the result of the pre-operational program.

There are no regulatory commitments contained in this letter.

If you have any questions or require any additional information, please contact Mr. Rick Heathwaite at (856) 339-2076.

Sincerely,

Patrick A. Martino
Plant Manager
Salem Generating Stations

Edward T. Casulli
Plant Manager
Hope Creek Generating Station

Enclosure 1: 2018 Annual Radiological Environmental Operating Report for Salem and Hope Creek Generating Stations

cc: Administrator, Region I, NRC
NRC Project Manager, Salem
NRC Project Manager, Hope Creek
NRC Senior Resident Inspector, Salem
NRC Senior Resident Inspector, Hope Creek
Mr. J. Furia, Inspector, Region I, NRC
Mr. P. Mulligan, Chief, NJ Bureau of Nuclear Engineering (NJBNE)
Mr. L. Marabella, Corporate Commitment Tracking Coordinator - w/o enclosure
Mr. T. Cachaza, Salem Commitment Tracking Coordinator - w/o enclosure
Ms. K. Stokes, Hope Creek Commitment Tracking Coordinator - w/o enclosure

2018 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1 THROUGH DECEMBER 31, 2018

PSEG Nuclear

Salem and Hope Creek Generating Stations

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Report Prepared by: _____ Date 4/2/2019

Rick Heathwaite (REMP/REC Program Manager)

Station Reviews and Approvals

Salem

_____ Date 4/5/19
Shane Howe (R.P. Manager)

_____ Date 04/05/19
William Gropp (Chem. Manager)

_____ Date 4/5/19
Richard DeSanctis (Sr. Dir. Operations)

_____ Date 4/5/19
Patrick Martino (Plant Manager)

Hope Creek

_____ Date 4/11/19
Harold Trimble (R.P. Manager)

_____ Date 4/11/19
Shelly Kugler (Chem. Manager)

_____ Date 4/11/19
Thomas Agster (Sr. Dir. Operations)

_____ Date 4/11/19
Edward Casulli (Plant Manager)

SGS AREOR-67		HCGS AREOR-41
Unit 1	Unit 2	Unit 1
DOCKET No. 50-272 OPERATING LICENSE No. DPR-070	DOCKET No. 50-311 OPERATING LICENSE No. DPR-075	DOCKET No. 50-311 OPERATING LICENSE No. NPF-057

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LIST OF ACRONYMS OR TERMS (in alphabetical order)

%	Percent
A	Acceptable
a posteriori	An “after the fact” limit representing the capability of a measurement system
a priori	A “before the fact” limit representing the capability of a measurement system
AIO	Air Iodine sample
Analyte	The substance being identified and measured in a chemical analysis
APT	Air Particulate sample
AREOR	Annual Radiological Environmental Operating Report
BNE	Bureau of Nuclear Engineering: A New Jersey state agency regulating, as applicable, the nuclear industry within the Department of Environmental Protection.
Bq	Becquerel: The SI unit of activity referring to the number of radioactive atoms. 1 Bq = 1 decay per second
C	Control
CAP	Corrective Action Program
CARR	Corrective/Preventive Action Request and Report (GEL CAP)
CVCS	Chemical Volume Control System
Ci	Curie: A non-SI unit of activity referring to the number of radioactive atoms. 1 Ci = 3.7×10^{10} decays per second
DOE	Department of Energy
DPM	Disintegrations per minute
ECH	Crab sample
ERA	Environmental Resource Associates
ESF	Fish sample
ESS	Sediment sample
EZA	Eckert & Ziegler Analytics, Inc.
FPL	Broad Leafy Vegetation sample
FPV	Vegetables sample
GAM	Game sample
GEL	General Engineering Laboratories; Duplicate sample analysis vendor
Gr-A	Gross alpha
Gr-B	Gross beta
H-3	Tritium
HCGS	Hope Creek Generating Station
IDM	Immersion Dose Monitor sample (direct radiation measurement made with field TLD)
ISFSI	Independent Spent Fuel Storage Installation
Kg	Kilogram
keV	Kilo-electron volts: A non-SI unit of energy equal to approximately 1.6×10^{-16} joules
L	Liter
LIMS	Laboratory Information Management System
LLD	Lower Limit of Detection: The predefined limit for the concentration at which the analyte will no longer be reliably detected with certainty (i.e method must be able to detect the analyte with certainty to a value at or below the LLD).
LTS	Laboratory Testing Services
m^3	Cubic meter

LIST OF ACRONYMS OR TERMS (in alphabetical order)

MAPEP	Mixed Analyte Performance Evaluation Program
MDC	Minimum Detectable Concentration: The minimum concentration that is practically achievable with certainty by an analytical method (not a predefined limit or goal).
mL	Milliliter
MLK	Milk sample
mR	MilliRoentgen: a unit of radiation, used to measure the exposure of somebody or something to X-rays and gamma rays, defined in terms of the ionization effect on air.
mrem	Millirem: a unit for measuring amounts of radiation, equal to the effect that one roentgen of X-rays or gamma-rays would produce in a human being.
MW_e	Megawatt Electric
MW_{th}	Megawatt Thermal
N	Not Acceptable
NCR	Nonconformance Report (TBE CAP)
NELAC	National Environmental Laboratory Conference
NRC / USNRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
pCi	Picocuries (one-trillionth of a Curie)
PD	Passive Dosimeter
PE	Performance Evaluation
PSEG	Public Service Enterprise Group
PT	Performance Testing
PWR	Potable (drinking) Water sample - Raw
PWT	Potable (drinking) Water sample - Treated
QA	Quality Assurance
REMP	Radiological Environmental Monitoring Program
RGPP	Radiological Groundwater Protection Program
SA	Salem
SAR	Safety Analysis Report
SCFM	Standard Cubic Feet per Minute
SGS	Salem Generating Station
SOL	Soil sample
SOP	Standard Operating Procedures
Std Quarter	Standard Quarter = 92 days
SWA	Surface Water sample
TBE	Teledyne Brown Engineering; Primary sample analysis vendor
TEDA	Triethylene-diamine
TLD	Thermoluminescent Dosimeter: A TLD measures ionizing radiation exposure by measuring the intensity of visible light emitted from a crystal when it is heated. The intensity of light emitted from the crystal is dependent upon the radiation exposure.
TS	Technical Specifications
uCi	Microcuries (one-millionth of a Curie)
USEPA	United States Environmental Protection Agency
VGT	Fodder Crop sample
W	Warning
WWA	Ground (well) Water sample

I. EXECUTIVE SUMMARY

PSEG Nuclear, LLC (PSEG) operates three nuclear reactors collectively referred to as the Site, which consists of Salem Generating Stations (SGS) Unit 1 and Unit 2, and the Hope Creek Generating Station (HCGS). The Site implements a Radiological Environmental Monitoring Program (REMP) in accordance with the Site Offsite Dose Calculation Manuals (ODCMs).

In 2018 there was no instance of radioactivity from plant effluents observed in the environment that exceeded any Reporting Levels identified in SGS ODCM Table 3.12-2 or HCGS ODCM Table 3.12.1-2. Furthermore, the data obtained during the Reporting Period were comparable to the results obtained during the pre-operational phase of the program, and are lower than the applicable limits. As expected, the operational REMP data from 2018 is consistent with historical data collected before, and throughout, commercial operation. Therefore, it can be concluded that the operation of the Site has had no significant radiological impact on the health and safety of the public or on the environment.

II. INTRODUCTION

The REMP monitors and evaluates the environment surrounding the Site to ensure that there are no adverse impacts on the health and safety of the public or on the environment. The results of the REMP are published annually in this report, the Annual Radiological Environmental Operating Report (AREOR). This AREOR provides a summary and interpretation of the data collected from January 1 through December 31, 2018 (the Reporting Period).

No cultural or historic resources officially identified and confirmed by regulatory agencies are known to exist at PSEG.

The REMP is based on NRC guidance as reflected in the Site ODCMs and establishes sample media, sampling locations, sampling frequency and analytical sensitivity requirements. It also identifies indicator and control locations established for comparison purposes to distinguish plant related radioactivity from naturally occurring or other radioactivity from man-made sources. The environmental monitoring program also verifies the projected and anticipated radionuclide concentrations in the environment and evaluates exposures associated with releases of radionuclides from the Site as described by the ODCM.

This program satisfies the requirements of Section IV.B.2 of Appendix I to 10 CFR 50 and provides surveillance of all appropriate critical exposure pathways to man. The REMP also complies with the following Technical Specifications and ODCM requirements:

Unit	Technical Specifications	ODCM
SGS U1	6.8.4.h Radiological Environmental Monitoring Program	3/4.12.1 Monitoring Program 6.9.1.7 Annual Radiological Environmental Operating Report
SGS U2	6.8.4.h Radiological Environmental Monitoring Program	3/4.12.1 Monitoring Program 6.9.1.7 Annual Radiological Environmental Operating Report
HCGS	6.8.4.h Radiological Environmental Monitoring Program	3/4.12.1 Monitoring Program

		6.9.1.6 Annual Radiological Environmental Operating Report

To demonstrate compliance with the requirements, samples of air particulates, air iodine, milk, surface water, ground (well) water, potable (drinking) water, vegetables, fodder crops, fish, crabs, oysters, game, and sediment were collected and analyzed. External radiation dose measurements were also made in the vicinity of the Site using passive dosimeters. These environmental media were analyzed for one or more of the following: gamma emitting isotopes, tritium (H-3), iodine-131 (I-131), gross alpha, gross beta, direct and immersion dose. Measurements made in the vicinity of the Site were compared to background or control measurements and the preoperational REMP study performed before SGS Unit 1 became operational. The results of these analyses were used to assess the impact on the health and safety of the public or on the environment of Site operations, thereby demonstrating compliance with the applicable Technical Specifications, ODCMs, and Federal regulations.

For the Reporting Period, there were a total of 1,690 analyses performed on 1,327 environmental samples. The radioactive materials noted in this Report are in general either naturally occurring in the environment such as K-40 or Be-7, or a result of other non-plant related human activities, such as historical atmospheric nuclear weapons testing or medical wastes from offsite. The majority of the remaining samples did not contain plant related radionuclides above detection limits.

The detection capabilities for environmental samples, required by the Site ODCMs, were achieved for the Reporting Period. Any exceptions to the program are noted in the Report and the associated PSEG Nuclear corrective action identifier was included in parenthesis.

III. THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

The Site is located in Lower Alloway's Creek Township, Salem County, New Jersey. SGS consists of two operating pressurized water nuclear power reactors. SGS Unit 1 has an approximate net electrical rating of 1,180 megawatts electric (MW_e) and SGS Unit 2 has an approximate net electrical rating of 1,178 MW_e. The licensed core thermal power rating for both Units is 3,459 megawatts thermal (MW_{th}). HCGS consists of an operating boiling water nuclear power reactor, which has an approximate net electrical rating of 1,212 MW_e. The licensed core thermal power rating is 3,902 MW_{th}.

The Site is located on a man-made peninsula on the east bank of the Delaware River called Artificial Island. The peninsula was created by the deposition of hydraulic fill from dredging operations. The surrounding environment is characterized mainly by the Delaware River Estuary, extensive tidal marshlands, and low-lying meadowlands. These land types make up a vast majority of the land area within five miles of the Site, with most of the remaining land used for agriculture.

Since 1968, a Radiological Environmental Monitoring Program (REMP) has been conducted at the Site. Starting in December 1972, a more extensive radiological monitoring program was initiated in preparation for the operation of SGS Unit 1. The operational REMP was initiated in December 1976 when SGS Unit 1 achieved criticality.

An overview of the 2018 REMP is provided in Table B-1. Radioanalytical data from samples collected under this program were compared with results from the preoperational phase and historical operational results. This report presents the results from January 1 through December 31, 2018 (the Reporting Period) for the Site REMP.

A. Objectives of the Operational REMP:

The objectives of the Operational REMP as described in the Site ODCMs are:

1. To determine whether any significant increases occur within the concentrations of radionuclides for critical pathways of exposure in the vicinity of Artificial Island.
2. To determine if the operation of the Site has resulted in any increase to the inventory of long lived radionuclides in the environment.
3. To detect any change in ambient gamma radiation levels.
4. To verify that Site operations do not have detrimental effects on the health and safety of the public or on the environment.

B. Implementation of the Objectives:

The following describes the actions taken by PSEG to meet the REMP objectives listed above:

1. Samples of various media were selected for monitoring due to the potential radiological dose impact to humans. The selection of samples was based on:
   a. Established critical pathways for the transfer of plant related radionuclides through the environment to man, and
   b. Experience gained during the preoperational phase. Sampling locations were determined based on site meteorology, Delaware River Estuary hydrology, local demography, and land uses.
2. Sampling locations are divided into two classes: indicator and control. Indicator locations are those which have the potential to be influenced by Site operations. Control samples are collected at locations which are believed to be unaffected by Site operations, usually at 15 to 30 kilometers (9.3 to 18.6 miles) away from the Site. Fluctuations in the levels of radionuclides and direct radiation at indicator locations are evaluated with respect to analogous fluctuations at control locations. Indicator and control location data are also evaluated relative to preoperational data.
3. Appendix A describes the coding system which identifies sample type and location and describes and summarizes the analytical results in accordance with Section 6.9.1.7 of the SGS ODCM and Section 6.9.1.6 of the HCGS ODCM. Table A-1 summarizes average, minimum and maximum activities of the indicator locations, control locations and the location with the highest mean using values above the Minimum Detectable Concentration (MDC).
4. Appendix B Table B-1 lists the types of samples collected, sample frequency, and analysis types. Table B-2 lists location codes, locations, and latitude and longitude coordinate.
5. The sampling locations are also indicated on Maps B-1 for on-site sampling locations out to 1 mile; B-2 for off-site sampling locations 1 to 10 miles; and B-3 for off-site sampling locations greater than 10 miles.

IV. PROGRAM DESCRIPTION

A. Data Interpretation

Results of analyses are grouped according to sample type and presented in Appendix C data tables. All results above the Lower Limit of Detection (LLD) are at a confidence level of ± 2 sigma. This represents the range of values into which 95% of repeated analyses of the same sample should fall. As defined in NRC NUREG-1301 and NUREG-1302, LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability, with only 5% probability of falsely concluding that a blank observation represents a "real signal." The equation for determining LLD is:

$$LLD = \frac{4.66 \bullet S_b}{E \bullet V \bullet 2.22 \bullet Y \bullet \exp(-\lambda \Delta t)}$$

4.66 is the statistical factor from NUREG 1301 and 1302,

S_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, as counts per minute,

E is the counting efficiency, as counts per disintegration,

V is the sample size in units of mass or volume,

2.22 is the number of disintegrations per minute per picocurie,

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec-1), and

Δt for environmental samples is the elapsed time between sample collection, or end of the sample collection period, and time of counting (sec).

The LLD is an *a priori* number, which represents the capability of the measurement system (including instrumentation, procedure and sample type) and not an after the fact criteria for the presence of activity. All analyses are designed to achieve the required detection limits for environmental sample analysis as described in the Site ODCMs.

The Minimum Detectable Concentration (MDC) is defined as above with the exception that the measurement is an *a posteriori* (after the fact) estimate of the presence of activity. The MDC should be lower than the required LLD.

The grouped data were averaged and standard deviations calculated. The ± 2 sigma deviations of the averaged data represent sample and not analytical variability. Averages are calculated using positive values. Results are considered positive if the activity exceeds the MDC and exceeds 3 sigma uncertainty. Additionally, for gamma analysis, the peak must be identified in the gamma spectrum.

B. Program Anomalies and Exceptions.

For the purpose of this report, a **Program Exception** is considered when a sample is missed; meaning that no scientifically valid data can be obtained (i.e. a forgotten or lost sample). Conversely, **Sample Anomalies** are instances where a partial sample was obtained, and despite potentially not meeting all the data objectives it still represents scientifically valid data (failed sample pump, defective TLD element, etc.). During the reporting period, anomalies and exceptions to REMP sampling requirements involved Air Sample weekly run times and Direct Radiation Monitoring dosimeters. In all but one air sampling instances, sufficient sample was collected during the week to meet the required LLD. One dosimeter was damaged and could not be read, and two dosimeters were identified as being placed on inner fences (closer to the site) than is described in the ODCM.

Air Sampling Locations

- **Sample Anomaly (Notification 20800432):** During weekly REMP air sample filter swaps on July 9, 2018 the sampler at location SA-APT/AIO-02F6 (EERC) was found running, but indicated system vacuum was lower than expected and there was no flow as indicated by the rotameter.

  In this instance, adequate sample volume was achieved and the LLD for I-131 was met. A sample that misses the LLD requirement still represents a valid scientific observation, which is why it is not considered a missed sample. It simply has not met the Data Quality Objectives (DQO) set forth in the REMP.

- **Sample Anomaly (Notification 20803621):** The week of September 4th, 2018, air sample station SA-APT/AIO-07S2 (southeast of site in the old Salem Parking Lot by Heli-Pad) was found not running. The total time the sampler was in operation was only 31.3 hours for the week.

  Upon inspecting the air sampler it was noted that the fuse was blown. The fuse was replaced in the field by the Laboratory Testing Services (LTS) Technician, but the unit still failed to turn on. Subsequently the pump was swapped out.

  The LLD for I-131 was not met for this sample. A sample that misses the LLD requirement still represents a valid scientific observation, which is why it is not considered a missed sample. It simply has not met the Data Quality Objectives (DQO) set forth in the REMP.

- **Sample Anomaly (Notification 20814324):** Power to Environmental Air Samplers SA-APT/AIO-05S1 and SA-APT/AIO-05S2 located near the security checkpoint were interrupted on June 26, 2018 for planned maintenance under Work Order 30299237.

  Tracking LCO 18-169 against ODCM 3.12.1 indicated the preventative maintenance removed power under clearance C1-ONL -SEC-MM -001 for approximately 9 hours.

  The LLDs were met for these samples.

Direct Radiation Measurement Locations

- **Sample Anomaly (Notification 20793365):** The Thermo-Luminescent Dosimeter (TLD) at REMP Location SA-IDM-14S1 was found on the inner security fence instead of the western (outer) security site boundary fence near the eastern shore line of the Delaware River as described in the ODCM. The actual TLD placement was more conservative than the intended location; because it was approximately 50 feet closer to the source it would potentially see more influence from plant operation.

  The error was due to new Technicians doing field work and inadequate turnover between the retiring technician and his replacement.

Potable Water Measurement Locations

- **Program Exception (Notification 20821248):** The Raw and Treated Potable Water samples from location SA-PWR/PWT-02F3 composited for February, 2018 did not have sufficient volume to perform Gross beta or Gross alpha analysis. The sample was analyzed for tritium, gammas, and Iodines. LTS had recently turned over to a new technician who set up the composite based on the LTS procedure. Inadequate sample was collected as a result. The LTS technician was counselled on the REMP requirements, and the LTS procedure was revised.

C. Program Changes

Program Changes are instances where a change to the REMP was assumed due to a permanent change in ability to obtain sample at that location.

Direct Radiation Measurements

- **Program Change (Notification 20793365):** On 5/15/2018 TLD SA-IDM-02S2 located between Hope Creek's Admin Building and the Learning and Development Center (LDC) was removed from Light Pole 65 as a result of activities associated with the Switchyard upgrade project. The Light Pole was permanently removed, and the TLD was provided to the REMP/REC Program Manager. This TLD would not yield any useful data for the Quarter and was not included in the 2Q REMP TLD analysis.

  A new permanent location needs to be identified for SA-IDM-02S2 (and should be renamed/re-mapped to distinguish it in the next revision of the Salem and Hope Creek ODCMs). In the meantime a temporary location, SA-IDM-02S2a, was identified for the remainder of the year. It is located in the general area (approximately 375 feet east southeast from the original location), but will not be disturbed by the ongoing switchyard project activities. The temporary location may be a good candidate for the new permanent location as well.

- **Program Change:** During the second quarter of 2018 the vendor used to supply and read environmental TLDs was swapped from Mirion Technologies to Stanford Dosimetry / EDC. The same style Panasonic UD-814 badges are used by each vendor, and both vendors have validated QA programs.

Milk Sample Locations

- **Program Change (Notification 20801535):** On August 6, 2018, the REMP LTS technician identified that the dairy farm at SA-MLK-03G1 (control location located 16.58 miles NE of S/HC) was no longer in business. The farm was still there; however, the farmer stated that he had recently ceased dairy production and sold all dairy cattle. This was the only dairy farm within the area (control area or indicator locations) requiring milk samples. There are no applicable dairy sources in the REMP at this time.

  An ODCM revision will be required to remove the SA-MLK-03G1 milk sampling location. Milk from location SA-MLK-02G3 should be considered for use as the new control location when the ODCM is revised.

D. Quality Assurance Program

Teledyne Brown Engineering

The results reported by TBE are consistent with the Quality Assurance Program as described in the TBE Quality Assurance Manual and the TBE Procedure Manual.

GEL Laboratories

The results reported by GEL Laboratories, LLC (GEL) are consistent with the Quality System described in GEL's Quality Assurance Manual and the requirements of ISO17025:2005.

E. Inter-laboratory Comparison Program

Inter-laboratory Comparison Programs are independent checks on the precision and accuracy of laboratory analyses. These checks are performed as part of the REMP and are part of the quality assurance program.

TBE analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices, as appropriate for 172 analyses (Appendix D, Tables D-1 through D-3).

GEL analyzed PE samples of air particulate, air iodine, milk, soil, vegetation and water matrices, as appropriate for 455 analyses (Appendix D, Tables D-4 through D-7).

The PE samples, supplied by Eckert & Ziegler Analytics, Inc. (EZA), Environmental Resource Associates (ERA), and the Department of Energy's (DOE) Mixed Analyte Performance Evaluation Program (MAPEP), were evaluated against the following acceptance criteria:

1. EZA Evaluation Criteria

   EZA's evaluation report provides a ratio of reported results and EZA's known value. Since flag acceptance criteria values are not assigned by EZA, TBE evaluated the reported ratios based on internal QC requirements, which are based on the DOE MAPEP criteria.

2. ERA Evaluation Criteria

   ERA's evaluation report provides an acceptance range for control and warning limits with associated flag values. ERA's acceptance limits are established in accordance with the United States Environmental Protection Agency (USEPA), National Environmental Laboratory Conference (NELAC) performance testing (PT) program requirements, or ERA's standard operating procedure (SOP) for the Generation of Performance Acceptance Limits, as applicable. The acceptance limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values. The MAPEP defines three levels of performance: Acceptable (flag = "A"), Acceptable with Warning (flag = "W"), and Not Acceptable (flag = "N"). Performance is considered acceptable when a mean result for the specified analyte is ± 20% of the reference value. Performance is "acceptable with warning" when a mean result falls in the range from ± 20% to ± 30% of the reference value (i.e., 20% < bias < 30%). If the mean result is greater than 30%, the results are deemed not acceptable.

Teledyne Brown Engineering

The DOE MAPEP samples are created to mimic conditions found at DOE sites which do not resemble typical environmental samples obtained at commercial nuclear power facilities.

Summary of Results – Inter-laboratory Comparison Program (ICP)

The TBE Laboratory analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation, and water matrices for various analytes. The PE samples supplied by Analytics Inc., Environmental Resource Associates (ERA) and Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP), were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

   Analytics' evaluation report provides a ratio of TBE's result and Analytics' known value. Since flag values are not assigned by Analytics, TBE evaluates the reported ratios based on internal QC requirements based on the DOE MAPEP criteria.

2. ERA Evaluation Criteria

   ERA's evaluation report provides an acceptance range for control and warning limits with associated flag values. ERA's acceptance limits are established per the USEPA, National Environmental Laboratory Accreditation Conference (NELAC), state-specific Performance Testing (PT) program requirements or ERA's SOP for the Generation of Performance Acceptance Limits, as applicable. The acceptance limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values. MAPEP defines three levels of performance:

- Acceptable (flag = "A")
  - result within ± 20% of the reference value
- Acceptable with Warning (flag = "W")
  - result falls in the ± 20% to ± 30% of the reference value
- Not Acceptable (flag = "N")
  - bias is greater than 30% of the reference value

NOTE

The Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP) samples are created to mimic conditions found at DOE sites which do not resemble typical environmental samples obtained at commercial nuclear power facilities.

For the TBE laboratory, 164 out of 172 analyses performed met the specified acceptance criteria. Six analyses did not meet the specified acceptance criteria for the following reasons and were addressed through the TBE Corrective Action Program.

1. TBE was unable to report the February 2018 DOE MAPEP vegetation Sr-90 result due to QC failure and limited sample amount. (NCR 18-09)

2. The Analytics September 2018 milk Fe-59 result was evaluated as *Not Acceptable* (Ratio of TBE to known result at 132%). The reported value was 158 ± 17.6 pCi/L and the known value was 119 ± 19.9 pCi/L. No cause for the failure could be determined. TBE has passed 24 of the previous 27 milk cross-check results since 2012. This sample was run in duplicate on a different detector with comparable results (162 +/- 16 pCi/L). *NOTE: TBE's 4th Qtr result passed at 105%* (NCR 18-20)

3. The Analytics September 2018 milk I-131 result was evaluated as *Not Acceptable* (Ratio of TBE to known result at 143%). Due to a personnel change in the gamma prep lab, the sample was not prepped/counted in a timely manner such as to accommodate the I-131 8-day half-life. Analysts have been made aware of the urgency for this analysis and it will be monitored more closely by QA. *NOTE: TBE's 4th Qtr result passed at 101%* (NCR 18-24)

4. The Analytics September soil Cr-51 result was evaluated as *Not Acceptable* (Ratio of TBE to known result at 131%). As with #3 above, the sample was not prepped/counted in a timely manner such as to accommodate the Cr-51 27-day half-life. The same corrective action applies here as in #3. (NCR 18-21)

5. The MAPEP November vegetation Sr-90 result of 0.338 Bq/sample was evaluated as Not Acceptable (Lower acceptable range was 0.554 Bq/sample). It appears that there has been incomplete dissolution of Sr-90 due to the composition of the MAPEP vegetation "matrix". To resolve this issue, the TBE-2018 procedure has been modified to add H_2O_2 to assist in breaking down the organic material that comprises this "matrix". This corrective action will be monitored closely by QA. (NCR 18-25).

6. The ERA November 2017 water Sr-90 sample was evaluated as *Not Acceptable*. TBE's initial reported result of 36.8 pCi/L exceeded the upper acceptance range (22.9 – 36.4 pCi/L). After reviewing the data for this sample, it was discovered that there was a typographical error at the time the results were entered at the ERA website. The correct result in LIMS of 36.2 should have been submitted instead. This result is within ERA's acceptance limits. In addition to the typo error, ERA's very stringent upper acceptance limit of 116% is not a reflection of TBE's ability to

successfully perform this analysis. (NCR 18-23)

The Inter-Laboratory Comparison Program provides evidence of "in control" counting systems and methods, and that the laboratories are producing accurate and reliable data.

GEL

During 2018, 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 2018. Of the four hundred fifty-five (455) total results, 98.5%% (448 of 455) 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

1. Analytics Evaluation

   Eckert & Ziegler Analytics provided samples to GEL for ninety-two (92) 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).

2. ERA Evaluation

   The ERA MRad program provided samples (MRAD-28 and MRAD-28) for one hundred eighty-seven (187) individual environmental analyses. Of the 187 analyses, 97.3% (182 out of 187) of all results fell within the PT provider's acceptance criteria.

   The ERA program provided samples (RAD-112 and RAD-114) for forty-nine (49) individual environmental analyses. Of the 49 analyses, 95.9% (47 out of 49) of all results fell within the PT provider's acceptance criteria.

3. DOE Evaluation

   MAPEP Series 38 and 39 were analyzed by the laboratory. All one hundred twenty-four (124) analyses fell within the PT provider's acceptance criteria (100% within acceptance).

CARR180226-1150 documents the unacceptable result of Natural Uranium (and mass) via KPA of ERA Study 112

CARR 180827-1171 documents the unacceptable result of Radium-226 of ERA Study RAD-114

CARR180522-1154 documents the unacceptable results of Uranium-234, Uranium-238, Uranium-Mass and Cobalt-60 in vegetation of ERA MRAD-28

CARR 181120-1190 documents the unacceptable result of Iron-55 in water of ERA MRAD-29.

F. Summary of Results: Split Sample Comparison Program

Duplicate samples were obtained for some samples of weekly air iodine and particulates, quarterly air particulate, sediment, broad leaf vegetation, milk, and surface water. These samples were analyzed by GEL as comparison and validation of TBE results. The GEL duplicate analysis results are shown in Table C-20.

1. Air Iodine

   I-131 was not detected (less than MDC) by TBE for all 52 air samples. 51 of 52 duplicate air samples counted by GEL were also less than MDC for I-131. However, one sample counted by GEL detected I-131 at a concentration of 5.81E-3 pCi/m^3 (the MDC for that sample also happened to be 5.81E-3 pCi/m^3)

2. Air Particulates

   Gross beta was detected by GEL and TBE in all 52 of the duplicate weekly APT samples. GEL detects significantly higher gross beta results due to different calibration energy sources used by each lab.

   All four duplicate quarterly composite samples analyzed had positive results for Be-7.

AIR PARTICULATE COMPOSITES

TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L77118	Q1 2018	Be-7**	5.87E-02	6.70E-03	9	448782	Be-7	6.41E-02	1.09	0.60	1.66	YES
L78179	Q2 2018	Be-7	6.01E-02	7.10E-03	8	454234	Be-7	6.72E-02	1.12	0.60	1.66	YES
L79806	Q3 2018	Be-7	7.36E-02	9.45E-03	8	461509	Be-7	6.19E-02	0.84	0.50	2.00	YES
L80953	Q4 2018	Be-7	5.64E-02	6.50E-03	9	468950	Be-7	6.02E-02	1.07	0.60	1.66	YES

3. Milk

   Naturally occurring K-40 was detected in all 12 duplicate samples and are all in agreement based on Criteria for Accepting the Licensee's Measurements in NRC Inspection Procedure 84525.

MILK												
TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L75902	1/2/2018	K-40	1.32E+03	8.40E+01	16	441034	K-40	1.67E+03	1.27	0.60	1.66	YES
L76342	2/6/2018	K-40	1.32E+03	8.30E+01	16	443523	K-40	1.27E+03	0.96	0.60	1.66	YES
L76652	3/5/2018	K-40	1.43E+03	6.91E+01	21	445699	K-40	1.14E+03	0.80	0.75	1.33	YES
L76959	4/2/2018	K-40	1.22E+03	7.05E+01	17	447353	K-40	1.23E+03	1.01	0.75	1.33	YES
L77453	5/8/2018	K-40	1.21E+03	7.10E+01	17	450075	K-40	1.47E+03	1.21	0.75	1.33	YES
L77814	6/4/2018	K-40	1.35E+03	9.85E+01	14	451988	K-40	1.31E+03	0.97	0.60	1.66	YES
L78199	7/2/2018	K-40	1.27E+03	9.25E+01	14	454136	K-40	1.46E+03	1.15	0.60	1.66	YES
L78696	8/6/2018	K-40	1.24E+03	8.70E+01	14	456832	K-40	1.17E+03	0.94	0.60	1.66	YES
L79089	9/4/2018	K-40	1.61E+03	1.14E+02	14	459055	K-40	1.84E+03	1.14	0.60	1.66	YES
L79472	10/2/2018	K-40	1.33E+03	7.70E+01	17	461054	K-40	1.41E+03	1.06	0.75	1.33	YES
L80146	11/13/2018	K-40	1.18E+03	8.00E+01	15	464607	K-40	1.41E+03	1.19	0.60	1.66	YES
L80341	12/3/2018	K-40	1.32E+03	8.45E+01	16	466278	K-40	1.42E+03	1.08	0.60	1.66	YES

4. Surface Water

Naturally occurring K-40 was detected by GEL and TBE in all 4 duplicate samples analyzed. All detections were in agreement based on Criteria for Accepting the Licensee's Measurements in NRC Inspection Procedure 84525.

SURFACE WATER												
TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L76852	3/19/18	K-40	5.29E+01	2.18E+01	2	446911	K-40	7.96E+01	1.50	0.40	2.25	YES
L78062	6/18/18	K-40	5.50E+01	3.32E+01	2	453424	K-40	4.47E+01	0.81	0.40	2.25	YES
L79363	9/17/18	K-40	5.65E+01	1.37E+01	4	460267	K-40	6.07E+01	1.07	0.50	2.00	YES
L80602	12/19/18	K-40	2.46E+01	1.54E+01	2	467776	K-40	2.32E+01	0.94	0.40	2.25	YES

5. Broad Leaf Vegetation

Naturally occurring K-40 was detected by GEL and TBE in all 5 duplicate samples analyzed. All results are in agreement based on Criteria for Accepting the Licensee's Measurements in NRC Inspection Procedure 84525.

VEGETATION												
TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L78500	7/25/18	K-40	3.91E+03	3.16E+02	12	455620	K-40	3.08E+03	0.79	0.60	1.66	YES
L78500	7/25/18	K-40	4.31E+03	2.89E+02	15	455620	K-40	5.13E+03	1.19	0.60	1.66	YES
L78987	8/29/2018	K-40	5.04E+03	3.20E+02	16	458576	K-40	3.95E+03	0.78	0.60	1.66	YES
L78987	8/29/2018	K-40	5.53E+03	3.64E+02	15	458576	K-40	6.02E+03	1.09	0.60	1.66	YES
L79345	9/24/2018	K-40	4.85E+03	2.52E+02	19	460188	K-40	3.65E+03	0.75	0.75	1.33	YES

6. Sediment

   Naturally occurring K-40 was detected in the sample by both GEL and TBE. Results are in agreement based on Criteria for Accepting the Licensee's Measurements in NRC Inspection Procedure 84525.

SEDIMENT												
TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L78158	6/29/18	K-40	2.88E+03	3.85E+02	7	453922	K-40	3.15E+03	1.09	0.50	2.00	YES

7. Fish

   Naturally occurring K-40 was detected in the sample by both GEL and TBE. Results are in agreement based on Criteria for Accepting the Licensee's Measurements in NRC Inspection Procedure 84525.

FISH												
TBE						GEL			TBE / GEL Comparison			
LIMS #	Collection Date	Nuclide	Decay Corrected Activity	1 Sigma Error	Resolution	LIMS #	Nuclide	Decay Corrected Activity	Ratio	Acceptance Criteria		Agreement
L77547	4.32E+04	K-40	3.13E+03	4.64E+02	7	450372	K-40	2.76E+03	0.88	0.50	2.00	YES

V. RESULTS AND DISCUSSION

The analytical results of the 2018 REMP samples were divided into categories based on exposure pathways: atmospheric, direct radiation, terrestrial, and aquatic. The ingestion pathway was evaluated under the terrestrial and aquatic categories. The analytical results for the Reporting Period are summarized in Appendix A, Radiological Environmental Monitoring Program Summary. The data for individual samples are presented in Appendix C data tables. The data are compared to the preoperational REMP data (1973-1976) and to historical data since Site operation commenced. The samples collected and analysis results indicate that the Site REMP was conducted in compliance with the Site Technical Specifications and ODCMs.

Effluent monitoring for the Site has historically included samples and analyses not specifically required by the Site ODCMs in addition to those required. Management Audit Samples are samples that are taken to augment the radiological effluent monitoring program, but do not fulfill any regulatory requirement. These analyses are referenced throughout the Report as Management Audit Samples. PSEG Nuclear continues to collect these samples. In addition to summarizing the required samples as part of the REMP, Table A-1, “Radiological Environmental Monitoring Program Summary”, of this report includes Management Audit Samples referenced in Table E-1 of each station’s ODCM. Additionally, Appendix C of this report includes a series of tables with analytical analysis results for all samples collected as the broader scope of the REMP. These tables also contain results for Management Audit Samples, including those not specified in ODCM Table E-1.

The following is a list and quantity of the Management audit samples collected in 2018:

Management Audit Sample Type	Number of Samples
Vegetables	21
Well Water	12
Potable Water (raw / treated)	12 / 12
Fodder Crops	3
Soil	0
Game	3
Oysters	4

A. Atmospheric

APT (Air Particulate) samples were collected on glass fiber filters with low-volume air samplers sampling at approximately 1.5 SCFM. Air sample volumes were measured with calibrated dry-gas meters.

AIO samples (Air Iodine) were collected from the air by adsorption on triethylene-diamine (TEDA) impregnated charcoal cartridges connected in series after the APT filters.

1. Air Particulates

APT samples were collected weekly at seven indicator locations (05S1, 07S2, 15S2, 05D1, 16E1, 01F1, and 02F6), one duplicate location (05S2) and one control location (14G1). Each weekly sample collected was analyzed for gross beta by TBE. Quarterly composites of the weekly samples from each location were analyzed for specific gamma emitters. The duplicate air location sample was shipped to GEL for analysis (Tables C-1, C-2 and C-20)

Gamma Spectroscopy

Gamma spectroscopy was performed on each of the 32 quarterly composite samples. Naturally occurring Be-7 was detected and no other gamma emitters were detected in any of the samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was detected in all 28 indicator location composites at concentrations ranging from 37E-03 pCi/m^3 to 79E-03 pCi/m^3 with an average concentration of 59E-03 pCi/m^3, and in the four control location composites ranging in concentration from 40E-03 pCi/m^3 to 61E-03 pCi/m^3 with an average concentration of 53E-03 pCi/m^3. The maximum preoperational level detected was 330E-03 pCi/m^3 with an average concentration of 109E-03 pCi/m^3 (Table C-1 and Reference [1] RMC-TR-77-03).

Gross Beta

Gross beta activity was detected in all 364 of the indicator location samples at concentrations ranging from 4E-03 pCi/m^3 to 36E-03 pCi/m^3 with an average concentration of 12E-03 pCi/m^3, and in 52 of 52 of the control location samples at concentrations ranging from 4E-03 pCi/m^3 to 22E-03 pCi/m^3 with an average of 12E-03 pCi/m^3. Gross beta activity was less than ten times the yearly mean of control samples. Therefore, per the ODCM gamma isotopic analysis was not

required to be performed on the individual samples. The maximum preoperational level detected was 920E-03 pCi/m^3 with an average concentration of 74E-03 pCi/m^3 (Table C-2 and Reference [1] RMC-TR-77-03). See Figure 1 (Appendix C).

2. Air Iodine

AIO were collected weekly at seven indicator locations (05S1, 07S2, 15S2, 05D1, 16E1, 01F1, and 02F6), one duplicate location (05S2) and one control location (14G1). The duplicate air location sample was shipped to GEL for analysis. Each sample was analyzed by TBE for I-131, and all 416 samples were less than the MDC for both indicator and control samples during the Reporting Period. The maximum preoperational level detected was 42E-03 pCi/m^3 (Table C-3 and Reference [1] RMC-TR-77-03).

B. Direct Radiation

Ambient radiation levels in the environment were monitored at locations on the Site and in the surrounding areas with pairs of passive dosimeters (PD) supplied and analyzed by Mirion Technologies. Packets containing the PDs were placed in the owner-controlled area, around the Site at various distances, and in each land based meteorological sector. Six were placed in control locations and the balance of measurement locations were placed at areas of interest such as population centers, nearby residences, and schools.

A total of 58 Immersion Dose Monitor (IDM) locations were established to monitor for direct radiation during 2017, including:

- 21 on-site locations:

  01S1, 01S2, 02S2, 02S4, 03S1, 04S1, 05S1, 06S2, 07S1, 08S1, 09S1, 10S1, 11S1, 12S1, 13S1, 14S1, 15S1, 15S2, 16S1, 16S2, and 16S3

- 32 off-site locations within the 10 mile zone:

  04D2, 05D1, 10D1, 14D1, 15D1, 02E1, 03E1, 11E2, 12E1, 13E1, 16E1, 01F1, 02F2, 02F5, 02F6, 03F2, 03F3, 04F2, 05F1, 06F1, 07F2, 08F1, 09F1, 10F2, 11F1, 12F1, 13F2, 13F3, 13F4, 14F2, 15F3, and 16F2

- 6 control locations beyond 10 miles:

  01G3, 03G1, 10G1, 14G1, 16G1, and 03H1.

The PDs at each location are changed and analyzed quarterly.

Two PDs (Panasonic type UD-814) are placed at each location. The laboratory utilizes a Panasonic based system using UD-814 dosimeters that are constructed of three rectangular, lead-shielded (protects against low-energy gamma radiation) teflon wafers, impregnated with 25% calcium sulfate phosphor ($CaSO_4$:Dy) to monitor gamma radiation. Additionally, each PD has one lithium borate (LiBO:Mn) element to monitor beta radiation (which is not used).

In 2018 PSEG implemented American National Standards Institute (ANSI) N13.37-2014 Environmental Dosimetry - Criteria for System Design and Implementation for comparing each PD location dose result to its historical background dose. Per the standard a well-functioning dosimetry system should be able to detect a 5 mrem difference in the quarterly data and a 10 mrem difference in the yearly data above background.

The two site boundary locations 01S1 and 16S2 showed measurable dose rates above background. The net dose radiation levels as measured by these site boundary locations

ranged from 12.4 to 17.0 mrem/Standard Quarter and an annual dose of 59.5 mrem for Locations 01S1 and 60.0 mrem for Location 16S2.

Dose to the nearest resident due to direct radiation from ISFSI was calculated to be 0.00648 mrem for the year which was a very small fraction of limit (40 CFR 190 and 10 CFR 72.104 both limit the dose to a real member of the public to 25 mrem in a year to the total body). The calculation was performed using the formula provided in ANSI/HPS N13.37-2014 as follows:

$$D_2 = OF * \left(\left(D_1 * R_1^{\,2} \right) / R_2^{\,2} \right)$$

Where:

D_1 = Dose that was measured from TLD Location 16S2

D_2 = Dose that will be extrapolated to Nearest Resident

R_1 = Distance from the source to the location where D1 was obtained. *(Distance from ISFSI to TLD at 16S2)*

R_2 = Distance from ISFSI to the location that dose will be extrapolated *(Nearest Resident)*

OF = Occupancy Factor (1 = full time)

Location	**R_1** (ft)	**D_1 Net Dose** (mrem)	**R_2** (ft)	**OF**	**D_2 Dose** (mrem)
Nearest Resident	203	60.0	19,536	1.0	6.48 E-03

C. Terrestrial

Terrestrial REMP sampling includes the collection of milk, well water, potable water, vegetables, and fodder crop samples.

Milk samples (MLK) were taken semi-monthly when cows were on pasture and monthly when cows were not grazing on open pasture, from three indicator locations (13E3, 14F4, 02G3) and one control location (03G1). Animals were considered on pasture from April to November of each year. Samples were collected in new polyethylene containers, sodium bisulfite was added as a sample preservative, and then samples were frozen and transported in ice chests to TBE.

Well water samples (WWA) were collected monthly from one location (03E1). Separate raw water (PWR) and treated potable water (PWT) composite samples were collected monthly from one location (02F3). Each monthly composite was made up of weekly samples. All samples were collected in new polyethylene containers and shipped to TBE for analysis.

Locally grown vegetables (FPV) were collected at the time of harvest at six locations (02F9, 03F8, 15F4, 01G1, 02G2, and 03H5); fodder crops (VGT) were sampled at three locations (13E3, 14F4, and 02G3); and broad leaf vegetation (FPL) was sampled at five locations (01S1, 07S2, 15S2, 16S1, and 10D1). The vegetables and fodder samples are additional samples (Management Audit) taken to enhance the radiological monitoring program. There is no dairy farm within three miles of the Site, and there is only one dairy farm within five miles (13E3). Therefore, broadleaf vegetation is grown, maintained

and harvested monthly during the growing season. All samples were weighed, packaged and shipped to TBE for analysis.

1. MILK

Milk samples were collected from two farms in New Jersey (02G3 and 03G1) and two farms in Delaware (13E3 and 14F4). Each sample was analyzed for I-131 and gamma emitters.

I-131

I-131 was not detected above MDC in any of the 71 samples analyzed. The maximum preoperational level detected was 65 pCi/L, which occurred following a period of atmospheric nuclear weapons tests (Table C-5 and Reference [1] RMC-TR-77-03).

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location milk samples.

Naturally occurring K-40 was detected in all 71 milk samples with concentrations for the 60 indicator location samples ranging from 1,113 pCi/L to 1,711 pCi/L with an average concentration of 1,328 pCi/L, and the 11 control location sample concentrations ranging from 997 pCi/L to 1,557 pCi/L, with an average concentration of 1,238 pCi/L. The maximum preoperational level detected was 2,000 pCi/L with an average concentration of 1,437 pCi/L (Table C-5 and Reference [1] RMC-TR-77-03).

2. WELL WATER (GROUND WATER)

Although offsite wells in the vicinity of the Site are not directly affected by plant operations, well water samples were collected monthly from one farm (03E1). Samples from this well are considered Management Audit samples.

Gross Alpha

Gross alpha activity was not detected above the MDC in any of the 12 well water samples. The maximum preoperational level detected was 9.6 pCi/L (Table C-6 and Reference [1] RMC-TR-77-03).

Gross Beta

Gross beta activity was not detected above the MDC in any of the 12 well water samples. The preoperational results ranged from <2.1 pCi/L to 38 pCi/L, with an average value of 9 pCi/L (Table C-6 and Reference [1] RMC-TR-77-03).

Tritium

Tritium activity was not detected above the MDC in any of the 12 well water samples. The maximum preoperational level detected was 380 pCi/L (Table C-6 and Reference [1] RMC-TR-77-03).

I-131

I-131 activity was not detected in any of the 12 well water samples. No preoperational data were available for comparison, since I-131 was not analyzed as a specific radionuclide prior to 1989. However, I-131 analytical results to date have been below the MDC (Table C-7 and Reference [1] RMC-TR-77-03).

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location well water samples. Naturally occurring K-40 was not detected in any of the well water samples. The maximum preoperational levels detected were 30 pCi/L (Table C-7 and Reference [1] RMC-TR-77-03).

3. POTABLE WATER (DRINKING WATER)

Both raw and treated potable water samples were collected and composited at the local water treatment facility. Each sample consisted of weekly aliquots composited into a monthly sample. The raw water source for this plant is a combination of surface water from Laurel Lake and groundwater from its adjacent wells. These are Management Audit samples as no liquid effluents discharged from the Site directly affect this pathway.

Gross Alpha

No Gross alpha activity was detected above the MDC in any of the raw or treated water samples. The maximum preoperational level detected was 2.7 pCi/L (Table C-8 and Reference [1] RMC-TR-77-03).

Gross Beta

Gross beta activity was detected in all of the raw and treated water samples. The concentrations for the raw samples ranged from 5.5 pCi/L to 9.4 pCi/L, with an average concentration of 6.5 pCi/L. Concentrations for the treated water ranged from 4.7 pCi/L to 9.2 pCi/L, with an average concentration of 6.7 pCi/L. The maximum preoperational level detected was 9.0 pCi/L with an average concentration of 4.2 pCi/L (Table C-8 and Reference [1] RMC-TR-77-03).

Tritium

Tritium activity was not detected above the MDC in any of the 12 raw or treated water samples. The maximum preoperational level detected was 350 pCi/L with an average of 179 pCi/L (Table C-8 and Reference [1] RMC-TR-77-03).

I-131

I-131 activity was not detected above the MDC in any of the 12 raw or treated water samples. No preoperational data were available for comparison, since I-131 was not analyzed as a specific radionuclide prior to 1989. However, I-131 analytical results to date have been below the MDC (Table C-9 and Reference [1] RMC-TR-77-03).

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the 12 potable water samples. Naturally occurring K-40 was not detected in any of the 12 raw or treated water samples. No preoperational data were available for comparison. Naturally occurring Ra-226 was not detected in any raw or treated water samples. The maximum preoperational level detected for Ra-226 was 1.4 pCi/L (Table C-9 and Reference [1] RMC-TR-77-03).

4. BROADLEAF VEGETATION

Broadleaf vegetation was grown by PSEG personnel at four onsite locations and one offsite location in Delaware at 3.9 miles SSW for purposes of REMP sampling. These broadleaf vegetation samples were collected since there were no dairy farms operating within the five km (three mile) radius of the Site. The closest dairy farm (13E3) was located in Odessa, DE at 5.0 miles to the West.

All samples were analyzed for gamma emitters and included kale, cabbage, and collards. These samples were obtained from five indicator locations (49 samples) and one control locations (1 samples). The results for these samples are discussed below.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location broadleaf vegetation samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was detected above the MDC in 5 of the 34 indicator location samples with concentrations ranging from 204 pCi/kg (wet) to 505 pCi/kg (wet), with an average concentration of 416 pCi/kg (wet). Be-7 was not detected in the control location sample. No preoperational Be-7 data was available for comparison (Table C-10).

Naturally occurring K-40 was detected in all 34 indicator samples, with concentrations ranging from 2,803 pCi/kg (wet) to 11,200 pCi/kg (wet) with an average concentration of 5,530 pCi/kg (wet), and in the control location sample at 1,805 pCi/kg (wet). The maximum preoperational level detected was 4,800 pCi/kg (wet) with an average concentration of 2,140 pCi/kg (wet) (Table C-10 and Reference [1] RMC-TR-77-03).

5. VEGETABLES

There are no farm products that are irrigated with water in which plant effluents have been discharged. The Delaware River at the location of the Site is brackish and therefore is not used for irrigation.

A variety of food products were sampled on and around the Site; however, the variety was dependent on the farmer's preference. These vegetables were collected as Management Audit samples.

All samples were analyzed for gamma emitters and included asparagus, sweet corn, peppers, tomatoes, and peaches. These samples were obtained from seven indicator locations (21 samples). The results for these samples are discussed below.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location vegetable samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was not detected above the MDC in any of the vegetables samples.

Naturally occurring K-40 was detected in all 22 indicator samples, with concentrations ranging from 1,294 pCi/kg (wet) to 3,372 pCi/kg (wet) with an average concentration of 2,358 pCi/kg (wet). The maximum preoperational level detected was 4,800 pCi/kg (wet) with an average concentration of 2,140 pCi/kg (wet) (Table C-10 and Reference [1] RMC-TR-77-03).

6. FODDER CROPS

Although not required by the Site ODCMs, four samples of silage normally used as cattle feed were collected from three indicator locations and one control location. It was determined that these products could be an element in the food-chain pathway. These fodder crops were collected as Management Audit samples and analyzed for gamma emitters. All four locations from which samples were collected are milk sampling locations.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location fodder crop samples. Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was detected in all three indicator samples with an average concentration of 409 pCi/kg (wet). The maximum preoperational level detected for fodder was 4,700 pCi/kg (wet) with an average concentration of 2,000 pCi/kg (wet) (Table C-11 and Reference [1] RMC-TR-77-03).

Naturally occurring K-40 was detected in all three indicator samples at concentrations ranging from 2,839 pCi/kg (wet) to 3,889 pCi/kg (wet) with an average concentration of 3,277 pCi/kg (wet). Preoperational results averaged 7,000 pCi/kg (wet) (Table C-11 and Reference [1] RMC-TR-77-03).

7. SOIL

Soil is sampled every three years and was not sampled in 2018. It will next be sampled in 2019.

8. GAME

Although not required by the Site ODCMs, three muskrat samples were collected from three indicator locations. The game samples were collected as Management Audit samples and analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator game samples. Naturally occurring K-40 was detected in all samples at concentrations ranging from 2,980 to 3,488 pCi/kg (wet) with an average concentration of 3,164 pCi/kg (wet). No preoperational data was available for comparison (Table C-13 and Reference [1] RMC-TR-77-03).

D. Aquatic

This sample set includes edible fish, shoreline and riverbed sediment, surface water, crabs, and oysters.

Surface water samples were collected offshore in new polyethylene containers that were rinsed twice with the sample medium prior to collection. The surface water samples were transported to TBE for analysis.

Edible fish were collected using gill nets while crabs were caught in commercial traps. These samples were processed by separating the flesh from the bone and shell. The flesh was placed in sealed containers and frozen before being transported in ice chests to TBE for analysis.

Sediment samples were taken with a bottom grab sampler and frozen in sealed polyethylene containers before being transported in ice chests to TBE. For the river bottom sediment, a marine GPS was used to locate the correct site and the sampling

boat was maneuvered over the area until the correct amount of sample was obtained (grabbed) with the sediment dredge.

Location 06S2 shoreline sediment sample (an onsite location) was sampled as follows: A square area, measuring one meter on each side was staked out and then divided into a grid of nine smaller boxes, three per side. A one inch deep scoop from the center of each of the small grids was taken. All the aliquots were combined and the total sample transported in the ice chest to TBE.

Oyster samples were collected by personnel licensed to harvest oysters by the State of New Jersey. Oysters in the vicinity of the plant were not large enough to be sold to the public, so they were added to the REMP as Management Audit samples. Oysters were collected and shucked; then the flesh and internal fluids were placed in sealed containers and frozen before being transported in ice chests to TBE for analysis.

1. SURFACE WATER

   Surface water samples were collected twice a month at four indicator locations and one control location in the Delaware River Estuary. The two samples for the month were combined to create a single monthly composite sample that was then analyzed. One location (11A1) is at the outfall area (which is the area potentially impacted by effluents discharged from the Site into the Delaware River), one location is downstream from the outfall area (07E1), and one location is directly west of the outfall area at the mouth of the Appoquinimink River (12C1). Samples were collected upstream in the Delaware River (01F2) and at the mouth of the Chesapeake and Delaware Canal (16F1) the latter being sampled when the flow was from the Canal into the river.

   Location 12C1, located directly west of the Site, at the mouth of the Appoquinimink River, serves as the control. 12C1 was chosen as the control location because the physical characteristics of this location more closely resemble those of the outfall area than do those at the farther upstream location (01F2). As discussed in the preoperational summary report, due to its tidal nature, there were flow rate and salinity variations in the Delaware River Estuary. These variations accounted for the differences in K-40 concentrations.

   Tritium

   Tritium activity was detected in 2 of the 48 indicator and none of the 12 control location samples. Both occurrences were from samples collected at location 11A1. The detected concentration ranged from 349 pCi/L to 729 pCi/L, with an average concentration of 539 pCi/L. The maximum preoperational level detected was 600 pCi/L, with an average concentration of 210 pCi/L (Table C-14 and Reference [1] RMC-TR-77-03). See Figure 3 for graphical presentation.

   See Figure 3 for graphical presentation.

   The dose impact, from the maximum tritium activity observed, to the maximum exposed individual through the consumption of fish and crabs was 1.99E-3 mrem/yr. This does not present any significant exposure. Sample location 11A1 is approximately 0.2 miles SW of the plant site at the Salem circulating water outfall area in the Delaware River.

   (Notifications 20801477 and **20809634):** A review of Salem's and Hope Creek's 2018 liquid effluents indicated that these surface water samples were collected subsequent to permitted liquid discharges from the station.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control surface water samples.

Naturally occurring K-40 was detected in 8 of the 48 indicator location samples at concentrations ranging from 39 pCi/L to 111 pCi/L, with an average of 72 pCi/L. K-40 was detected in 1 of the 12 control location samples at 93 pCi/L. The maximum preoperational level detected for K-40 was 200 pCi/L with an average concentration of 48 pCi/L (Table C-15 and Reference [1] RMC-TR-77-03).

I-131

I-131 was not detected above the MDC in any of the 48 indicator samples or in any of the control location samples (Table C-15).

2. FISH

Edible species of fish were collected semi-annually at two indicator locations and one control location and analyzed for gamma emitters in edible flesh. Sample species collected in 2017 were perch, striped bass and catfish.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location fish samples. Naturally occurring K-40 was detected in all indicator location samples at concentrations ranging from 3,132 pCi/kg (wet) to 3,453 pCi/kg (wet) with an average concentration of 3,301 pCi/kg (wet). All control location samples had concentrations ranging from 2,645 pCi/kg (wet) to 4,254 pCi/kg (wet), with an average of 3,696 pCi/kg (wet). The maximum preoperational detection was 13,000 pCi/kg (wet) with an average concentration of 2,900 pCi/kg (wet) (Table C-16 and Reference [1] RMC-TR-77-03).

3. BLUE CRAB

Blue crab samples were collected twice during the season at one indicator and one control location. The edible portions were analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location blue crab samples. Naturally occurring K-40 was detected in both indicator location samples at concentrations of 2,066 pCi/kg (wet) and 3,084 pCi/kg (wet) with an average concentration of 2,575 pCi/kg (wet). Both control location samples had concentrations of 2,785 pCi/kg (wet) and 2,909 pCi/kg (wet), with an average concentration of 2,847 pCi/kg (wet). The maximum preoperational level for K-40 detected was 12,000 pCi/kg (wet) with an average concentration of 2,835 pCi/kg (wet). All other gamma emitters were less than the MDC (Table C-17 and Reference [1] RMC-TR-77-03).

4. SEDIMENT

Sediment samples were collected semi-annually from six indicator locations and one control location. Location 06S2 was the only shoreline sediment sample location that was directly subjected to tidal fluctuations. The remaining locations were located offshore.

Gamma Spectroscopy

Naturally occurring K-40 was detected in all 12 indicator location samples at

concentrations ranging from 1,963 pCi/kg (dry) to 17,420 pCi/kg (dry), with an average concentration of 7,511 pCi/kg (dry). Both control locations samples had concentrations of 13,110 pCi/kg (dry) and 14,100 pCi/kg (dry) with an average concentration of 13,605 pCi/kg (dry). The maximum preoperational level detected was 21,000 pCi/kg (dry) with an average concentration of 15,000 pCi/kg (dry) (Table C-18 and Reference [1] RMC-TR-77-03).

Cs-137 was not detected in any of the indicator or control samples. The maximum preoperational level detected was 400 pCi/kg (dry) with an average concentration of 150 pCi/kg (dry) (Table C-18 and Reference [1] RMC-TR-77-03).

Naturally occurring Ra-226 was detected in 3 of the 12 indicator location samples at concentrations ranging from 2,273 pCi/kg (dry) to 2,734 pCi/kg (dry) with an average concentration of 2,427 pCi/kg (dry) and was not detected above the MDC in the control location samples. The maximum preoperational level detected was 1,200 pCi/kg (dry) with an average concentration of 760 pCi/kg (dry) (Table C-18 and Reference [1] RMC-TR-77-03).

Naturally occurring Th-232 was detected in 7 of the 12 indicator location samples at concentrations ranging from 202 pCi/kg (dry) to 1,208 pCi/kg (dry) with an average concentration of 808 pCi/kg (dry), and in both of the control location samples at concentrations of 929 pCi/kg (dry) and 1,069 pCi/kg (dry) with an average concentration of 999 pCi/kg (dry). The maximum preoperational level detected was 1,300 pCi/kg (dry) with an average concentration of 840 pCi/kg (dry). All other gamma emitters were less than the MDC (Table C-18 and Reference [1] RMC-TR-77-03).

5. OYSTERS

Oyster samples were collected twice during the season at one indicator and one control location. The edible portions were analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control location oyster samples.

Naturally occurring K-40 was detected in both indicator location samples at concentrations of 764 and 1,688 pCi/kg (wet) with an average concentration of 1,226 pCi/kg. One control location sample had a concentration of 1,703 pCi/kg (wet). There were no preoperational analyses preformed on oysters as there were no significant quantities of oysters or other shellfish within 5 miles of the plant discharge. All other gamma emitters were less than the MDC (Table C-19 and Reference [6]).

E. Land Use Census

A land use census was conducted during the reporting period in each of the 16 meteorological sectors to identify, within a distance of 8 km (5 miles), the location of the nearest milk animal, the nearest meat animal, the nearest residence and the nearest garden of greater than 50 m^2 (500 ft^2) producing broad leaf vegetation. In accordance with the Site ODCMs, the survey was performed using a visual survey, Post Office inquiries, Yellow Pages, and Google Earth mapping software.

No cultural or historic resource officially identified and confirmed by regulatory agencies is known to exist at PSEG.

A comparison of the identified locations from the 2018 table with the 2017 table shows that there was no change to the nearest resident or vegetable garden larger than 50 m^2 (500 ft^2) with broadleaf vegetation. Dose evaluations do not need to be updated and no changes to the Site ODCMs are required. The 2018 Land Use Survey results are summarized below:

Meteorological Sector	Milk Animal *August, 2018* km (miles)	Nearest Residence *August, 2018* km (miles)	Vegetable Garden *August, 2018* km (miles)	Meat Animal *August, 2018* km (miles)
N	None	None	None	None
NNE	None	**8.0 (5.0)**	None	None
NE	None	**6.2 (3.9)**	None	**6.8 (4.2)**
ENE	None	**6.2 (3.9)**	None	None
E	None	None	None	None
ESE	None	None	None	None
SE	None	None	None	None
SSE	None	None	None	None
S	None	None	None	None
SSW	None	**6.2 (3.9)**	None	None
SW	None	**6.9 (4.3)**	None	**7.3 (4.6)**
WSW	None	**7.1 (4.4)**	None	None
W	**8.0 (5.0)**	**6.5 (4.0)**	None	None
WNW	None	**5.5 (3.4)**	None	None
NW	None	**5.9 (3.7)**	None	None
NNW	None	**6.8 (4.2)**	None	None

VI. ANNOTATIONS TO PREVIOUS AREOR

Erratum in 2016 AREOR **(Notification 20814324 & 20794415):** The 2016 AREOR referenced order 80116636-0010 for the program exception pertaining to the REMP air sampler outage at location 14G1. 80116636-0010 was a work tracking order designed to ensure the air sampler outage was included as an exception in the 2016 AREOR. However, 80116636 was not a 'notification' documenting the condition of the outage.

It would have been ideal and prudent to document the 14G1 air sample station outage in a notification, which would direct action to include in the 2016 AREOR.

Subsequently, operation 80116636-0**010** pertains to the loss of power to air samplers 05S1 and 05S2, and operation 0**110** should have been referenced in the 2016 AREOR for the loss of power at 14G1. This was a non-consequential typographical error.

VII. HOPE CREEK TECHNICAL SPECIFICATION LIMIT FOR PRIMARY WATER IODINE CONCENTRATION

The HCGS primary coolant results for Dose Equivalent Iodine-131, Total Gamma, and Total Beta were reviewed. The specific activity of the primary coolant did not exceed 0.2 micro curies per gram Dose Equivalent I-131 (DEI).

The Total Gamma and the Total Beta activity (microcuries per gram) did not exceed the 100/E-Bar limit. Therefore, HCGS did not exceed the Technical Specifications limit specified in section 3.4.5.

Hope Creek Dose Equivalent Iodine Concentrations in 2018

Sample Date & Time	HC DEI (µCi/mL)	Sample Date & Time	HC DEI (µCi/mL)	Sample Date & Time	HC DEI (µCi/mL)	Sample Date & Time	HC DEI (µCi/mL)	Sample Date & Time	HC DEI (µCi/mL)	Sample Date & Time	HC DEI (µCi/mL)
1/1/2018 0:38	1.98E-05	3/3/2018 1:39	2.09E-05	5/26/2018 1:15	2.38E-05	7/23/2018 0:14	2.46E-05	9/15/2018 0:35	2.29E-05	11/21/2018 0:27	2.45E-05
1/3/2018 1:36	2.09E-05	3/5/2018 0:04	2.26E-05	5/28/2018 1:29	2.25E-05	7/24/2018 0:13	1.84E-05	9/17/2018 0:24	2.30E-05	11/23/2018 0:08	2.25E-05
1/5/2018 8:23	2.00E-05	3/7/2018 9:39	2.41E-05	5/30/2018 0:44	2.09E-05	7/25/2018 9:20	1.80E-05	9/19/2018 8:20	2.49E-05	11/24/2018 1:03	2.30E-05
1/6/2018 1:26	2.16E-05	3/9/2018 2:23	2.70E-05	6/1/2018 8:32	2.10E-05	7/26/2018 2:06	2.37E-05	9/21/2018 5:53	3.46E-05	11/26/2018 1:01	2.23E-05
1/8/2018 2:18	2.07E-05	3/10/2018 0:12	2.04E-05	6/2/2018 0:32	2.22E-05	7/27/2018 2:07	2.17E-05	9/22/2018 1:24	2.08E-05	11/28/2018 9:30	2.26E-05
1/10/2018 9:16	2.69E-05	3/12/2018 0:22	2.16E-05	6/4/2018 0:48	1.81E-05	7/28/2018 0:49	2.41E-05	9/24/2018 1:14	1.94E-05	11/30/2018 1:44	2.23E-05
1/11/2018 21:07	2.29E-05	3/14/2018 0:12	2.13E-05	6/6/2018 9:43	1.82E-05	7/29/2018 1:20	2.27E-05	9/26/2018 9:38	2.72E-05	12/1/2018 1:19	2.60E-05
1/12/2018 1:35	2.22E-05	3/16/2018 1:14	2.07E-05	6/8/2018 0:16	2.20E-05	7/30/2018 0:13	2.54E-05	9/28/2018 0:54	2.27E-05	12/3/2018 1:39	2.26E-05
1/13/2018 0:18	2.13E-05	3/17/2018 0:09	2.17E-05	6/9/2018 1:56	2.16E-05	7/31/2018 1:23	2.25E-05	9/29/2018 0:16	2.32E-05	12/5/2018 9:17	2.14E-05
1/15/2018 1:36	1.93E-05	3/19/2018 0:39	2.23E-05	6/11/2018 3:49	2.14E-05	8/1/2018 9:25	2.28E-05	10/1/2018 0:34	2.25E-05	12/7/2018 1:02	2.36E-05
1/17/2018 3:17	2.08E-05	3/21/2018 2:13	2.59E-05	6/13/2018 9:32	2.10E-05	8/2/2018 0:41	2.23E-05	10/3/2018 9:33	2.31E-05	12/8/2018 0:14	2.27E-05
1/19/2018 3:30	2.27E-05	3/23/2018 0:11	2.13E-05	6/15/2018 0:31	2.18E-05	8/3/2018 0:20	1.82E-05	10/5/2018 2:18	2.76E-05	12/10/2018 2:07	2.19E-05
1/20/2018 3:03	2.49E-05	3/24/2018 0:39	2.10E-05	6/16/2018 1:29	2.13E-05	8/4/2018 2:27	2.52E-05	10/6/2018 0:08	2.33E-05	12/12/2018 9:28	2.24E-05
1/22/2018 2:15	2.34E-05	3/26/2018 0:16	2.55E-05	6/18/2018 0:38	1.85E-05	8/4/2018 4:24	1.88E-05	10/8/2018 0:13	2.37E-05	12/14/2018 0:28	2.34E-05
1/24/2018 2:32	2.44E-05	3/28/2018 1:23	2.67E-05	6/20/2018 9:36	2.25E-05	8/6/2018 0:20	1.78E-05	10/10/2018 10:28	2.71E-05	12/15/2018 1:21	2.30E-05
1/26/2018 2:29	2.24E-05	3/30/2018 0:45	2.20E-05	6/22/2018 0:45	2.09E-05	8/8/2018 10:31	2.55E-05	10/12/2018 0:47	2.39E-05	12/17/2018 8:08	2.59E-05
1/27/2018 2:39	2.29E-05	3/31/2018 1:49	2.70E-05	6/23/2018 0:48	2.10E-05	8/10/2018 0:19	2.87E-05	10/13/2018 0:59	2.26E-05	12/19/2018 9:10	2.31E-05
1/29/2018 2:19	2.07E-05	4/2/2018 0:56	2.58E-05	6/25/2018 8:25	2.14E-05	8/11/2018 0:42	2.51E-05	10/15/2018 0:19	2.25E-05	12/21/2018 0:10	2.23E-05
1/31/2018 4:28	2.08E-05	4/4/2018 9:08	2.14E-05	6/27/2018 9:30	2.25E-05	8/13/2018 1:04	2.27E-05	10/17/2018 9:06	2.29E-05	12/22/2018 11:57	2.58E-05
2/2/2018 1:08	1.89E-05	4/6/2018 0:23	2.66E-05	6/29/2018 0:35	2.01E-05	8/15/2018 9:15	2.25E-05	10/19/2018 0:09	2.61E-05	12/24/2018 7:48	2.77E-05
2/3/2018 0:18	2.12E-05	4/7/2018 1:19	2.12E-05	6/30/2018 0:43	2.19E-05	8/17/2018 0:27	2.07E-05	10/20/2018 0:54	2.35E-05	12/26/2018 9:32	2.22E-05
2/5/2018 0:13	2.05E-05	4/9/2018 1:25	2.62E-05	7/2/2018 0:40	1.90E-05	8/18/2018 0:25	1.90E-05	10/22/2018 0:40	2.25E-05	12/28/2018 2:28	2.19E-05
2/7/2018 9:29	2.49E-05	4/11/2018 1:54	2.55E-05	7/4/2018 1:44	2.14E-05	8/20/2018 0:34	2.69E-05	10/24/2018 9:20	2.31E-05	12/29/2018 0:31	2.19E-05
2/8/2018 0:02	1.48E-05	4/12/2018 20:08	2.56E-05	7/6/2018 9:39	2.15E-05	8/22/2018 9:13	2.17E-05	10/26/2018 3:43	2.51E-05	12/31/2018 0:47	2.14E-05
2/9/2018 2:48	2.25E-05	**4/13/2018 3:25**	**7.11E-05**	7/7/2018 0:45	2.21E-05	8/24/2018 0:26	2.34E-05	10/27/2018 1:12	2.58E-05		
2/10/2018 2:30	2.57E-05	4/13/2018 8:00	3.56E-05	7/9/2018 0:41	1.87E-05	8/25/2018 0:14	1.81E-05	10/29/2018 9:35	2.62E-05		
2/12/2018 1:42	2.57E-05	4/14/2018 20:50	2.39E-05	7/11/2018 9:18	2.19E-05	8/27/2018 0:21	1.99E-05	10/31/2018 9:23	2.35E-05		
2/14/2018 0:10	2.32E-05	5/9/2018 17:10	3.32E-05	7/13/2018 0:07	1.87E-05	8/29/2018 9:20	2.02E-05	11/2/2018 0:14	2.28E-05	**Max DEI (µCi/mL)**	**7.11E-05**
2/15/2018 0:03	1.35E-05	5/11/2018 0:22	2.38E-05	7/13/2018 4:45	2.26E-05	8/29/2018 19:16	2.70E-05	11/3/2018 0:45	2.40E-05		
2/16/2018 3:08	2.04E-05	5/12/2018 4:24	2.08E-05	7/14/2018 2:31	2.25E-05	8/31/2018 9:27	2.55E-05	11/5/2018 0:20	2.36E-05		
2/17/2018 0:17	2.03E-05	5/14/2018 2:26	3.15E-05	7/15/2018 0:39	1.89E-05	9/1/2018 1:30	2.64E-05	11/7/2018 9:25	2.34E-05		
2/19/2018 0:38	2.08E-05	5/16/2018 8:14	2.05E-05	7/16/2018 9:05	1.83E-05	9/3/2018 1:28	1.99E-05	11/9/2018 0:38	2.84E-05	**Min DEI (µCi/mL)**	**1.35E-05**
2/21/2018 1:04	2.27E-05	5/18/2018 8:51	2.39E-05	7/17/2018 1:30	2.23E-05	9/5/2018 9:24	2.36E-05	11/10/2018 1:04	2.44E-05		
2/23/2018 1:46	2.58E-05	5/19/2018 0:36	2.41E-05	7/18/2018 9:24	1.79E-05	9/7/2018 0:39	2.02E-05	11/12/2018 0:37	2.51E-05		
2/24/2018 2:30	2.87E-05	5/20/2018 8:48	2.20E-05	7/19/2018 7:56	2.16E-05	9/8/2018 1:40	2.01E-05	11/14/2018 10:00	2.38E-05		
2/26/2018 2:00	1.98E-05	5/21/2018 8:30	2.03E-05	7/20/2018 1:49	2.16E-05	9/10/2018 9:19	2.69E-05	11/16/2018 0:03	2.41E-05		
2/28/2018 0:47	2.01E-05	5/23/2018 1:34	1.87E-05	7/21/2018 0:34	1.72E-05	9/12/2018 9:29	2.69E-05	11/17/2018 1:43	2.31E-05		
3/2/2018 0:45	2.10E-05	5/25/2018 10:02	2.35E-05	7/22/2018 0:11	2.08E-05	9/14/2018 1:02	2.31E-05	11/19/2018 1:44	2.41E-05		

VIII. CONCLUSIONS

The Radiological Environmental Monitoring Program for the Site was conducted during 2018 in accordance with the Site ODCMs. The required sample analysis LLD values were achieved (See Appendix A and Appendix C) and the REMP objectives were met. The data collected demonstrates that the Site was operated in compliance with the Site ODCMs' REMP requirements.

The concentration of radioactive material in the environment that could be attributable to Site operations was only a small fraction of the total radioactivity when compared to the concentration of naturally occurring and non-plant related man-made radioactivity in the environment.

Since these results were comparable to the results obtained during the preoperational phase of the program, which ran from 1973 to 1976, and with historical results collected since commercial operation, it can be concluded that the operation of the Site had no significant radiological impact on the health and safety of the public or on the environment.

IX. REFERENCES

[1] Radiation Management Corporation. "Artificial Island Radiological Environmental Monitoring Program - Reoperation Summary - 1973 through 1976". RMC-TR-77-03, 1978.

[2] Public Service Enterprise Group. "Offsite Dose Calculation Manual" - Salem Generating Station. Revisions 27 and 28.

[3] Public Service Enterprise Group. "Offsite Dose Calculation Manual" - Hope Creek Generating Station. Revisions 27 and 28.

[4] U.S. Nuclear Regulatory Commission: NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors", published April 1991.

[5] U.S. Nuclear Regulatory Commission: NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors", published April 1991.

[6] U.S. Atomic Energy Commission, Docket NOS. 50-272/50-311, "Salem Nuclear Generating Station Units 1 and 2, Environmental Report, Operating License Stage".

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APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING

PROGRAM SUMMARY

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SAMPLE DESIGNATION

Samples locations are generally identified by a three part code. 1) The first two letters are the program identification code. Because of the proximity of the SGS and HCGS, a common environmental surveillance program is conducted. The identification code, "SA", has been applied to SGS and HCGS. 1) The next three letters identify the media sampled.

AIO = Air Iodine
APT = Air Particulate
ECH = Hard Shell Blue Crab
ESF = Edible Fish
ESS = Sediment
FPL = Green Leaf Vegetables
FPV = Vegetables (Various)
GAM = Game (Muskrat)
IDM = Immersion Dose (TLD)
MLK = Milk
PWR = Potable Water (Raw)
PWT = Potable Water (Treated)
SOL = Soil
SWA = Surface Water
VGT = Fodder Crops (Various)
WWA= Well Water

3) The last three or four alphanumeric designator is a general location code based on direction and distance from a standard reference point (SSRLL) The reference point is located at the midpoint between the center of the SGS Unit 1 and Unit 2 containments. Of these, the first one or two represent each of the sixteen angular sectors of 22.5 degrees centered about the reactor site. Sector one is divided evenly by the north axis and other sectors are numbered in a clockwise direction as follows:

The first numerical digits are the directional sector designator

01 = N	05 = E	09 = S	13 = W
02 = NNE	06 = ESE	10 = SSW	14 = WNW
03 = NE	07 = SE	11 = SW	15 = NW
04 = ENE	08 = SSE	12 = WSW	16= NNW

The next alpha character represents the radial distance from the reference point:

S = On-site location
A = 0-1 miles off-site
B = 1-2 miles off-site
C = 2-3 miles off-site
D = 3-4 miles off-site
E = 4-5 miles off-site
F = 5-10 miles off-site
G = 10-20 miles off-site
H = >20 miles off-site

The last number is the location numerical designation within each sector and zone; e.g. 1,2,3,...etc.

For example, the location designation SA-WWA-03E1 would indicate a sample in the SGS and HCGS program (SA) consisting of well water (WWA) which was collected in sector number 03, centered at 45 degrees (north east) with respect to the midpoint between SGS Units 1 and 2 Containments at a radial distance of 4 to 5 miles offsite, (therefore, radial distance E). The number 1 indicates that this is sampling location number 1 in that particular sector.

SAMPLING LOCATIONS

All sampling locations and specific information about the individual locations are given in Appendix B, Table B-2. Additionally Maps B-1, B-2, and B-3 of Appendix B show the locations of sampling locations with respect to the Site. Not all locations in Table B-2 are required sample locations. Some of the locations identified in Table B-2 are used for management audit samples.

TABLE A-1

Radiological Environmental Monitoring Program Summary

SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
I. AIRBORNE							
AIR PARTICULATE (E-3 pCi/m^3)	**Gr-B** ***416***	10	12 (364/364) *(4/36)*	SA-APT-7S2 0.20 MILES SE	12 (52/52) *(5/36)*	12 (52/52) *(4/22)*	0
	GAMMA ***32***						
	Be-6	N/A	58.6 (28/28) *(36.6/78.8)*	SA-APT-5D1 3.50 MILES E	62.8 (4/4) *(52.6/75.8)*	53.4 (4/4) *(40.4/60.6)*	0
	K-40	N/A	<MDC	N/A	N/A	<MDC	0
	Cs-134	50	<MDC	N/A	N/A	<MDC	0
	Cs-137	60	<MDC	N/A	N/A	<MDC	0
AIR IODINE (E-3 pCi/m^3)	**GAMMA** ***416*** I-131	70	<MDC	N/A	N/A	<MDC	0
II. DIRECT							
DIRECT RADIATION (mR/standard quarter)	**TLD-QUARTERLY** ***233***	N/A	13.9 (209/209) *(9.1/30.5)*	SA-IDM-16S2 0.6 MILES N OF SITE	28.6 (4/4) *(26.5/30.5)*	13.6 (24/24) *(11.4/15.6)*	0
III. TERRESTRIAL							
MILK (pCi/L)	**I-131 (LOW LVL)** ***71***	1	<MDC	N/A	N/A	<MDC	0
	GAMMA ***71***						
	K-40	N/A	1328 (60/60) *(1113/1711)*	SA-MLK-13E3 4.62 MILES W	1348 (20/20) *(1155/1610)*	1238 (11/11) *(997/1557)*	0

TABLE A-1

Radiological Environmental Monitoring Program Summary

SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
MILK (pCi/L) (Cont.)	Cs-134	15	<MDC	N/A	N/A	<MDC	0
	Cs-137	18	<MDC	N/A	N/A	<MDC	0
	BaLa-140	15	<MDC	N/A	N/A	<MDC	0
	Ra-226	N/A	<MDC	N/A	N/A	<MDC	0
WELL WATER (pCi/L)	**Gr-A** ***12***	3	<MDC	N/A	N/A	N/A	0
	Gr-B ***12***	4	<MDC	N/A	N/A	N/A	0
	H-3 ***12***	200	<MDC	N/A	N/A	N/A	0
	I-131 (LLVL) ***12***	1	<MDC	N/A	N/A	N/A	0
	GAMMA ***12***						
	K-40	N/A	<MDC	N/A	N/A	N/A	0
	Mn-54	15	<MDC	N/A	N/A	N/A	0
	Co-58	15	<MDC	N/A	N/A	N/A	0
	Fe-59	30	<MDC	N/A	N/A	N/A	0
	Co-60	15	<MDC	N/A	N/A	N/A	0
	Zn-65	30	<MDC	N/A	N/A	N/A	0
	ZrNb-95	15	<MDC	N/A	N/A	N/A	0
	Cs-134	15	<MDC	N/A	N/A	N/A	0
	Cs-137	18	<MDC	N/A	N/A	N/A	0

TABLE A-1

Radiological Environmental Monitoring Program Summary

SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
WELL WATER (pCi/L) (Cont.)	BaLa-140	15	<MDC	N/A	N/A	N/A	0
	Ra-226	N/A	<MDC	N/A	N/A	N/A	0
POTABLE WATER (RAW) (pCi/L)	**Gr-A** ***11***	3	<MDC	N/A	N/A	N/A	0
	Gr-B ***11***	4	6.5 (11/11) *(5.5/9.4)*	SA-PWR-2F3 7.85 MILES NNE	6.5 (11/11) *(5.5/9.4)*	N/A	0
	H-3 ***12***	200	<MDC	N/A	N/A	N/A	0
	I-131 (LOW LVL) ***12***	1	<MDC	N/A	N/A	N/A	0
	GAMMA ***12***						
	K-40	N/A	<MDC	N/A	N/A	N/A	0
	Mn-54	15	<MDC	N/A	N/A	N/A	0
	Co-58	15	<MDC	N/A	N/A	N/A	0
	Fe-59	30	<MDC	N/A	N/A	N/A	0
	Co-60	15	<MDC	N/A	N/A	N/A	0
	Zn-65	30	<MDC	N/A	N/A	N/A	0
	ZrNb-95	15	<MDC	N/A	N/A	N/A	0
	Cs-134	15	<MDC	N/A	N/A	N/A	0

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SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
POTABLE WATER (RAW) (pCi/L) (Cont.)	Cs-137	18	<MDC	N/A	N/A	N/A	0
	BaLa-140	15	<MDC	N/A	N/A	N/A	0
	Ra-226	N/A	<MDC	N/A	N/A	N/A	0
POTABLE WATER (TREATED) (pCi/L)	**Gr-A** ***11***	**3**	<MDC	N/A	N/A	N/A	0
	Gr-B ***11***	**4**	6.7 (11/11) *(4.7/9.2)*	SA-PWT-2F3 7.85 MILES NNE	6.7 (11/11) *(4.7/9.2)*	N/A	0
	H-3 ***12***	**200**	<MDC	N/A	N/A	N/A	0
	I-131 (LOW LVL) ***12***	**1**	<MDC	N/A	N/A	N/A	0
	GAMMA ***12***						
	K-40	N/A	<MDC	N/A	N/A	N/A	0
	Mn-54	15	<MDC	N/A	N/A	N/A	0
	Co-58	15	<MDC	N/A	N/A	N/A	0
	Fe-59	30	<MDC	N/A	N/A	N/A	0
	Co-60	15	<MDC	N/A	N/A	N/A	0
	Zn-65	30	<MDC	N/A	N/A	N/A	0

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Radiological Environmental Monitoring Program Summary

SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
POTABLE WATER (TREATED) (pCi/L)	ZrNb-95	15	<MDC	N/A	N/A	N/A	0
	Cs-134	15	<MDC	N/A	N/A	N/A	0
	Cs-137	18	<MDC	N/A	N/A	N/A	0
	BaLa-140	15	<MDC	N/A	N/A	N/A	0
	Ra-226	N/A	<MDC	N/A	N/A	N/A	0
BROAD-LEAF VEGETATION, FPL (pCi/kg wet)	**GAMMA** ***36***						
	Be-7	N/A	416 (5/34) *(204/505)*	SA-FPL-10D1 3.89 MILES SSW	480 (1/6)	<MDC	0
	K-40	N/A	5530 (34/34) *(2803/11200)*	SA-FPL-1S1 0.56 MILES N	6340 (8/8) *(5130/8113)*	1805 (2/2) *(1692/1917)*	0
	I-131	60	<MDC	N/A	N/A	<MDC	0
	Cs-134	60	<MDC	N/A	N/A	<MDC	0
	Cs-137	80	<MDC	N/A	N/A	<MDC	0
	Ra-226	N/A	<MDC	N/A	N/A	<MDC	0
	Th-232	N/A	<MDC	N/A	N/A	<MDC	0
VEGETABLES, FPV (pCi/kg wet)	**GAMMA** ***22***						
	Be-7	N/A	<MDC	N/A	N/A	N/A	0
	K-40	N/A	2358 (22/22) *(1294/3372)*	SA-FPV-3H5 25 MILES NE	2508 (4/4) *(1294/3208)*	N/A	0
	I-131	60	<MDC	N/A	N/A	N/A	0
	Cs-134	60	<MDC	N/A	N/A	N/A	0

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MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
VEGETABLES, FPV (pCi/kg wet) (Cont.)	Cs-137	80	<MDC	N/A	N/A	N/A	0
	Ra-226	N/A	<MDC	N/A	N/A	N/A	0
	Th-232	N/A	<MDC	N/A	N/A	N/A	0
FODDER CROPS (pCi/kg wet)	**GAMMA** ***3***						
	Be-7	N/A	409 (3/3) (320/570)	SA-VGT-14F4 7.6 MILES WNW	570 (1/1)	N/A	0
	K-40	N/A	3277 (3/3) *(2839/3889)*	SA-VGT-2G3 11.85 MILES NNE	3889 (1/1)	N/A	0
	I-131	60	<MDC	N/A	N/A	N/A	0
	Cs-134	60	<MDC	N/A	N/A	N/A	0
	Cs-137	80	<MDC	N/A	N/A	N/A	0
	Ra-226	N/A	<MDC	N/A	N/A	N/A	0
	Th-232	N/A	<MDC	N/A	N/A	N/A	0
SOIL* (pCi/kg dry)	**GAMMA** ***0***						
	Be-7	N/A	N/A	N/A	N/A	N/A	0
	K-40	N/A	N/A	N/A	N/A	N/A	0
	Cs-134	150	N/A	N/A	N/A	N/A	0
	Cs-137	180	N/A	N/A	N/A	N/A	0

* Soils are sampled triennially and will be sampled again in 2019

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			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
	Ra-226	N/A	N/A	N/A	N/A	N/A	0
	Th-232	N/A	N/A	N/A	N/A	N/A	0
GAME (pCi/kg wet)	**GAMMA** ***3***						
	Be-7	N/A	<MDC	N/A	N/A	N/A	0
	K-40	N/A	3164 (3/3) *(2980/3488)*	SA-GAM-3E1 4.13 Miles NE	3488 (1/1)	N/A	0
	I-131	60	<MDC	N/A	N/A	N/A	0
	Cs-134	60	<MDC	N/A	N/A	N/A	0
	Cs-137	80	<MDC	N/A	N/A	N/A	0
IV. AQUATIC ENVIRONMENT							
SURFACE WATER (pCi/L)	**H-3** ***60***	200	539 (2/48) *(349/729)*	SA-SWA-11A1 0.19 Miles SW	539 (2/12) *(349/729)*	<MDC	0
	I-131 (LOW LVL) ***60***	1	<MDC	N/A	N/A	<MDC	0
	GAMMA ***60***						
	K-40	N/A	70 (8/48) *(39/111)*	SA-SWA-12C1 C 1.81 Miles WSW	93 (1/12)	93 (1/12)	0
	Mn-54	15	<MDC	N/A	N/A	<MDC	0
	Co-58	15	<MDC	N/A	N/A	<MDC	0
	Fe-59	30	<MDC	N/A	N/A	<MDC	0

TABLE A-1

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HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2018 to December 31, 2018**

MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
	Co-60	15	<MDC	N/A	N/A	<MDC	0
	Zn-65	30	<MDC	N/A	N/A	<MDC	0
SURFACE WATER (pCi/L) (Cont.)	ZrNb-95	15	<MDC	N/A	N/A	<MDC	0
	Cs-134	15	<MDC	N/A	N/A	<MDC	0
	Cs-137	18	<MDC	N/A	N/A	<MDC	0
	BaLa-140	15	<MDC	N/A	N/A	<MDC	0
FISH (pCi/kg wet)	**GAMMA** ***9***						
	K-40	N/A	3301 (5/5) *(3132/3453)*	SA-ESF-12C1 C 1.81 MILES WSW	3696 (4/4) *(2645/4254)*	3696 (4/4) *(2645/4254)*	0
	Mn-54	130	<MDC	N/A	N/A	<MDC	0
	Co-58	130	<MDC	N/A	N/A	<MDC	0
	Fe-59	260	<MDC	N/A	N/A	<MDC	0
	Co-60	130	<MDC	N/A	N/A	<MDC	0
	Zn-65	260	<MDC	N/A	N/A	<MDC	0
	Cs-134	130	<MDC	N/A	N/A	<MDC	0
	Cs-137	150	<MDC	N/A	N/A	<MDC	0
	Ra-226	N/A	<MDC	N/A	N/A	<MDC	0

TABLE A-1

Radiological Environmental Monitoring Program Summary

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HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
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MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
BLUE CRABS (pCi/kg wet)	**GAMMA** ***4***						
	K-40	N/A	2575 (2/2) *(2066/3084)*	SA-ECH-12C1 C 1.81 MILES WSW	2847 (2/2) *(2785/2909)*	2847 (2/2) *(2785/2909)*	0
	Mn-54	130	<MDC	N/A	N/A	<MDC	0
	Co-58	130	<MDC	N/A	N/A	<MDC	0
	Fe-59	260	<MDC	N/A	N/A	<MDC	0
	Co-60	130	<MDC	N/A	N/A	<MDC	0
	Zn-65	260	<MDC	N/A	N/A	<MDC	0
	Cs-134	130	<MDC	N/A	N/A	<MDC	0
	Cs-137	150	<MDC	N/A	N/A	<MDC	0
	Ra-226	N/A	<MDC	N/A	N/A	<MDC	0
SEDIMENT (pCi/kg dry)	**GAMMA** ***14***						
	Be-7	N/A	993 (1/12)	SA-ESS-7E1 4.5 MILES SE	993 (1/2)	<MDC	0
	K-40	N/A	7511 (12/12) *(1963/17420)*	SA-ESS-12C1 C 1.81 MILES WSW	13605 (2/2) *(13110/14100)*	13605 (2/2) *(13110/14100)*	0
	Cs-134	150	<MDC	N/A	N/A	<MDC	0
	Cs-137	180	<MDC	N/A	N/A	<MDC	0

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HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**
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MEDIUM OR PATHWAY SAMPLED (UNTS OF ANALYSIS)	ANALYSIS, AND TOTAL NUMBER OF ANALYSIS PERFORMED	LOWER LIMIT OF DETECTION (LLD*)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST MEAN		CONTROL LOCATION	NUMBER OF NON-ROUTINE REPORTED MEASUREMENTS
			MEAN (f) ** *(RANGE)*	NAME, DISTANCE AND DIRECTION	MEAN (f) ** *(RANGE)*	MEAN (f) ** *(RANGE)*	
SEDIMENT (pCi/kg dry) (Cont.)	Ra-226	N/A	2427 (3/12) *(2273/2734)*	SA-ESS-16A1 0.64 MILES NNW	2504 (2/2) (2273/2734)	<MDC	0
	Th-232	N/A	808 (7/12) *(202/1208)*	SA-ESS-16F1 6.89 MILES NNW	1122 (1/2)	999 (2/2) *(929/1069)*	0
OYSTERS (EOY) (pCi/kg wet)	**GAMMA** ***4***						
	K-40	N/A	1226 (2/2) *(764/1688)*	SA-EOY-7H1 C BENNIES OYSTER BED AREA	1703 (1/2)	1703 (1/2)	0
	Mn-54	130	<MDC	N/A	N/A	<MDC	0
	Co-58	130	<MDC	N/A	N/A	<MDC	0
	Fe-59	260	<MDC	N/A	N/A	<MDC	0
	Co-60	130	<MDC	N/A	N/A	<MDC	0
	Zn-65	260	<MDC	N/A	N/A	<MDC	0
	Cs-134	130	<MDC	N/A	N/A	<MDC	0
	Cs-137	150	<MDC	N/A	N/A	<MDC	0
	Ra-226	N/A	<MDC	N/A	N/A	<MDC	0

* The LLD listed is the Lower Limit of Detection, which was requested by PSEG to be achieved.
** Mean was calculated using values above the MDC only. f = the fraction of measurements above the MDC.
(C) = Control Location
N/A = Not Applicable

APPENDIX B

SAMPLE DESIGNATION

AND

LOCATIONS

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TABLE B-1

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Program Overview)

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
1. DIRECT RADIATION			
a. Dosimeters (IDM)	Fifty-eight routine monitoring locations with two or more dosimeters placed as follows: An inner ring of locations, one in each land based meteorological sector in the general area of the SITE BOUNDARY. An outer ring of locations, one in each land based meteorological sector in the 5 to 11 km (3.1 - 6.8 miles) range from the site ; and The balance of the locations placed in areas of special interest such as population centers, nearby residences, and schools and in six areas beyond 10 miles to serve as control locations.	Quarterly	Gamma dose / quarterly

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
2. ATMOSPHERIC			
a. Air Particulate (APT)	3 samples from close to the Site Boundary: 05S1, 07S2, 15S2. One duplicate sample from close to the site boundary: 05S2. 3 Samples in different land based sectors: 01F1, 02F6, 05D1.	Continuous sampler operation with sample collection weekly or more frequently if required by dust loading	Gross Beta / weekly Gamma isotopic analysis / quarterly composite*
b. Air Iodine (AIO)	One sample from the vicinity of a community having a highest annual average ground level D/Q: 16E1. One sample from a control location; for example 15 - 30 km distant (9.3 - 18.6 miles) and in the least prevalent wind direction: 14G1.	Continuous sampler operation with sample collection weekly or more frequently if required by dust loading	Iodine-131 / weekly
3. TERRESTRIAL			
a. Milk (MLK)	Samples from milking animals in 3 locations within 5 km distance (3.1 miles) having the highest dose potential. If there are none, then 1 sample from milking animals in each of 3 areas between 5 - 8 km distant (3.1 - 5.0 miles) where doses are calculated to be greater than 1 mrem per yr: 13E3, 14F4, 02G3[(1)]. 1 Sample from milking animals at a control location 15 - 30 km distant (9.3 - 18.6 miles): 03G1.	Semi-monthly (when animals are on pasture) Monthly (when animals are not on pasture)	Gamma scan / semi-monthly Iodine-131 / semi-monthly Gamma scan / monthly Iodine-131 / monthly

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
b. Well Water (Ground) (WWA)	Although wells in the vicinity of SGS/HCGS are not directly affected by plant operations so sampling is not required by SGS/HCGS ODCM, samples of 03E1 farm's well are collected as management audit samples.	Monthly	Gamma scan / monthly Gross alpha / monthly Gross beta / monthly Tritium / monthly
c. Potable Water (Drinking Water) (PWR, PWT)	Although no potable water samples are required as liquid effluents discharged from SGS/HCGS do not directly affect this pathway and it is not required by SGS/HCGS ODCM, one raw and one treated water sample from a public water supply (City of Salem Water and Sewer Department) are collected: 02F3 as management audit samples.	Monthly (composited weekly)	Gross alpha / monthly Gross beta / monthly Tritium / monthly Gamma scan / monthly Iodine-131 / monthly
d. Vegetables (FPL, FPV)	Although the Delaware River at the location of SGS/HCGS is a brackish water source and is not used for irrigation of food products and so sampling is not required by SGS/HCGS ODCM, samples of vegetables are collected as management audit samples from various locations during harvest. In addition, broad leaf vegetation is collected from various offsite locations as well as being planted & collected onsite (01S1, 07S2, 15S2, 16S1). This is in lieu of having a milk farm within 5 km (3.1 miles) of the Site(1).	Monthly (during growing season)	Gamma scan / on collection

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
e. Fodder Crops (VGT)	Although not required by SGS/HCGS ODCM, samples of crops normally used as cattle feed (silage) were collected from milk farms as management audit samples: 14F4, 03G1, 2G3, 13E3.	Annually (at harvest)	Gamma scan / on collection
f. Soil (SOL)	Although not required by SGS/HCGS ODCM, samples of soil are collected as management audit samples.	Every 3 years (2013-2016-2019)	Gamma scan / on collection
4. AQUATIC ENVIRONMENT			
a. Surface Water (SWA)	One sample upstream: 01F2. One sample downstream: 07E1. One sample outfall: 11A1. One sample cross-stream (mouth of Appoquinimink River): 12C1(2). And an additional location in the Chesapeake & Delaware Canal: 16F1.	Semi-Monthly	Gamma scan / monthly Tritium / monthly**
b. Edible Fish (ESF)	One sample of each commercially and recreationally important species in vicinity of plant discharge area: 11A1. One sample of same species in area not influenced by plant discharge: 12C1(2), and an additional location downstream: 7E1.	Semi-Annually	Gamma scan (flesh) / on collection

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
c. Blue Crabs (ECH)	One sample of each commercially and recreationally important species in vicinity of plant discharge area 11A1.	Semi-Annually	Gamma scan (flesh) /on collection
	One sample of same species in area not influenced by plant discharge 12C1[(2)].	Semi-Annually	Gamma scan / on collection
d. Sediment (ESS)	One sample from downstream area: 07E1.		
	One sample from cross-stream area and control location: 12C1[(2)].		
	One sample from outfall area: 11A1.		
	One sample from upstream, the C & D Canal: 16F1.		
	One sample from shoreline area: 06S2.		
	One sample from Cooling Tower Blowdown discharge: 15A1.		
	One sample south storm drain discharge line: 16A1.		

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY OF ANALYSIS
e. Oysters[3] (EOY)	One sample near plant discharge area (Hope Creek Oyster Bed Area, approximately 2 miles SE of Site) as a management audit sample (07C1) One sample in area not influenced by plant discharge (Bennies Oyster Beds Area, approximately 19 miles SE of Site) as a management audit sample (07H1)	Twice per year, once near start and once near end of NJ harvest season	Gamma scan (flesh and liquids) / on collection

* Except for Passive Dosimeters, the quarterly analysis is performed on a composite of individual samples collected during the quarter.

** ODCM requires a minimum of semi-monthly sample collection with monthly composites for gamma isotopic analysis, and quarterly composites for tritium analysis. However, it was decided to analyze surface waters on a monthly basis for tritium as a program enhancement.

(1) While these milk locations are not within the 5 km range, they are the closest farms in the Site vicinity.

Since broad leaf vegetation is acceptable in lieu of milk collections, gardens were planted and harvested at four locations on Site (01S1, 07S2, 15S2, and 16S1) and one in Delaware (10D1).

(2) Location 12C1 was made the operational control (1975) for aquatic samples since the physical characteristics of this location more closely resemble those of the outfall area than do those at the upstream location originally chosen. This is due to the distance from Liston Point, which is the boundary between the Delaware River and Delaware Bay. As discussed extensively in the SGS/HCGS Pre-operational reports, the sampling locations further upstream show significantly lower background levels due to tidal flow.

(3) Oysters were added as a management audit sample in 2015. As such they are not required by the program, nor are they listed in the ODCM. The oysters from the indicator location (7C1) are impacted by bacteria and are considered too small to be sold to the public. In 2018 the oyster management audit program was terminated because the hope creek oyster bed suffered a high mortality rate due to low salinity water from excessive rain (as reported by Rutgers University), and to date the study concluded there is no impact from the station.

TABLE B-2

SAMPLING LOCATIONS

Specific information about the individual sampling locations are given in Table B-1. Maps B-1, B-2, and B-3 show the locations of sampling locations with respect to the Site. A Portable Global Positioning System (GPS) was used to provide the coordinates of sampling locations.

All sample types are not required to be collected at all possible sites every year.

LOCATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
01S1	0.55 mi. N side of road near ISFSI pad.	39 – 28.260	75 – 32.222	IDM, FPL
01S2	0.62 mi. N (382 of TLD 1S1).	39 – 28.260	75 – 32.222	IDM, FPL
02S2	0.40 mi. NNE; lamp pole 65 near HC switch yard	39 – 28.98	75 – 32.10	IDM
02S4	0.60 mi. NNE; in the equipment laydown area	39 – 28.110	75 – 31.992	IDM
03S1	0.58 mi. NE; behind refrigeration building	39 – 28.140	75 – 31.678	IDM
04S1	0.60 mi. ENE; site access road near intersection to TB-02	39 – 28.023	75 – 31.544	IDM
05S1	0.86 mi. E; site access road	39 – 27.668	75 – 31.187	IDM, AIO, APT
05S2	0.86 mi. E; site access road, duplicate sample	39 – 27.668	75 – 31.187	AIO, APT
06S2	0.23mi. ESE; area around helicopter pad	39 – 27.719	75 – 31.912	IDM, ESS
07S1	0.14 mi. SE; station personnel gate	39 – 27.701	75 – 32.05	IDM
07S2	0.12 mi. SE; station personnel gate	39 – 27.720	75 – 32.15	AIO, APT, FPL, SOL
08S1	0.12 mi. SSE; fuel oil storage	39 – 27.676	75 – 32.055	IDM
09S1	0.12 mi. S; fuel oil storage	39 – 27.636	75 – 32.091	IDM
10S1	0.14 mi. SSW; circulating water building	39 – 27.700	75 – 32.160	IDM
11S1	0.09 mi. SW; circulating water building	39 – 27.719	75 – 32.225	IDM
12S1	0.09 mi. WSW; outside security fence	39 – 27.756	75 – 32.236	IDM
13S1	0.09 mi. W; outside security fence	39 – 27.801	75 – 32.267	IDM
14S1	0.10 mi. NNW; outside security fence	39 – 27.893	75 – 32.280	IDM
15S1	0.57 mi. NW; near river and HCGS barge slip	39 – 28.161	75 – 32.525	IDM
15S2	0.59 mi. NW; near river and HCGS barge slip	39 – 28.12	75 – 32.32	IDM, AIO, APT, FPL
16S1	0.57 mi. NNW; on road near fuel oil storage tank	39 – 28.215	75 – 32.432	IDM, FPL
16S2	0.60 mi. NNW; near security firing range	39 – 28.16	75 – 32.17	IDM
16S3	1.0 mi. NNW; consolidated spoils facility	39 – 28.350	75 – 32.550	IDM
11A1	0.20 mi. SW; SGS outfall area	39 – 27.59	75 – 32.25	ESS, SWA, ECH, ESF
11A1A	0.15 mi. SE; Located in the plant barge slip area	39 – 27.41	75 – 32.02	Alternate SWA

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year.

LOCATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
15A1	0.65 mi. NW; HCGS outfall area	39.2767	75 – 32.19	ESS
16A1	0.24 mi. NNW; South Storm Drain outfall	39.2824	75 – 32.58	ESS
12C1	2.5 mi. WSW; West bank of Delaware River	39 – 27.22	75 – 34.08	ESS, SWA, ECH, ESF
12C1A	3.7 mi. WSW; Tip of Augustine Beach Boat Ramp	39 – 30.17	75 – 34.48	Alternate SWA
04D2	3.7 mi. ENE; Alloway Creek Neck Road	39 – 29.292	75 – 28.175	IDM
05D1	3.5 mi. E; local farm along SGS/HCGS access road.	39 – 28.396	75 – 28.334	IDM, AIO, APT
10D1	3.9 mi. SSW; Taylor's Bridge Spur, DE	39 – 24.613	75 – 33.733	IDM, FPL, SOL
14D1	3.4 mi. WNW; Bay View, DE	39 – 29.26	75 – 35.521	IDM
15D1	3.8 mi NW; Route 9, Augustine Beach, DE	39 – 30.125	75 – 35.28	IDM
02E1	4.4 mi. NNE; local farm, NJ	39 – 31.380	75 – 30.428	IDM
03E1	4.2 mi. NE; local farm, NJ	39 – 30.098	75 – 28.646	IDM, WWA, GAM
07E1	4.5 mi. SE; River Bank 1 mi. W of Mad Horse Creek	39 – 25.08	75 – 28.64	ESS, SWA, ESF
7E1A	8.9 mi. SE; Located at the end of Bayside Road, NJ	39 – 22.57	75 – 24.24	Alternate SWA
11E2	5.0 mi. SW; Route 9, DE	39 – 24.328	75 – 35.546	IDM
12E1	4.4 mi. WSW; Thomas Landing, DE	39 – 26.862	75 – 36.968	IDM
13E1	4.2 mi. W; Diehl House Lab, DE	39 – 27.989	75 – 36.735	IDM
13E3	5.0 mi. W; local farm, DE	39 – 27.17	75 – 37.30	MLK, VGT, SOL, GAM
16E1	4.1 mi. NNW; Port Penn, DE	39 – 30.762	75 – 34.580	IDM, AIO, APT, SOL
01F1	5.8 mi. N; Fort Elfsborg, NJ	39 – 32.693	75 – 31.124	IDM, AIO, APT
01F2	7.1 mi. N; midpoint of Delaware River	39 – 33.08	75 – 32.54	SWA
02F2	8.5 mi. NNE; Salem Substation, Salem NJ	39 – 34.522	75 – 28.120	IDM
02F3	8.0 mi. NNE; City of Salem, NJ Water and Sewage Dep	39 – 33.40	75 – 27.18	PWR, PWT
02F5	7.4 mi. NNE; Salem High School, Salem, NJ	39 – 33.448	75 – 28.514	IDM
02F6	7.3 mi. NNE; PSE&G Training Center, Salem NJ	39 – 33.713	75 – 28.819	IDM, AIO, APT
02F9	7.5 mi. NNE; Local Farm , Tilbury Rd, Salem, NJ	39 – 33.55	75 – 29.30	FPV, SOL

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year.

LOCATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
03F2	5.1 mi. NE; Hancocks Bridge, NJ Munc Bldg	39 – 30.410	75 – 27.578	IDM
03F3	8.6 mi. NE; Quinton Township Elem. School NJ	39 – 32.616	75 – 24.735	IDM
03F8	9.3 mi. NE; Circle M Orchard, NJ	39 – 33.987	75 – 25.468	FPV
04F2	6.0 mi. ENE; Mays Lane, Harmersville, NJ	39 – 29.953	75 – 26.076	IDM
05F1	6.5 mi. E; Canton, NJ	39 – 28.360	75 – 25.031	IDM,SOL
06F1	6.4 mi. ESE; Stow Neck Road, NJ	39 – 26.396	75 – 25.148	IDM
07F2	9.1 mi. SE; Bayside, NJ	39 – 22.971	75 – 24.261	IDM
08F1	9.7 mi. SE; Woodland Beach, DE	39 – 19.933	75 – 28.463	IDM
09F1	5.3 mi. S; off Route #9, DE	39 – 23.042	75 – 32.95	IDM
10F2	5.8 mi. SSW; Route #9, DE	39 – 23.034	75 – 34.152	IDM
11F1	6.2 mi. SW; Taylor's Bridge, DE	39 – 24.766	75 – 37.632	IDM
12F1	9.4 mi. WSW; Townsend Elementary School, DE	39 – 23.778	75 – 41.311	IDM
13F2	6.5 mi W; Odessa, DE	39 – 27.297	75 – 39.372	IDM
13F3	9.3 mi. W; Redding Middle School, Middletown, DE	39 – 27.215	75 – 42.543	IDM
13F4	9.8 mi. W; Middletown, DE	39 – 26.857	75 – 43.111	IDM
14F2	6.7 mi. WNW; Route 13 and Boyds Corner Rd, DE	39 – 29.979	75 – 39.042	IDM
14F4	8.0 mi. WNW; local farm, DE	39 – 30.44	75 – 40.52	MLK, VGT, SOL, FPV
15F3	5.4 mi. NW, Port Penn Rd. at Pole Bridge Rd., DE	39 – 30.987	75 – 36.586	IDM
15F4	7.0 mi. NW; local farm; Port Penn Road; DE	39 – 31.21	75 – 38.31	FPV
16F1	6.9 mi. NNW; C&D Canal, DE	39 – 33.55	75 – 34.25	ESS, SWA
16F1A	6.8 mi. NNW; Located at the C&D Canal Tip, DE	39 – 33.34	75 – 33.56	Alternate SWA

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year.

LOCATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
16F2	8.1 mi. NNW; Delaware City Public School, DE	39 – 34.314	75 – 35.429	IDM
01G1	10.9 mi. NNE; Route 49, South Broadway, NJ	39 – 37.113	75 – 30.178	FPV, FPL
01G3	19 mi. N; N. Church Street Wilmington, DE	39 – 44.287	75 – 32.512	IDM
02G2	13.5 mi. NNE; Local Farm; Pointers Auburn Road (Route 540), Salem, NJ	39 – 38.19	75 – 26.10	FPV
02G3	11.8 mi. NNE; Local Milk Farm, NJ	39 – 36.21	75 – 24.53	MLK, VGT, SOL
03G1	17 mi. NE; local farm, NJ	39 – 35.913	75 – 16.804	IDM, MLK, VGT, SOL
10G1	12 mi. SSW; Smyrna, DE	39 – 18.223	75 – 36.095	IDM
14G1	11.8 mi. WNW; Route 286, Bethel Church Road, DE	39 – 31.290	75 – 46.495	AIO,APT,IDM
16G1	15 mi. NNW; Wilmington Airport, DE	39 – 40.637	75 – 35.570	IDM
03H1	32 mi. NE; National Park, NJ	39 – 51.599	75 – 11.96	IDM
03H5	25 mi. NE; Farm Market, Route 77, NJ	39 – 41.040	75 – 12.380	FPV, FPL
07C1*	2 mi SE; Hope Creek Bed, near mouth of Hope Creek	39 – 26.611	75 – 30.328	EOY
07H1*	19 mi SE; Bennies Oyster Bed, near Nantuxent Cove	39 – 15.500	75 – 17.500	EOY

NOTES:

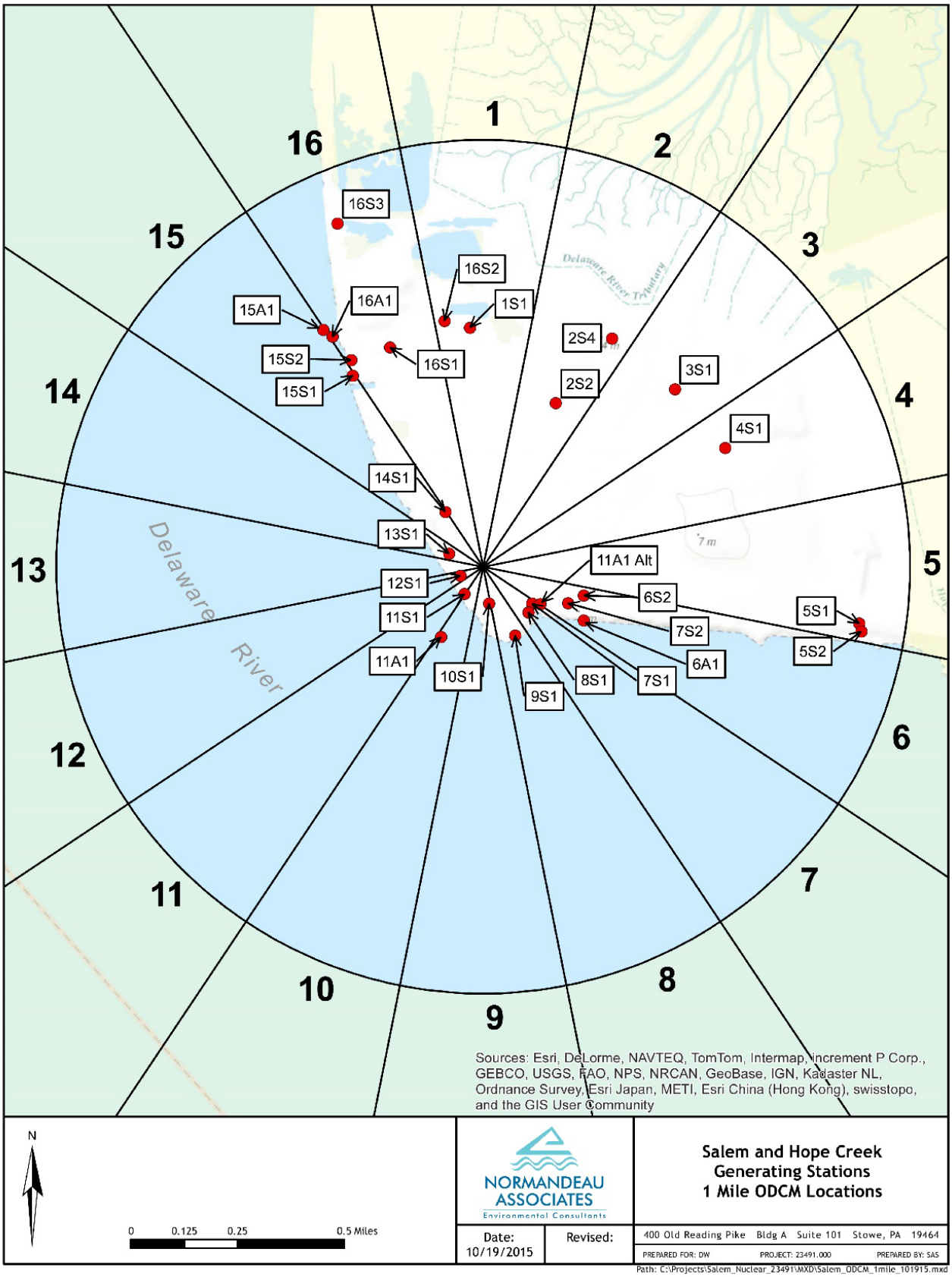
All locations are referenced to the midpoint of the two SGS Units' Containments. The coordinates of this location are: Latitude N 39° - 27' - 46.5" and Longitude W 75° - 32' - 10.6".

Vegetable samples are not always collected in consecutive years from the same farmer due to crop rotation.

* Oysters were added as a management audit sample in 2015. As such they are not required by the program, nor are they listed in the ODCM. The oysters from the indicator location (7C1) are impacted by bacteria and are considered too small to be sold to the public. In 2018 the oyster management audit program was terminated because the hope creek oyster bed suffered a high mortality rate due to low salinity water from excessive rain (as reported by Rutgers University), and to date the study concluded there is no impact from the station.

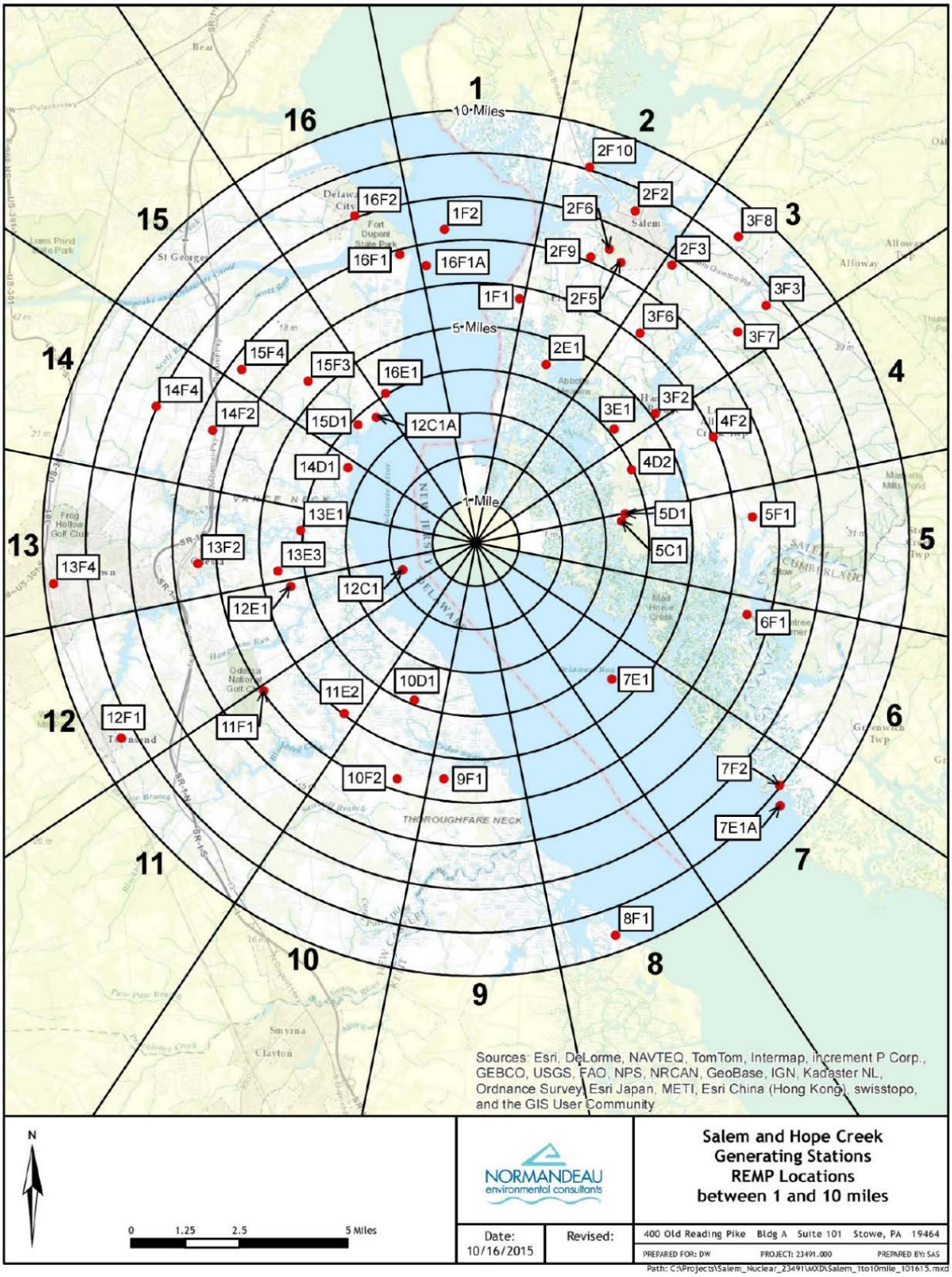
MAP B-1

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ON-SITE SAMPLING LOCATIONS OUT TO 1 MILE



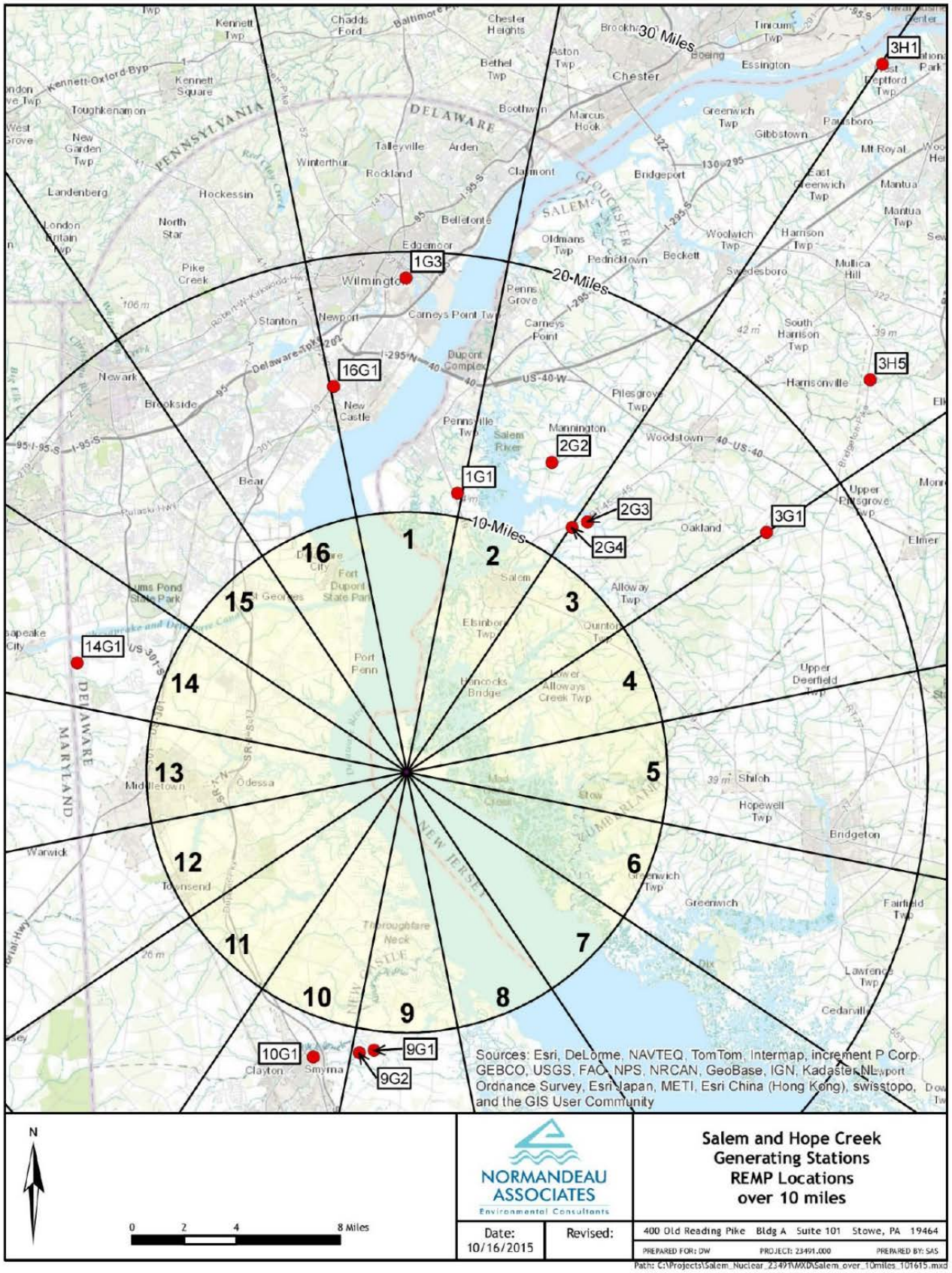
MAP B-2

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM OFF-SITE SAMPLING LOCATIONS 1 TO 10 MILES



MAP B-3

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM OFF-SITE SAMPLING LOCATIONS GREATER THAN 10 MILES



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APPENDIX C

DATA TABLES AND FIGURES

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Table C-1

CONCENTRATIONS OF GAMMA EMMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES, 2018

Results in Units of E-03 pCi/m^3 ± 2σ

STATION ID	COLLECTION PERIOD			<----------GAMMA EMITTERS---------->			
	START		STOP	Be-7	K-40	Cs-134	Cs-137
SA-APT-14G1 (C)	01/02/18	-	04/02/18	**58** ± 15	< 31	< 2	< 2
	04/02/18	-	07/02/18	**61** ± 12	< 29	< 1	< 1
	07/02/18	-	10/02/18	**55** ± 19	< 29	< 2	< 2
	10/02/18	-	01/02/19	**40** ± 12	< 17	< 2	< 2
			AVERAGE*	**53** ± 18	–	–	–
SA-APT-05S1	01/02/18	-	04/02/18	**59** ± 13	< 22	< 1	< 1
	04/02/18	-	07/02/18	**60** ± 14	< 8	< 1	< 1
	07/02/18	-	10/02/18	**74** ± 19	< 15	< 2	< 2
	10/02/18	-	01/02/19	**56** ± 13	< 21	< 2	< 2
			AVERAGE*	**62** ± 15	–	–	–
SA-APT-07S2	01/02/18	-	04/02/18	**72** ± 15	< 26	< 1	< 2
	04/02/18	-	07/02/18	**70** ± 15	< 8	< 1	< 1
	07/02/18	-	10/02/18	**59** ± 15	< 42	< 2	< 2
	10/02/18	-	01/02/19	**41** ± 12	< 32	< 2	< 2
			AVERAGE*	**60** ± 28	–	–	–
SA-APT-15S2	01/02/18	-	04/02/18	**65** ± 13	< 13	< 1	< 1
	04/02/18	-	07/02/18	**60** ± 13	< 30	< 1	< 1
	07/02/18	-	10/02/18	**63** ± 18	< 43	< 2	< 2
	10/02/18	-	01/02/19	**39** ± 11	< 28	< 2	< 2
			AVERAGE*	**57** ± 24	–	–	–
SA-APT-05D1	01/02/18	-	04/02/18	**56** ± 19	< 52	< 3	< 3
	04/02/18	-	07/02/18	**67** ± 12	< 11	< 1	< 1
	07/02/18	-	10/02/18	**76** ± 21	< 22	< 2	< 2
	10/02/18	-	01/02/19	**53** ± 12	< 22	< 2	< 1
			AVERAGE*	**63** ± 21	–	–	–
SA-APT-16E1	01/02/18	-	04/02/18	**51** ± 16	< 27	< 2	< 2
	04/02/18	-	07/02/18	**59** ± 12	< 30	< 1	< 1
	07/02/18	-	10/02/18	**51** ± 15	< 15	< 2	< 2
	10/02/18	-	01/02/19	**53** ± 16	< 20	< 1	< 1
			AVERAGE*	**54** ± 8	–	–	–

Table C-1 (cont.)

CONCENTRATIONS OF GAMMA EMMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES, 2018

Results in Units of E-03 pCi/m^3 ± 2σ

STATION ID	COLLECTION PERIOD START		STOP	<----------GAMMA EMITTERS----------> Be-7	K-40	Cs-134	Cs-137
SA-APT-01F1	01/02/18	-	04/02/18	**63** ± 14	< 28	< 2	< 1
	04/02/18	-	07/02/18	**79** ± 14	< 25	< 1	< 1
	07/02/18	-	10/02/18	**44** ± 14	< 16	< 2	< 2
	10/02/18	-	01/02/19	**37** ± 14	< 20	< 2	< 1
			AVERAGE*	**56** ± 38	–	–	–
SA-APT-02F6	01/02/18	-	04/02/18	**59** ± 13	< 30	< 1	< 2
	04/02/18	-	07/02/18	**59** ± 12	< 22	< 1	< 1
	07/02/18	-	10/02/18	**72** ± 19	< 53	< 3	< 3
	10/02/18	-	01/02/19	**45** ± 13	< 32	< 2	< 2
			AVERAGE*	**59** ± 22	–	–	–
ALL INDICATOR AVERAGE * .				**59** ± 22	-	-	-

(C) CONTROL LOCATION.

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-2 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES, 2018

Results in Units of E-03 pCi/m^3 ± 2σ

COLLECTION PERIOD			CONTROL	INDICATORS						
START		STOP	SA-APT-14G1	SA-APT-05S1	SA-APT-07S2	SA-APT-15S2	SA-APT-05D1	SA-APT-16E1	SA-APT-01F1	SA-APT-02F6
01/02/18	-	01/08/18	**13** ± 3	**17** ± 4	**13** ± 4	**13** ± 4	**15** ± 4	**12** ± 3	**13** ± 3	**14** ± 3
01/08/18	-	01/15/18	**16** ± 3	**14** ± 3	**16** ± 3	**16** ± 3	**17** ± 3	**16** ± 3	**16** ± 3	**17** ± 3
01/15/18	-	01/22/18	**20** ± 3	**19** ± 3	**21** ± 3	**21** ± 3	**22** ± 3	**20** ± 3	**23** ± 3	**23** ± 3
01/22/18	-	01/29/18	**12** ± 3	**11** ± 3	**13** ± 3	**11** ± 3	**12** ± 3	**10** ± 3	**9** ± 3	**9** ± 3
01/29/18	-	02/06/18	**12** ± 2	**12** ± 3	**13** ± 3	**11** ± 2	**12** ± 3	**12** ± 3	**11** ± 2	**12** ± 3
02/06/18	-	02/12/18	**14** ± 3	**14** ± 3	**11** ± 3	**11** ± 3	**15** ± 3	**9** ± 3	**9** ± 3	**13** ± 3
02/12/18	-	02/20/18	**15** ± 3	**17** ± 3	**14** ± 3	**13** ± 3	**15** ± 3	**16** ± 3	**15** ± 3	**14** ± 3
02/20/18	-	02/26/18	**7** ± 3	**6** ± 3	**9** ± 3	**6** ± 3	**6** ± 3	**7** ± 3	**6** ± 3	**6** ± 3
02/26/18	-	03/05/18	**18** ± 3	**15** ± 3	**15** ± 3	**15** ± 3	**14** ± 3	**14** ± 3	**13** ± 3	**14** ± 3
03/05/18	-	03/12/18	**8** ± 3	**11** ± 3	**7** ± 3	**8** ± 3	**7** ± 2	**10** ± 3	**7** ± 2	**9** ± 3
03/12/18	-	03/19/18	**15** ± 3	**15** ± 3	**14** ± 3	**13** ± 3	**16** ± 3	**18** ± 3	**14** ± 3	**14** ± 3
03/19/18	-	03/26/18	**10** ± 3	**8** ± 3	**11** ± 3	**11** ± 3	**10** ± 3	**13** ± 3	**10** ± 3	**9** ± 3
03/26/18	-	04/02/18	**10** ± 3	**12** ± 3	**11** ± 3	**12** ± 3	**9** ± 3	**10** ± 3	**8** ± 3	**10** ± 3
04/02/18	-	04/09/18	**12** ± 3	**11** ± 3	**13** ± 3	**9** ± 3	**12** ± 3	**9** ± 3	**11** ± 3	**13** ± 3
04/09/18	-	04/16/18	**16** ± 3	**15** ± 3	**12** ± 3	**15** ± 3	**15** ± 3	**15** ± 3	**14** ± 3	**14** ± 3
04/16/18	-	04/23/18	**4** ± 2	**9** ± 3	**8** ± 3	**10** ± 3	**9** ± 3	**8** ± 3	**8** ± 3	**9** ± 3
04/23/18	-	04/30/18	**11** ± 3	**9** ± 3	**12** ± 3	**11** ± 3	**12** ± 3	**12** ± 3	**9** ± 3	**9** ± 3
04/30/18	-	05/08/18	**18** ± 3	**19** ± 3	**18** ± 3	**19** ± 3	**17** ± 3	**17** ± 3	**14** ± 3	**15** ± 3
05/08/18	-	05/14/18	**13** ± 3	**13** ± 4	**13** ± 4	**11** ± 3	**13** ± 3	**11** ± 3	**12** ± 3	**13** ± 4
05/14/18	-	05/21/18	**6** ± 2	**8** ± 3	**6** ± 3	**7** ± 2	**6** ± 2	**7** ± 2	**5** ± 2	**5** ± 3
05/21/18	-	05/29/18	**10** ± 3	**9** ± 2	**9** ± 3	**7** ± 2	**9** ± 2	**8** ± 2	**10** ± 3	**8** ± 2
05/29/18	-	06/04/18	**7** ± 3	**5** ± 3	**5** ± 3	**6** ± 3	**6** ± 3	**5** ± 3	**6** ± 3	**8** ± 3
06/04/18	-	06/11/18	**10** ± 3	**12** ± 3	**9** ± 3	**8** ± 3	**8** ± 3	**11** ± 3	**9** ± 3	**9** ± 3
06/11/18	-	06/18/18	**11** ± 3	**11** ± 3	**11** ± 3	**11** ± 3	**9** ± 3	**12** ± 3	**8** ± 3	**11** ± 3
06/18/18	-	06/25/18	**10** ± 3	**10** ± 3	**9** ± 3	**9** ± 3	**12** ± 3	**8** ± 3	**9** ± 3	**12** ± 3
06/25/18	-	07/02/18	**13** ± 3	**13** ± 3	**14** ± 3	**13** ± 3	**13** ± 3	**11** ± 3	**10** ± 3	**15** ± 3
07/02/18	-	07/09/18	**14** ± 3	**12** ± 3	**14** ± 3	**14** ± 3	**13** ± 3	**11** ± 3	**13** ± 3	**10** ± 5
07/09/18	-	07/17/18	**13** ± 3	**15** ± 3	**12** ± 3	**13** ± 3	**14** ± 3	**12** ± 3	**14** ± 3	**14** ± 4
07/17/18	-	07/25/18	**8** ± 2	**8** ± 2	**9** ± 2	**7** ± 2	**8** ± 2	**7** ± 2	**7** ± 2	**7** ± 2
07/25/18	-	07/31/18	**12** ± 3	**10** ± 3	**11** ± 3	**8** ± 3	**8** ± 3	**10** ± 3	**8** ± 3	**9** ± 3
07/31/18	-	08/06/18	**8** ± 3	**8** ± 3	**5** ± 3	**8** ± 3	**9** ± 3	**8** ± 3	**8** ± 3	**7** ± 3
08/06/18	-	08/13/18	**15** ± 3	**13** ± 3	**16** ± 3	**15** ± 3	**14** ± 3	**12** ± 3	**12** ± 3	**16** ± 3
08/13/18	-	08/20/18	**22** ± 4	**21** ± 3	**17** ± 3	**15** ± 3	**14** ± 3	**18** ± 3	**17** ± 3	**19** ± 3
08/20/18	-	08/27/18	**10** ± 3	**11** ± 3	**12** ± 3	**9** ± 3	**12** ± 3	**14** ± 3	**10** ± 3	**11** ± 3
08/27/18	-	09/04/18	**20** ± 3	**18** ± 3	**36** ± 15 [E]	**17** ± 3	**19** ± 3	**17** ± 3	**17** ± 3	**23** ± 3
09/04/18	-	09/10/18	**11** ± 3	**12** ± 3	**14** ± 3	**14** ± 3	**11** ± 3	**11** ± 3	**11** ± 3	**13** ± 3
09/10/18	-	09/17/18	**6** ± 2	**8** ± 3	**7** ± 3	**6** ± 2	**7** ± 3	**4** ± 2	**7** ± 3	**5** ± 3
09/17/18	-	09/24/18	**11** ± 3	**10** ± 3	**10** ± 3	**9** ± 3	**9** ± 3	**8** ± 3	**9** ± 3	**8** ± 2
09/24/18	-	10/02/18	**13** ± 3	**11** ± 3	**9** ± 3	**13** ± 3	**12** ± 3	**13** ± 3	**8** ± 3	**13** ± 3
10/02/18	-	10/08/18	**17** ± 4	**14** ± 3	**18** ± 4	**18** ± 3	**20** ± 4	**18** ± 4	**13** ± 3	**19** ± 4
10/08/18	-	10/15/18	**9** ± 3	**10** ± 3	**8** ± 3	**9** ± 3	**8** ± 3	**10** ± 3	**11** ± 3	**11** ± 3
10/15/18	-	10/22/18	**10** ± 3	**13** ± 3	**13** ± 3	**10** ± 3	**9** ± 3	**13** ± 3	**11** ± 3	**13** ± 3
10/22/18	-	10/29/18	**6** ± 2	**6** ± 2	**9** ± 3	**9** ± 2	**5** ± 2	**8** ± 3	**6** ± 2	**9** ± 3
10/29/18	-	11/05/18	**10** ± 3	**10** ± 3	**13** ± 3	**13** ± 3	**11** ± 3	**11** ± 3	**9** ± 3	**13** ± 3
11/05/18	-	11/13/18	**9** ± 2	**8** ± 2	**10** ± 2	**9** ± 2	**9** ± 2	**9** ± 2	**7** ± 2	**11** ± 2
11/13/18	-	11/19/18	**9** ± 3	**12** ± 3	**12** ± 3	**14** ± 4	**11** ± 3	**12** ± 4	**11** ± 3	**12** ± 3
11/19/18	-	11/26/18	**18** ± 3	**16** ± 3	**17** ± 3	**18** ± 3	**15** ± 3	**12** ± 3	**14** ± 3	**14** ± 3
11/26/18	-	12/03/18	**10** ± 3	**10** ± 3	**11** ± 3	**9** ± 3	**9** ± 3	**9** ± 3	**9** ± 3	**9** ± 3
12/03/18	-	12/10/18	**14** ± 3	**15** ± 3	**14** ± 3	**15** ± 3	**12** ± 3	**13** ± 3	**11** ± 3	**11** ± 3
12/10/18	-	12/18/18	**17** ± 3	**17** ± 3	**20** ± 3	**16** ± 3	**19** ± 3	**20** ± 3	**20** ± 3	**21** ± 3
12/18/18	-	12/26/18	**11** ± 3	**10** ± 3	**12** ± 3	**10** ± 3	**10** ± 3	**11** ± 3	**10** ± 3	**11** ± 3
12/26/18	-	01/02/19	**15** ± 3	**12** ± 3	**12** ± 3	**14** ± 3	**13** ± 3	**12** ± 3	**12** ± 3	**13** ± 3
AVERAGE*			**12** ± 8	**12** ± 7	**12** ± 10 **12**	**12** ± 7	**12** ± 7	**12** ± 7	**11** ± 7	**12** ± 8
				ALL INDICATOR AVERAGE*			**12** ± 7			

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING ONLY THE POSITIVE VALUES.

[E] SEE 'SAMPLE ANOMOLIES AND PROGRAM EXCEPTIONS' SECTION OF THS REPORT

TABLE C-3 CONCENTRATIONS OF IODINE-131 IN FILTERED AIR, 2018

Results in Units of E-03 pCi/m^3 ± 2σ

COLLECTION PERIOD		CONTROL	INDICATORS						
START	STOP	SA-AIO-14G1	SA-AIO-05S1	SA-AIO-07S2	SA-AIO-15S2	SA-AIO-05D1	SA-AIO-16E1	SA-AIO-01F1	SA-AIO-2F6
01/02/18 -	01/08/18	< 20	< 28	< 20	< 20	< 27	< 20	< 25	< 26
01/08/18 -	01/15/18	< 17	< 29	< 22	< 22	< 32	< 21	< 29	< 30
01/15/18 -	01/22/18	< 21	< 22	< 21	< 20	< 22	< 22	< 11	< 23
01/22/18 -	01/29/18	< 24	< 22	< 24	< 26	< 23	< 25	< 21	< 22
01/29/18 -	02/06/18	< 24	< 20	< 24	< 24	< 20	< 25	< 7	< 19
02/06/18 -	02/12/18	< 29	< 23	< 28	< 28	< 23	< 28	< 11	< 23
02/12/18 -	02/20/18	< 15	< 12	< 15	< 15	< 12	< 16	< 10	< 13
02/20/18 -	02/26/18	< 27	< 32	< 25	< 27	< 34	< 27	< 11	< 32
02/26/18 -	03/05/18	< 22	< 21	< 22	< 10	< 22	< 20	< 7	< 22
03/05/18 -	03/12/18	< 18	< 27	< 18	< 18	< 25	< 19	< 24	< 28
03/12/18 -	03/19/18	< 25	< 36	< 25	< 24	< 35	< 24	< 17	< 37
03/19/18 -	03/26/18	< 22	< 26	< 19	< 20	< 24	< 20	< 10	< 25
03/26/18 -	04/02/18	< 19	< 28	< 18	< 20	< 27	< 20	< 26	< 28
04/02/18 -	04/09/18	< 39	< 22	< 39	< 35	< 21	< 39	< 20	< 25
04/09/18 -	04/16/18	< 15	< 29	< 14	< 14	< 28	< 14	< 27	< 25
04/16/18 -	04/23/18	< 17	< 23	< 16	< 13	< 23	< 16	< 23	< 25
04/23/18 -	04/30/18	< 39	< 18	< 38	< 37	< 18	< 16	< 14	< 18
04/30/18 -	05/08/18	< 30	< 11	< 29	< 16	< 27	< 29	< 27	< 31
05/08/18 -	05/14/18	< 28	< 36	< 29	< 27	< 35	< 22	< 14	< 36
05/14/18 -	05/21/18	< 20	< 32	< 22	< 20	< 31	< 20	< 13	< 35
05/21/18 -	05/29/18	< 14	< 9	< 15	< 13	< 9	< 14	< 8	< 9
05/29/18 -	06/04/18	< 19	< 30	< 15	< 19	< 30	< 19	< 29	< 30
06/04/18 -	06/11/18	< 27	< 17	< 27	< 26	< 16	< 27	< 16	< 17
06/11/18 -	06/18/18	< 30	< 19	< 31	< 12	< 20	< 30	< 20	< 19
06/18/18 -	06/25/18	< 15	< 24	< 14	< 15	< 25	< 15	< 23	< 25
06/25/18 -	07/02/18	< 20	< 40	< 21	< 20	< 37	< 21	< 15	< 38
07/02/18 -	07/09/18	< 29	< 22	< 28	< 28	< 21	< 22	< 18	< 64
07/09/18 -	07/17/18	< 23	< 17	< 22	< 23	< 17	< 25	< 17	< 35
07/17/18 -	07/25/18	< 19	< 25	< 19	< 20	< 11	< 22	< 25	< 26
07/25/18 -	07/31/18	< 28	< 45	< 28	< 29	< 48	< 47	< 17	< 46
07/31/18 -	08/06/18	< 17	< 20	< 17	< 17	< 20	< 16	< 21	< 21
08/06/18 -	08/13/18	< 14	< 15	< 15	< 14	< 14	< 14	< 13	< 14
08/13/18 -	08/20/18	< 24	< 21	< 24	< 24	< 22	< 24	< 20	< 22
08/20/18 -	08/27/18	< 24	< 14	< 26	< 24	< 16	< 24	< 15	< 15
08/27/18 -	09/04/18	< 32	< 19	< 215 E	< 29	< 19	< 32	< 18	< 15
09/04/18 -	09/10/18	< 36	< 15	< 14	< 34	< 15	< 36	< 14	< 14
09/10/18 -	09/17/18	< 29	< 15	< 30	< 11	< 16	< 29	< 16	< 18
09/17/18 -	09/24/18	< 17	< 13	< 17	< 16	< 13	< 17	< 14	< 12
09/24/18 -	10/02/18	< 15	< 25	< 15	< 12	< 25	< 15	< 24	< 27
10/02/18 -	10/08/18	< 30	< 29	< 29	< 12	< 30	< 30	< 29	< 29
10/08/18 -	10/15/18	< 16	< 25	< 16	< 13	< 25	< 17	< 24	< 25
10/15/18 -	10/22/18	< 20	< 21	< 21	< 21	< 20	< 20	< 20	< 21
10/22/18 -	10/29/18	< 30	< 21	< 29	< 27	< 22	< 31	< 21	< 22
10/29/18 -	11/05/18	< 24	< 27	< 24	< 25	< 25	< 24	< 25	< 25
11/05/18 -	11/13/18	< 17	< 13	< 17	< 18	< 12	< 17	< 12	< 12
11/13/18 -	11/19/18	< 43	< 48	< 16	< 42	< 50	< 48	< 18	< 46
11/19/18 -	11/26/18	< 19	< 25	< 18	< 18	< 10	< 19	< 24	< 24
11/26/18 -	12/03/18	< 24	< 13	< 22	< 10	< 13	< 25	< 12	< 13
12/03/18 -	12/10/18	< 26	< 15	< 25	< 26	< 12	< 27	< 15	< 15
12/10/18 -	12/18/18	< 15	< 23	< 16	< 12	< 25	< 15	< 24	< 25
12/18/18 -	12/26/18	< 27	< 32	< 28	< 26	< 31	< 27	< 31	< 31
12/26/18 -	01/02/19	< 33	< 19	< 33	< 33	< 24	< 24	< 24	< 24
AVERAGE		–	–	–	–	–	–	–	–

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING ONLY THE POSITIVE VALUES.

E SEE 'SAMPLE ANOMOLIES AND PROGRAM EXCEPTIONS' SECTION OF THS REPORT

Table C-4 **DIRECT AND IMMERSION RADIATION MEASUREMENTS, 2018**
(REMP DOSIMETRY RESULTS*)

STATION ID	ANNUAL NET DOSE (mrem)	GROSS ANNUAL DOSE (mrem)	QUARTERLY NET DOSE AND GROSS DOSE (mrem/Standard Quarter)							
			JAN - MAR		APR - JUN		JUL - SEP		OCT - DEC	
			Net	Gross	Net	Gross	Net	Gross	Net	Gross
SA-IDM-01G3 (C)	ND	54.9	ND	12.3	ND	13.4	ND	14.4	ND	14.8
SA-IDM-03G1 (C)	ND	56.1	ND	13.1	ND	12.8	ND	14.9	ND	15.2
SA-IDM-10G1 (C)	ND	57.5	ND	13.4	ND	13.8	ND	14.8	ND	15.6
SA-IDM-14G1 (C)	ND	57.6	ND	12.9	ND	14.1	ND	15.2	ND	15.4
SA-IDM-16G1 (C)	ND	51.1	ND	11.5	ND	12.4	ND	13.4	ND	13.9
SA-IDM-03H1 (C)	ND	49.9	ND	11.4	ND	12.2	ND	13.3	ND	12.9
SA-IDM-01S1 **	**59.5**	113.7	**12.4**	25.9	**13.5**	27.0	**16.7**	30.3	**16.9**	30.5
SA-IDM-01S2	ND	48.4	ND	10.2	ND	12.4	ND	12.6	ND	13.3
SA-IDM-02S2	ND	15.0	ND	15.0		***		***		***
SA-IDM-02S4	ND	53.7	ND	12.5	ND	12.7	ND	14.3	ND	14.3
SA-IDM-03S1	ND	49.0	ND	11.3	ND	12.0	ND	12.6	ND	13.1
SA-IDM-04S1	ND	48.3	ND	11.6	ND	10.9	ND	12.6	ND	13.2
SA-IDM-05S1	ND	46.6	ND	11.1	ND	10.3	ND	12.4	ND	12.8
SA-IDM-06S2	ND	62.4	ND	15.1	ND	14.5	ND	15.9	ND	17.0
SA-IDM-07S1	ND	48.8	ND	11.7	ND	11.1	ND	12.7	ND	13.2
SA-IDM-08S1	ND	49.7	ND	12.7	ND	14.2	ND	10.9	ND	11.9
SA-IDM-09S1	ND	50.9	ND	14.0	ND	14.6	ND	11.0	ND	11.4
SA-IDM-10S1	ND	52.7	ND	13.2	ND	14.1	ND	12.5	ND	12.9
SA-IDM-11S1	ND	51.1	ND	13.3	ND	13.5	ND	11.9	ND	12.4
SA-IDM-12S1	ND	57.4	ND	13.1	ND	14.2	ND	14.7	ND	15.5
SA-IDM-13S1	ND	60.6	ND	13.6	ND	14.2	ND	15.9	ND	16.9
SA-IDM-14S1	ND	58.0	ND	12.6	ND	11.7	ND	16.4	ND	17.3
SA-IDM-15S1	ND	45.8	ND	10.8	ND	11.1	ND	11.5	ND	12.5
SA-IDM-15S2	ND	51.0	ND	11.8	ND	11.8	ND	13.2	ND	14.2
SA-IDM-16S1	ND	55.0	ND	13.2	ND	13.0	ND	14.0	ND	14.9
SA-IDM-16S2 **	**60.0**	114.2	**12.9**	26.5	**13.2**	26.8	**16.9**	30.5	**17.0**	30.5
SA-IDM-16S3	ND	48.0	ND	9.6	ND	11.8	ND	13.2	ND	13.4
SA-IDM-04D2	ND	58.1	ND	13.5	ND	13.9	ND	15.0	ND	15.7
SA-IDM-05D1	ND	53.6	ND	11.9	ND	13.1	ND	13.7	ND	14.9
SA-IDM-10D1	ND	49.5	ND	9.1	ND	9.9	ND	14.8	ND	15.7
SA-IDM-14D1	ND	50.9	ND	11.0	ND	12.5	ND	13.2	ND	14.2
SA-IDM-15D1	ND	55.6	ND	12.9	ND	13.3	ND	14.5	ND	15.0
SA-IDM-02E1	ND	54.6	ND	12.5	ND	13.8	ND	13.7	ND	14.7
SA-IDM-03E1	ND	46.0	ND	10.9	ND	10.4	ND	12.1	ND	12.7
SA-IDM-11E2	ND	53.4	ND	11.4	ND	10.8	ND	15.2	ND	16.1
SA-IDM-12E1	ND	53.5	ND	10.8	ND	11.3	ND	15.4	ND	16.0
SA-IDM-13E1	ND	51.4	ND	12.6	ND	13.4	ND	12.6	ND	12.9
SA-IDM-16E1	ND	54.7	ND	12.4	ND	13.3	ND	14.3	ND	14.6
SA-IDM-01F1	ND	71.0	ND	16.5	ND	17.3	ND	18.4	ND	18.9
SA-IDM-02F2	ND	51.1	ND	11.8	ND	12.1	ND	13.3	ND	13.9
SA-IDM-02F5	ND	56.3	ND	13.2	ND	13.1	ND	14.6	ND	15.4
SA-IDM-02F6	ND	51.9	ND	12.1	ND	12.7	ND	12.9	ND	14.2
SA-IDM-03F2	ND	50.8	ND	11.7	ND	12.7	ND	13.1	ND	13.4
SA-IDM-03F3	ND	47.9	ND	10.9	ND	11.6	ND	12.3	ND	13.1
SA-IDM-04F2	ND	46.8	ND	10.9	ND	10.4	ND	12.7	ND	12.9
SA-IDM-05F1	ND	52.0	ND	12.0	ND	12.5	ND	13.6	ND	13.9
SA-IDM-06F1	ND	43.9	ND	10.0	ND	10.3	ND	12.2	ND	11.5
SA-IDM-07F2	ND	50.1	ND	11.2	ND	11.9	ND	13.4	ND	13.6
SA-IDM-08F1	ND	58.2	ND	12.4	ND	13.8	ND	15.3	ND	16.7
SA-IDM-09F1	ND	52.9	ND	9.1	ND	10.9	ND	16.5	ND	16.5
SA-IDM-10F2	ND	56.9	ND	12.7	ND	14.0	ND	14.9	ND	15.3
SA-IDM-11F1	ND	60.4	ND	13.9	ND	14.9	ND	15.7	ND	16.0
SA-IDM-12F1	ND	59.1	ND	13.7	ND	14.4	ND	15.2	ND	15.8
SA-IDM-13F2	ND	50.7	ND	11.1	ND	10.8	ND	14.0	ND	14.8
SA-IDM-13F3	ND	56.6	ND	12.1	ND	14.0	ND	14.8	ND	15.7
SA-IDM-13F4	ND	57.1	ND	13.3	ND	13.3	ND	14.7	ND	15.8
SA-IDM-14F2	ND	59.3	ND	12.3	ND	14.1	ND	16.1	ND	16.7
SA-IDM-15F3	ND	60.5	ND	13.6	ND	14.9	ND	15.4	ND	16.6
SA-IDM-16F2	ND	52.1	ND	11.6	ND	13.3	ND	13.5	ND	13.7

ND NOT DETECTABLE ABOVE BACKGROUND
(C) CONTROL LOCATION
* QUARTERLY ELEMENT TLD RESULTS BY VENDOR LABORATORY.
** SAMPLE RESULTS ARE AFFECTED BY THE INDPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)
*** SEE 'SAMPLE ANOMOLIES AND PROGRAM EXCEPTIONS' SECTION OF THIS REPORT.

Table C-5 **CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK, 2018**

Results in Units of pCi/L ± 2σ

COLLECTION PERIOD				< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >				
STATION ID	START	STOP	I-131 LL	K-40	Cs-134	Cs-137	BaLa-140	Ra-226
*SA-MLK-3G1 (C)	01/01/18	01/02/18	< 0.6	**1,145** ± 183	< 7	< 7	< 13	< 204
	02/05/18	02/06/18	< 0.3	**997** ± 209	< 10	< 9	< 14	< 191
	03/04/18	03/05/18	< 0.6	**1,266** ± 157	< 6	< 6	< 12	< 138
	04/01/18	04/02/18	< 0.5	**1,557** ± 210	< 9	< 7	< 13	< 130
	04/15/18	04/16/18	< 0.5	**1,117** ± 194	< 10	< 8	< 9	< 207
	05/07/18	05/08/18	< 0.5	**1,229** ± 157	< 7	< 7	< 7	< 164
	05/20/18	05/21/18	< 0.6	**1,235** ± 126	< 7	< 5	< 9	< 108
	06/03/18	06/04/18	< 0.5	**1,320** ± 179	< 6	< 8	< 9	< 182
	06/17/18	06/18/18	< 0.6	**1,303** ± 160	< 9	< 7	< 9	< 193
	07/01/18	07/02/18	< 0.9	**1,285** ± 163	< 9	< 7	< 8	< 170
	07/16/18	07/17/18	< 0.5	**1,166** ± 184	< 6	< 8	< 10	< 194
	AVERAGE		–	**1,238** ± 284	–	–	–	–
SA-MLK-13E3	01/01/18	01/02/18	< 0.7	**1,610** ± 217	< 6	< 8	< 12	< 133
	02/05/18	02/06/18	< 0.5	**1,327** ± 157	< 11	< 10	< 10	< 264
	03/04/18	03/05/18	< 0.8	**1,420** ± 173	< 7	< 6	< 6	< 135
	04/01/18	04/02/18	< 0.8	**1,479** ± 194	< 8	< 8	< 7	< 199
	04/15/18	04/16/18	< 0.8	**1,161** ± 173	< 9	< 8	< 10	< 194
	05/07/18	05/08/18	< 0.6	**1,462** ± 142	< 7	< 6	< 8	< 122
	05/20/18	05/21/18	< 0.8	**1,273** ± 157	< 7	< 6	< 12	< 127
	06/03/18	06/04/18	< 0.8	**1,155** ± 184	< 8	< 9	< 9	< 193
	06/17/18	06/18/18	< 0.6	**1,392** ± 150	< 9	< 8	< 12	< 212
	07/01/18	07/02/18	< 0.6	**1,164** ± 179	< 8	< 9	< 10	< 192
	07/16/18	07/17/18	< 0.6	**1,566** ± 225	< 7	< 10	< 13	< 191
	08/05/18	08/06/18	< 0.5	**1,195** ± 190	< 9	< 8	< 10	< 196
	08/19/18	08/20/18	< 0.5	**1,285** ± 206	< 9	< 9	< 13	< 188
	09/03/18	09/04/18	< 0.5	**1,266** ± 170	< 11	< 10	< 11	< 205
	09/16/18	09/17/18	< 0.6	**1,191** ± 224	< 13	< 10	< 13	< 230
	10/01/18	10/02/18	< 0.6	**1,369** ± 190	< 10	< 8	< 10	< 213
	10/14/18	10/15/18	< 0.6	**1,238** ± 161	< 6	< 8	< 11	< 163
	11/12/18	11/13/18	< 0.5	**1,439** ± 170	< 7	< 6	< 14	< 161
	11/25/18	11/26/18	< 0.9	**1,440** ± 177	< 9	< 8	< 8	< 212
	12/02/18	12/03/18	< 0.6	**1,522** ± 206	< 9	< 8	< 3	< 165
	AVERAGE		–	**1,348** ± 284	–	–	–	–

Table C-5 (Cont.) **CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK, 2018**

Results in Units of pCi/L ± 2σ

COLLECTION PERIOD				< - - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - - >				
STATION ID	START	STOP	I-131 LL	K-40	Cs-134	Cs-137	BaLa-140	Ra-226
SA-MLK-14F4	01/01/18	01/02/18	< 0.6	**1,323** ± 168	< 9	< 7	< 11	< 154
	02/05/18	02/06/18	< 0.7	**1,315** ± 166	< 8	< 7	< 6	< 170
	03/04/18	03/05/18	< 0.7	**1,429** ± 138	< 7	< 7	< 10	< 144
	04/01/18	04/02/18	< 0.4	**1,219** ± 141	< 6	< 6	< 6	< 152
	04/15/18	04/16/18	< 0.6	**1,210** ± 166	< 8	< 8	< 10	< 170
	05/07/18	05/08/18	< 0.5	**1,214** ± 147	< 8	< 6	< 9	< 167
	05/20/18	05/21/18	< 0.6	**1,156** ± 161	< 7	< 7	< 12	< 184
	06/03/18	06/04/18	< 0.5	**1,349** ± 197	< 10	< 9	< 13	< 212
	06/17/18	06/18/18	< 0.7	**1,271** ± 168	< 8	< 7	< 10	< 182
	07/01/18	07/02/18	< 0.5	**1,273** ± 185	< 9	< 9	< 13	< 202
	07/16/18	07/17/18	< 0.4	**1,433** ± 214	< 9	< 9	< 11	< 195
	08/05/18	08/06/18	< 0.6	**1,243** ± 174	< 8	< 8	< 13	< 167
	08/19/18	08/20/18	< 0.6	**1,226** ± 167	< 7	< 11	< 10	< 207
	09/03/18	09/04/18	< 0.5	**1,614** ± 228	< 12	< 10	< 12	< 253
	09/16/18	09/17/18	< 0.4	**1,287** ± 180	< 9	< 7	< 12	< 208
	10/01/18	10/02/18	< 0.5	**1,333** ± 154	< 6	< 6	< 8	< 170
	10/14/18	10/15/18	< 0.6	**1,418** ± 160	< 7	< 7	< 14	< 122
	11/12/18	11/13/18	< 0.4	**1,179** ± 160	< 8	< 8	< 10	< 166
	11/25/18	11/26/18	< 0.7	**1,472** ± 170	< 7	< 7	< 10	< 132
	12/02/18	12/03/18	< 0.6	**1,324** ± 169	< 6	< 7	< 8	< 179
	AVERAGE		–	**1,314** ± 227	–	–	–	–
SA-MLK-2G3	01/01/18	01/02/18	< 0.8	**1,249** ± 159	< 8	< 6	< 10	< 147
	02/05/18	02/06/18	< 0.3	**1,317** ± 193	< 9	< 8	< 11	< 181
	03/04/18	03/05/18	< 0.7	**1,379** ± 143	< 6	< 6	< 7	< 128
	04/01/18	04/02/18	< 0.8	**1,457** ± 188	< 8	< 8	< 10	< 203
	04/15/18	04/16/18	< 0.7	**1,329** ± 144	< 6	< 7	< 8	< 156
	05/07/18	05/08/18	< 0.4	**1,311** ± 156	< 7	< 6	< 11	< 168
	05/20/18	05/21/18	< 0.5	**1,281** ± 146	< 5	< 5	< 5	< 131
	06/03/18	06/04/18	< 0.5	**1,246** ± 218	< 11	< 8	< 12	< 189
	06/17/18	06/18/18	< 0.5	**1,236** ± 197	< 8	< 7	< 10	< 170
	07/01/18	07/02/18	< 0.9	**1,321** ± 198	< 7	< 7	< 12	< 190
	07/16/18	07/17/18	< 0.5	**1,402** ± 173	< 8	< 8	< 13	< 152
	08/05/18	08/06/18	< 0.6	**1,319** ± 146	< 8	< 8	< 13	< 180
	08/19/18	08/20/18	< 0.4	**1,113** ± 155	< 9	< 8	< 11	< 198
	09/03/18	09/04/18	< 0.4	**1,711** ± 244	< 10	< 8	< 14	< 228
	09/16/18	09/17/18	< 0.5	**1,127** ± 174	< 8	< 8	< 5	< 174
	10/01/18	10/02/18	< 0.4	**1,431** ± 144	< 6	< 5	< 8	< 105
	10/14/18	10/15/18	< 0.6	**1,440** ± 183	< 8	< 7	< 14	< 186
	11/12/18	11/13/18	< 0.5	**1,203** ± 140	< 6	< 5	< 12	< 142
	11/25/18	11/26/18	< 1.0	**1,224** ± 191	< 8	< 8	< 14	< 169
	12/02/18	12/03/18	< 0.8	**1,367** ± 182	< 7	< 7	< 15	< 187
	AVERAGE*		–	**1,323** ± 265	–	–	–	–
ALL INDICATOR AVERAGE*			–	**1,328** ± 257	–	–	–	–

(C) CONTROL LOCATION.

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-6 CONCENTRATIONS OF GROSS ALPHA AND BETA EMITTERS AND TRITIUM IN WELL WATER, 2018**

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION DATE	Gross Alpha	Gross Beta	H-3
SA-WWA-3E1	01/15/18	< 1.4	< 2.4	< 193
	02/20/18	< 1.9	< 2.1	< 186
	03/12/18	< 1.4	< 3.2	< 186
	04/16/18	< 2.0	< 2.3	< 184
	05/21/18	< 1.6	< 2.2	< 176
	06/18/18	< 1.2	< 2.2	< 194
	07/17/18	< 2.1	< 2.6	< 189
	08/20/18	< 1.5	< 2.3	< 194
	09/17/18	< 2.0	< 2.3	< 187
	10/15/18	< 1.0	< 2.3	< 190
	11/19/18	< 2.2	< 2.3	< 196
	12/18/18	< 2.0	< 2.3	< 195
	AVERAGE*	–	–	–

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

TABLE C-7 CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN WELL WATER, 2018**

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION DATE	I-131 LL	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >										
			K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140	Ra-226
SA-WWA-3E1	01/15/18	< 0.6	< 135	< 7	< 7	< 13	< 6	< 13	< 8	< 8	< 6	< 7	< 162
	02/20/18	< 0.3	< 135	< 6	< 7	< 14	< 6	< 11	< 7	< 7	< 7	< 9	< 180
	03/12/18	< 0.9	< 152	< 5	< 6	< 11	< 7	< 13	< 5	< 7	< 6	< 8	< 197
	04/16/18	< 0.5	< 131	< 7	< 7	< 13	< 5	< 14	< 8	< 10	< 8	< 12	< 183
	05/21/18	< 0.3	< 126	< 5	< 6	< 12	< 6	< 12	< 5	< 6	< 7	< 6	< 155
	06/18/18	< 0.2	< 52	< 6	< 6	< 13	< 3	< 13	< 6	< 6	< 6	< 6	< 137
	07/17/18	< 0.5	< 79	< 4	< 3	< 7	< 4	< 7	< 4	< 4	< 4	< 5	< 97
	08/20/18	< 0.5	< 126	< 5	< 6	< 12	< 7	< 11	< 6	< 7	< 7	< 8	< 170
	09/17/18	< 0.4	< 114	< 5	< 5	< 11	< 6	< 13	< 6	< 8	< 7	< 9	< 177
	10/15/18	< 0.4	< 107	< 6	< 6	< 13	< 6	< 15	< 8	< 6	< 7	< 14	< 174
	11/19/18	< 0.3	< 76	< 4	< 4	< 10	< 4	< 8	< 4	< 5	< 4	< 8	< 103
	12/18/18	< 0.3	< 82	< 4	< 4	< 8	< 5	< 10	< 5	< 4	< 4	< 6	< 105
	AVERAGE*	–	–	–	–	–	–	–	–	–	–	–	–

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

TABLE C-8 **CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS AND TRITIUM IN RAW AND TREATED POTABLE WATER**, 2018**

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION PERIOD START	STOP	Gross Alpha	Gross Beta	H-3
SA-PWR-2F3	12/26/17	01/29/18	< 2.6	**6.2** ± 2.1	< 196
	01/29/18	02/26/18	***	***	< 173
	02/26/18	03/26/18	< 0.9	**6.1** ± 2.0	< 178
	03/26/18	04/30/18	< 1.9	**6.2** ± 1.6	< 180
	04/30/18	05/29/18	< 2.5	**5.8** ± 2.1	< 171
	05/29/18	06/25/18	< 1.3	**5.5** ± 1.9	< 197
	06/25/18	07/31/18	< 3.0	**5.5** ± 2.4	< 198
	07/31/18	08/27/18	< 1.0	**7.0** ± 1.7	< 182
	08/27/18	09/24/18	< 1.9	**5.9** ± 1.9	< 199
	09/24/18	10/29/18	< 1.9	**6.2** ± 2.2	< 187
	10/29/18	11/26/18	< 2.5	**9.4** ± 2.2	< 187
	11/26/18	12/26/18	< 1.0	**7.6** ± 2.2	< 196
	AVERAGE*		–	**6.5** ± 2.3	–
SA-PWT-2F3	12/26/17	01/29/18	< 2.6	**6.2** ± 2.1	< 195
	01/29/18	02/26/18	***	***	< 174
	02/26/18	03/26/18	< 0.9	**6.0** ± 1.9	< 180
	03/26/18	04/30/18	< 1.8	**8.0** ± 1.7	< 180
	04/30/18	05/29/18	< 2.5	**5.5** ± 2.0	< 172
	05/29/18	06/25/18	< 1.3	**9.1** ± 2.2	< 197
	06/25/18	07/31/18	< 2.8	**9.2** ± 2.5	< 193
	07/31/18	08/27/18	< 1.3	**5.5** ± 1.6	< 186
	08/27/18	09/24/18	< 2.0	**6.1** ± 2.0	< 196
	09/24/18	10/29/18	< 1.9	**4.7** ± 2.1	< 189
	10/29/18	11/26/18	< 2.5	**7.1** ± 2.0	< 189
	11/26/18	12/26/18	< 1.0	**6.8** ± 2.2	< 195
	AVERAGE*		–	**6.7** ± 2.9	–

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES.
IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

****** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

******* COULD NOT BE ANALYZED DUE TO THE VOLUME SENT FROM COLLECTION.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-9 CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN RAW AND TREATED POTABLE WATER, 2018**

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION PERIOD START	STOP	I-131 LL	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - > K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140	Ra-226
SA-PWR-2F3	12/26/17	01/29/18	< 0.5	< 111	< 5	< 4	< 12	< 6	< 11	< 6	< 7	< 6	< 5	< 184
	01/29/18	02/26/18	< 0.7	< 99	< 5	< 6	< 12	< 6	< 13	< 7	< 7	< 6	< 8	< 151
	02/26/18	03/26/18	< 0.5	< 70	< 7	< 5	< 12	< 8	< 11	< 7	< 7	< 6	< 8	< 172
	03/26/18	04/30/18	< 0.3	< 94	< 5	< 5	< 11	< 5	< 13	< 6	< 6	< 5	< 10	< 138
	04/30/18	05/29/18	< 0.3	< 101	< 5	< 6	< 11	< 6	< 9	< 6	< 6	< 6	< 8	< 134
	05/29/18	06/25/18	< 0.8	< 149	< 6	< 6	< 12	< 5	< 13	< 5	< 6	< 7	< 7	< 173
	06/25/18	07/31/18	< 0.4	< 79	< 3	< 3	< 7	< 4	< 8	< 4	< 4	< 4	< 6	< 97
	07/31/18	08/27/18	< 0.9	< 54	< 5	< 5	< 10	< 2	< 10	< 5	< 7	< 6	< 7	< 126
	08/27/18	09/24/18	< 0.4	< 43	< 8	< 6	< 16	< 8	< 15	< 7	< 9	< 8	< 11	< 184
	09/24/18	10/29/18	< 0.4	< 125	< 7	< 8	< 15	< 8	< 15	< 7	< 7	< 7	< 10	< 148
	10/29/18	11/26/18	< 0.3	< 45	< 5	< 6	< 12	< 5	< 11	< 5	< 6	< 6	< 8	< 154
	11/26/18	12/26/18	< 0.8	< 50	< 5	< 5	< 12	< 5	< 12	< 6	< 5	< 5	< 5	< 143
–	AVERAGE*		–	–	–	–	–	–	–	–	–	–	–	–
SA-PWT-2F3	12/26/17	01/29/18	< 0.6	< 145	< 4	< 5	< 14	< 6	< 9	< 8	< 9	< 7	< 5	< 177
	01/29/18	02/26/18	< 0.9	< 141	< 6	< 6	< 14	< 7	< 9	< 6	< 7	< 6	< 10	< 168
	02/26/18	03/26/18	< 0.4	< 83	< 4	< 4	< 11	< 6	< 10	< 5	< 5	< 6	< 7	< 126
	03/26/18	04/30/18	< 0.3	< 45	< 3	< 4	< 8	< 4	< 10	< 4	< 5	< 5	< 7	< 103
	04/30/18	05/29/18	< 0.3	< 99	< 5	< 5	< 9	< 6	< 9	< 5	< 6	< 4	< 7	< 129
	05/29/18	06/25/18	< 0.8	< 125	< 7	< 7	< 12	< 8	< 13	< 6	< 7	< 6	< 11	< 141
	06/25/18	07/31/18	< 0.5	< 34	< 4	< 4	< 9	< 4	< 7	< 4	< 4	< 4	< 7	< 89
	07/31/18	08/27/18	< 0.6	< 68	< 6	< 7	< 13	< 6	< 11	< 6	< 7	< 6	< 7	< 172
	08/27/18	09/24/18	< 0.5	< 100	< 5	< 5	< 9	< 5	< 10	< 5	< 4	< 4	< 6	< 107
	09/24/18	10/29/18	< 0.6	< 62	< 7	< 5	< 13	< 8	< 16	< 7	< 7	< 8	< 9	< 173
	10/29/18	11/26/18	< 0.2	< 112	< 7	< 7	< 11	< 7	< 10	< 7	< 6	< 6	< 6	< 129
	11/26/18	12/26/18	< 0.7	< 95	< 4	< 5	< 8	< 4	< 8	< 5	< 5	< 4	< 6	< 98
	AVERAGE*		–	–	–	–	–	–	–	–	–	–	–	–

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

****** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-10a **CONCENTRATIONS OF GAMMA EMITTERS IN BROADLEAF VEGETATION, 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	SAMPLE TYPE	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPL-1G1 (C)	10/22/18	Cabbage	< 128	**1,917** ± 308	< 21	< 17	< 15	< 401	< 66
SA-FPL-3H5 (C)	06/25/18	Cabbage	< 129	**1,692** ± 250	< 22	< 16	< 18	< 348	< 63
SA-FPL-1S1	07/25/18	Cabbage	< 270	**5,398** ± 680	< 50	< 30	< 31	< 728	< 116
SA-FPL-1S1	07/25/18	Kale	< 230	**5,746** ± 808	< 38	< 36	< 26	< 666	< 122
SA-FPL-1S1	07/25/18	Collards	< 274	**5,130** ± 673	< 42	< 31	< 33	< 635	< 115
SA-FPL-1S1	08/29/18	Kale	**505** ± 267	**8,113** ± 818	< 56	< 28	< 34	< 632	< 133
SA-FPL-1S1	08/29/18	Cabbage	< 232	**6,973** ± 665	< 42	< 30	< 26	< 454	< 102
SA-FPL-1S1	08/29/18	Collards	**415** ± 266	**7,987** ± 782	< 54	< 35	< 27	< 698	< 133
SA-FPL-1S1	09/24/18	Collards	< 190	**6,155** ± 584	< 24	< 28	< 21	< 509	< 103
SA-FPL-1S1	09/24/18	Kale	< 170	**5,219** ± 655	< 17	< 18	< 15	< 357	< 76
SA-FPL-7S2	07/25/18	Kale	< 264	**5,971** ± 845	< 48	< 34	< 30	< 679	< 97
SA-FPL-7S2	07/25/18	Cabbage	< 334	**4,816** ± 561	< 56	< 37	< 37	< 812	< 129
SA-FPL-7S2	07/25/18	Collards	< 293	**5,541** ± 677	< 41	< 30	< 38	< 800	< 114
SA-FPL-7S2	08/29/18	Kale	< 275	**7,702** ± 723	< 57	< 29	< 32	< 566	< 111
SA-FPL-7S2	08/29/18	Collards	< 283	**5,531** ± 728	< 45	< 38	< 24	< 713	< 139
SA-FPL-7S2	09/24/18	Collards	< 238	**6,593** ± 801	< 32	< 22	< 31	< 672	< 139
SA-FPL-7S2	09/24/18	Kale	< 159	**6,377** ± 523	< 24	< 26	< 23	< 471	< 95
SA-FPL-15S2	07/25/18	Cabbage	< 245	**4,482** ± 649	< 38	< 29	< 28	< 618	< 111
SA-FPL-15S2	07/25/18	Kale	< 255	**4,084** ± 707	< 42	< 28	< 36	< 719	< 124
SA-FPL-15S2	07/25/18	Collards	< 306	**4,381** ± 687	< 50	< 33	< 33	< 797	< 140
SA-FPL-15S2	08/29/18	Kale	< 221	**5,040** ± 639	< 49	< 24	< 29	< 598	< 100
SA-FPL-15S2	08/29/18	Cabbage	< 219	**5,506** ± 590	< 47	< 31	< 27	< 607	< 112
SA-FPL-15S2	08/29/18	Collards	< 260	**4,729** ± 618	< 51	< 26	< 29	< 624	< 119
SA-FPL-15S2	09/24/18	Collards	< 206	**3,385** ± 481	< 30	< 28	< 27	< 500	< 86
SA-FPL-15S2	09/24/18	Kale	**204** ± 132	**4,847** ± 503	< 20	< 20	< 18	< 449	< 78

Table C-10a
(Cont.)

CONCENTRATIONS OF GAMMA EMITTERS IN BROADLEAF VEGETATION, 2018

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	SAMPLE TYPE	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPL-16S1	07/25/18	Kale	< 275	4,307 ± 578	< 39	< 32	< 32	< 589	< 123
SA-FPL-16S1	07/25/18	Cabbage	< 262	3,575 ± 662	< 47	< 25	< 28	< 598	< 90
SA-FPL-16S1	07/25/18	Collards	< 338	5,773 ± 620	< 58	< 43	< 38	< 926	< 162
SA-FPL-16S1	08/29/18	Kale	474 ± 315	11,200 ± 1008	< 57	< 41	< 36	< 623	< 142
SA-FPL-16S1	08/29/18	Cabbage	< 283	6,203 ± 665	< 56	< 31	< 30	< 722	< 116
SA-FPL-10D1	07/25/18	Kale	< 312	3,909 ± 631	< 42	< 41	< 39	< 754	< 113
SA-FPL-10D1	07/25/18	Cabbage	< 279	2,803 ± 605	< 41	< 30	< 28	< 456	< 114
SA-FPL-10D1	07/25/18	Collards	< 214	3,203 ± 767	< 39	< 31	< 34	< 535	< 149
SA-FPL-10D1	08/29/18	Kale	480 ± 229	6,352 ± 640	< 51	< 28	< 23	< 549	< 125
SA-FPL-10D1	08/29/18	Cabbage	< 273	4,634 ± 663	< 52	< 33	< 34	< 591	< 130
SA-FPL-10D1	08/29/18	Collards	< 256	6,350 ± 704	< 46	< 32	< 30	< 650	< 109
	AVERAGE OFALL LOCATIONS *		416 ± 245	5,323 ± 3627	–	–	–	–	–
ALL INDICATOR AVERAGE*			416 ± 245	5,530 ± 3,282	–	–	–	–	–

(C) CONTROL LOCATION.

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-10b **CONCENTRATIONS OF GAMMA EMITTERS IN VEGETABLES (FPV), 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	SAMPLE TYPE	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPV-2F9**	05/02/18	Asparagus	< 231	**2,298** ± 514	< 44	< 27	< 23	< 481	< 115
SA-FPV-2F9**	06/27/18	Corn	< 170	**2,848** ± 384	< 29	< 22	< 23	< 443	< 71
SA-FPV-2F9**	06/27/18	Peaches	< 166	**2,343** ± 509	< 48	< 25	< 24	< 543	< 92
SA-FPV-2F9**	07/02/18	Tomatoes	< 179	**2,034** ± 428	< 43	< 24	< 18	< 543	< 98
SA-FPV-2F9**	07/09/18	Peppers	< 149	**1,621** ± 349	< 32	< 25	< 17	< 350	< 76
SA-FPV-3F8**	07/09/18	Peaches	< 157	**2,007** ± 339	< 31	< 19	< 22	< 475	< 84
SA-FPV-15F4**	07/25/18	Corn	< 255	**3,372** ± 684	< 43	< 27	< 29	< 707	< 130
SA-FPV-15F4**	08/03/18	Peppers	< 162	**1,460** ± 329	< 53	< 20	< 18	< 352	< 80
SA-FPV-15F4**	08/10/18	Tomatoes	< 203	**1,925** ± 456	< 46	< 26	< 21	< 581	< 91
SA-FPV-1G1**	05/02/18	Asparagus	< 221	**2,543** ± 478	< 47	< 29	< 29	< 511	< 134
SA-FPV-1G1**	07/02/18	Peppers	< 178	**1,643** ± 378	< 47	< 23	< 24	< 491	< 92
SA-FPV-1G1**	07/02/18	Tomatoes	< 202	**2,834** ± 516	< 43	< 26	< 25	< 576	< 98
SA-FPV-1G1**	07/02/18	Corn	< 160	**2,744** ± 354	< 58	< 19	< 17	< 485	< 72
SA-FPV-1G1**	07/09/18	Peaches	< 158	**2,309** ± 372	< 29	< 21	< 17	< 390	< 64
SA-FPV-2G2**	05/08/18	Asparagus	< 192	**2,558** ± 389	< 38	< 24	< 21	< 573	< 97
SA-FPV-2G2**	06/25/18	Corn	< 201	**2,485** ± 453	< 44	< 29	< 25	< 610	< 105
SA-FPV-2G2**	06/25/18	Peppers	< 170	**1,880** ± 374	< 38	< 24	< 23	< 512	< 88
SA-FPV-2G2**	07/09/18	Tomatoes	< 189	**2,930** ± 493	< 38	< 23	< 23	< 401	< 93
SA-FPV-3H5**	05/02/18	Asparagus	< 210	**2,503** ± 486	< 39	< 25	< 24	< 621	< 92
SA-FPV-3H5**	06/27/18	Tomatoes	< 162	**3,028** ± 411	< 27	< 23	< 16	< 376	< 76
SA-FPV-3H5**	07/02/18	Corn	< 149	**3,208** ± 517	< 35	< 24	< 23	< 447	< 100
SA-FPV-3H5**	07/02/18	Peppers	< 208	**1,294** ± 361	< 41	< 29	< 30	< 573	< 104
AVERAGE*			–	**2,358** ± 1146	–	–	–	–	–

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

\- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

TABLE C-11 **CONCENTRATIONS OF GAMMA EMITTERS IN FODDER CROPS**, 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	SAMPLE TYPE	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-VGT-13E3**	11/26/18	Silage	**320** ± 118	**2,839** ± 390	< 19	< 18	< 16	< 355	< 72
SA-VGT-14F4**	11/26/18	Silage	**570** ± 178	**3,102** ± 346	< 20	< 19	< 17	< 395	< 66
SA-VGT-2G3**	11/26/18	Silage	**337** ± 160	**3,889** ± 454	< 22	< 15	< 17	< 357	< 72
AVERAGE*			**409** ± 280	**3,277** ± 1,093	–	–	–	–	–

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-12 CONCENTRATIONS OF GAMMA EMITTERS IN SOIL, 2018**

Soil is only sampled every 3 years.
Due again in 2019.

** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

Table C-13 **CONCENTRATIONS OF GAMMA EMITTERS IN GAME**, 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	SAMPLE TYPE	< - - - - - - - - - - - - - - GAMMA EMITTERS - - - - - - - - - - - - - - >				
			Be-7	K-40	I-131	Cs-134	Cs-137
SA-GAM-3E1	01/19/18	Muskrat	< 61	**3,488** ± 197	< 55	< 7	< 6
SA-GAM-13E3	02/09/18	Muskrat	< 114	**2,980** ± 358	< 26	< 15	< 13
SA-GAM-5C1	02/13/18	Muskrat	< 88	**3,025** ± 305	< 18	< 14	< 15
ALL INDICATOR AVERAGE*			–	**3,164** ± 562	–	–	–

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE THE AVERAGE AND THE ERROR ARE DISPLAYED.

****** MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-14 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER, 2018**

Results in Units of pCi/L ± 2σ

COLLECTION PERIOD			CONTROL	INDICATORS			
START		STOP	SA-SWA-12C1 (C)	SA-SWA-11A1	SA-SWA-7E1	SA-SWA-1F2	SA-SWA-16F1
01/18/18	-	01/26/18	< 194	< 195	< 197	< 195	< 193
02/09/18	-	02/21/18	< 192	< 191	< 194	< 193	< 193
03/06/18	-	03/19/18	< 183	< 179	< 178	< 180	< 179
04/03/18	-	04/21/18	< 186	< 194	< 186	< 187	< 188
05/07/18	-	05/24/18	< 192	< 192	< 188	< 187	< 189
06/08/18	-	06/21/18	< 198	< 198	< 197	< 198	< 196
07/05/18	-	07/19/18	< 194	**349** ± 135	< 189	< 194	< 192
08/09/18	-	08/20/18	< 187	< 191	< 188	< 188	< 186
09/06/18	-	09/20/18	< 196	**729** ± 153	< 200	< 191	< 194
10/04/18	-	10/19/18	< 197	< 194	< 197	< 196	< 194
11/08/18	-	11/19/18	< 190	< 192	< 193	< 193	< 189
12/05/18	-	12/19/18	< 187	< 186	< 185	< 183	< 184
		AVERAGE*	–	**539** ± 537	–	–	–

(C) CONTROL LOCATION.

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-15 **CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN SURFACE WATER, 2018**

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION DATE	<----------GAMMA EMITTERS---------->										
		I-131 LL	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140
SA-SWA-12C1 (C)	01/18/18	< 0.6	< 41	< 6	< 6	< 12	< 5	< 11	< 6	< 7	< 7	< 9
	02/09/18	< 0.6	< 76	< 5	< 6	< 10	< 6	< 11	< 5	< 6	< 4	< 6
	03/06/18	< 0.6	< 81	< 3	< 3	< 6	< 4	< 6	< 4	< 4	< 3	< 7
	04/03/18	< 0.8	< 51	< 6	< 4	< 9	< 5	< 8	< 6	< 6	< 6	< 8
	05/07/18	< 0.7	< 53	< 4	< 5	< 12	< 6	< 11	< 4	< 5	< 5	< 10
	06/08/18	< 0.9	< 38	< 5	< 7	< 12	< 7	< 12	< 5	< 6	< 6	< 8
	07/05/18	< 0.6	93 ± 41	< 3	< 3	< 5	< 3	< 6	< 3	< 3	< 3	< 6
	08/09/18	< 0.6	< 104	< 5	< 6	< 10	< 6	< 8	< 5	< 6	< 6	< 10
	09/06/18	< 0.7	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 2	< 5
	10/04/18	< 0.5	< 14	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 2	< 5
	11/08/18	< 0.8	< 71	< 3	< 3	< 7	< 3	< 6	< 3	< 3	< 3	< 8
	12/05/18	< 0.6	< 28	< 1	< 2	< 3	< 1	< 3	< 2	< 1	< 1	< 5
	AVERAGE*	**–**	**93 ± 0**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
SA-SWA-11A1	01/18/18	< 0.8	< 57	< 5	< 6	< 14	< 7	< 15	< 6	< 7	< 5	< 12
	02/09/18	< 0.5	< 48	< 5	< 5	< 11	< 5	< 9	< 5	< 6	< 5	< 9
	03/06/18	< 0.7	< 29	< 3	< 3	< 9	< 5	< 6	< 4	< 4	< 4	< 6
	04/03/18	< 0.9	< 117	< 3	< 5	< 9	< 5	< 10	< 5	< 5	< 6	< 4
	05/07/18	< 0.6	< 27	< 3	< 3	< 7	< 4	< 8	< 4	< 3	< 4	< 7
	06/08/18	< 0.5	< 59	< 5	< 7	< 13	< 5	< 11	< 6	< 6	< 6	< 10
	07/05/18	< 0.6	72 ± 34	< 2	< 2	< 6	< 3	< 5	< 3	< 3	< 3	< 4
	08/09/18	< 0.7	< 44	< 5	< 5	< 11	< 6	< 10	< 5	< 5	< 5	< 9
	09/06/18	< 0.6	57 ± 27	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 2	< 6
	10/04/18	< 0.5	< 30	< 3	< 3	< 7	< 3	< 7	< 4	< 3	< 3	< 7
	11/08/18	< 0.6	< 71	< 3	< 3	< 5	< 3	< 5	< 3	< 3	< 3	< 8
	12/05/18	< 0.9	< 16	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 1	< 6
	AVERAGE*	**–**	**64 ± 22**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**

Table C-15 (Cont.)

CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN SURFACE WATER, 2018

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION DATE	<----------GAMMA EMITTERS---------->										
		I-131 LL	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140
SA-SWA-07E1	01/18/18	< 0.7	< 68	< 6	< 6	< 13	< 6	< 15	< 5	< 7	< 7	< 10
	02/09/18	< 0.5	< 45	< 4	< 4	< 9	< 4	< 8	< 4	< 4	< 4	< 8
	03/06/18	< 0.9	111 ± 42	< 3	< 4	< 9	< 4	< 7	< 4	< 4	< 4	< 7
	04/03/18	< 0.7	< 42	< 6	< 6	< 12	< 5	< 10	< 6	< 7	< 7	< 7
	05/07/18	< 0.5	< 35	< 4	< 4	< 9	< 5	< 6	< 4	< 4	< 4	< 8
	06/08/18	< 0.7	101 ± 41	< 2	< 3	< 6	< 3	< 6	< 3	< 3	< 3	< 5
	07/05/18	< 0.7	67 ± 43	< 3	< 3	< 6	< 3	< 6	< 3	< 3	< 3	< 6
	08/09/18	< 0.8	< 48	< 2	< 2	< 5	< 2	< 4	< 3	< 3	< 2	< 5
	09/06/18	< 0.8	< 16	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 6
	10/04/18	< 0.8	< 24	< 3	< 3	< 6	< 3	< 6	< 3	< 3	< 3	< 6
	11/08/18	< 0.7	< 32	< 3	< 3	< 7	< 4	< 6	< 3	< 3	< 2	< 7
	12/05/18	< 0.6	47 ± 28	< 1	< 2	< 4	< 1	< 3	< 2	< 2	< 2	< 5
	AVERAGE*	–	**81 ± 59**	–	–	–	–	–	–	–	–	–
SA-SWA-01F2	01/26/18	< 0.5	< 113	< 5	< 4	< 14	< 5	< 7	< 6	< 6	< 7	< 10
	02/09/18	< 0.9	< 43	< 6	< 5	< 12	< 6	< 10	< 6	< 7	< 6	< 11
	03/06/18	< 0.6	< 62	< 3	< 4	< 8	< 4	< 6	< 4	< 3	< 3	< 6
	04/03/18	< 0.8	< 52	< 6	< 5	< 12	< 6	< 9	< 5	< 8	< 5	< 7
	05/07/18	< 0.8	< 38	< 4	< 4	< 8	< 4	< 8	< 4	< 4	< 4	< 8
	06/09/18	< 0.7	< 62	< 7	< 6	< 12	< 7	< 12	< 7	< 6	< 7	< 8
	07/05/18	< 0.7	65 ± 32	< 2	< 3	< 5	< 2	< 5	< 2	< 2	< 3	< 4
	08/09/18	< 0.5	< 22	< 2	< 3	< 5	< 2	< 5	< 3	< 3	< 2	< 5
	09/06/18	< 0.5	< 19	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 6
	10/04/18	< 0.5	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	11/08/18	< 0.8	< 29	< 3	< 3	< 4	< 4	< 5	< 3	< 2	< 3	< 10
	12/05/18	< 0.5	< 11	< 1	< 1	< 4	< 1	< 3	< 2	< 2	< 1	< 5
	AVERAGE*	–	**65 ± 0**	–	–	–	–	–	–	–	–	–

Table C-15 (Cont.)

CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN SURFACE WATER, 2018

Results in Units of pCi/L ± 2σ

STATION ID	COLLECTION DATE	<----------GAMMA EMITTERS---------->										
		I-131 LL	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140
SA-SWA-16F1	01/18/18	< 0.6	< 69	< 5	< 6	< 11	< 5	< 14	< 6	< 6	< 7	< 7
	02/09/18	< 0.6	< 69	< 4	< 4	< 8	< 4	< 8	< 4	< 4	< 3	< 8
	03/06/18	< 0.8	< 32	< 3	< 3	< 7	< 3	< 8	< 3	< 4	< 3	< 6
	04/03/18	< 0.8	< 55	< 5	< 4	< 12	< 6	< 10	< 6	< 5	< 4	< 6
	05/07/18	< 0.5	< 78	< 4	< 4	< 7	< 4	< 9	< 4	< 5	< 4	< 9
	06/09/18	< 0.6	< 62	< 5	< 6	< 14	< 6	< 13	< 7	< 6	< 6	< 10
	07/05/18	< 0.6	< 30	< 3	< 3	< 6	< 3	< 5	< 2	< 2	< 2	< 5
	08/09/18	< 0.8	< 27	< 2	< 3	< 6	< 3	< 6	< 3	< 3	< 3	< 5
	09/06/18	< 0.5	**39** ± 24	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 4
	10/04/18	< 0.5	< 31	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 5
	11/08/18	< 0.9	< 66	< 3	< 2	< 6	< 3	< 7	< 3	< 2	< 2	< 6
	12/05/18	< 0.7	< 28	< 1	< 2	< 4	< 2	< 3	< 2	< 2	< 1	< 5
	AVERAGE*	–	**39** ± 0	–	–	–	–	–	–	–	–	–
ALL INDICATOR AVERAGE		–	**70 ± 50**	–	–	–	–	–	–	–	–	–

(C) CONTROL LOCATION.

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-16 **CONCENTRATIONS OF GAMMA EMITTERS IN EDIBLE FISH, 2018**

Results in Units of pCi/L ± 2σ

		<----------GAMMA EMITTERS---------->								
STATION ID	**Collection Date**	**K-40**	**Mn-54**	**Co-58**	**Fe-59**	**Co-60**	**Zn-65**	**Cs-134**	**Cs-137**	**Ra-226**
SA-ESF-12C1 (C)	05/09/18	**2,645** ± 735	< 40	< 53	< 96	< 21	< **80**	< 44	< 46	< 950
	05/09/18	**4,122** ± 902	< 44	< 52	< 126	< 50	< **86**	< 55	< 44	< 1127
	10/31/18	**3,764** ± 713	< 44	< 50	< 141	< 46	< **118**	< 50	< 48	< 886
	10/31/18	**4,254** ± 931	< 46	< 70	< 137	< 48	< 113	< 63	< 46	< 1208
	AVERAGE*	**3,696** ± 1,462	–	–	–	–	–	–	–	–
SA-ESF-11A1	05/09/18	**3,174** ± 925	< 48	< 57	< 152	< 58	< 115	< 63	< 46	< 947
	05/09/18	**3,453** ± 1,002	< 65	< 68	< 87	< 66	< 99	< 71	< 55	< 1145
	10/31/18	**3,314** ± 916	< 77	< 67	< 162	< 81	< 137	< 71	< 59	< 1322
	AVERAGE*	**3,314** ± 279	–	–	–	–	–	–	–	–
SA-ESF-07E1	05/11/18	**3,132** ± 927	< 47	< 62	< 116	< 65	< 105	< 58	< 49	< 984
	11/08/18	**3,434** ± 988	< 51	< 47	< 140	< 45	< 113	< 57	< 54	< 1076
	AVERAGE*	**3,283** ± 427	–	–	–	–	–	–	–	–
ALL INDICATOR AVERAGE*		**3,301** ± 293	–	–	–	–	–	–	–	–

(C) CONTROL LOCATION.

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-17 **CONCENTRATIONS OF GAMMA EMITTERS IN CRABS, 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	COLLECTION DATE	<----------GAMMA EMITTERS---------->								
		K-40	**Mn-54**	**Co-58**	**Fe-59**	**Co-60**	**Zn-65**	**Cs-134**	**Cs-137**	**Ra-226**
SA-ECH-12C1 (C)	07/26/18	**2,909** ± 730	< 42	< 32	< 92	< 46	< 79	< 32	< 44	< 831
	08/20/18	**2,785** ± 857	< 57	< 61	< 132	< 65	< 112	< 55	< 48	< 1,209
	AVERAGE*	**2,847** ± 175	–	–	–	–	–	–	–	–
SA-ECH-11A1	07/26/18	**2,066** ± 796	< 48	< 55	< 116	< 60	< 92	< 60	< 53	< 1,117
	08/20/18	**3,084** ± 952	< 39	< 54	< 109	< 45	< 113	< 54	< 57	< 947
	AVERAGE*	**2,575** ± 1,440	–	–	–	–	–	–	–	–

(C) CONTROL LOCATION.

***** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-18 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT, 2018

Results in Units of pCi/kg (dry) ± 2σ

STATION ID	Collection Date	<----------GAMMA EMITTERS----------> Be-7	K-40	Cs-134	Cs-137	Ra-226	Th-232
SA-ESS-12C1 (C)	06/29/18	< 800	**14,100** ± 1,879	< 97	< 109	< 1,952	**1069** ± 267
	12/05/18	< 506	**13,110** ± 1,194	< 74	< 55	< 1,323	**929** ± 177
	AVERAGE*	–	**13,605** ± 1,400	–	–	–	**999** ± 198
SA-ESS-06A1	07/02/18	< 595	**7,767** ± 1,360	< 94	< 80	< 1,222	< 397
	12/10/18	< 694	**5,828** ± 1,113	< 79	< 78	< 2,085	< 366
	AVERAGE*	–	**6,798** ± 2,742	–	–	–	-
SA-ESS-11A1	06/29/18	< 425	**2,878** ± 769	< 49	< 49	< 1,022	**202** ± 93
	12/05/18	< 453	**2,378** ± 561	< 46	< 39	< 1,164	< 230
	AVERAGE*	–	**2,628** ± 707	–	–	–	**202** ± 0
SA-ESS-15A1	06/29/18	< 548	**7,777** ± 1,226	< 82	< 70	< 1,418	**435** ± 141
	12/05/18	< 457	**4,431** ± 990	< 69	< 58	< 1,198	< 344
	AVERAGE*	–	**6,104** ± 4,732	–	–	–	**435** ± 0
SA-ESS-16A1	06/29/18	< 465	**5,453** ± 918	< 75	< 55	**2,273** ± 1,221	**883** ± 170
	12/05/18	< 548	**1,963** ± 1,076	< 78	< 61	**2,734** ± 1563	**1208** ± 187
	AVERAGE*	–	**3,708** ± 4,936	–	–	**2,504** ± 652	**1046** ± 460
SA-ESS-07E1	06/29/18	< 757	**12,750** ± 1,731	< 102	< 83	< 1,606	**1120** ± 229
	12/05/18	**993** ± 469	**12,800** ± 1,924	< 105	< 77	< 1,436	**683** ± 165
	AVERAGE*	**993** ± 0	**12,775** ± 71	–	–	–	**901** ± 619
SA-ESS-16F1	06/29/18	< 621	**17,420** ± 2,078	< 100	< 94	**2,273** ± 1338	**1122** ± 234
	12/05/18	< 668	**8,689** ± 1,839	< 113	< 93	< 1,524	< 484
	AVERAGE*	–	**13,055** ± 12,347	–	–	**2,273** ± 0	**1122** ± 0
ALL INDICATOR AVERAGE*		**993** ± 0	**7,511** ± 9,540	–	–	**2,427** ± 532	**808** ± 767

(C) CONTROL LOCATION.

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES. IF THERE IS ONLY 1 POSITIVE VALUE, THE AVERAGE AND THE ERROR ARE DISPLAYED.

\- INDICATES AVERAGE WAS NOT CALCULATED DUE TO NO POSITIVE VALUES FOR THE REPORTING PERIOD.

Table C-19 **CONCENTRATIONS OF GAMMA EMITTERS IN OYSTERS**, 2018**

Results in Units of pCi/kg (wet) ± 2σ

STATION ID	Collection Date	<----------GAMMA EMITTERS---------->								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
SA-EOY-07H1 (C)	06/18/18	**1,703** ± 738	< 59	< 59	< 127	< 64	<95	<60	< 57	<1,229
	10/19/18	< 604	< 74	< 67	< 123	< 100	<131	<57	< 64	<1,419
	AVERAGE*	**1,703** ± 0	–	–	–	–	–	–	–	–
SA-EOY-07C1	06/18/18	**764** ± 431	< 42	< 39	< 80	< 42	<61	< 40	< 33	<549
	10/19/18	**1,688** ± 925	< 83	< 87	< 221	< 74	< 242	< 91	< 93	< 1,826
	AVERAGE*	**1,226** ± 1,307	–	–	–	–	–	–	–	–

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Weekly Air Iodine Cartridge							
SA-AIO-05S2(440980002) - Air Cartridge	2-Jan-18	Iodine-131	< MDC	6.14E-03pCi/m^3	2.06E-02pCi/m^3	9.96E-03	U
SA-AIO-05S2(441336002) - Air Cartridge	8-Jan-18	Iodine-131	< MDC	-2.09E-03pCi/m^3	1.27E-02pCi/m^3	8.27E-03	U
SA-AIO-05S2(441743002) - Air Cartridge	15-Jan-18	Iodine-131	< MDC	-1.96E-03pCi/m^3	1.00E-02pCi/m^3	6.56E-03	U
SA-AIO-05S2(442293002) - Air Cartridge	22-Jan-18	Iodine-131	< MDC	2.93E-03pCi/m^3	9.49E-03pCi/m^3	4.82E-03	U
SA-AIO-05S2(442739002) - Air Cartridge	29-Jan-18	Iodine-131	< MDC	-4.92E-04pCi/m^3	9.07E-03pCi/m^3	5.47E-03	U
SA-AIO-05S2(443340002) - Air Cartridge	6-Feb-18	Iodine-131	< MDC	4.69E-04pCi/m^3	6.28E-03pCi/m^3	3.60E-03	U
SA-AIO-05S2(443780002) - Air Cartridge	12-Feb-18	Iodine-131	< MDC	-8.21E-04pCi/m^3	6.44E-03pCi/m^3	3.89E-03	U
SA-AIO-05S2(444477002) - Air Cartridge	20-Feb-18	Iodine-131	< MDC	4.92E-03pCi/m^3	8.34E-03pCi/m^3	3.66E-03	U
SA-AIO-05S2(444799002) - Air Cartridge	26-Feb-18	Iodine-131	< MDC	-2.46E-03pCi/m^3	7.55E-03pCi/m^3	4.84E-03	U
SA-AIO-05S2(445312002) - Air Cartridge	5-Mar-18	Iodine-131	< MDC	-1.92E-03pCi/m^3	6.22E-03pCi/m^3	3.98E-03	U
SA-AIO-05S2(445838002) - Air Cartridge	12-Mar-18	Iodine-131	**5.81E-03pCi/m^3**	5.81E-03pCi/m^3	5.81E-03pCi/m^3	9.94E-03	
SA-AIO-05S2(446360002) - Air Cartridge	19-Mar-18	Iodine-131	< MDC	-3.14E-04pCi/m^3	9.89E-03pCi/m^3	5.82E-03	U
SA-AIO-05S2(446840002) - Air Cartridge	26-Mar-18	Iodine-131	< MDC	-3.12E-03pCi/m^3	8.09E-03pCi/m^3	5.74E-03	U
SA-AIO-05S2(447240002) - Air Cartridge	2-Apr-18	Iodine-131	< MDC	2.37E-03pCi/m^3	6.36E-03pCi/m^3	3.30E-03	U
SA-AIO-05S2(447811002) - Air Cartridge	9-Apr-18	Iodine-131	< MDC	-2.59E-03pCi/m^3	5.29E-03pCi/m^3	3.57E-03	U
SA-AIO-05S2(448265002) - Air Cartridge	16-Apr-18	Iodine-131	< MDC	1.79E-03pCi/m^3	7.66E-03pCi/m^3	4.27E-03	U
SA-AIO-05S2(448767002) - Air Cartridge	23-Apr-18	Iodine-131	< MDC	2.43E-03pCi/m^3	9.91E-03pCi/m^3	5.22E-03	U
SA-AIO-05S2(449206002) - Air Cartridge	30-Apr-18	Iodine-131	< MDC	-4.73E-04pCi/m^3	7.83E-03pCi/m^3	4.68E-03	U
SA-AIO-05S2(449863002) - Air Cartridge	8-May-18	Iodine-131	< MDC	1.48E-03pCi/m^3	5.45E-03pCi/m^3	2.95E-03	U
SA-AIO-05S2(450233002) - Air Cartridge	14-May-18	Iodine-131	< MDC	9.84E-06pCi/m^3	9.69E-03pCi/m^3	5.75E-03	U
SA-AIO-05S2(450973002) - Air Cartridge	21-May-18	Iodine-131	< MDC	3.49E-03pCi/m^3	1.04E-02pCi/m^3	5.42E-03	U
SA-AIO-05S2(451473002) - Air Cartridge	29-May-18	Iodine-131	< MDC	-1.92E-03pCi/m^3	5.78E-03pCi/m^3	4.05E-03	U
SA-AIO-05S2(451846002) - Air Cartridge	4-Jun-18	Iodine-131	< MDC	-4.86E-03pCi/m^3	1.13E-02pCi/m^3	8.08E-03	U
SA-AIO-05S2(452410002) - Air Cartridge	11-Jun-18	Iodine-131	< MDC	5.08E-04pCi/m^3	7.88E-03pCi/m^3	4.33E-03	U
SA-AIO-05S2(452900002) - Air Cartridge	18-Jun-18	Iodine-131	< MDC	1.23E-03pCi/m^3	8.00E-03pCi/m^3	4.15E-03	U
SA-AIO-05S2(453422002) - Air Cartridge	25-Jun-18	Iodine-131	< MDC	1.31E-03pCi/m^3	8.44E-03pCi/m^3	4.80E-03	U
SA-AIO-05S2(454067002) - Air Cartridge	2-Jul-18	Iodine-131	< MDC	1.14E-03pCi/m^3	9.23E-03pCi/m^3	5.21E-03	U
SA-AIO-05S2(454276002) - Air Cartridge	9-Jul-18	Iodine-131	< MDC	1.80E-05pCi/m^3	8.61E-03pCi/m^3	5.11E-03	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Weekly Air Iodine Cartridge (Cont.)							
SA-AIO-05S2(454956002) - Air Cartridge	17-Jul-18	Iodine-131	< MDC	-1.94E-03pCi/m^3	9.42E-03pCi/m^3	5.99E-03	U
SA-AIO-05S2(455621002) - Air Cartridge	25-Jul-18	Iodine-131	< MDC	-1.43E-03pCi/m^3	8.15E-03pCi/m^3	5.19E-03	U
SA-AIO-05S2(456260002) - Air Cartridge	31-Jul-18	Iodine-131	< MDC	-6.30E-03pCi/m^3	8.14E-03pCi/m^3	7.19E-03	U
SA-AIO-05S2(456712002) - Air Cartridge	6-Aug-18	Iodine-131	< MDC	-3.25E-03pCi/m^3	9.98E-03pCi/m^3	7.38E-03	U
SA-AIO-05S2(457360002) - Air Cartridge	13-Aug-18	Iodine-131	< MDC	-4.24E-03pCi/m^3	9.33E-03pCi/m^3	7.60E-03	U
SA-AIO-05S2(457908002) - Air Cartridge	20-Aug-18	Iodine-131	< MDC	-1.84E-03pCi/m^3	1.20E-02pCi/m^3	7.99E-03	U
SA-AIO-05S2(458333002) - Air Cartridge	27-Aug-18	Iodine-131	< MDC	4.85E-03pCi/m^3	1.69E-02pCi/m^3	8.50E-03	U
SA-AIO-05S2(458844002) - Air Cartridge	4-Sep-18	Iodine-131	< MDC	2.34E-03pCi/m^3	6.71E-03pCi/m^3	3.46E-03	U
SA-AIO-05S2(459301002) - Air Cartridge	10-Sep-18	Iodine-131	< MDC	-8.62E-03pCi/m^3	1.92E-02pCi/m^3	1.50E-02	U
SA-AIO-05S2(459569002) - Air Cartridge	17-Sep-18	Iodine-131	< MDC	-1.62E-03pCi/m^3	1.12E-02pCi/m^3	7.24E-03	U
SA-AIO-05S2(460193002) - Air Cartridge	24-Sep-18	Iodine-131	< MDC	6.97E-03pCi/m^3	2.23E-02pCi/m^3	1.18E-02	U
SA-AIO-05S2(460880002) - Air Cartridge	2-Oct-18	Iodine-131	< MDC	4.31E-04pCi/m^3	1.40E-02pCi/m^3	8.01E-03	U
SA-AIO-05S2(461327002) - Air Cartridge	8-Oct-18	Iodine-131	< MDC	3.73E-03pCi/m^3	1.56E-02pCi/m^3	7.55E-03	U
SA-AIO-05S2(461916002) - Air Cartridge	15-Oct-18	Iodine-131	< MDC	3.57E-03pCi/m^3	1.44E-02pCi/m^3	7.14E-03	U
SA-AIO-05S2(462475002) - Air Cartridge	22-Oct-18	Iodine-131	< MDC	-8.60E-03pCi/m^3	9.58E-03pCi/m^3	8.97E-03	U
SA-AIO-05S2(463047002) - Air Cartridge	29-Oct-18	Iodine-131	< MDC	-8.48E-04pCi/m^3	5.51E-03pCi/m^3	3.63E-03	U
SA-AIO-05S2(463837002) - Air Cartridge	5-Nov-18	Iodine-131	< MDC	3.09E-03pCi/m^3	1.31E-02pCi/m^3	6.48E-03	U
SA-AIO-05S2(464535002) - Air Cartridge	13-Nov-18	Iodine-131	< MDC	4.26E-03pCi/m^3	1.71E-02pCi/m^3	8.81E-03	U
SA-AIO-05S2(465222002) - Air Cartridge	19-Nov-18	Iodine-131	< MDC	2.13E-03pCi/m^3	1.76E-02pCi/m^3	9.59E-03	U
SA-AIO-05S2(465644002) - Air Cartridge	26-Nov-18	Iodine-131	< MDC	1.66E-04pCi/m^3	7.96E-03pCi/m^3	4.56E-03	U
SA-AIO-05S2(466126002) - Air Cartridge	3-Dec-18	Iodine-131	< MDC	-5.07E-03pCi/m^3	1.75E-02pCi/m^3	1.13E-02	U
SA-AIO-05S2(466752002) - Air Cartridge	10-Dec-18	Iodine-131	< MDC	4.51E-03pCi/m^3	2.02E-02pCi/m^3	1.10E-02	U
SA-AIO-05S2(467416002) - Air Cartridge	18-Dec-18	Iodine-131	< MDC	3.61E-03pCi/m^3	1.35E-02pCi/m^3	7.56E-03	U
SA-AIO-05S2(467773002) - Air Cartridge	26-Dec-18	Iodine-131	< MDC	-3.31E-03pCi/m^3	1.12E-02pCi/m^3	7.75E-03	U
Weekly Air Particulate Filter							
SA-APT-05S2(440980001) - Air Particulate	2-Jan-18	BETA	**2.73E-02pCi/m^3**	2.73E-02pCi/m^3	1.69E-03pCi/m^3	3.63E-03	
SA-APT-05S2(441336001) - Air Particulate	8-Jan-18	BETA	**2.51E-02pCi/m^3**	2.51E-02pCi/m^3	2.01E-03pCi/m^3	3.85E-03	
SA-APT-05S2(441743001) - Air Particulate	15-Jan-18	BETA	**2.00E-02pCi/m^3**	2.00E-02pCi/m^3	1.63E-03pCi/m^3	3.18E-03	

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Weekly Air Particulate Filter (Cont.)							
SA-APT-05S2(442293001) - Air Particulate	22-Jan-18	BETA	**3.20E-02pCi/m^3**	3.20E-02pCi/m^3	1.62E-03pCi/m^3	3.98E-03	
SA-APT-05S2(442739001) - Air Particulate	29-Jan-18	BETA	**1.46E-02pCi/m^3**	1.46E-02pCi/m^3	1.64E-03pCi/m^3	2.77E-03	
SA-APT-05S2(443340001) - Air Particulate	6-Feb-18	BETA	**1.87E-02pCi/m^3**	1.87E-02pCi/m^3	1.38E-03pCi/m^3	2.86E-03	
SA-APT-05S2(443780001) - Air Particulate	12-Feb-18	BETA	**1.60E-02pCi/m^3**	1.60E-02pCi/m^3	1.84E-03pCi/m^3	3.13E-03	
SA-APT-05S2(444477001) - Air Particulate	20-Feb-18	BETA	**2.74E-02pCi/m^3**	2.74E-02pCi/m^3	1.45E-03pCi/m^3	3.06E-03	
SA-APT-05S2(444799001) - Air Particulate	26-Feb-18	BETA	**1.33E-02pCi/m^3**	1.33E-02pCi/m^3	2.43E-03pCi/m^3	2.73E-03	
SA-APT-05S2(445312001) - Air Particulate	5-Mar-18	BETA	**2.76E-02pCi/m^3**	2.76E-02pCi/m^3	2.04E-03pCi/m^3	3.30E-03	
SA-APT-05S2(445838001) - Air Particulate	12-Mar-18	BETA	**1.73E-02pCi/m^3**	1.73E-02pCi/m^3	1.80E-03pCi/m^3	2.67E-03	
SA-APT-05S2(446360001) - Air Particulate	19-Mar-18	BETA	**2.56E-02pCi/m^3**	2.56E-02pCi/m^3	1.64E-03pCi/m^3	3.54E-03	
SA-APT-05S2(446840001) - Air Particulate	26-Mar-18	BETA	**1.50E-02pCi/m^3**	1.50E-02pCi/m^3	1.64E-03pCi/m^3	2.78E-03	
SA-APT-05S2(447240001) - Air Particulate	2-Apr-18	BETA	**1.88E-02pCi/m^3**	1.88E-02pCi/m^3	2.69E-03pCi/m^3	3.24E-03	
SA-APT-05S2(447811001) - Air Particulate	9-Apr-18	BETA	**2.25E-02pCi/m^3**	2.25E-02pCi/m^3	1.68E-03pCi/m^3	3.37E-03	
SA-APT-05S2(448265001) - Air Particulate	16-Apr-18	BETA	**2.47E-02pCi/m^3**	2.47E-02pCi/m^3	2.28E-03pCi/m^3	3.56E-03	
SA-APT-05S2(448767001) - Air Particulate	23-Apr-18	BETA	**2.02E-02pCi/m^3**	2.02E-02pCi/m^3	2.04E-03pCi/m^3	3.06E-03	
SA-APT-05S2(449206001) - Air Particulate	30-Apr-18	BETA	**1.92E-02pCi/m^3**	1.92E-02pCi/m^3	2.25E-03pCi/m^3	3.24E-03	
SA-APT-05S2(449863001) - Air Particulate	8-May-18	BETA	**3.39E-02pCi/m^3**	3.39E-02pCi/m^3	1.90E-03pCi/m^3	3.71E-03	
SA-APT-05S2(450233001) - Air Particulate	14-May-18	BETA	**2.38E-02pCi/m^3**	2.38E-02pCi/m^3	2.38E-03pCi/m^3	3.64E-03	
SA-APT-05S2(450973001) - Air Particulate	21-May-18	BETA	**1.39E-02pCi/m^3**	1.39E-02pCi/m^3	2.00E-03pCi/m^3	2.64E-03	
SA-APT-05S2(451473001) - Air Particulate	29-May-18	BETA	**1.05E-02pCi/m^3**	1.05E-02pCi/m^3	1.88E-03pCi/m^3	2.27E-03	
SA-APT-05S2(451846001) - Air Particulate	4-Jun-18	BETA	**1.22E-02pCi/m^3**	1.22E-02pCi/m^3	2.42E-03pCi/m^3	2.86E-03	
SA-APT-05S2(452410001) - Air Particulate	11-Jun-18	BETA	**1.47E-02pCi/m^3**	1.47E-02pCi/m^3	1.98E-03pCi/m^3	2.69E-03	
SA-APT-05S2(452900001) - Air Particulate	18-Jun-18	BETA	**1.98E-02pCi/m^3**	1.98E-02pCi/m^3	2.08E-03pCi/m^3	3.11E-03	
SA-APT-05S2(453422001) - Air Particulate	25-Jun-18	BETA	**2.33E-02pCi/m^3**	2.33E-02pCi/m^3	2.12E-03pCi/m^3	3.42E-03	
SA-APT-05S2(454067001) - Air Particulate	2-Jul-18	BETA	**2.64E-02pCi/m^3**	2.64E-02pCi/m^3	2.12E-03pCi/m^3	3.70E-03	
SA-APT-05S2(454276001) - Air Particulate	9-Jul-18	BETA	**2.44E-02pCi/m^3**	2.44E-02pCi/m^3	1.99E-03pCi/m^3	3.44E-03	
SA-APT-05S2(454956001) - Air Particulate	17-Jul-18	BETA	**2.48E-02pCi/m^3**	2.48E-02pCi/m^3	1.72E-03pCi/m^3	3.16E-03	
SA-APT-05S2(455621001) - Air Particulate	25-Jul-18	BETA	**1.56E-02pCi/m^3**	1.56E-02pCi/m^3	2.14E-03pCi/m^3	2.90E-03	
SA-APT-05S2(456260001) - Air Particulate	31-Jul-18	BETA	**2.33E-02pCi/m^3**	2.33E-02pCi/m^3	2.91E-03pCi/m^3	4.09E-03	

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Weekly Air Particulate Filter (Cont.)							
SA-APT-05S2(456712001) - Air Particulate	6-Aug-18	BETA	**1.97E-02pCi/m^3**	1.97E-02pCi/m^3	2.34E-03pCi/m^3	3.40E-03	
SA-APT-05S2(457360001) - Air Particulate	13-Aug-18	BETA	**3.12E-02pCi/m^3**	3.12E-02pCi/m^3	2.06E-03pCi/m^3	3.89E-03	
SA-APT-05S2(457908001) - Air Particulate	20-Aug-18	BETA	**3.58E-02pCi/m^3**	3.58E-02pCi/m^3	2.53E-03pCi/m^3	4.53E-03	
SA-APT-05S2(458333001) - Air Particulate	27-Aug-18	BETA	**2.13E-02pCi/m^3**	2.13E-02pCi/m^3	2.10E-03pCi/m^3	3.28E-03	
SA-APT-05S2(458844001) - Air Particulate	4-Sep-18	BETA	**3.23E-02pCi/m^3**	3.23E-02pCi/m^3	1.76E-03pCi/m^3	3.56E-03	
SA-APT-05S2(459301001) - Air Particulate	10-Sep-18	BETA	**2.63E-02pCi/m^3**	2.63E-02pCi/m^3	2.55E-03pCi/m^3	3.94E-03	
SA-APT-05S2(459569001) - Air Particulate	17-Sep-18	BETA	**1.35E-02pCi/m^3**	1.35E-02pCi/m^3	1.87E-03pCi/m^3	2.47E-03	
SA-APT-05S2(460193001) - Air Particulate	24-Sep-18	BETA	**2.23E-02pCi/m^3**	2.23E-02pCi/m^3	2.04E-03pCi/m^3	3.25E-03	
SA-APT-05S2(460880001) - Air Particulate	2-Oct-18	BETA	**2.78E-02pCi/m^3**	2.78E-02pCi/m^3	1.72E-03pCi/m^3	3.23E-03	
SA-APT-05S2(461327001) - Air Particulate	8-Oct-18	BETA	**3.50E-02pCi/m^3**	3.50E-02pCi/m^3	3.07E-03pCi/m^3	4.90E-03	
SA-APT-05S2(461916001) - Air Particulate	15-Oct-18	BETA	**2.27E-02pCi/m^3**	2.27E-02pCi/m^3	2.57E-03pCi/m^3	3.67E-03	
SA-APT-05S2(462475001) - Air Particulate	22-Oct-18	BETA	**3.08E-02pCi/m^3**	3.08E-02pCi/m^3	2.54E-03pCi/m^3	4.17E-03	
SA-APT-05S2(463047001) - Air Particulate	29-Oct-18	BETA	**1.66E-02pCi/m^3**	1.66E-02pCi/m^3	2.27E-03pCi/m^3	3.05E-03	
SA-APT-05S2(463837001) - Air Particulate	5-Nov-18	BETA	**2.30E-02pCi/m^3**	2.30E-02pCi/m^3	2.08E-03pCi/m^3	3.27E-03	
SA-APT-05S2(464535001) - Air Particulate	13-Nov-18	BETA	**2.00E-02pCi/m^3**	2.00E-02pCi/m^3	1.96E-03pCi/m^3	3.01E-03	
SA-APT-05S2(465222001) - Air Particulate	19-Nov-18	BETA	**2.18E-02pCi/m^3**	2.18E-02pCi/m^3	2.37E-03pCi/m^3	3.50E-03	
SA-APT-05S2(465644001) - Air Particulate	26-Nov-18	BETA	**2.85E-02pCi/m^3**	2.85E-02pCi/m^3	2.19E-03pCi/m^3	3.68E-03	
SA-APT-05S2(466126001) - Air Particulate	3-Dec-18	BETA	**2.09E-02pCi/m^3**	2.09E-02pCi/m^3	2.48E-03pCi/m^3	3.46E-03	
SA-APT-05S2(466752001) - Air Particulate	10-Dec-18	BETA	**2.18E-02pCi/m^3**	2.18E-02pCi/m^3	2.10E-03pCi/m^3	3.19E-03	
SA-APT-05S2(467416001) - Air Particulate	18-Dec-18	BETA	**3.16E-02pCi/m^3**	3.16E-02pCi/m^3	2.13E-03pCi/m^3	3.75E-03	
SA-APT-05S2(467773001) - Air Particulate	26-Dec-18	BETA	**2.30E-02pCi/m^3**	2.30E-02pCi/m^3	1.79E-03pCi/m^3	3.04E-03	
Quarterly Air Particulate Filter							
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Barium-140	< MDC	5.77E-03pCi/m^3	1.18E-02pCi/m^3	8.79E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Beryllium-7	**6.41E-02pCi/m^3**	6.41E-02pCi/m^3	5.14E-03pCi/m^3	1.19E-02	
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cerium-141	< MDC	-2.72E-04pCi/m^3	9.52E-04pCi/m^3	5.77E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cerium-144	< MDC	-7.47E-04pCi/m^3	2.43E-03pCi/m^3	1.64E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cesium-134	< MDC	7.45E-05pCi/m^3	6.10E-04pCi/m^3	3.81E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cesium-137	< MDC	7.45E-05pCi/m^3	5.20E-04pCi/m^3	2.85E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Chromium-51	**6.89E-03pCi/m^3**	6.89E-03pCi/m^3	6.89E-03pCi/m^3	8.34E-03	

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Quarterly Air Particulate Filter (Cont.)							
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cobalt-58	< MDC	-1.17E-04pCi/m^3	7.69E-04pCi/m^3	4.72E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Cobalt-60	< MDC	-1.57E-04pCi/m^3	4.77E-04pCi/m^3	3.50E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Iodine-131	< MDC	6.93E-04pCi/m^3	7.28E-03pCi/m^3	4.25E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Iron-59	< MDC	-5.60E-06pCi/m^3	1.53E-03pCi/m^3	9.13E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Lanthanum-140	< MDC	6.89E-04pCi/m^3	4.40E-03pCi/m^3	2.45E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Manganese-54	< MDC	-8.46E-05pCi/m^3	6.01E-04pCi/m^3	3.69E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Niobium-95	< MDC	2.85E-04pCi/m^3	7.81E-04pCi/m^3	4.33E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Potassium-40	< MDC	3.70E-03pCi/m^3	7.62E-03pCi/m^3	5.65E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Ruthenium-103	< MDC	2.56E-04pCi/m^3	8.13E-04pCi/m^3	4.44E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Ruthenium-106	< MDC	3.42E-04pCi/m^3	3.98E-03pCi/m^3	2.37E-03	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Zinc-65	< MDC	-2.61E-04pCi/m^3	8.47E-04pCi/m^3	6.06E-04	U
SA-APT-05S2(448782001) - Air Particulate	26-Mar-18	Zirconium-95	< MDC	-4.50E-04pCi/m^3	1.07E-03pCi/m^3	8.48E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Barium-140	< MDC	-5.48E-04pCi/m^3	1.80E-03pCi/m^3	1.19E-03	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Beryllium-7	**6.72E-02pCi/m^3**	6.72E-02pCi/m^3	2.48E-03pCi/m^3	6.20E-03	
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cerium-141	< MDC	5.23E-06pCi/m^3	4.07E-04pCi/m^3	2.33E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cerium-144	< MDC	-1.37E-04pCi/m^3	1.16E-03pCi/m^3	6.74E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cesium-134	< MDC	1.61E-04pCi/m^3	3.53E-04pCi/m^3	1.85E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cesium-137	< MDC	1.24E-06pCi/m^3	2.24E-04pCi/m^3	1.37E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Chromium-51	< MDC	-1.27E-03pCi/m^3	2.37E-03pCi/m^3	1.56E-03	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cobalt-58	< MDC	1.58E-04pCi/m^3	2.30E-04pCi/m^3	1.86E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Cobalt-60	< MDC	1.17E-04pCi/m^3	3.57E-04pCi/m^3	1.82E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Iodine-131	< MDC	-1.29E-06pCi/m^3	9.22E-04pCi/m^3	5.47E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Iron-59	< MDC	7.47E-05pCi/m^3	7.30E-04pCi/m^3	4.12E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Lanthanum-140	< MDC	-2.21E-05pCi/m^3	9.47E-04pCi/m^3	5.75E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Manganese-54	< MDC	2.28E-05pCi/m^3	3.35E-04pCi/m^3	1.90E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Niobium-95	< MDC	-1.44E-04pCi/m^3	2.84E-04pCi/m^3	2.32E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Potassium-40	**2.80E-03pCi/m^3**	2.80E-03pCi/m^3	2.80E-03pCi/m^3	2.75E-03	
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Ruthenium-103	< MDC	3.39E-05pCi/m^3	2.83E-04pCi/m^3	1.65E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Ruthenium-106	< MDC	-8.29E-04pCi/m^3	2.21E-03pCi/m^3	1.50E-03	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Zinc-65	< MDC	-2.04E-04pCi/m^3	7.25E-04pCi/m^3	4.95E-04	U
SA-APT-05S2(454234001) - Air Particulate	25-Jun-18	Zirconium-95	< MDC	6.73E-05pCi/m^3	4.50E-04pCi/m^3	2.60E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Barium-140	< MDC	-2.12E-04pCi/m^3	2.88E-03pCi/m^3	1.76E-03	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Beryllium-7	**6.19E-02pCi/m^3**	6.19E-02pCi/m^3	3.90E-03pCi/m^3	8.22E-03	

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Quarterly Air Particulate Filter (Cont.)							
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cerium-141	< MDC	-1.40E-04pCi/m^3	5.36E-04pCi/m^3	3.51E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cerium-144	< MDC	-7.97E-04pCi/m^3	1.58E-03pCi/m^3	1.08E-03	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cesium-134	< MDC	3.29E-06pCi/m^3	3.95E-04pCi/m^3	2.40E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cesium-137	< MDC	1.64E-05pCi/m^3	3.06E-04pCi/m^3	1.80E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Chromium-51	< MDC	4.32E-04pCi/m^3	4.13E-03pCi/m^3	2.33E-03	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cobalt-58	< MDC	4.20E-05pCi/m^3	3.99E-04pCi/m^3	2.58E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Cobalt-60	< MDC	8.73E-05pCi/m^3	3.85E-04pCi/m^3	1.95E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Iodine-131	< MDC	7.40E-04pCi/m^3	2.04E-03pCi/m^3	1.08E-03	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Iron-59	< MDC	-2.55E-05pCi/m^3	7.08E-04pCi/m^3	4.19E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Lanthanum-140	< MDC	1.67E-04pCi/m^3	1.33E-03pCi/m^3	7.20E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Manganese-54	< MDC	-6.41E-05pCi/m^3	3.60E-04pCi/m^3	2.36E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Niobium-95	< MDC	1.41E-04pCi/m^3	4.22E-04pCi/m^3	2.40E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Potassium-40	**3.32E-03pCi/m^3**	3.32E-03pCi/m^3	3.32E-03pCi/m^3	4.49E-03	
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Ruthenium-103	< MDC	1.69E-05pCi/m^3	4.16E-04pCi/m^3	2.43E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Ruthenium-106	< MDC	-1.59E-03pCi/m^3	2.77E-03pCi/m^3	2.00E-03	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Zinc-65	< MDC	4.72E-04pCi/m^3	9.49E-04pCi/m^3	4.48E-04	U
SA-APT-05S2(461509001) - Air Particulate	24-Sep-18	Zirconium-95	< MDC	-3.07E-04pCi/m^3	5.48E-04pCi/m^3	4.22E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Barium-140	< MDC	-1.85E-03pCi/m^3	3.16E-03pCi/m^3	2.35E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Beryllium-7	**6.02E-02pCi/m^3**	6.02E-02pCi/m^3	4.51E-03pCi/m^3	7.32E-03	
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cerium-141	< MDC	-1.42E-04pCi/m^3	6.22E-04pCi/m^3	4.07E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cerium-144	< MDC	1.50E-04pCi/m^3	1.73E-03pCi/m^3	1.06E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cesium-134	< MDC	1.49E-04pCi/m^3	4.93E-04pCi/m^3	2.67E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cesium-137	< MDC	-4.45E-05pCi/m^3	3.40E-04pCi/m^3	2.06E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Chromium-51	< MDC	-1.58E-04pCi/m^3	3.67E-03pCi/m^3	2.20E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cobalt-58	< MDC	4.64E-06pCi/m^3	3.25E-04pCi/m^3	1.90E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Cobalt-60	< MDC	1.51E-04pCi/m^3	5.26E-04pCi/m^3	2.75E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Iodine-131	< MDC	1.08E-03pCi/m^3	2.00E-03pCi/m^3	1.02E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Iron-59	< MDC	7.02E-05pCi/m^3	9.93E-04pCi/m^3	5.77E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Lanthanum-140	< MDC	-4.43E-04pCi/m^3	1.32E-03pCi/m^3	9.31E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Manganese-54	< MDC	3.08E-05pCi/m^3	4.01E-04pCi/m^3	2.30E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Niobium-95	< MDC	-1.61E-04pCi/m^3	4.82E-04pCi/m^3	2.92E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Potassium-40	< MDC	-5.68E-04pCi/m^3	7.04E-03pCi/m^3	3.84E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Ruthenium-103	< MDC	-1.05E-04pCi/m^3	3.76E-04pCi/m^3	2.53E-04	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Quarterly Air Particulate Filter (Cont.)							
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Ruthenium-106	< MDC	2.76E-04pCi/m^3	3.53E-03pCi/m^3	1.99E-03	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Zinc-65	< MDC	-2.18E-04pCi/m^3	8.98E-04pCi/m^3	5.99E-04	U
SA-APT-05S2(468950001) - Air Particulate	26-Dec-18	Zirconium-95	< MDC	1.07E-04pCi/m^3	6.09E-04pCi/m^3	3.25E-04	U
Fish							
SA-ESF-11A1(450372001) - Fish	11-May-18	Barium-140	< MDC	2.85E+00pCi/kg	1.30E+02pCi/kg	7.87E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Beryllium-7	< MDC	1.20E+02pCi/kg	2.24E+02pCi/kg	1.15E+02	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cerium-141	< MDC	-1.08E+01pCi/kg	2.80E+01pCi/kg	1.96E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cerium-144	< MDC	-4.33E+00pCi/kg	8.70E+01pCi/kg	5.44E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cesium-134	< MDC	6.13E+00pCi/kg	2.68E+01pCi/kg	1.44E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cesium-137	< MDC	-1.12E+01pCi/kg	2.15E+01pCi/kg	1.58E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Chromium-51	< MDC	2.77E+01pCi/kg	1.80E+02pCi/kg	1.02E+02	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cobalt-58	< MDC	9.02E+00pCi/kg	2.98E+01pCi/kg	1.58E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Cobalt-60	< MDC	-1.78E+01pCi/kg	1.08E+01pCi/kg	1.47E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Iodine-131	< MDC	2.82E+00pCi/kg	4.01E+01pCi/kg	2.32E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Iron-59	< MDC	1.10E+01pCi/kg	5.29E+01pCi/kg	2.87E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Lanthanum-140	< MDC	-7.64E+00pCi/kg	4.15E+01pCi/kg	2.79E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Manganese-54	< MDC	3.63E+00pCi/kg	2.30E+01pCi/kg	1.27E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Niobium-95	< MDC	1.74E+01pCi/kg	2.84E+01pCi/kg	1.65E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Potassium-40	**2.76E+03 pCi/kg**	2.76E+03pCi/kg	2.29E+02pCi/kg	5.89E+02	
SA-ESF-11A1(450372001) - Fish	11-May-18	Ruthenium-103	< MDC	7.28E-01pCi/kg	2.48E+01pCi/kg	1.49E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Ruthenium-106	< MDC	4.39E+00pCi/kg	1.84E+02pCi/kg	1.26E+02	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Zinc-65	< MDC	1.95E+01pCi/kg	6.24E+01pCi/kg	3.30E+01	U
SA-ESF-11A1(450372001) - Fish	11-May-18	Zirconium-95	< MDC	4.99E+00pCi/kg	4.24E+01pCi/kg	2.36E+01	U
Crab							
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Barium-140	< MDC	-1.25E+01pCi/kg	4.13E+01pCi/kg	2.68E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Beryllium-7	< MDC	1.93E+01pCi/kg	6.97E+01pCi/kg	4.34E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cerium-141	< MDC	6.04E-01pCi/kg	1.20E+01pCi/kg	7.98E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cerium-144	< MDC	6.32E+00pCi/kg	4.39E+01pCi/kg	2.65E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cesium-134	< MDC	5.15E+00pCi/kg	1.05E+01pCi/kg	5.38E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cesium-137	< MDC	-2.55E-01pCi/kg	7.72E+00pCi/kg	4.79E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Chromium-51	< MDC	-1.74E+01pCi/kg	6.17E+01pCi/kg	3.80E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cobalt-58	< MDC	2.40E+00pCi/kg	7.66E+00pCi/kg	4.04E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Crab (Cont.)							
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Cobalt-60	< MDC	5.02E+00pCi/kg	1.24E+01pCi/kg	1.24E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Iodine-131	< MDC	-7.41E+00pCi/kg	1.55E+01pCi/kg	9.89E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Iron-59	< MDC	4.49E+00pCi/kg	2.05E+01pCi/kg	1.28E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Lanthanum-140	< MDC	-2.15E+00pCi/kg	1.58E+01pCi/kg	9.66E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Manganese-54	< MDC	-9.59E-01pCi/kg	8.70E+00pCi/kg	5.20E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Niobium-95	< MDC	-2.42E+00pCi/kg	8.04E+00pCi/kg	5.40E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Potassium-40	**1.86E+03pCi/kg**	1.86E+03pCi/kg	8.19E+01pCi/kg	2.53E+02	
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Ruthenium-103	< MDC	-4.19E+00pCi/kg	7.68E+00pCi/kg	5.18E+00	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Ruthenium-106	< MDC	-7.18E+00pCi/kg	7.87E+01pCi/kg	4.91E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Zinc-65	< MDC	5.17E+00pCi/kg	2.27E+01pCi/kg	1.43E+01	U
SA-ESH-11A1(456453001) - Crab	30-Jul-18	Zirconium-95	< MDC	6.20E+00pCi/kg	1.72E+01pCi/kg	9.15E+00	U
Sediment							
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Barium-140	< MDC	-1.66E+00pCi/kg	3.94E+01pCi/kg	2.34E+01	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Beryllium-7	< MDC	2.41E+01pCi/kg	5.98E+01pCi/kg	5.29E+01	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cerium-141	< MDC	-1.43E+00pCi/kg	1.45E+01pCi/kg	8.93E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cerium-144	< MDC	-2.22E+01pCi/kg	4.73E+01pCi/kg	3.20E+01	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cesium-134	**9.75E+00pCi/kg**	9.75E+00pCi/kg	9.75E+00pCi/kg	8.34E+00	
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cesium-137	< MDC	1.39E+00pCi/kg	6.61E+00pCi/kg	4.27E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Chromium-51	< MDC	-8.33E+00pCi/kg	6.20E+01pCi/kg	3.60E+01	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cobalt-58	< MDC	2.10E+00pCi/kg	6.03E+00pCi/kg	3.78E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Cobalt-60	< MDC	3.73E+00pCi/kg	7.37E+00pCi/kg	3.86E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Iodine-131	< MDC	5.58E+00pCi/kg	1.56E+01pCi/kg	8.67E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Iron-59	< MDC	8.96E-01pCi/kg	1.45E+01pCi/kg	8.31E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Manganese-54	< MDC	4.14E+00pCi/kg	7.08E+00pCi/kg	4.29E+00	U
SA-ESS-11A1(453922001) - Sediment	1-Jun-17	Moisture	**2.79E+01%**	2.79E+01%			
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Niobium-95	< MDC	-3.90E+00pCi/kg	6.90E+00pCi/kg	5.17E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Potassium-40	**3.15E+03pCi/kg**	3.15E+03pCi/kg	4.63E+01pCi/kg	1.93E+02	
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Radium-226	**1.98E+02pCi/kg**	1.98E+02pCi/kg	1.17E+01pCi/kg	2.08E+01	
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Ruthenium-103	< MDC	3.29E+00pCi/kg	7.28E+00pCi/kg	4.03E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Ruthenium-106	< MDC	2.19E+01pCi/kg	5.18E+01pCi/kg	3.16E+01	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Zinc-65	< MDC	-5.56E+00pCi/kg	1.37E+01pCi/kg	9.86E+00	U
SA-ESS-11A1(453922001) - Sediment	29-Jun-18	Zirconium-95	< MDC	2.58E+00pCi/kg	1.30E+01pCi/kg	7.62E+00	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Barium-140	< MDC	2.74E+01pCi/kg	9.23E+01pCi/kg	5.02E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Broad Leaf Vegetation							
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Beryllium-7	**1.31E+02pCi/kg**	1.31E+02pCi/kg	1.31E+02pCi/kg	1.45E+02	
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cerium-141	< MDC	-3.73E+00pCi/kg	2.77E+01pCi/kg	1.73E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cerium-144	< MDC	-6.30E+01pCi/kg	9.31E+01pCi/kg	6.28E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cesium-134	< MDC	-2.08E-01pCi/kg	2.07E+01pCi/kg	1.24E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cesium-137	< MDC	5.29E+00pCi/kg	1.84E+01pCi/kg	1.01E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Chromium-51	< MDC	1.08E+01pCi/kg	1.68E+02pCi/kg	9.52E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cobalt-58	< MDC	-1.01E+01pCi/kg	1.32E+01pCi/kg	1.00E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Cobalt-60	< MDC	4.81E+00pCi/kg	1.68E+01pCi/kg	8.90E+00	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Iodine-131	< MDC	6.93E+00pCi/kg	3.46E+01pCi/kg	1.92E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Iron-59	< MDC	4.33E+00pCi/kg	4.19E+01pCi/kg	2.47E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Lanthanum-140	< MDC	1.17E+01pCi/kg	3.58E+01pCi/kg	1.82E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Manganese-54	< MDC	-9.44E-01pCi/kg	1.50E+01pCi/kg	9.18E+00	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Niobium-95	< MDC	-7.24E+00pCi/kg	1.66E+01pCi/kg	1.11E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Potassium-40	**3.08E+03pCi/kg**	3.08E+03pCi/kg	1.81E+02pCi/kg	4.74E+02	
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Ruthenium-103	< MDC	-3.32E-01pCi/kg	1.69E+01pCi/kg	9.92E+00	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Ruthenium-106	< MDC	5.59E+00pCi/kg	1.57E+02pCi/kg	9.16E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Zinc-65	< MDC	8.91E+00pCi/kg	5.22E+01pCi/kg	3.05E+01	U
SA-FPL-10D1(455620001) - Kale	25-Jul-18	Zirconium-95	< MDC	-1.20E+01pCi/kg	2.88E+01pCi/kg	1.93E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Barium-140	< MDC	-1.23E+01pCi/kg	7.09E+01pCi/kg	4.27E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Beryllium-7	< MDC	5.82E+01pCi/kg	1.32E+02pCi/kg	7.17E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cerium-141	< MDC	-3.02E+00pCi/kg	2.21E+01pCi/kg	1.37E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cerium-144	< MDC	3.08E+01pCi/kg	7.97E+01pCi/kg	4.65E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cesium-134	< MDC	-7.41E+00pCi/kg	1.63E+01pCi/kg	1.06E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cesium-137	< MDC	9.75E+00pCi/kg	1.67E+01pCi/kg	8.88E+00	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Chromium-51	< MDC	3.21E+01pCi/kg	1.33E+02pCi/kg	7.38E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cobalt-58	< MDC	3.67E+00pCi/kg	1.46E+01pCi/kg	8.24E+00	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Cobalt-60	**1.83E+01pCi/kg**	1.83E+01pCi/kg	1.83E+01pCi/kg	1.91E+01	
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Iodine-131	< MDC	-7.63E+00pCi/kg	2.50E+01pCi/kg	1.50E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Iron-59	< MDC	-6.58E+00pCi/kg	3.02E+01pCi/kg	1.94E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Lanthanum-140	< MDC	-6.27E+00pCi/kg	2.23E+01pCi/kg	1.42E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Manganese-54	< MDC	-7.35E-01pCi/kg	1.45E+01pCi/kg	8.82E+00	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Niobium-95	< MDC	3.63E+00pCi/kg	1.35E+01pCi/kg	9.97E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Broad Leaf Vegetation (Cont.)							
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Potassium-40	**3.95E+03pCi/kg**	3.95E+03pCi/kg	1.33E+02pCi/kg	4.20E+02	
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Ruthenium-103	< MDC	1.05E+00pCi/kg	1.46E+01pCi/kg	8.38E+00	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Ruthenium-106	< MDC	7.59E+00pCi/kg	1.14E+02pCi/kg	7.38E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Zinc-65	< MDC	-1.07E+01pCi/kg	3.47E+01pCi/kg	2.27E+01	U
SA-FPL-15S2(458576001) - Kale	29-Aug-18	Zirconium-95	< MDC	8.57E-01pCi/kg	2.65E+01pCi/kg	1.57E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Barium-140	< MDC	7.01E+00pCi/kg	5.72E+01pCi/kg	3.24E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Beryllium-7	**2.52E+02pCi/kg**	2.52E+02pCi/kg	1.19E+02pCi/kg	1.46E+02	
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cerium-141	< MDC	-2.00E-01pCi/kg	2.13E+01pCi/kg	1.30E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cerium-144	< MDC	-1.99E+01pCi/kg	7.52E+01pCi/kg	5.00E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cesium-134	< MDC	8.25E+00pCi/kg	1.86E+01pCi/kg	9.68E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cesium-137	< MDC	5.32E+00pCi/kg	1.65E+01pCi/kg	8.92E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Chromium-51	**1.01E+02pCi/kg**	1.01E+02pCi/kg	1.01E+02pCi/kg	7.11E+01	
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cobalt-58	< MDC	8.15E-02pCi/kg	1.46E+01pCi/kg	8.76E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Cobalt-60	< MDC	3.35E+00pCi/kg	2.42E+01pCi/kg	1.37E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Iodine-131	< MDC	-9.44E+00pCi/kg	1.40E+01pCi/kg	9.40E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Iron-59	< MDC	3.40E-01pCi/kg	3.45E+01pCi/kg	2.38E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Lanthanum-140	< MDC	4.03E+00pCi/kg	2.11E+01pCi/kg	1.13E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Manganese-54	< MDC	8.66E+00pCi/kg	1.78E+01pCi/kg	9.28E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Niobium-95	< MDC	-3.91E-01pCi/kg	1.40E+01pCi/kg	8.48E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Potassium-40	**3.65E+03pCi/kg**	3.65E+03pCi/kg	1.49E+02pCi/kg	4.80E+02	
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Ruthenium-103	< MDC	5.90E+00pCi/kg	1.37E+01pCi/kg	7.14E+00	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Ruthenium-106	< MDC	-2.49E+00pCi/kg	1.30E+02pCi/kg	7.76E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Zinc-65	< MDC	-8.44E+00pCi/kg	3.38E+01pCi/kg	2.58E+01	U
SA-FPL-15S2(460188001) - Kale	24-Sep-18	Zirconium-95	< MDC	-3.69E+00pCi/kg	2.81E+01pCi/kg	1.75E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Barium-140	< MDC	-3.59E+00pCi/kg	1.06E+02pCi/kg	6.43E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Beryllium-7	< MDC	1.24E+02pCi/kg	2.19E+02pCi/kg	1.68E+02	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cerium-141	< MDC	-5.25E+00pCi/kg	4.25E+01pCi/kg	2.76E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cerium-144	< MDC	-4.73E+01pCi/kg	1.37E+02pCi/kg	8.23E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cesium-134	< MDC	2.03E+01pCi/kg	3.04E+01pCi/kg	2.32E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cesium-137	< MDC	-1.18E+00pCi/kg	2.69E+01pCi/kg	1.65E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Chromium-51	< MDC	-8.30E+01pCi/kg	2.13E+02pCi/kg	1.36E+02	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cobalt-58	< MDC	-7.33E-01pCi/kg	2.70E+01pCi/kg	1.66E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Broad Leaf Vegetation (Cont.)							
SA-FPL-1651(455620002) - Kale	25-Jul-18	Cobalt-60	< MDC	2.14E+01pCi/kg	4.14E+01pCi/kg	2.00E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Iodine-131	< MDC	6.49E-01pCi/kg	5.14E+01pCi/kg	3.02E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Iron-59	< MDC	-5.23E+00pCi/kg	6.09E+01pCi/kg	3.61E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Lanthanum-140	< MDC	-2.04E+01pCi/kg	3.09E+01pCi/kg	2.58E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Manganese-54	< MDC	3.56E+00pCi/kg	2.99E+01pCi/kg	1.75E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Niobium-95	< MDC	-1.02E+00pCi/kg	3.38E+01pCi/kg	2.08E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Potassium-40	**5.13E+03pCi/kg**	5.13E+03pCi/kg	3.12E+02pCi/kg	8.06E+02	
SA-FPL-1651(455620002) - Kale	25-Jul-18	Ruthenium-103	< MDC	-8.71E+00pCi/kg	2.96E+01pCi/kg	1.88E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Ruthenium-106	< MDC	-7.81E+01pCi/kg	2.51E+02pCi/kg	1.64E+02	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Zinc-65	< MDC	2.25E+01pCi/kg	8.22E+01pCi/kg	4.39E+01	U
SA-FPL-1651(455620002) - Kale	25-Jul-18	Zirconium-95	< MDC	-1.40E+01pCi/kg	4.66E+01pCi/kg	3.12E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Barium-140	< MDC	1.35E+01pCi/kg	4.38E+01pCi/kg	2.43E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Beryllium-7	< MDC	-2.03E+01pCi/kg	9.36E+01pCi/kg	5.78E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cerium-141	< MDC	-2.78E+01pCi/kg	1.74E+01pCi/kg	1.43E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cerium-144	< MDC	-8.70E+00pCi/kg	7.42E+01pCi/kg	4.76E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cesium-134	**1.57E+01pCi/kg**	1.57E+01pCi/kg	1.57E+01pCi/kg	1.05E+01	
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cesium-137	< MDC	-7.04E+00pCi/kg	1.26E+01pCi/kg	8.48E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Chromium-51	< MDC	1.13E+01pCi/kg	9.69E+01pCi/kg	5.57E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cobalt-58	< MDC	-1.39E-01pCi/kg	1.20E+01pCi/kg	7.29E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Cobalt-60	< MDC	-1.33E+00pCi/kg	1.38E+01pCi/kg	9.65E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Iodine-131	< MDC	-5.14E+00pCi/kg	1.22E+01pCi/kg	7.71E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Iron-59	< MDC	-8.96E+00pCi/kg	2.01E+01pCi/kg	1.43E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Lanthanum-140	< MDC	-6.46E+00pCi/kg	1.23E+01pCi/kg	8.83E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Manganese-54	< MDC	-1.38E-01pCi/kg	1.29E+01pCi/kg	7.86E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Niobium-95	< MDC	1.38E+00pCi/kg	1.47E+01pCi/kg	9.13E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Potassium-40	**1.63E+03pCi/kg**	1.63E+03pCi/kg	1.29E+02pCi/kg	2.71E+02	
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Ruthenium-103	< MDC	-1.79E+00pCi/kg	1.09E+01pCi/kg	6.67E+00	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Ruthenium-106	< MDC	3.59E+01pCi/kg	1.27E+02pCi/kg	7.21E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Zinc-65	< MDC	8.61E+00pCi/kg	3.24E+01pCi/kg	1.87E+01	U
SA-FPL-3H5(453423001) - Cabbage	25-Jun-18	Zirconium-95	< MDC	-6.98E+00pCi/kg	1.81E+01pCi/kg	1.39E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Barium-140	< MDC	2.57E+01pCi/kg	8.70E+01pCi/kg	4.85E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Beryllium-7	**4.81E+02pCi/kg**	4.81E+02pCi/kg	1.29E+02pCi/kg	1.63E+02	
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cerium-141	< MDC	-5.72E+01pCi/kg	2.27E+01pCi/kg	2.03E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Broad Leaf Vegetation (Cont.)							
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cerium-144	< MDC	1.57E+01pCi/kg	9.58E+01pCi/kg	5.71E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cesium-134	< MDC	1.08E+01pCi/kg	2.03E+01pCi/kg	1.60E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cesium-137	< MDC	2.52E+00pCi/kg	1.89E+01pCi/kg	1.10E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Chromium-51	< MDC	-3.26E+01pCi/kg	1.29E+02pCi/kg	7.72E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cobalt-58	< MDC	5.56E+00pCi/kg	1.78E+01pCi/kg	1.04E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Cobalt-60	< MDC	6.93E+00pCi/kg	2.31E+01pCi/kg	1.25E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Iodine-131	< MDC	-7.28E+00pCi/kg	2.66E+01pCi/kg	1.61E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Iron-59	< MDC	-2.04E+01pCi/kg	3.92E+01pCi/kg	2.56E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Lanthanum-140	< MDC	9.35E+00pCi/kg	3.14E+01pCi/kg	2.42E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Manganese-54	< MDC	5.31E+00pCi/kg	1.55E+01pCi/kg	9.32E+00	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Niobium-95	< MDC	-3.86E+00pCi/kg	1.78E+01pCi/kg	1.36E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Potassium-40	**6.02E+03pCi/kg**	6.02E+03pCi/kg	1.20E+02pCi/kg	5.45E+02	
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Ruthenium-103	< MDC	5.17E+00pCi/kg	1.76E+01pCi/kg	9.80E+00	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Ruthenium-106	< MDC	-1.24E+01pCi/kg	1.40E+02pCi/kg	8.58E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Zinc-65	< MDC	-1.42E+01pCi/kg	3.64E+01pCi/kg	2.34E+01	U
SA-FPL-7S2(458576002) - Collards	29-Aug-18	Zirconium-95	< MDC	-3.41E-01pCi/kg	3.06E+01pCi/kg	1.86E+01	U
Vegetables							
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Barium-140	< MDC	-2.70E+01pCi/kg	9.89E+01pCi/kg	6.40E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Beryllium-7	< MDC	4.26E+01pCi/kg	1.82E+02pCi/kg	1.03E+02	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cerium-141	< MDC	-9.17E+00pCi/kg	2.68E+01pCi/kg	1.86E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cerium-144	< MDC	-5.26E+00pCi/kg	1.01E+02pCi/kg	6.16E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cesium-134	< MDC	-5.06E+00pCi/kg	2.17E+01pCi/kg	1.43E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cesium-137	< MDC	-5.95E+00pCi/kg	1.72E+01pCi/kg	1.19E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Chromium-51	< MDC	-7.12E+01pCi/kg	1.66E+02pCi/kg	1.04E+02	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cobalt-58	< MDC	1.08E+01pCi/kg	1.92E+01pCi/kg	8.90E+00	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Cobalt-60	< MDC	2.07E+00pCi/kg	2.51E+01pCi/kg	1.60E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Iodine-131	< MDC	5.85E+00pCi/kg	3.51E+01pCi/kg	2.19E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Iron-59	< MDC	1.11E+01pCi/kg	4.68E+01pCi/kg	2.86E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Lanthanum-140	< MDC	1.49E+01pCi/kg	4.33E+01pCi/kg	2.17E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Manganese-54	< MDC	-7.36E+00pCi/kg	2.27E+01pCi/kg	1.43E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Niobium-95	< MDC	-2.61E+00pCi/kg	2.06E+01pCi/kg	1.24E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Potassium-40	**2.60E+03pCi/kg**	2.60E+03pCi/kg	1.71E+02pCi/kg	4.91E+02	
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Ruthenium-103	< MDC	1.23E+01pCi/kg	2.48E+01pCi/kg	1.33E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Vegetables (Cont.)							
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Ruthenium-106	< MDC	-4.79E+01pCi/kg	1.60E+02pCi/kg	1.07E+02	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Zinc-65	< MDC	1.80E+01pCi/kg	5.75E+01pCi/kg	3.12E+01	U
SA-FPV-15F4(455617001) - Corn	25-Jul-18	Zirconium-95	< MDC	-2.20E+01pCi/kg	3.82E+01pCi/kg	2.54E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Barium-140	< MDC	3.40E+01pCi/kg	6.73E+01pCi/kg	3.68E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Beryllium-7	< MDC	5.19E+01pCi/kg	1.09E+02pCi/kg	6.00E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cerium-141	< MDC	1.40E+01pCi/kg	1.66E+01pCi/kg	1.99E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cerium-144	< MDC	2.39E+01pCi/kg	6.53E+01pCi/kg	3.76E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cesium-134	< MDC	1.42E+00pCi/kg	1.46E+01pCi/kg	8.82E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cesium-137	< MDC	-3.46E+00pCi/kg	1.13E+01pCi/kg	8.22E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Chromium-51	< MDC	-5.18E+01pCi/kg	9.68E+01pCi/kg	5.91E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cobalt-58	< MDC	1.16E+00pCi/kg	1.32E+01pCi/kg	7.96E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Cobalt-60	< MDC	2.69E+00pCi/kg	1.45E+01pCi/kg	8.24E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Iodine-131	< MDC	-1.80E+00pCi/kg	2.15E+01pCi/kg	1.26E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Iron-59	< MDC	-5.96E+00pCi/kg	2.60E+01pCi/kg	1.61E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Lanthanum-140	< MDC	4.07E+00pCi/kg	1.96E+01pCi/kg	1.09E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Manganese-54	< MDC	-1.96E+00pCi/kg	1.17E+01pCi/kg	7.47E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Niobium-95	< MDC	-1.04E+00pCi/kg	1.24E+01pCi/kg	7.70E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Potassium-40	**2.35E+03pCi/kg**	2.35E+03pCi/kg	1.26E+02pCi/kg	3.18E+02	
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Ruthenium-103	< MDC	3.58E+00pCi/kg	1.22E+01pCi/kg	6.85E+00	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Ruthenium-106	< MDC	-3.95E+01pCi/kg	1.10E+02pCi/kg	6.98E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Zinc-65	< MDC	-5.27E-01pCi/kg	2.86E+01pCi/kg	1.69E+01	U
SA-FPV-1G1(454137002) - Corn	2-Jul-18	Zirconium-95	< MDC	-3.70E-01pCi/kg	2.33E+01pCi/kg	1.43E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Barium-140	< MDC	-2.59E+01pCi/kg	3.40E+01pCi/kg	2.58E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Beryllium-7	< MDC	-1.39E+01pCi/kg	6.33E+01pCi/kg	4.03E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cerium-141	< MDC	4.24E+00pCi/kg	1.17E+01pCi/kg	6.55E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cerium-144	< MDC	-9.53E+00pCi/kg	3.60E+01pCi/kg	2.26E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cesium-134	< MDC	9.28E-01pCi/kg	9.17E+00pCi/kg	5.21E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cesium-137	< MDC	3.10E+00pCi/kg	9.37E+00pCi/kg	4.94E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Chromium-51	< MDC	5.23E+00pCi/kg	6.79E+01pCi/kg	3.87E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cobalt-58	< MDC	1.33E+00pCi/kg	8.99E+00pCi/kg	5.04E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Cobalt-60	< MDC	-3.92E+00pCi/kg	8.56E+00pCi/kg	5.97E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Iodine-131	< MDC	9.92E-01pCi/kg	1.74E+01pCi/kg	1.01E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Vegetables (Cont.)							
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Iron-59	< MDC	-1.59E+01pCi/kg	1.92E+01pCi/kg	1.73E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Lanthanum-140	< MDC	-1.13E-01pCi/kg	1.93E+01pCi/kg	1.15E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Manganese-54	< MDC	-1.19E+00pCi/kg	8.28E+00pCi/kg	5.10E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Niobium-95	< MDC	3.17E+00pCi/kg	1.04E+01pCi/kg	5.58E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Potassium-40	**2.08E+03pCi/kg**	2.08E+03pCi/kg	9.20E+01pCi/kg	2.71E+02	
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Ruthenium-103	< MDC	-1.01E+00pCi/kg	8.25E+00pCi/kg	5.14E+00	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Ruthenium-106	< MDC	1.53E+01pCi/kg	8.60E+01pCi/kg	5.06E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Zinc-65	< MDC	-5.12E+00pCi/kg	1.52E+01pCi/kg	1.25E+01	U
SA-FPV-1G1(454137001) - Tomato	2-Jul-18	Zirconium-95	< MDC	2.71E+00pCi/kg	1.76E+01pCi/kg	9.85E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Barium-140	< MDC	1.33E+01pCi/kg	8.93E+01pCi/kg	5.19E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Beryllium-7	< MDC	7.34E-01pCi/kg	1.13E+02pCi/kg	6.68E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cerium-141	< MDC	1.10E+01pCi/kg	2.39E+01pCi/kg	1.77E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cerium-144	< MDC	4.54E+00pCi/kg	7.84E+01pCi/kg	4.45E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cesium-134	< MDC	6.83E+00pCi/kg	1.51E+01pCi/kg	1.33E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cesium-137	< MDC	-2.42E-01pCi/kg	1.27E+01pCi/kg	8.59E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Chromium-51	< MDC	1.60E+01pCi/kg	1.37E+02pCi/kg	7.90E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cobalt-58	< MDC	-5.07E+00pCi/kg	1.25E+01pCi/kg	8.34E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Cobalt-60	< MDC	8.52E+00pCi/kg	1.37E+01pCi/kg	6.55E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Iodine-131	< MDC	6.30E+00pCi/kg	3.78E+01pCi/kg	2.17E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Iron-59	< MDC	-3.49E+00pCi/kg	3.26E+01pCi/kg	2.06E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Lanthanum-140	< MDC	-2.95E+00pCi/kg	2.44E+01pCi/kg	1.50E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Manganese-54	< MDC	-3.45E+00pCi/kg	1.37E+01pCi/kg	8.74E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Niobium-95	< MDC	3.47E+00pCi/kg	1.36E+01pCi/kg	7.78E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Potassium-40	**3.12E+03pCi/kg**	3.12E+03pCi/kg	1.19E+02pCi/kg	3.60E+02	
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Ruthenium-103	< MDC	-9.94E-01pCi/kg	1.37E+01pCi/kg	8.24E+00	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Ruthenium-106	< MDC	-3.44E+01pCi/kg	1.04E+02pCi/kg	6.68E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Zinc-65	< MDC	3.74E+00pCi/kg	2.91E+01pCi/kg	1.94E+01	U
SA-FPV-2F9(453680002) - Corn	27-Jun-18	Zirconium-95	< MDC	-1.33E+01pCi/kg	2.20E+01pCi/kg	1.52E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Barium-140	< MDC	-2.45E+00pCi/kg	2.77E+01pCi/kg	1.68E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Beryllium-7	< MDC	1.69E+01pCi/kg	6.11E+01pCi/kg	3.38E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cerium-141	< MDC	-7.38E+00pCi/kg	8.79E+00pCi/kg	6.06E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cerium-144	< MDC	-1.46E+00pCi/kg	3.94E+01pCi/kg	2.39E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Vegetables (Cont.)							
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cesium-134	< MDC	2.15E+00pCi/kg	8.69E+00pCi/kg	4.93E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cesium-137	< MDC	3.74E-02pCi/kg	7.56E+00pCi/kg	7.13E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Chromium-51	< MDC	9.75E+00pCi/kg	5.67E+01pCi/kg	3.15E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cobalt-58	< MDC	5.48E+00pCi/kg	9.56E+00pCi/kg	5.01E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Cobalt-60	< MDC	2.86E+00pCi/kg	1.15E+01pCi/kg	6.35E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Iodine-131	< MDC	2.35E+00pCi/kg	8.18E+00pCi/kg	4.45E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Iron-59	< MDC	-8.57E-01pCi/kg	1.66E+01pCi/kg	9.83E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Lanthanum-140	< MDC	-3.68E+00pCi/kg	7.72E+00pCi/kg	5.83E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Manganese-54	< MDC	-1.11E+00pCi/kg	5.97E+00pCi/kg	3.92E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Niobium-95	< MDC	3.36E+00pCi/kg	9.67E+00pCi/kg	5.43E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Potassium-40	**2.51E+03pCi/kg**	2.51E+03pCi/kg	6.80E+01pCi/kg	2.47E+02	
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Ruthenium-103	< MDC	-3.25E+00pCi/kg	6.78E+00pCi/kg	5.04E+00	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Ruthenium-106	< MDC	-5.20E+00pCi/kg	5.84E+01pCi/kg	3.60E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Zinc-65	< MDC	1.49E+00pCi/kg	1.89E+01pCi/kg	1.08E+01	U
SA-FPV-2G2(454322001) - Tomato	9-Jul-18	Zirconium-95	< MDC	-4.73E+00pCi/kg	1.13E+01pCi/kg	7.79E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Barium-140	< MDC	-2.79E+01pCi/kg	5.46E+01pCi/kg	4.01E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Beryllium-7	**1.46E+02pCi/kg**	1.46E+02pCi/kg	8.84E+01pCi/kg	9.96E+01	
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cerium-141	< MDC	4.79E+00pCi/kg	2.14E+01pCi/kg	1.20E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cerium-144	< MDC	1.29E+01pCi/kg	9.05E+01pCi/kg	5.15E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cesium-134	< MDC	-2.96E+00pCi/kg	1.58E+01pCi/kg	9.93E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cesium-137	< MDC	-2.70E+00pCi/kg	1.65E+01pCi/kg	1.00E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Chromium-51	< MDC	5.96E+01pCi/kg	1.15E+02pCi/kg	5.80E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cobalt-58	< MDC	5.70E+00pCi/kg	1.67E+01pCi/kg	8.45E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Cobalt-60	< MDC	-1.42E-01pCi/kg	1.58E+01pCi/kg	9.47E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Iodine-131	< MDC	1.12E+01pCi/kg	1.54E+01pCi/kg	2.16E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Iron-59	< MDC	8.45E+00pCi/kg	3.96E+01pCi/kg	2.15E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Lanthanum-140	< MDC	1.96E+00pCi/kg	2.27E+01pCi/kg	1.30E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Manganese-54	< MDC	2.23E+00pCi/kg	1.56E+01pCi/kg	8.60E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Niobium-95	< MDC	6.98E+00pCi/kg	1.57E+01pCi/kg	7.98E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Potassium-40	**1.72E+03pCi/kg**	1.72E+03pCi/kg	2.15E+02pCi/kg	3.90E+02	
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Ruthenium-103	< MDC	5.48E+00pCi/kg	1.60E+01pCi/kg	8.68E+00	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Ruthenium-106	< MDC	2.18E+01pCi/kg	1.48E+02pCi/kg	8.12E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Zinc-65	< MDC	-3.44E+00pCi/kg	2.94E+01pCi/kg	1.85E+01	U
SA-FPV-3F8(454322002) - Peach	9-Jul-18	Zirconium-95	< MDC	1.09E+01pCi/kg	3.10E+01pCi/kg	1.57E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Vegetables (Cont.)							
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Barium-140	< MDC	4.76E+00pCi/kg	3.97E+01pCi/kg	2.26E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Beryllium-7	< MDC	-2.43E+01pCi/kg	5.82E+01pCi/kg	3.73E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cerium-141	< MDC	1.16E+00pCi/kg	1.26E+01pCi/kg	8.25E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cerium-144	< MDC	1.59E+00pCi/kg	4.94E+01pCi/kg	3.00E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cesium-134	< MDC	6.23E-01pCi/kg	8.36E+00pCi/kg	4.88E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cesium-137	< MDC	-3.74E-02pCi/kg	9.71E+00pCi/kg	6.43E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Chromium-51	< MDC	-4.50E+00pCi/kg	7.01E+01pCi/kg	4.05E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cobalt-58	< MDC	-1.53E+00pCi/kg	9.18E+00pCi/kg	5.74E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Cobalt-60	< MDC	-4.00E+00pCi/kg	9.07E+00pCi/kg	6.57E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Iodine-131	< MDC	-3.66E+00pCi/kg	1.16E+01pCi/kg	7.07E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Iron-59	< MDC	5.19E+00pCi/kg	2.31E+01pCi/kg	1.33E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Lanthanum-140	< MDC	-3.11E+00pCi/kg	1.36E+01pCi/kg	8.61E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Manganese-54	< MDC	8.27E-01pCi/kg	9.00E+00pCi/kg	5.27E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Niobium-95	< MDC	1.76E-01pCi/kg	8.64E+00pCi/kg	5.13E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Potassium-40	**2.21E+03pCi/kg**	2.21E+03pCi/kg	9.54E+01pCi/kg	2.56E+02	
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Ruthenium-103	< MDC	1.13E+00pCi/kg	7.73E+00pCi/kg	4.80E+00	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Ruthenium-106	< MDC	8.73E+00pCi/kg	7.33E+01pCi/kg	4.20E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Zinc-65	< MDC	3.56E-01pCi/kg	2.02E+01pCi/kg	1.29E+01	U
SA-FPV-3H5(449546001) - Asparagus	2-May-18	Zirconium-95	**1.74E+01pCi/kg**	1.74E+01pCi/kg	1.74E+01pCi/kg	1.42E+01	
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Barium-140	< MDC	-3.51E+00pCi/kg	2.86E+01pCi/kg	1.76E+01	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Beryllium-7	< MDC	1.03E+01pCi/kg	4.01E+01pCi/kg	2.43E+01	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cerium-141	< MDC	3.23E+00pCi/kg	6.59E+00pCi/kg	7.41E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cerium-144	< MDC	2.99E-01pCi/kg	2.34E+01pCi/kg	1.44E+01	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cesium-134	< MDC	-1.64E+00pCi/kg	4.73E+00pCi/kg	2.89E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cesium-137	< MDC	1.72E+00pCi/kg	4.81E+00pCi/kg	2.80E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Chromium-51	< MDC	-3.34E+01pCi/kg	4.08E+01pCi/kg	3.11E+01	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cobalt-58	< MDC	7.87E-01pCi/kg	4.97E+00pCi/kg	2.82E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Cobalt-60	< MDC	-5.87E-01pCi/kg	4.93E+00pCi/kg	3.92E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Iodine-131	< MDC	-4.21E+00pCi/kg	1.11E+01pCi/kg	7.70E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Iron-59	< MDC	3.69E+00pCi/kg	1.22E+01pCi/kg	6.92E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Lanthanum-140	< MDC	1.43E+00pCi/kg	1.02E+01pCi/kg	5.72E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Manganese-54	< MDC	-4.99E-01pCi/kg	3.85E+00pCi/kg	2.61E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Niobium-95	< MDC	6.58E-01pCi/kg	4.49E+00pCi/kg	5.42E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Vegetables (Cont.)							
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Potassium-40	**2.20E+03pCi/kg**	2.20E+03pCi/kg	3.41E+01pCi/kg	1.41E+02	
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Ruthenium-103	< MDC	-1.06E+00pCi/kg	4.52E+00pCi/kg	2.81E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Ruthenium-106	< MDC	7.67E+00pCi/kg	4.17E+01pCi/kg	2.48E+01	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Zinc-65	< MDC	-3.78E+00pCi/kg	1.03E+01pCi/kg	6.54E+00	U
SA-FPV-3H5(453680001) - Tomato	27-Jun-18	Zirconium-95	< MDC	-6.50E-01pCi/kg	8.28E+00pCi/kg	4.84E+00	U
Milk							
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Barium-140	< MDC	3.02E+00pCi/L	8.22E+00pCi/L	4.74E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Beryllium-7	< MDC	2.68E+00pCi/L	1.34E+01pCi/L	7.79E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cerium-141	< MDC	-1.19E+00pCi/L	2.72E+00pCi/L	1.72E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cerium-144	< MDC	-8.22E+00pCi/L	9.83E+00pCi/L	6.34E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cesium-134	< MDC	2.25E-01pCi/L	1.73E+00pCi/L	1.05E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cesium-137	**1.44E+00pCi/L**	1.44E+00pCi/L	1.44E+00pCi/L	1.55E+00	
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Chromium-51	< MDC	6.75E+00pCi/L	1.55E+01pCi/L	8.72E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cobalt-58	< MDC	2.21E-01pCi/L	1.66E+00pCi/L	1.00E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Cobalt-60	< MDC	4.99E-01pCi/L	1.72E+00pCi/L	9.77E-01	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Iodine-131	< MDC	-5.71E-02pCi/L	4.88E-01pCi/L	2.93E-01	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Iodine-131	< MDC	-5.17E-01pCi/L	2.90E+00pCi/L	1.72E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Iron-59	< MDC	7.30E-01pCi/L	4.07E+00pCi/L	2.34E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Lanthanum-140	< MDC	-1.16E+00pCi/L	2.14E+00pCi/L	1.48E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Manganese-54	< MDC	-6.84E-01pCi/L	1.55E+00pCi/L	1.00E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Niobium-95	< MDC	-4.27E-01pCi/L	1.58E+00pCi/L	9.96E-01	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Potassium-40	**1.67E+03pCi/L**	1.67E+03pCi/L	1.24E+01pCi/L	5.77E+01	
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Ruthenium-103	< MDC	-8.54E-01pCi/L	1.45E+00pCi/L	1.03E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Ruthenium-106	< MDC	3.06E+00pCi/L	1.37E+01pCi/L	8.07E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Zinc-65	< MDC	1.25E+00pCi/L	3.61E+00pCi/L	2.28E+00	U
SA-MLK-14F4(441034001) - Milk	2-Jan-18	Zirconium-95	< MDC	1.00E+00pCi/L	2.80E+00pCi/L	1.64E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Barium-140	< MDC	2.82E+00pCi/L	1.17E+01pCi/L	6.97E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Beryllium-7	< MDC	8.25E+00pCi/L	1.54E+01pCi/L	8.84E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cerium-141	< MDC	4.43E-01pCi/L	2.71E+00pCi/L	1.81E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cerium-144	< MDC	4.11E+00pCi/L	9.09E+00pCi/L	5.48E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cesium-134	< MDC	-2.09E-02pCi/L	1.98E+00pCi/L	1.15E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cesium-137	< MDC	4.34E-01pCi/L	1.95E+00pCi/L	1.18E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Chromium-51	< MDC	-1.23E+00pCi/L	1.63E+01pCi/L	9.60E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cobalt-58	< MDC	4.97E-01pCi/L	2.10E+00pCi/L	1.20E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Cobalt-60	< MDC	3.72E-01pCi/L	2.14E+00pCi/L	1.27E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Iodine-131	< MDC	-1.23E-01pCi/L	5.68E-01pCi/L	3.32E-01	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Iodine-131	< MDC	8.14E-02pCi/L	4.69E+00pCi/L	2.77E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Iron-59	< MDC	1.57E+00pCi/L	5.10E+00pCi/L	2.96E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Lanthanum-140	< MDC	-1.05E+00pCi/L	3.48E+00pCi/L	2.14E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Manganese-54	< MDC	4.79E-02pCi/L	1.94E+00pCi/L	1.13E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Niobium-95	< MDC	9.82E-01pCi/L	2.18E+00pCi/L	1.22E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Potassium-40	**1.27E+03pCi/L**	1.27E+03pCi/L	1.61E+01pCi/L	5.85E+01	
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Ruthenium-103	< MDC	-1.45E+00pCi/L	1.93E+00pCi/L	1.41E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Ruthenium-106	**1.60E+01pCi/L**	1.60E+01pCi/L	1.60E+01pCi/L	1.53E+01	
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Zinc-65	< MDC	-1.53E-01pCi/L	4.67E+00pCi/L	2.80E+00	U
SA-MLK-14F4(443523001) - Milk	6-Feb-18	Zirconium-95	< MDC	9.78E-02pCi/L	3.69E+00pCi/L	2.14E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Barium-140	< MDC	1.66E+00pCi/L	1.10E+01pCi/L	6.54E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Beryllium-7	< MDC	5.44E+00pCi/L	1.70E+01pCi/L	9.85E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cerium-141	< MDC	-9.81E-01pCi/L	3.07E+00pCi/L	1.89E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cerium-144	< MDC	5.67E+00pCi/L	1.10E+01pCi/L	6.45E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cesium-134	< MDC	2.74E-01pCi/L	2.10E+00pCi/L	1.20E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cesium-137	< MDC	4.67E-01pCi/L	2.05E+00pCi/L	1.23E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Chromium-51	< MDC	-9.36E+00pCi/L	1.68E+01pCi/L	1.01E+01	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cobalt-58	< MDC	-1.05E-01pCi/L	2.11E+00pCi/L	1.24E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Cobalt-60	< MDC	2.06E-01pCi/L	2.11E+00pCi/L	1.27E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Iodine-131	< MDC	-4.77E-02pCi/L	6.06E-01pCi/L	3.62E-01	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Iodine-131	< MDC	3.94E-01pCi/L	4.24E+00pCi/L	2.74E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Iron-59	< MDC	-2.97E-01pCi/L	5.03E+00pCi/L	3.03E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Lanthanum-140	< MDC	1.70E+00pCi/L	3.89E+00pCi/L	2.39E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Manganese-54	< MDC	1.32E-02pCi/L	1.95E+00pCi/L	1.14E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Niobium-95	< MDC	-1.12E+00pCi/L	1.94E+00pCi/L	1.19E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Potassium-40	**1.14E+03pCi/L**	1.14E+03pCi/L	1.90E+01pCi/L	5.54E+01	
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Ruthenium-103	< MDC	-1.30E+00pCi/L	1.96E+00pCi/L	1.25E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Ruthenium-106	< MDC	1.76E+00pCi/L	1.69E+01pCi/L	1.02E+01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Zinc-65	< MDC	4.86E-01pCi/L	4.93E+00pCi/L	2.92E+00	U
SA-MLK-14F4(445699001) - Milk	5-Mar-18	Zirconium-95	< MDC	3.03E-01pCi/L	3.51E+00pCi/L	2.02E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Barium-140	< MDC	9.73E-01pCi/L	9.04E+00pCi/L	5.30E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Beryllium-7	< MDC	2.38E-01pCi/L	1.38E+01pCi/L	8.11E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cerium-141	< MDC	-2.24E+00pCi/L	3.11E+00pCi/L	2.96E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cerium-144	< MDC	3.94E+00pCi/L	1.15E+01pCi/L	6.93E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cesium-134	< MDC	-1.03E+00pCi/L	1.80E+00pCi/L	1.72E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cesium-137	< MDC	1.90E-01pCi/L	1.76E+00pCi/L	1.04E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Chromium-51	< MDC	-2.31E+00pCi/L	1.56E+01pCi/L	9.11E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cobalt-58	< MDC	1.51E-01pCi/L	1.65E+00pCi/L	1.04E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Cobalt-60	< MDC	-3.11E-01pCi/L	1.79E+00pCi/L	1.07E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Iodine-131	< MDC	-2.01E-01pCi/L	6.19E-01pCi/L	3.68E-01	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Iodine-131	< MDC	9.49E-04pCi/L	3.26E+00pCi/L	1.89E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Iron-59	< MDC	1.50E+00pCi/L	4.21E+00pCi/L	2.61E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Lanthanum-140	< MDC	-6.52E-01pCi/L	2.61E+00pCi/L	1.62E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Manganese-54	< MDC	-2.48E-01pCi/L	1.59E+00pCi/L	9.89E-01	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Niobium-95	< MDC	-8.01E-01pCi/L	1.69E+00pCi/L	1.22E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Potassium-40	**1.23E+03pCi/L**	1.23E+03pCi/L	1.57E+01pCi/L	5.74E+01	
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Ruthenium-103	< MDC	-3.93E-01pCi/L	1.68E+00pCi/L	1.13E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Ruthenium-106	< MDC	-2.53E+00pCi/L	1.45E+01pCi/L	9.89E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Zinc-65	< MDC	1.13E+00pCi/L	3.80E+00pCi/L	2.11E+00	U
SA-MLK-14F4(447353001) - Milk	2-Apr-18	Zirconium-95	< MDC	-9.20E-01pCi/L	2.99E+00pCi/L	1.87E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Barium-140	< MDC	-1.65E+00pCi/L	7.55E+00pCi/L	4.58E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Beryllium-7	< MDC	-3.03E+00pCi/L	1.16E+01pCi/L	7.00E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cerium-141	< MDC	-1.85E+00pCi/L	2.64E+00pCi/L	1.66E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cerium-144	< MDC	3.64E-01pCi/L	9.48E+00pCi/L	5.71E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cesium-134	< MDC	4.56E-01pCi/L	1.81E+00pCi/L	1.08E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cesium-137	< MDC	-1.74E+00pCi/L	2.04E+00pCi/L	1.90E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Chromium-51	< MDC	5.13E-01pCi/L	1.40E+01pCi/L	7.99E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cobalt-58	< MDC	-1.25E+00pCi/L	1.49E+00pCi/L	9.99E-01	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Cobalt-60	< MDC	3.11E-01pCi/L	1.64E+00pCi/L	9.49E-01	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Iodine-131	< MDC	-8.57E-02pCi/L	7.11E-01pCi/L	4.27E-01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(450075001) - Milk	8-May-18	Iodine-131	< MDC	-3.64E-01pCi/L	2.93E+00pCi/L	1.71E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Iron-59	< MDC	4.96E-01pCi/L	3.81E+00pCi/L	2.20E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Lanthanum-140	< MDC	-1.20E+00pCi/L	2.07E+00pCi/L	1.39E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Manganese-54	< MDC	-2.19E-01pCi/L	1.43E+00pCi/L	8.96E-01	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Niobium-95	< MDC	3.18E-01pCi/L	1.64E+00pCi/L	9.81E-01	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Potassium-40	**1.47E+03pCi/L**	1.47E+03pCi/L	1.36E+01pCi/L	5.60E+01	
SA-MLK-14F4(450075001) - Milk	8-May-18	Ruthenium-103	< MDC	-8.76E-02pCi/L	1.59E+00pCi/L	1.05E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Ruthenium-106	< MDC	9.11E-01pCi/L	1.36E+01pCi/L	8.09E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Zinc-65	< MDC	-8.18E-01pCi/L	3.83E+00pCi/L	2.29E+00	U
SA-MLK-14F4(450075001) - Milk	8-May-18	Zirconium-95	< MDC	-6.84E-02pCi/L	2.77E+00pCi/L	1.69E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Barium-140	< MDC	1.62E+00pCi/L	9.95E+00pCi/L	5.80E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Beryllium-7	< MDC	-6.58E+00pCi/L	1.48E+01pCi/L	1.33E+01	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cerium-141	< MDC	-3.43E+00pCi/L	3.27E+00pCi/L	2.79E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cerium-144	< MDC	-1.76E-01pCi/L	1.19E+01pCi/L	7.32E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cesium-134	< MDC	5.19E-02pCi/L	1.85E+00pCi/L	1.26E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cesium-137	< MDC	4.94E-01pCi/L	1.89E+00pCi/L	1.11E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Chromium-51	< MDC	-1.02E+00pCi/L	1.65E+01pCi/L	9.60E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cobalt-58	< MDC	5.10E-01pCi/L	1.62E+00pCi/L	1.05E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Cobalt-60	< MDC	-8.10E-01pCi/L	1.77E+00pCi/L	1.95E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Iodine-131	< MDC	-2.20E-01pCi/L	5.19E-01pCi/L	3.16E-01	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Iodine-131	< MDC	-8.22E-01pCi/L	3.98E+00pCi/L	2.35E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Iron-59	< MDC	-4.46E-01pCi/L	4.17E+00pCi/L	2.43E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Lanthanum-140	< MDC	6.16E-01pCi/L	3.03E+00pCi/L	1.72E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Manganese-54	< MDC	-7.08E-01pCi/L	1.55E+00pCi/L	9.96E-01	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Niobium-95	< MDC	-5.85E-01pCi/L	1.59E+00pCi/L	1.14E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Potassium-40	**1.31E+03pCi/L**	1.31E+03pCi/L	1.71E+01pCi/L	5.95E+01	
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Ruthenium-103	< MDC	-8.56E-01pCi/L	1.73E+00pCi/L	1.07E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Ruthenium-106	< MDC	6.40E+00pCi/L	1.53E+01pCi/L	8.73E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Zinc-65	< MDC	-9.45E-02pCi/L	4.03E+00pCi/L	2.33E+00	U
SA-MLK-14F4(451988001) - Milk	4-Jun-18	Zirconium-95	< MDC	2.34E-01pCi/L	3.25E+00pCi/L	2.19E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Barium-140	< MDC	1.03E+00pCi/L	9.71E+00pCi/L	5.71E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Beryllium-7	< MDC	-1.78E+00pCi/L	1.19E+01pCi/L	7.06E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cerium-141	< MDC	-1.84E-02pCi/L	2.66E+00pCi/L	1.75E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cerium-144	< MDC	-1.70E+00pCi/L	8.53E+00pCi/L	5.21E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cesium-134	< MDC	1.41E+00pCi/L	1.61E+00pCi/L	9.01E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cesium-137	< MDC	-5.41E-01pCi/L	1.22E+00pCi/L	7.69E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Chromium-51	< MDC	-3.60E+00pCi/L	1.41E+01pCi/L	8.20E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cobalt-58	< MDC	-2.64E-01pCi/L	1.43E+00pCi/L	8.93E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Cobalt-60	< MDC	-1.29E-01pCi/L	1.56E+00pCi/L	9.31E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Iodine-131	< MDC	-1.03E-01pCi/L	5.70E-01pCi/L	3.44E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Iodine-131	< MDC	9.18E-01pCi/L	4.76E+00pCi/L	2.72E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Iron-59	< MDC	2.37E+00pCi/L	3.47E+00pCi/L	3.48E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Lanthanum-140	< MDC	-2.27E-02pCi/L	3.47E+00pCi/L	2.09E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Manganese-54	< MDC	-1.19E+00pCi/L	1.26E+00pCi/L	8.45E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Niobium-95	< MDC	6.08E-01pCi/L	1.50E+00pCi/L	8.79E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Potassium-40	**1.46E+03pCi/L**	1.46E+03pCi/L	1.15E+01pCi/L	4.97E+01	
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Ruthenium-103	< MDC	5.85E-01pCi/L	1.57E+00pCi/L	9.99E-01	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Ruthenium-106	< MDC	-1.22E+00pCi/L	1.18E+01pCi/L	7.15E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Zinc-65	< MDC	1.37E+00pCi/L	3.48E+00pCi/L	2.20E+00	U
SA-MLK-14F4(454136001) - Milk	2-Jul-18	Zirconium-95	< MDC	-7.12E-01pCi/L	2.48E+00pCi/L	1.55E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Barium-140	< MDC	3.71E+00pCi/L	9.64E+00pCi/L	7.53E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Beryllium-7	< MDC	-2.50E-01pCi/L	1.46E+01pCi/L	8.63E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cerium-141	< MDC	-1.59E+00pCi/L	2.85E+00pCi/L	1.77E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cerium-144	< MDC	-6.23E+00pCi/L	1.04E+01pCi/L	6.45E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cesium-134	< MDC	3.22E-01pCi/L	2.13E+00pCi/L	1.44E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cesium-137	< MDC	2.88E-01pCi/L	1.87E+00pCi/L	1.11E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Chromium-51	< MDC	-4.43E+00pCi/L	1.58E+01pCi/L	9.22E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cobalt-58	< MDC	-4.35E-01pCi/L	1.81E+00pCi/L	1.15E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Cobalt-60	< MDC	1.10E-01pCi/L	2.23E+00pCi/L	1.32E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Iodine-131	< MDC	1.67E-02pCi/L	4.95E-01pCi/L	2.93E-01	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Iodine-131	< MDC	-1.41E+00pCi/L	2.85E+00pCi/L	1.72E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Iron-59	< MDC	-4.60E-01pCi/L	4.65E+00pCi/L	2.76E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Lanthanum-140	< MDC	2.85E-02pCi/L	2.77E+00pCi/L	1.68E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Manganese-54	< MDC	-2.01E-01pCi/L	1.76E+00pCi/L	1.24E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Niobium-95	< MDC	-7.92E-01pCi/L	1.85E+00pCi/L	1.66E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Potassium-40	**1.17E+03pCi/L**	1.17E+03pCi/L	1.90E+01pCi/L	6.20E+01	
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Ruthenium-103	< MDC	3.25E-01pCi/L	1.86E+00pCi/L	1.20E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Ruthenium-106	< MDC	7.69E-01pCi/L	1.60E+01pCi/L	9.54E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Zinc-65	< MDC	-1.87E+00pCi/L	4.33E+00pCi/L	2.69E+00	U
SA-MLK-14F4(456832001) - Milk	6-Aug-18	Zirconium-95	< MDC	4.67E-01pCi/L	3.38E+00pCi/L	2.03E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Barium-140	< MDC	6.66E-01pCi/L	1.09E+01pCi/L	6.50E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Beryllium-7	< MDC	6.77E-01pCi/L	1.47E+01pCi/L	8.73E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cerium-141	< MDC	8.71E-01pCi/L	3.33E+00pCi/L	3.72E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cerium-144	< MDC	7.11E+00pCi/L	1.22E+01pCi/L	6.81E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cesium-134	< MDC	4.23E-01pCi/L	2.02E+00pCi/L	1.21E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cesium-137	< MDC	9.18E-01pCi/L	1.82E+00pCi/L	1.05E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Chromium-51	< MDC	5.51E+00pCi/L	1.70E+01pCi/L	1.08E+01	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cobalt-58	< MDC	4.03E-01pCi/L	1.90E+00pCi/L	1.13E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Cobalt-60	< MDC	3.94E-01pCi/L	2.15E+00pCi/L	1.22E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Iodine-131	< MDC	-1.58E-01pCi/L	3.76E-01pCi/L	2.23E-01	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Iodine-131	< MDC	-2.30E+00pCi/L	4.35E+00pCi/L	2.65E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Iron-59	< MDC	-3.85E+00pCi/L	4.58E+00pCi/L	3.26E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Lanthanum-140	< MDC	3.89E-01pCi/L	3.71E+00pCi/L	2.43E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Manganese-54	< MDC	1.89E-01pCi/L	1.68E+00pCi/L	1.01E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Niobium-95	< MDC	-1.29E+00pCi/L	1.97E+00pCi/L	2.05E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Potassium-40	**1.84E+03pCi/L**	1.84E+03pCi/L	1.63E+01pCi/L	6.50E+01	
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Ruthenium-103	< MDC	-1.04E+00pCi/L	1.76E+00pCi/L	1.10E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Ruthenium-106	< MDC	2.07E+00pCi/L	1.58E+01pCi/L	9.37E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Zinc-65	< MDC	-1.44E+00pCi/L	4.05E+00pCi/L	2.76E+00	U
SA-MLK-14F4(459055001) - Milk	4-Sep-18	Zirconium-95	< MDC	-7.47E-01pCi/L	3.11E+00pCi/L	1.94E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Barium-140	< MDC	-8.06E-01pCi/L	8.44E+00pCi/L	5.06E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Beryllium-7	< MDC	2.07E+00pCi/L	1.36E+01pCi/L	7.92E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cerium-141	< MDC	1.27E+00pCi/L	2.67E+00pCi/L	3.35E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cerium-144	< MDC	8.69E-01pCi/L	1.07E+01pCi/L	6.40E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cesium-134	< MDC	2.89E-01pCi/L	1.79E+00pCi/L	1.20E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cesium-137	< MDC	7.20E-01pCi/L	1.62E+00pCi/L	2.09E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Chromium-51	< MDC	-2.74E+00pCi/L	1.48E+01pCi/L	8.62E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cobalt-58	< MDC	-6.43E-01pCi/L	1.63E+00pCi/L	1.05E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Cobalt-60	< MDC	1.28E-01pCi/L	1.90E+00pCi/L	1.27E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Iodine-131	< MDC	-1.03E-03pCi/L	6.63E-01pCi/L	3.94E-01	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Iodine-131	< MDC	-1.06E+00pCi/L	3.00E+00pCi/L	1.78E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Iron-59	< MDC	-6.59E-01pCi/L	4.08E+00pCi/L	2.43E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Lanthanum-140	< MDC	-1.65E+00pCi/L	2.74E+00pCi/L	1.82E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Manganese-54	< MDC	-5.82E-01pCi/L	1.63E+00pCi/L	1.04E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Niobium-95	< MDC	3.35E-01pCi/L	1.81E+00pCi/L	1.08E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Potassium-40	**1.41E+03pCi/L**	1.41E+03pCi/L	1.59E+01pCi/L	5.72E+01	
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Ruthenium-103	< MDC	-1.31E-01pCi/L	1.58E+00pCi/L	1.05E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Ruthenium-106	< MDC	6.08E+00pCi/L	1.48E+01pCi/L	8.53E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Zinc-65	< MDC	-3.94E-01pCi/L	4.00E+00pCi/L	2.69E+00	U
SA-MLK-14F4(461054001) - Milk	2-Oct-18	Zirconium-95	< MDC	1.20E+00pCi/L	3.02E+00pCi/L	1.76E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Barium-140	< MDC	2.48E+00pCi/L	7.30E+00pCi/L	4.29E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Beryllium-7	< MDC	4.22E+00pCi/L	1.23E+01pCi/L	7.18E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cerium-141	< MDC	-6.24E-01pCi/L	2.38E+00pCi/L	1.62E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cerium-144	< MDC	1.99E+00pCi/L	9.08E+00pCi/L	5.53E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cesium-134	< MDC	1.57E-01pCi/L	1.62E+00pCi/L	9.31E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cesium-137	< MDC	6.38E-01pCi/L	1.53E+00pCi/L	9.07E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Chromium-51	< MDC	-2.99E+00pCi/L	1.25E+01pCi/L	7.43E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cobalt-58	< MDC	3.84E-02pCi/L	1.47E+00pCi/L	8.49E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Cobalt-60	< MDC	2.83E-01pCi/L	1.60E+00pCi/L	9.49E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Iodine-131	< MDC	-1.65E-01pCi/L	4.74E-01pCi/L	4.72E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Iodine-131	< MDC	-2.15E-01pCi/L	2.53E+00pCi/L	1.50E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Iron-59	< MDC	-7.08E-01pCi/L	3.24E+00pCi/L	1.97E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Lanthanum-140	< MDC	-2.00E-01pCi/L	2.19E+00pCi/L	1.29E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Manganese-54	< MDC	-5.53E-01pCi/L	1.41E+00pCi/L	8.50E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Niobium-95	< MDC	-3.57E-02pCi/L	1.43E+00pCi/L	9.37E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Potassium-40	**1.41E+03pCi/L**	1.41E+03pCi/L	1.32E+01pCi/L	4.88E+01	
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Ruthenium-103	< MDC	-3.55E-01pCi/L	1.49E+00pCi/L	9.10E-01	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Ruthenium-106	< MDC	3.20E-02pCi/L	1.21E+01pCi/L	7.40E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Zinc-65	< MDC	-5.18E-01pCi/L	3.35E+00pCi/L	2.31E+00	U
SA-MLK-14F4(464607001) - Milk	13-Nov-18	Zirconium-95	< MDC	1.28E-01pCi/L	2.62E+00pCi/L	1.51E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Milk (Cont.)							
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Barium-140	< MDC	3.60E-01pCi/L	8.35E+00pCi/L	4.94E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Beryllium-7	< MDC	4.24E+00pCi/L	1.43E+01pCi/L	8.17E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cerium-141	< MDC	-2.45E+00pCi/L	2.73E+00pCi/L	1.74E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cerium-144	< MDC	3.28E+00pCi/L	1.06E+01pCi/L	6.28E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cesium-134	< MDC	7.26E-01pCi/L	1.86E+00pCi/L	1.21E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cesium-137	**1.60E+00pCi/L**	1.60E+00pCi/L	1.60E+00pCi/L	2.31E+00	
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Chromium-51	< MDC	4.36E+00pCi/L	1.58E+01pCi/L	8.88E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cobalt-58	< MDC	-6.63E-01pCi/L	1.56E+00pCi/L	1.01E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Cobalt-60	< MDC	-3.28E-02pCi/L	1.72E+00pCi/L	1.02E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Iodine-131	< MDC	1.45E-01pCi/L	5.53E-01pCi/L	4.37E-01	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Iodine-131	< MDC	2.28E-01pCi/L	3.08E+00pCi/L	1.77E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Iron-59	< MDC	-5.48E-01pCi/L	4.06E+00pCi/L	2.41E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Lanthanum-140	< MDC	1.70E-01pCi/L	2.25E+00pCi/L	1.33E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Manganese-54	< MDC	5.67E-02pCi/L	1.55E+00pCi/L	9.48E-01	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Niobium-95	< MDC	7.24E-02pCi/L	1.74E+00pCi/L	1.05E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Potassium-40	**1.42E+03pCi/L**	1.42E+03pCi/L	1.70E+01pCi/L	5.78E+01	
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Ruthenium-103	< MDC	-6.57E-01pCi/L	1.70E+00pCi/L	1.04E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Ruthenium-106	< MDC	-6.65E-01pCi/L	1.33E+01pCi/L	8.00E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Zinc-65	< MDC	-1.29E-01pCi/L	3.86E+00pCi/L	2.26E+00	U
SA-MLK-14F4(466278001) - Milk	3-Dec-18	Zirconium-95	< MDC	-4.62E-01pCi/L	2.99E+00pCi/L	1.86E+00	U
Surface Water							
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Barium-140	< MDC	-4.50E-01pCi/L	8.34E+00pCi/L	4.97E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Beryllium-7	< MDC	1.14E+00pCi/L	1.28E+01pCi/L	7.45E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	BETA	**6.57E+01pCi/L**	6.57E+01pCi/L	2.21E+01pCi/L	1.53E+01	
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cerium-141	< MDC	-2.50E+00pCi/L	2.75E+00pCi/L	2.26E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cerium-144	< MDC	-2.64E+00pCi/L	9.31E+00pCi/L	5.73E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cesium-134	< MDC	-3.09E-01pCi/L	1.47E+00pCi/L	1.42E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cesium-137	< MDC	4.92E-01pCi/L	1.48E+00pCi/L	1.03E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Chromium-51	< MDC	-2.40E+00pCi/L	1.48E+01pCi/L	8.57E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cobalt-58	< MDC	-6.38E-01pCi/L	1.30E+00pCi/L	8.56E-01	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Cobalt-60	< MDC	7.61E-01pCi/L	1.77E+00pCi/L	9.72E-01	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Iodine-131	< MDC	3.63E-01pCi/L	3.68E+00pCi/L	2.20E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Iron-59	< MDC	-1.08E+00pCi/L	3.18E+00pCi/L	1.94E+00	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Surface Water (Cont.)							
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Lanthanum-140	**2.78E+00pCi/L**	2.78E+00pCi/L	2.78E+00pCi/L	1.97E+00	
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Manganese-54	< MDC	2.61E-01pCi/L	1.39E+00pCi/L	8.23E-01	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Niobium-95	< MDC	7.32E-01pCi/L	1.41E+00pCi/L	1.98E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Potassium-40	**7.96E+01pCi/L**	7.96E+01pCi/L	1.57E+01pCi/L	2.30E+01	
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Ruthenium-103	< MDC	4.94E-01pCi/L	1.35E+00pCi/L	1.68E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Ruthenium-106	< MDC	1.07E+01pCi/L	1.28E+01pCi/L	1.17E+01	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Tritium	< MDC	9.90E+01pCi/L	2.07E+02pCi/L	1.28E+02	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Zinc-65	< MDC	-8.49E-02pCi/L	2.95E+00pCi/L	1.72E+00	U
SA-SWA-11A1(446911001) - Surface Water	19-Mar-18	Zirconium-95	< MDC	-1.10E+00pCi/L	2.50E+00pCi/L	1.71E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Barium-140	< MDC	1.63E+00pCi/L	1.02E+01pCi/L	6.00E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Beryllium-7	< MDC	2.75E+00pCi/L	1.43E+01pCi/L	8.31E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	BETA	**4.41E+01pCi/L**	4.41E+01pCi/L	1.44E+01pCi/L	1.08E+01	
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cerium-141	**2.91E+00pCi/L**	2.91E+00pCi/L	2.91E+00pCi/L	3.81E+00	
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cerium-144	< MDC	2.32E+00pCi/L	1.06E+01pCi/L	5.98E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cesium-134	< MDC	-1.04E+00pCi/L	1.60E+00pCi/L	2.07E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cesium-137	< MDC	4.03E-01pCi/L	1.50E+00pCi/L	8.77E-01	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Chromium-51	< MDC	8.52E-01pCi/L	1.60E+01pCi/L	9.29E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cobalt-58	< MDC	3.61E-01pCi/L	1.54E+00pCi/L	9.07E-01	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Cobalt-60	< MDC	6.65E-03pCi/L	1.53E+00pCi/L	8.89E-01	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Iodine-131	< MDC	4.94E-02pCi/L	4.76E+00pCi/L	2.79E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Iron-59	< MDC	-3.24E-02pCi/L	3.12E+00pCi/L	1.93E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Lanthanum-140	< MDC	4.74E-01pCi/L	3.67E+00pCi/L	2.10E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Manganese-54	< MDC	-3.87E-01pCi/L	1.42E+00pCi/L	8.93E-01	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Niobium-95	< MDC	2.46E-01pCi/L	1.66E+00pCi/L	9.86E-01	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Potassium-40	**4.47E+01pCi/L**	4.47E+01pCi/L	1.45E+01pCi/L	3.63E+01	
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Ruthenium-103	< MDC	1.33E+00pCi/L	1.34E+00pCi/L	1.03E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Ruthenium-106	< MDC	2.98E+00pCi/L	1.33E+01pCi/L	7.80E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Tritium	< MDC	1.34E+02pCi/L	2.83E+02pCi/L	1.76E+02	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Zinc-65	< MDC	7.24E-01pCi/L	3.20E+00pCi/L	1.91E+00	U
SA-SWA-11A1(453424001) - Surface Water	21-Jun-18	Zirconium-95	< MDC	-6.99E-02pCi/L	2.70E+00pCi/L	1.64E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Barium-140	< MDC	-5.95E+00pCi/L	8.38E+00pCi/L	5.41E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Beryllium-7	< MDC	3.72E+00pCi/L	1.33E+01pCi/L	7.64E+00	U

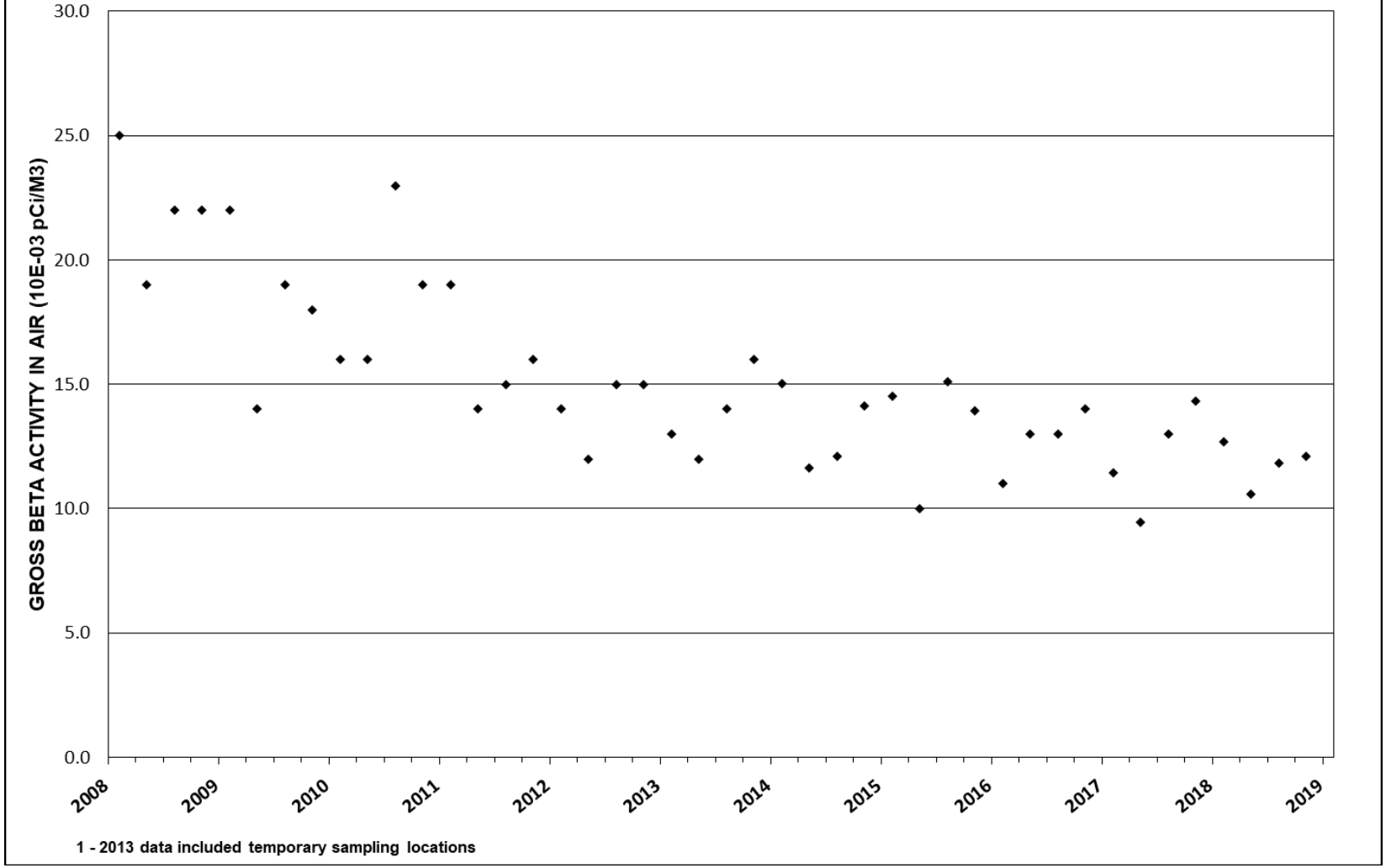
Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Surface Water (Cont.)							
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	BETA	**4.21E+01pCi/L**	4.21E+01pCi/L	1.82E+01pCi/L	1.26E+01	
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cerium-141	< MDC	2.45E+00pCi/L	2.98E+00pCi/L	4.33E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cerium-144	< MDC	1.11E+00pCi/L	1.08E+01pCi/L	6.61E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cesium-134	< MDC	4.43E-01pCi/L	1.61E+00pCi/L	9.44E-01	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cesium-137	< MDC	4.00E-01pCi/L	1.60E+00pCi/L	1.60E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Chromium-51	< MDC	9.45E-01pCi/L	1.62E+01pCi/L	9.36E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cobalt-58	< MDC	-4.77E-01pCi/L	1.54E+00pCi/L	9.77E-01	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Cobalt-60	< MDC	-3.42E-01pCi/L	1.54E+00pCi/L	9.38E-01	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Iodine-131	< MDC	4.63E-02pCi/L	3.86E+00pCi/L	2.24E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Iron-59	< MDC	-4.33E-01pCi/L	3.21E+00pCi/L	1.89E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Lanthanum-140	< MDC	-2.32E-01pCi/L	2.83E+00pCi/L	1.71E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Manganese-54	< MDC	6.18E-02pCi/L	1.35E+00pCi/L	8.18E-01	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Niobium-95	< MDC	-4.29E-01pCi/L	1.42E+00pCi/L	1.02E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Potassium-40	**6.07E+01pCi/L**	6.07E+01pCi/L	1.58E+01pCi/L	2.65E+01	
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Ruthenium-103	< MDC	-3.72E-01pCi/L	1.61E+00pCi/L	1.10E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Ruthenium-106	< MDC	-4.89E+00pCi/L	1.16E+01pCi/L	7.34E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Tritium	< MDC	3.72E+02pCi/L	3.99E+02pCi/L	2.79E+02	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Zinc-65	< MDC	-8.90E-01pCi/L	2.91E+00pCi/L	1.77E+00	U
SA-SWA-11A1(460267001) - Surface Water	20-Sep-18	Zirconium-95	< MDC	-3.41E-01pCi/L	2.60E+00pCi/L	1.69E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Barium-140	< MDC	6.84E+00pCi/L	1.99E+01pCi/L	1.17E+01	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Beryllium-7	< MDC	6.76E+00pCi/L	1.34E+01pCi/L	7.69E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	BETA	**1.71E+01pCi/L**	1.71E+01pCi/L	8.20E+00pCi/L	5.65E+00	
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cerium-141	< MDC	-1.10E+00pCi/L	3.25E+00pCi/L	2.04E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cerium-144	< MDC	-4.44E+00pCi/L	7.81E+00pCi/L	4.94E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cesium-134	< MDC	2.89E-01pCi/L	1.32E+00pCi/L	7.48E-01	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cesium-137	< MDC	4.58E-01pCi/L	1.13E+00pCi/L	1.03E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Chromium-51	< MDC	-6.68E+00pCi/L	1.81E+01pCi/L	1.08E+01	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cobalt-58	< MDC	6.94E-02pCi/L	1.43E+00pCi/L	8.29E-01	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Cobalt-60	< MDC	5.26E-02pCi/L	1.20E+00pCi/L	7.24E-01	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Iodine-131	< MDC	5.39E-01pCi/L	1.40E+01pCi/L	8.23E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Iron-59	< MDC	-1.20E+00pCi/L	3.29E+00pCi/L	2.34E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Lanthanum-140	< MDC	2.40E+00pCi/L	7.10E+00pCi/L	3.95E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Manganese-54	< MDC	1.32E-01pCi/L	1.18E+00pCi/L	7.67E-01	U

Table C-20 **Concentrations of Duplicate Samples as Analyzed by GEL**

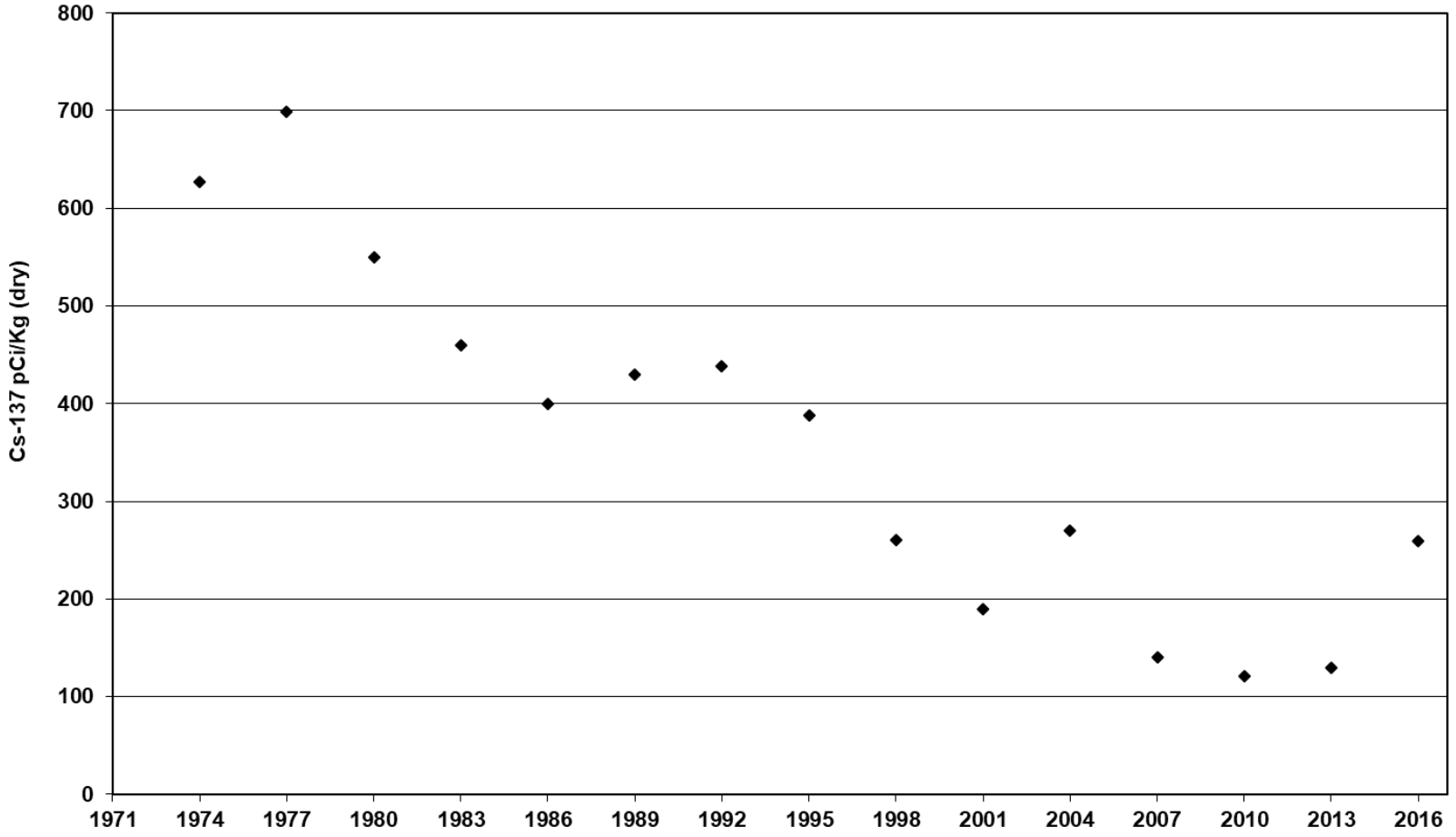
Sample Name	Date Collected	Nuclide	Reported Activity	Analysis Result	MDC	2 Sigma Uncert	Qualifier
Surface Water (Cont.)							
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Niobium-95	< MDC	5.01E-01pCi/L	1.56E+00pCi/L	2.10E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Potassium-40	**1.17E+01pCi/L**	1.17E+01pCi/L	1.17E+01pCi/L	2.83E+01	
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Ruthenium-103	< MDC	8.76E-03pCi/L	1.83E+00pCi/L	1.10E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Ruthenium-106	< MDC	-8.37E-01pCi/L	1.08E+01pCi/L	6.64E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Tritium	< MDC	5.15E+01pCi/L	4.56E+02pCi/L	2.77E+02	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Zinc-65	< MDC	7.52E-01pCi/L	2.61E+00pCi/L	1.70E+00	U
SA-SWA-11A1(467776001) - Surface Water	5-Dec-18	Zirconium-95	< MDC	-4.06E-01pCi/L	2.60E+00pCi/L	1.64E+00	U

FIGURE 1
GROSS BETA ACTIVITY IN AIR PARTICULATES -
QUARTERLY AVERAGE FOR ALL LOCATIONS
2008 THROUGH 2018[1]



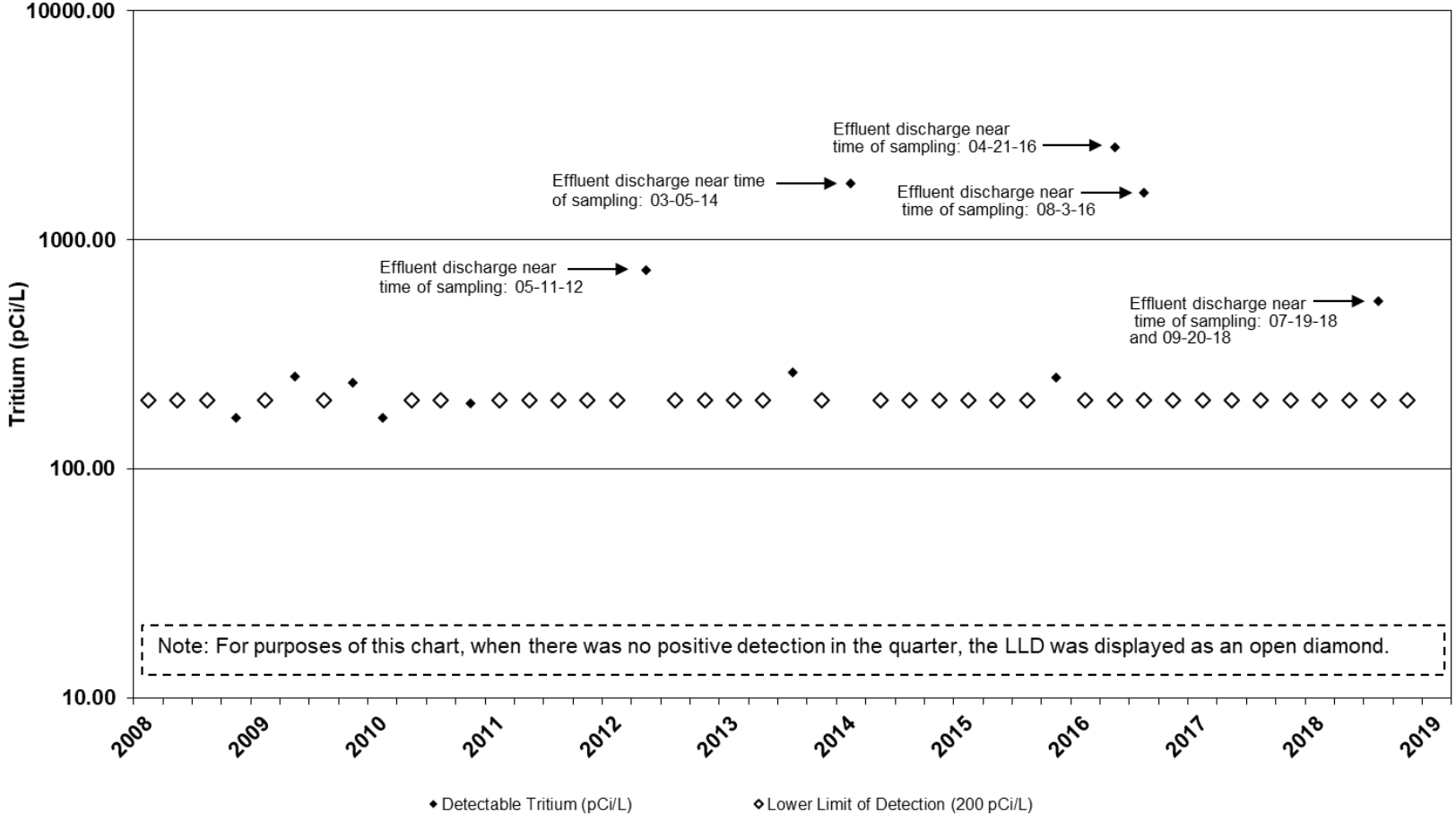
1 - 2013 data included temporary sampling locations

FIGURE 2
CESIUM-137 ACTIVITY IN SOIL 1974 THROUGH 2018
(TRIENNIAL)



Soil is sampled every three years. Last samples were taken in 2016. Annual values are an average of the results from the ten soil sites.

FIGURE 3
TRITIUM ACTIVITY IN SURFACE WATER - QUARTERLY AVERAGE
2008 THROUGH 2018



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APPENDIX D

SUMMARY OF INTER-LABORATORY COMPARISON PROGRAM

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Table D-1
Analytics Environmental Radioactivity Cross Check Program
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Ratio of TBE to Analytics Result	Evaluation (b)
March 2018	E12133	Milk	Sr-89	pCi/L	76.1	90.1	0.84	A
			Sr-90	pCi/L	12.2	12.5	0.98	A
	E12134	Milk	Ce-141	pCi/L	77.8	77.0	1.01	A
			Co-58	pCi/L	105	114	0.92	A
			Co-60	pCi/L	181	187	0.97	A
			Cr-51	pCi/L	298	326	0.92	A
			Cs-134	pCi/L	150	180	0.84	A
			Cs-137	pCi/L	164	172	0.95	A
			Fe-59	pCi/L	140	139	1.01	A
			I-131	pCi/L	105	108.0	0.97	A
			Mn-54	pCi/L	133	131	1.01	A
			Zn-65	pCi/L	242	244	0.99	A
	E12135	Charcoal	I-131	pCi	93.7	95.4	0.98	A
	E12136	AP	Ce-141	pCi	92.6	85.3	1.09	A
			Co-58	pCi	130	126	1.03	A
			Co-60	pCi	237	207	1.14	A
			Cr-51	pCi	411	361	1.14	A
			Cs-134	pCi	194	199	0.98	A
			Cs-137	pCi	200	191	1.05	A
			Fe-59	pCi	160	154	1.04	A
			Mn-54	pCi	152	145	1.05	A
			Zn-65	pCi	267	271	0.99	A
	E12137	Water	Fe-55	pCi/L	1990	1700	1.17	A
	E12138	Soil	Ce-141	pCi/g	0.148	0.118	1.26	W
			Co-58	pCi/g	0.171	0.174	0.98	A
			Co-60	pCi/g	0.297	0.286	1.04	A
			Cr-51	pCi/g	0.537	0.498	1.08	A
			Cs-134	pCi/g	0.274	0.275	1.00	A
			Cs-137	pCi/g	0.355	0.337	1.05	A
			Fe-59	pCi/g	0.243	0.212	1.15	A
			Mn-54	pCi/g	0.228	0.201	1.14	A
			Zn-65	pCi/g	0.395	0.374	1.06	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

Table D-1
Analytics Environmental Radioactivity Cross Check Program
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Ratio of TBE to Analytics Result	Evaluation (b)
June 2018	E12205	Milk	Sr-89	pCi/L	74.9	84.6	0.89	A
			Sr-90	pCi/L	10.5	11.4	0.92	A
	E12206	Milk	Ce-141	pCi/L	89.2	82.2	1.08	A
			Co-58	pCi/L	94.8	89	1.07	A
			Co-60	pCi/L	125	113	1.10	A
			Cr-51	pCi/L	256	239	1.07	A
			Cs-134	pCi/L	112	114	0.99	A
			Cs-137	pCi/L	107	98.8	1.08	A
			Fe-59	pCi/L	95.9	86.0	1.12	A
			I-131	pCi/L	69.8	71.9	0.97	A
			Mn-54	pCi/L	138	130	1.06	A
			Zn-65	pCi/L	186	157	1.18	A
	E12207	Charcoal	I-131	pCi	69.6	72.2	0.96	A
	E12208	AP	Ce-141	pCi	151	165	0.92	A
			Co-58	pCi	174	178	0.98	A
			Co-60	pCi	290	227	1.28	W
			Cr-51	pCi	452	478	0.95	A
			Cs-134	pCi	215	227	0.95	A
			Cs-137	pCi	206	198	1.04	A
			Fe-59	pCi	180	172	1.05	A
			Mn-54	pCi	265	260	1.02	A
			Zn-65	pCi	280	315	0.89	A
	E12209	Water	Fe-55	pCi/L	1790	1740	1.03	A
	E12210	AP	Sr-89	pCi	77.8	90.3	0.86	A
			Sr-90	pCi	9.54	12.2	0.78	W

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

Table D-1
Analytics Environmental Radioactivity Cross Check Program
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Ratio of TBE to Analytics Result	Evaluation (b)
September 2018	E12271	Milk	Sr-89	pCi/L	79.4	81.7	0.97	A
			Sr-90	pCi/L	12.2	14.8	0.82	A
	E12272	Milk	Ce-141	pCi/L	152	128	1.19	A
			Co-58	pCi/L	161	144	1.12	A
			Co-60	pCi/L	208	190	1.10	A
			Cr-51	pCi/L	244	265	0.92	A
			Cs-134	pCi/L	124	123	1.01	A
			Cs-137	pCi/L	166	147	1.13	A
			Fe-59	pCi/L	158	119	1.32	N(1)
			I-131	pCi/L	83.1	58.2	1.43	N(2)
			Mn-54	pCi/L	191	167	1.14	A
			Zn-65	pCi/L	229	201	1.14	A
	E12273	Charcoal	I-131	pCi	83.0	80.7	1.03	A
	E12274	AP	Ce-141	pCi	101	85.6	1.18	A
			Co-58	pCi	92.7	96.0	0.97	A
			Co-60	pCi	142	127	1.12	A
			Cr-51	pCi	218	177	1.23	W
			Cs-134	pCi	81.2	81.9	0.99	A
			Cs-137	pCi	99.0	98.5	1.01	A
			Fe-59	pCi	93.7	79.7	1.18	A
			Mn-54	pCi	116	112	1.04	A
			Zn-65	pCi	139	134	1.04	A
	E12302	Water	Fe-55	pCi/L	2120	1820	1.17	A
	E12276	Soil	Ce-141	pCi/g	0.259	0.221	1.17	A
			Co-58	pCi/g	0.279	0.248	1.12	A
			Co-60	pCi/g	0.367	0.328	1.12	A
			Cr-51	pCi/g	0.597	0.457	1.31	N (3)
			Cs-134	pCi/g	0.261	0.212	1.23	W
			Cs-137	pCi/g	0.376	0.330	1.14	A
			Fe-59	pCi/g	0.248	0.206	1.20	A
			Mn-54	pCi/g	0.317	0.289	1.10	A
			Zn-65	pCi/g	0.407	0.347	1.17	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A Acceptable - reported result falls within ratio limits of 0.80-1.20

W Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) *See **NCR 18-20***

(2) *See **NCR 18-24***

(3) *See **NCR 18-21***

Table D-1
Analytics Environmental Radioactivity Cross Check Program
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Ratio of TBE to Analytics Result	Evaluation (b)
December 2018	E12313	Milk	Sr-89	pCi/L	71.9	91.9	0.78	W
			Sr-90	pCi/L	12.1	13.3	0.91	A
	E12314	Milk	Ce-141	pCi/L	124	133	0.93	A
			Co-58	pCi/L	110	119	0.93	A
			Co-60	pCi/L	202	212	0.95	A
			Cr-51	pCi/L	292	298	0.98	A
			Cs-134	pCi/L	146	171	0.85	A
			Cs-137	pCi/L	118	121	0.98	A
			Fe-59	pCi/L	120	114	1.05	A
			I-131	pCi/L	94.2	93.3	1.01	A
			Mn-54	pCi/L	151	154	0.98	A
			Zn-65	pCi/L	266	264	1.01	A
	E12315	Charcoal	I-131	pCi	94.8	89.9	1.05	A
	E12316A	AP	Ce-141	pCi	92.3	94.0	0.98	A
			Co-58	pCi	73.4	83.8	0.88	A
			Co-60	pCi	137	150	0.91	A
			Cr-51	pCi	202	210	0.96	A
			Cs-134	pCi	115	121	0.95	A
			Cs-137	pCi	85.0	85.4	1.00	A
			Fe-59	pCi	83.1	80.8	1.03	A
			Mn-54	pCi	104	109	0.96	A
			Zn-65	pCi	168	187	0.90	A
	E12317	Water	Fe-55	pCi/L	2110	1840	1.15	A
	E12318	AP	Sr-89	pCi	81.1	83.0	0.98	A
			Sr-90	pCi	11.4	12.0	0.95	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A Acceptable - reported result falls within ratio limits of 0.80-1.20

W Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

Table D-2
DOE's Mixed Analyte Performance Evaluation Program (MAPEP)
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Acceptance Range	Evaluation (b)
February 2018	18-MaS38	Soil	Ni-63	Bq/kg	9.94		*(1)*	A
			Sr-90	Bq/kg	0.846		*(1)*	A
	18-MaW38	Water	Am-241	Bq/L	0.785	0.709	0.496 - 0.922	A
			Ni-63	Bq/L	12.6	14.0	9.8 - 18.2	A
			Pu-238	Bq/L	0.0214	0.023	*(2)*	A
			Pu-239/240	Bq/L	0.544	0.600	0.420 - 0.780	A
	18-RdF38	AP	U-234/233	Bq/sample	0.111	0.124	0.087 - 0.161	A
			U-238	Bq/sample	0.123	0.128	0.090 - 0.166	A
	18-RdV38	Vegetation	Cs-134	Bq/sample	2.46	3.23	2.26 - 4.20	W
			Cs-137	Bq/sample	3.14	3.67	2.57 - 4.77	A
			Co-57	Bq/sample	4.12	4.42	3.09 - 5.75	A
			Co-60	Bq/sample	1.86	2.29	1.60 - 2.98	A
			Mn-54	Bq/sample	2.21	2.66	1.86 - 3.46	A
			Sr-90	Bq/sample				NR(3)
			Zn-65	Bq/sample	-0.201		*(1)*	A
November 2018	18-MaS39	Soil	Ni-63	Bq/kg	703	765	536 - 995	A
			Sr-90	Bq/kg	137	193	*135 - 251*	W
	18-MaW39	Water	Am-241	Bq/L	0.0363		*(1)*	A
			Ni-63	Bq/L	6.18	7.0	4.9 - 9.1	A
			Pu-238	Bq/L	0.73	0.674	0.472 - 0.876	A
			Pu-239/240	Bq/L	0.89	0.928	0.650 - 1.206	A
	18-RdF39	AP	U-234/233	Bq/sample	0.159	0.152	0.106 - 0.198	A
			U-238	Bq/sample	0.162	0.158	0.111 - 0.205	A
	18-RdV39	Vegetation	Cs-134	Bq/sample	1.85	1.94	1.36 - 2.52	A
			Cs-137	Bq/sample	2.5	2.36	1.65 - 3.07	A
			Co-57	Bq/sample	3.53	3.31	2.32 - 4.30	A
			Co-60	Bq/sample	1.6	1.68	1.18 - 2.18	A
			Mn-54	Bq/sample	2.61	2.53	1.77 - 3.29	A
			Sr-90	Bq/sample	0.338	0.791	0.554 - 1.028	N(4)
			Zn-65	Bq/sample	1.32	1.37	*0.96 - 1.78*	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A Acceptable - reported result falls within ratio limits of 0.80-1.20

W Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) False positive test

(2) Sensitivity evaluation

(3)** See **NCR 18-09

(4)** See **NCR 18-25

Table D-3
ERA Environmental Radioactivity Cross Check Program
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [(a)]	Acceptance Limits	Evaluation [(b)]
March 2018	MRAD-28	AP	GR-A	pCi/sample	65.7	43.4	22.7 - 71.5	A
			GR-B	pCi/sample	57.2	52	31.5 - 78.6	A
April 2018	RAD-113	Water	Ba-133	pCi/L	91.2	91.5	77.1 - 101	A
			Cs-134	pCi/L	70.4	75.9	62.0 - 83.5	A
			Cs-137	pCi/L	122	123	111 - 138	A
			Co-60	pCi/L	64.8	64.3	57.9 - 73.2	A
			Zn-65	pCi/L	98.6	86.7	78.0 - 104	A
			GR-A	pCi/L	32.8	28.6	14.6 - 37.5	A
			GR-B	pCi/L	62.9	73.7	51.4 - 81.1	A
			U-Nat	pCi/L	6.7	6.93	5.28 - 8.13	A
			H-3	pCi/L	17100	17200	15000 - 18900	A
			Sr-89	pCi/L	38.6	48.8	38.3 - 56.2	A
			Sr-90	pCi/L	27.1	26.5	19.2 - 30.9	A
			I-131	pCi/L	26.7	24.6	20.4 - 29.1	A
September 2018	MRAD-29	AP	GR-A	pCi/sample	49.7	55.3	28.9 - 91.1	A
		AP	GR-B	pCi/sample	75.3	86.5	52.4 - 131	A
October 2018	RAD-115	Water	Ba-133	pCi/L	15.2	16.3	11.9 - 19.4	A
			Cs-134	pCi/L	85.9	93.0	76.4 - 102	A
			Cs-137	pCi/L	229	235	212 - 260	A
			Co-60	pCi/L	81.9	80.7	72.6 - 91.1	A
			Zn-65	pCi/L	348	336	302 - 392	A
			GR-A	pCi/L	38.9	60.7	31.8 - 75.4	A
			GR-B	pCi/L	36.5	41.8	27.9 - 49.2	A
			U-Nat	pCi/L	17.48	20.9	16.8 - 23.4	A
			H-3	pCi/L	2790	2870	2410 - 3170	A
			I-131	pCi/L	26.9	27.2	22.6 - 32.0	A
			Sr-89	pCi/L	57.2	56.9	45.5 - 64.6	A
			Sr-90	pCi/L	36.8	31.4	22.9- 36.4	N(1)

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A Acceptable - reported result falls within ratio limits of 0.80-1.20

W Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

*(1) See **NCR 18-23***

TABLE D-4
2018 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st / 2018	05/11/18	E12100	Cartridge	pCi	Iodine-131	9.20E+01	8.52E+01	0.97	Acceptable
EZA	1st / 2018	05/11/18	E12101	Milk	pCi/L	Strontium-89	9.16E+01	9.01E+01	1.02	Acceptable
EZA	1st / 2018	05/11/18	E12101	Milk	pCi/L	Strontium-90	8.00E+01	1.25E+02	0.64	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Iodine-131	1.05E+02	1.08E+02	0.97	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Cerium-141	7.23E+01	7.70E+01	0.94	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Cobalt-58	1.11E+02	1.14E+02	0.97	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Cobalt-60	1.90E+02	1.87E+02	1.02	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Chromium-51	3.00E+02	3.26E+02	0.92	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Cesium-134	1.58E+02	1.80E+02	0.88	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Cesium-137	1.75E+02	1.72E+02	1.02	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Manganese-54	1.36E+02	1.31E+02	1.04	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Iron-59	1.52E+02	1.39E+02	1.10	Acceptable
EZA	1st / 2018	05/11/18	E12102	Milk	pCi/L	Zinc-65	2.73E+02	2.44E+02	1.12	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Iodine-131	9.37E+01	9.10E+01	1.03	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Cerium-141	7.86E+01	7.34E+01	1.07	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Chromium-51	3.44E+02	3.10E+02	1.11	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Cesium-134	1.61E+02	1.71E+02	0.94	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Cesium-137	1.64E+02	1.64E+02	1.00	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Cobalt-58	1.92E+02	1.78E+02	1.08	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Manganese-54	1.36E+02	1.25E+02	1.09	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Iron-59	1.48E+02	1.32E+02	1.12	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Zinc-65	2.53E+02	2.33E+02	1.09	Acceptable
EZA	1st / 2018	05/11/18	E12103	Water	pCi/L	Cobalt-60	1.92E+02	1.78E+02	1.08	Acceptable
EZA	2nd/2018	07/07/18	E12171	Cartridge	pCi	Iodine-131	7.22E+01	7.16E+01	1.01	Acceptable
EZA	2nd/2018	07/07/18	E12172	Milk	pCi/L	Strontium-89	9.58E+01	8.46E+01	1.13	Acceptable
EZA	2nd/2018	07/07/18	E12172	Milk	pCi/L	Strontium-90	8.47E+00	1.14E+01	0.74	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Iodine-131	7.89E+01	7.19E+01	1.10	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Cerium-141	9.01E+01	8.22E+01	1.10	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Cobalt-58	9.26E+01	8.90E+01	1.04	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Cobalt-60	1.18E+02	1.13E+02	1.04	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Chromium-51	2.58E+02	2.39E+02	1.08	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Cesium-134	1.10E+02	1.14E+02	0.97	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Cesium-137	1.04E+02	9.88E+01	1.05	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Manganese-54	1.42E+02	1.30E+02	1.09	Acceptable

TABLE D-4
2018 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Iron-59	8.87E+01	8.60E+01	1.03	Acceptable
EZA	2nd/2018	07/07/18	E12173	Milk	pCi/L	Zinc-65	1.83E+02	1.57E+02	1.16	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Iodine-131	7.31E+01	7.44E+01	0.98	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Cerium-141	1.02E+02	8.58E+01	1.19	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Chromium-51	2.73E+02	2.49E+02	1.10	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Cesium-134	1.06E+02	1.19E+02	0.89	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Cesium-137	9.86E+01	1.03E+02	0.96	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Cobalt-58	9.76E+01	9.29E+01	1.05	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Manganese-54	1.47E+02	1.35E+02	1.09	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Iron-59	1.08E+02	8.97E+01	1.20	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Zinc-65	1.97E+02	1.64E+02	1.20	Acceptable
EZA	2nd/2018	07/07/18	E12174	Water	pCi/L	Cobalt-60	1.22E+02	1.18E+02	1.03	Acceptable
EZA	3rd/2018	11/12/18	E12240	Cartridge	pCi	Iodine-131	7.95E+01	8.03E+01	0.99	Acceptable
EZA	3rd/2018	11/12/18	E12241	Milk	pCi/L	Strontium-89	8.57E+01	8.17E+01	1.05	Acceptable
EZA	3rd/2018	11/12/18	E12241	Milk	pCi/L	Strontium-90	9.22E+00	1.48E+01	0.62	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Iodine-131	7.18E+01	5.82E+01	1.23	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Cerium-141	1.43E+02	1.28E+02	1.12	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Chromium-51	2.54E+02	2.65E+02	0.96	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Cesium-134	1.18E+02	1.23E+02	0.96	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Cesium-137	1.53E+02	1.47E+02	1.04	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Cobalt-58	1.54E+02	1.44E+02	1.07	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Manganese-54	1.84E+02	1.67E+02	1.09	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Iron-59	1.20E+02	1.19E+02	1.01	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Zinc-65	2.44E+02	2.01E+02	1.22	Acceptable
EZA	3rd/2018	11/12/18	E12242	Milk	pCi/L	Cobalt-60	2.02E+02	1.90E+02	1.06	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Iodine-131	6.76E+01	6.25E+01	1.08	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Cerium-141	1.48E+02	1.33E+02	1.11	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Chromium-51	2.92E+02	2.75E+02	1.06	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Cesium-134	1.20E+02	1.28E+02	0.94	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Cesium-137	1.64E+02	1.54E+02	1.07	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Cobalt-58	1.53E+02	1.50E+02	1.02	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Manganese-54	1.91E+02	1.74E+02	1.1	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Iron-59	1.39E+02	1.24E+02	1.12	Acceptable
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Zinc-65	2.41E+02	2.09E+02	1.15	Acceptable

TABLE D-4
2018 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	3rd/2018	11/12/18	E12243	Water	pCi/L	Cobalt-60	2.09E+02	1.98E+02	1.06	Acceptable
EZA	4th/2018	01/23/19	E12346	Cartridge	pCi	Iodine-131	8.92E+01	8.98E+01	0.99	Acceptable
EZA	4th/2018	01/23/19	E12347	Milk	pCi/L	Strontium-89	8.67E+01	9.19E+01	0.94	Acceptable
EZA	4th/2018	01/23/19	E12347	Milk	pCi/L	Strontium-90	1.07E+01	1.33E+01	0.80	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Iodine-131	9.58E+01	9.33E+01	1.03	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Cerium-141	1.37E+02	1.33E+02	1.03	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Chromium-51	2.66E+02	2.98E+02	0.89	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Cesium-134	1.52E+02	1.71E+02	0.89	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Cesium-137	1.25E+02	1.21E+02	1.03	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Cobalt-58	1.19E+02	1.19E+02	1.00	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Manganese-54	1.70E+02	1.54E+02	1.10	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Iron-59	1.25E+02	1.14E+02	1.09	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Zinc-65	2.75E+02	2.64E+02	1.04	Acceptable
EZA	4th/2018	01/23/19	E12348	Milk	pCi/L	Cobalt-60	2.12E+02	2.12E+02	1.00	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Iodine-131	8.19E+01	8.04E+01	1.02	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Cerium-141	1.26E+02	1.24E+02	1.02	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Chromium-51	3.20E+02	2.78E+02	1.15	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Cesium-134	1.41E+02	1.60E+02	0.88	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Cesium-137	1.21E+02	1.13E+02	1.07	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Cobalt-58	1.09E+02	1.11E+02	0.99	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Manganese-54	1.51E+02	1.44E+02	1.05	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Iron-59	1.16E+02	1.07E+02	1.09	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Zinc-65	2.76E+02	2.46E+02	1.12	Acceptable
EZA	4th/2018	01/23/19	E12349	Water	pCi/L	Cobalt-60	2.06E+02	1.98E+02	1.04	Acceptable

TABLE D-5

2018 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Americium-241	1.84		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Cesium-134	1.85		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Cesium-137	4.85	4.6	Sens. Eval.	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Cobalt-57	798	826	578 - 1074	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Cobalt-60	581	560	392 - 728	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Iron-55	67		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Manganese-54	1060	1010	707 - 1313	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Nickel-63	1.05		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Plutonium-238	42.7	45.2	31.6 - 58.8	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Plutonium-239/240	46.9	50.8	35.6 - 66.0	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Potassium-40	649	577	404 - 750	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Strontium-90	-1.08		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Technetium-99	890	980	686 - 1274	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	U-234/233	58.9	52.9	37.0 - 68.8	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Uranium-238	134	141	99 - 183	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaS38	Soil	Bq/Kg	Zinc-65	1060	960	672 - 1248	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Americium-241	0.685	0.709	0.496 - 0.922	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Cesium-134	9.140	10.2	7.1 - 13.3	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Cesium-137	12.8	12.2	8.5 - 15.9	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Cobalt-57	-0.042		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Cobalt-60	12.1	11.5	8.1 - 15.0	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Hydrogen-3	1.14		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Iron-55	11.90	11.1	7.8 - 14.1	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Manganese-54	9.35E-04		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Nickel-63	14.5	14.0	9.8 - 18.2	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Plutonium-238	0.014	0.023	Sens. Eval.	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Plutonium-239/240	0.586	0.600	0.420 - 0.780	Acceptable

TABLE D-5

2018 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Potassium-40	-0.23		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Radium-226	0.249	0.257	0.180 - 0.334	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Strontium-90	10.70	11.400	8.0 - 14.8	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Technetium-99	3.84	4.4	3.06 - 5.68	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Uranium-234/233	0.45	0.43	0.301 - 0.559	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Uranium-238	0.48	0.44	0.306 - 0.568	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-MaW38	Water	Bq/L	Zinc-65	15.7	14.30	0.0 - 18.6	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-235	0.076	0.0739	0.0517 - 0.0961	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-238	10.60	10.4	7.3 - 13.5	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-Total	10.68	10.5	7.4 - 13.7	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Americium-241	0.0646	0.0670	0.047 - 0.087	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Cesium-134	0.72	0.675	0.473 - 0.878	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Cesium-137	-0.023		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Cobalt-57	1.22	1.18	0.83 - 1.53	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Cobalt-60	0.010		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Manganese-54	1.08	1.03	0.72 - 1.34	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Plutonium-238	0.0440	0.0445	0.0312 - 0.0579	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Plutonium-239/240	0.0010		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Strontium-90	0.840	1.010	0.71 - 1.31	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Uranium-234/233	0.121	0.124	0.087 - 0.161	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Uranium-238	0.126	0.128	0.090 - 0.166	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdF38	Filter	Bq/sample	Zinc-65	1.54	1.33	0.93 - 1.73	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Americium-241	0.107	0.106	0.074 - 0.138	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cesium-134	3.17	3.23	2.26 - 4.2	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cesium-137	4.03	3.67	2.57 - 4.77	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cobalt-57	4.76	4.42	3.09 - 5.75	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cobalt-60	2.49	2.3	1.60 - 2.98	Acceptable

TABLE D-5

2018 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Manganese-54	3.02	2.66	1.86 - 3.46	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Plutonium-238	0.0005		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Plutonium-239/240	0.0679	0.0770	0.054 - 0.1	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Strontium-90	0.61	0.675	0.473 - 0.878	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Uranium-234/233	0.21	0.179	0.125 - 0.233	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Uranium-238	0.197	0.186	0.130 - 0.242	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Zinc-65	0.02		False Pos Test	Acceptable
MAPEP	2nd/2018	05/31/18	MAPEP-18-XaW38	Water	Bq/L	Iodine-129	2.00	1.93	1.35 - 2.51	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Americium-241	55.4	55.5	38.9 - 72.2	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Cesium-134	693	781	547 - 1015	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Cesium-137	598	572	400 - 744	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Cobalt-57	1080	958	671 - 1245	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Cobalt-60	595	608	426 - 790	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Iron-55	434	512	358 - 666	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Manganese-54	0.24		False Pos Test	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Nickel-63	793	765	536 - 995	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Plutonium-238	55.2	57.0	39.9 - 74.1	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Plutonium-239/240	-0.33	0.34	Sens. Eval	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Potassium-40	556	566	396 - 736	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Strontium-90	162	193	135 - 251	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Technetium-99	239	252	176 - 328	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	U-234/233	113	160	112 - 208	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Uranium-238	224	276	193 - 359	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaS39	Soil	Bq/Kg	Zinc-65	537	500	350 - 650	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Americium-241	0.007		False Pos Test	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Cesium-134	7.94	8.7	6.1 - 11.3	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Cesium-137	7.41	6.9	4.8 - 9.0	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Cobalt-57	15.1	14.9	10.4 - 19.4	Acceptable

TABLE D-5

2018 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Cobalt-60	0.0408		False Pos Test	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Hydrogen-3	331	338	237 - 439	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Iron-55	8.41	9.0	6.3 - 11.7	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Manganese-54	13.2	12.5	8.8 - 16.3	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Nickel-63	6.14	7.0	4.9 - 9.1	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Plutonium-238	0.591	0.67	0.472 - 0.876	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Plutonium-239/240	0.801	0.928	0.650 - 1.206	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Potassium-40	0.884		False Pos Test	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Radium-226	0.566	0.44	0.309 - 0.575	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Strontium-90	8.24	9.41	6.59 - 12.23	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Technetium-99	3.87	3.39	2.73 - 4.41	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Uranium-234/233	2.13	2.11	1.48 - 2.74	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Uranium-238	2.170	2.180	1.53-2.83	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-MaW39	Water	Bq/L	Zinc-65	8.52	7.53	5.27-9.79	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-235	0.0936	0.0913	0.0650 - 0.1208	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-238	13.4	12.7	8.9 - 16.5	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	ug/sample	Uranium-Total	13.5	12.8	9.0 - 16.6	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Americium-241	0.0919	0.0913	0.0639 - 0.1187	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Cesium-134	0.431	0.444	0.311 - 0.577	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Cesium-137	0.338	0.345	0.242 - 0.449	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Cobalt-57	0.598	0.592	0.414 - 0.770	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Cobalt-60	0.338	0.294	0.206 - 0.382	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Manganese-54	0.326	0.266	0.186 - 0.346	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Plutonium-238	0.000398	0.0011	Sens. Evaluation	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Plutonium-239/240	0.0672	0.0698	0.0489 - 0.0907	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Strontium-90	-0.026		False Pos Test	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Uranium-234/233	0.148	0.152	0.106 - 0.198	Acceptable

TABLE D-5

2018 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Uranium-238	0.150	0.158	0.111 - 0.205	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdF38	Filter	Bq/sample	Zinc-65	0.229	0.201	Sens. Evaluation	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Americium-241	0.0851	0.0930	0.065 - 0.121	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cesium-134	1.74	1.94	1.36 - 2.52	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cesium-137	2.42	2.36	1.65 - 3.07	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cobalt-57	3.24	3.31	2.32 - 4.30	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Cobalt-60	1.69	1.68	1.18 - 2.18	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Manganese-54	2.59	2.53	1.77 - 3.29	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Plutonium-238	0.0680	0.070	0.049 - 0.091	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Plutonium-239/240	0.0605	0.0620	0.043 - 0.081	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Strontium-90	0.718	0.791	0.554 - 1.028	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Uranium-234/233	0.136	0.138	0.097 - 0.179	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Uranium-238	0.140	0.143	0.100 - 0.186	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-RdV38	Vegetation	Bq/sample	Zinc-65	1.51	1.37	0.96 - 1.78	Acceptable
MAPEP	4th/2018	12/03/18	MAPEP-18-XaW39	Alk. Water	Bq/L	Iodine-129	1.63	1.62	1.13 - 2.11	Acceptable

TABLE D-6
2018 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range	Evaluation
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Barium-133	97.6	95.1	80.2 - 105	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Cesium-134	64.9	65.6	53.4 - 72.2	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Cesium-137	117	112	101 - 126	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Cobalt-60	122	114	103 - 128	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Zinc-65	320	277	249 - 324	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Gross Alpha	67.7	72.4	38.1 - 89.2	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Gross Alpha	66.4	72.4	38.1 - 89.2	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Gross Beta	47.6	54.8	37.5 - 61.7	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Radium-226	16.2	14.2	10.6 - 16.3	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Radium-226	16.3	14.2	10.6 - 16.3	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Radium-226	5	4.21	2.43 - 5.81	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Radium-228	4.44	4.21	2.43 - 5.81	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Radium-228	65.4	58.6	47.8 - 64.5	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Uranium (Nat)	56.4	58.6	47.8-64.5	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Uranium (Nat)	65.4	58.6	47.8 - 64.5	Not Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	µg/L	Uranium (Nat) mass	97.6	86.2	70.3 - 94.9	Not Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	µg/L	Uranium (Nat) mass	93.3	86.2	70.3 - 94.9	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Tritium	20000	21200	18600 - 23300	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Tritium	20200	21200	18600 - 23300	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Strontium-89	59.7	65.2	52.9 - 73.2	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Strontium-89	68.6	65.2	52.9 - 73.2	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Strontium-90	36.1	39.2	28.8 - 45.1	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Strontium-90	36.9	39.2	28.8 - 45.1	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Iodine-131	25.3	28.1	23.4 - 33.0	Acceptable
ERA	1st / 2018	2/26/18	RAD-112	Water	pCi/L	Iodine-131	28.6	28.1	23.4 - 33.0	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Barium-133	28.5	25.6	19.9 - 29.4	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Cesium-134	15.9	15.7	11.4 - 18.2	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Cesium-137	196	192	173 - 213	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Cobalt-60	122	119	107 - 133	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Zinc-65	196	177	159 - 208	Acceptable

TABLE D-6
2018 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS (GEL)

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range	Evaluation
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Gross Alpha	15.5	16	7.79 - 22.6	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Gross Alpha	18.2	16	7.79 - 22.6	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Gross Beta	43.6	49	33.2 - 56.1	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Radium-226	8.44	9.08	6.81 - 10.6	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Radium-228	2.72	2.28	1.07 - 3.60	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Radium-228	3.3	2.28	1.07 - 3.60	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Uranium (Nat)	53.8	51.8	42.2 - 57.1	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Uranium (Nat)	50.3	51.8	42.2 - 57.1	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	µg/L	Uranium (Nat) mass	80.3	75.5	61.5 - 83.2	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	µg/L	Uranium (Nat) mass	78.36	75.5	61.5 - 83.2	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	µg/L	Uranium (Nat)mass	77.8	75.5	61.5 - 83.2	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Tritium	19900	20400	17900 - 22400	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Tritium	21200	20400	17900 - 22400	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Strontium-89	61.5	62.7	50.7 - 70.6	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Strontium-89	69	62.7	50.7 - 70.6	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Strontium-90	34.4	40.1	29.5 - 46.1	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Strontium-90	36.2	40.1	29.5 - 46.1	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Iodine-131	25.6	28.1	23.4 - 33.0	Acceptable
ERA	3rd / 2018	08/23/18	RAD-114	Water	pCi/L	Iodine-131	28.7	28.1	23.4 - 33.0	Acceptable