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THREE MILE ISLAND NUCLEAR STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2015

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Three Mile Island Nuclear Station (TMINS) by Exelon covers the period 1 January 2015 through 31 December 2015. During that time period, 1,694 analyses were performed on 1,305 samples. In assessing all the data gathered for this report and comparing these results with preoperational data and operational REMP data, it was concluded that the operation of TMINS had no adverse radiological impact on the environment.

Surface, drinking and effluent water samples were analyzed for concentrations of tritium and gamma emitting nuclides. Surface, drinking and effluent water samples were also analyzed for concentrations of I-131. Drinking and effluent water samples were also analyzed for concentrations of gross beta. Effluent water samples were also analyzed for concentrations of Sr-89 and Sr-90. All groundwater, precipitation water and storm water results are now being reported in the ARGPPR, Appendix F. No I-131, Sr-89 and Sr-90 activities were detected. Gross beta concentrations detected were consistent with those detected in previous years. Tritium activity in 11 surface water samples, two drinking water samples and 11 monthly effluent water samples was due to TMINS activities or releases. No other fission or activation products potentially attributed to TMI liquid releases were detected.

Fish (predator and bottom feeder) and sediment samples were analyzed for concentrations of gamma emitting nuclides. Fish samples were also analyzed for concentrations of Sr-90. No Sr-90 activity was detected. No fission or activation products were detected in fish samples. Cesium-137 was detected in one sediment sample. Occasionally Cs-137 is detected at very low levels (just above LLD) and is not distinguishable from background levels.

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. Gross beta activity is consistent with data from previous years. Cosmogenic Be-7 was detected at levels consistent with those detected in previous years. No other activation products were detected.

High sensitivity I-131 analyses were performed on weekly air samples. All results were less than the minimum detectable activity for I-131.

Cow milk samples were analyzed for concentrations of I-131, gamma emitting nuclides, Sr-89 and Sr-90. No I-131, Sr-89 or Sr-90 activities were detected. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. Occasionally Sr-90 activities are detected and are consistent with those detected in previous years and were attributed to fallout from nuclear weapons testing. No other fission or activation products were found.

Food Product samples were analyzed for concentrations of gamma emitting nuclides (including I-131) and Sr-90. Strontium-90 activity was detected in both the indicator and control samples. This was a result of plant uptake of Sr-90 in soil as a result of past nuclear weapons testing. Concentrations of naturally

occurring Be-7 and K-40 were consistent with those detected in previous years. No other fission or activation products were detected.

Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry (OSLD) were deployed and Thermo-luminescent Dosimetry (TLD) were discontinued. This change resulted in a slight change in process and reporting of quarterly results. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

In conclusion, radioactive materials related to TMINS operations were detected in environmental samples, but the measured concentrations were low and consistent with measured effluents. The environmental sample results verified that the doses received by the public from TMINS effluents in 2015 were well below applicable dose limits and only a small fraction of the doses received from natural background radiation. Additionally, the results indicated that there was no permanent buildup of radioactive materials in the environment and no increase in background radiation levels.

Therefore, based on the results of the radiological environmental monitoring program (REMP) and the doses calculated from measured effluents, TMINS operations in 2015 did not have any adverse effects on the health of the public or on the environment.

II. Introduction

The Three Mile Island Nuclear Station (TMINS), consisting of two pressurized water reactors (PWR), is located on the northern end of Three Mile Island in the Susquehanna River approximately 2.5 miles south of Middletown in Londonderry Township, Dauphin County, Pennsylvania. TMI-1 is owned and operated by Exelon and became operational in 1974. TMI-2 is operated by GPU Nuclear, Inc. and owned by Metropolitan Edison (50%), Pennsylvania Electric (25%) and Jersey Central Power & Light (25%). TMI-2 became operational in 1978 and was shut down following the 1979 accident. At the end of 1993 TMI-2 was placed in a condition called Post-Defueling Monitored Storage. TMI-2 is maintained by Exelon under contract with GPU Nuclear.

A Radiological Environmental Monitoring Program (REMP) for TMINS was initiated in 1974. This report covers those analyses performed by Teledyne Brown Engineering (TBE), Landauer and Environmental Inc. (Midwest Labs) on samples collected during the period 1 January 2015 through 31 December 2015.

A. Objective of the REMP

The objectives of the REMP are to:

1. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.

2. Provide data on measurable levels of radiation and radioactive materials in the site environs.

3. To verify inplant controls for the containment of radioactive materials.

4. To determine buildup of long-lived radionuclides in the environment and changes in background radiation levels.

5. To provide reassurance to the public that the program is capable of adequately assessing impacts and identifying noteworthy changes in the radiological status of the environment.

6. To fulfill the requirements of the TMI-1 and TMI-2 Technical Specifications.

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways.

2. Establishing baseline radiological data of media within those pathways.

3. Continuously monitoring those media before and during Station operation to assess Station radiological effects (if any) on man and the environment.

III. Program Description

A. Sample Collection

Samples for the TMINS REMP were collected for Exelon by Normandeau Associates, RMC Environmental Services Division (RMC). This section describes the general collection methods used by RMC to obtain environmental samples for the TMINS REMP in 2015. Sample locations and descriptions can be found in Tables B-1 and B-2, and Figures B-1 through B-3, Appendix B. The collection procedures used by RMC are listed in Table B-3.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, drinking water, effluent water, fish and sediment. Two gallon water samples were collected monthly from continuous samplers located at two surface water locations (J1-2 and Q9-1), three drinking water locations (G15-2, G15-3 and Q9-1), and one effluent water location (K1-1). A composite of weekly grab samples at one surface water location (A3-2) were collected. The control locations were A3-2 and Q9-1. All groundwater and storm water results are now being reported in the ARGPPR, Appendix F. All water samples were collected in unused plastic bottles, which were rinsed at least twice with source water prior to collection. Fish samples comprising the flesh of two groups, bottom feeders and predators, were collected semiannually at an upstream control (BKG) and a downstream Indicator (IND) location. Location IND could be affected by TMINS' effluent releases. Sediment samples composed of recently deposited substrate were collected semiannually at three locations (A1-3, J2-1 and K1-3). In addition, one sediment sample was collected annually at the East Dike Catch Basin

(EDCB). Location A1-3 was the control.

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulates, airborne iodine, milk and food product. Airborne iodine and particulate samples were collected and analyzed weekly at seven locations (A3-1, E1-2, F1-3, G2-1, H3-1, M2-1 and Q15-1). The control location was Q15-1. Airborne iodine and particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters attached. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The filters were replaced weekly and sent to the laboratory for analysis.

Terrestrial Environment

The terrestrial environment was evaluated by performing radiological analyses on samples of milk and food product. Milk samples were collected biweekly at five locations (E2-2, F4-1, G2-1, K15-3 and P4-1) from March through November, and monthly from December through February. The control location was K15-3. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite and shipped promptly to the laboratory.

Food products were collected monthly at three locations (B10-2, E1-2 and H1-2), in lieu of milk sampling and annually from the four food product groups at two locations (B10-2 and H1-2). B10-2 was the control location for both annual and monthly sampling. Three different kinds of vegetation samples and seven different kinds of vegetation leaves were collected and placed in new unused plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry (OSLD) were deployed and Thermo-luminescent Dosimetry (TLD) were discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation). The OSLDs were placed at locations on and around the TMINS site as follows:

A site boundary ring consisting of 19 locations (A1-4, B1-2, C1-2, D1-1, E1-4, F1-2, F1-4, G1-3, G1-5, G1-6, H1-1, J1-3, K1-4, L1-1, M1-1, N1-3, P1-2, Q1-2 and R1-1) near and within the site perimeter representing fence post doses (i.e., at locations where the doses will be potentially greater than maximum annual off–site doses) from TMINS release.

An indicator ring consisting of 60 locations (A3-1, A5-1, A9-3; B1-1, B2-1, B5-1, B10-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F2-1, F5-1, F10-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J1-1, J3-1, J5-1, J7-1 K2-1, K3-1, K5-1, K8-1, L1-2, L2-1, L5-1, L8-1, M1-2, M2-1, M5-1, M9-1, N1-1, N2-1, N5-1, N8-1, P1-1, P2-1, P5-1, P8-1, Q1-1, Q2-1, Q5-1, Q9-1, R1-2, R3-1, R5-1 and R9-1) extending to approximately 10 miles from the site, designed to measure possible exposures to close-in population.

The balance of 11 locations (D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1 and R15-1) represent control areas.

The specific dosimeter locations were determined by the following criteria:

1. The presence of relatively dense population;

2. Site meteorological data taking into account distance and elevation for each of the sixteen–22 1/2 degree sectors around the site, where estimated annual dose from TMINS, if any, would be most significant;

3. On hills free from local obstructions and within sight of the vents (where practical);

4. And near the closest dwelling to the vents in the prevailing downwind direction.

Each station has two Al_2O_3:C Optically Stimulated Luminescence Dosimeters enclosed in plastic placed at each location in a frame located approximately three to six feet above ground level. Since each OSLD responds to radiation independently, this provides two independent detectors at each station.

B. Sample Analysis

This section describes the general analytical methods used by TBE and Midwest Labs to analyze the environmental samples for radioactivity for the TMINS REMP in 2015. The analytical procedures used by the laboratories are listed in Table B-3.

In order to achieve the stated objectives the current program includes the following analyses:

1. Concentrations of beta emitters in drinking and effluent water and air particulates.

2. Concentrations of gamma emitters in surface, drinking, and effluent water, air particulates, milk, fish, sediment and food products.

3. Concentrations of tritium in surface, drinking and effluent water.

4. Concentrations of I-131 in surface, drinking and effluent water, air, milk and food products.

5. Concentrations of strontium in effluent water, fish, milk and food products.

6. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

Data were compared to previous years' operational data for consistency and trending. In addition, comparison to pre-operational data is sometimes made. For the purpose of this report, TMINS was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD was intended as a before the fact estimate of a system (including instrumentation, procedure and sample type) and not as an after the fact criteria for the presence of activity. All analyses were designed to achieve the required TMINS detection capabilities for environmental sample analysis.

The minimum detectable concentration (MDC) is defined above with the exception that the measurement is an after the fact estimate of the presence of activity.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity affecting a negative number. An MDC was reported in all cases where positive activity was not detected. Gamma spectroscopy results for each type of sample were grouped as follows:

For surface, drinking, and effluent water 11 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For fish eight nuclides, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Cs-134 and Cs-137 were reported.

For sediment six nuclides, K-40, Mn-54, Co-58, Co-60, Cs-134 and Cs-137 were reported.

For air particulate eight nuclides, Be-7, Mn-54, Co-58, Co-60, Nb-95, Zn-95, Cs-134 and Cs-137 were reported.

For milk five nuclides, K-40, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For food products five nuclides, Be-7, K-40, I-131, Cs-134 and Cs-137 were reported.

Means and standard deviations of the results were calculated. The standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

D. Program Exceptions

For 2015 the TMINS REMP had a sample recovery rate in excess of 99%. Issue Reports (IR) were initiated to document significant exceptions and missing samples. All exceptions are listed below:

AIR

Q15-1

1. For the sampling period 02/05/15 to 02/12/15, the vacuum pump malfunctioned. Pump and timer were operating but not pulling any

vacuum. Per procedures, samples were invalid and not sent to the lab for analyses. Pump was replaced on 02/14/15, and sampler was returned to service. For sampling period 02/12/15 – 02/19/15, the total volume was impacted, but per procedures, the samples were valid and sent to the lab for analysis. (IR 2500642)

G2-1

2. For the sampling period 04/02/15 to 04/09/15 and 04/09/15 to 04/16/15, there were lower than expected run times and air volumes due to power interruptions. Maintenance work was in-progress at the farm which is now completed. Per procedure, the samples were still valid and sent to the lab for analysis. Offsite lab still achieved required LLD for iodine sampling and particulate results were normal. (IR 2500733)

H3-1

3. For the sampling period 05/14/15 to 05/21/15 and 05/21/15 to 05/28/15, the breaker was found tripped. The breaker was reset and sampler was returned to service. Sample volumes were lower than normal but still valid per procedure and sent to the lab for analyses. (IR 2553457)

H3-1

4. For the sampling period 06/18/15 to 06/25/15, the sample pump malfunctioned and was found not operating. The sample volume was insufficient. Per procedure, the samples were not valid and were not sent for analysis. The pump was replaced on 06/26/15 and the sampler was returned to service. (IR 2553457)

H3-1

5. For the sampling period 08/19/15 to 08/27/15, a potentially invalid sample was collected. During the previous weeks collection, the vacuum switch tubing was not seated properly when connected, and as a result the run timer did not operate. The pump was operational and the sample appeared normal. The sample on and off time were used to calculate run hours as an alternate volume estimation. The samples were not valid per procedure, but were sent for analyses to the lab with the approximated volume. (IR 2553457)

E1-2

6. For the sampling period 12/03/15 to 12/10/15, the breaker was found tripped. The breaker was reset and sampler was returned to service. Sample volumes were lower than normal but still valid per procedure and sent to the lab for analysis. (IR 2631797)

WATER

1. A3-2
   Due to Swatara Creek being frozen over could not break ice and collect grab sample for 02/17/15 to 02/24/15 sampling period. February composite will consist of three rather than four samples. (IR 2500642)

   Q9-1
2. For the sampling period 04/14/15 to 04/21/15, the drinking water sampler was found with the GFI tripped. One hundred and twenty three (123) samples were missed, and insufficient sample volume was collected. Grab samples were taken to supplement the volume of water collected for the week. The GFI was reset and the sampler was returned to service.
   (IR 2500733)

   Q9-1
3. For drinking water weekly sample from 10/27/15 to 11/03/15, 105 hourly samples were missed due to a power interruption probably related to plant maintenance at the water treatment facility. Insufficient sample volume was collected to meet all QA and backup samples, and grab samples were taken to supplement the volume of water collected for the week. (IR 2631797)

   Q9-1
4. For surface water weekly sample from 12/01/15 to 12/08/15, sampler was found with GFI tripped and 97 hourly samples were missed. Sufficient sample volume was collected. The GFI was reset and the sampler was returned to service. (IR 2631797)

Dosimeter

   L2-1
1. Telephone mounting pole replaced and first quarter dosimeters could not be located. New mounting hardware was installed on the new pole for second quarter dosimeter installation. (IR 2500642)

   R3-1
2. First quarter dosimeters found under snow on the ground. Dosimeters were sent for analyses. Dosimeter analysis results were not impacted. (IR 2500642)

Vegetation

H1-2

1. Indicator vegetation plants were not mature enough to harvest for June. (IR 488572)

2. B10-2
   Due to growing season ending, only one of three monthly samples were available from the control garden for August and September. (IR 488572)

Each program exception was reviewed to understand the causes of the program exception. Sampling and maintenance errors were reviewed with the personnel involved to prevent recurrence. Occasional equipment breakdowns and power outages were unavoidable.

The overall sample recovery rate (>99%) indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

E. Program Changes

There were no changes to the program in 2015.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly from a continuous sampler at two locations (J1-2 and Q9-1) and weekly grab samples from one location (A3-2). Weekly samples were composited on a monthly schedule. Of these locations only J1-2 located downstream could be affected by TMINS' effluent releases. The following analyses were performed:

Tritium

Monthly samples from J1-2 and Q9-1 were analyzed for tritium activity (Table C–I.1, Appendix C). Positive tritium activity was detected in 11 of 12 samples at location J1-2 which is located immediately downstream of the TMINS effluent outfall. The concentrations ranged from 454 to 6,250 pCi/l. The increased

tritium concentrations detected were a result of TMINS releasing radwaste treatment system effluent water under permitted discharges in accordance with NRC regulations. The indicator surface water sample is taken just downstream of the liquid discharge outfall where mixing of liquid effluents with the river water is incomplete. More complete mixing is not achieved until liquid effluents pass over the York Haven Dam. This water is normally not consumed by humans. The concentrations detected were well below any regulatory limits (Figures C–1 and C–2, Appendix C).

Iodine

Monthly samples were taken from location A3-2. This is a control or background station sampled because known medical discharges of radiopharmaceuticals occur into the surface water upstream of TMI from a nearby hospital.

Monthly samples were taken from A3-2 and analyzed for I-131. (Table C–I.2, Appendix C). Iodine-131 activity was not detected in any samples.

Gamma Spectrometry

Locations J1-2 and Q9-1 were analyzed for gamma emitting nuclides (Table C–I.3, Appendix C). All nuclides were less than the MDC.

2. Drinking Water

Monthly samples were collected from continuous water samplers at three locations (G15-2, G15-3 and Q9-1). Two locations (G15-2 and G15-3) could be affected by TMINS' effluent releases. The following analyses were performed:

Gross Beta

Monthly samples from all locations were analyzed for concentrations of gross beta (Tables C–II.1, Appendix C). Gross beta activity was detected in 21 of 36 samples. The concentrations ranged from 2.0 to 5.5 pCi/l. Concentrations detected were consistent with those detected in previous years (Figure C–3, Appendix C).

Iodine

Monthly samples from all locations were analyzed for concentrations of I-131 (Table C–II.2, Appendix C). Iodine-131 activity was not detected in any samples.

Tritium

Monthly samples from all locations were analyzed for tritium activity (Table C–II.3, Appendix C). Tritium was detected in two of 36. The concentrations ranged from 288 to 621 pCi/L. The hypothetical dose to the maximum exposed individual from consuming this water during both time periods was calculated as <0.009 mrem (IR 2469947/2531179 (Figures C–4, Appendix C).

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–II.4, Appendix C). All nuclides were less than the MDC.

3. Effluent Water

Monthly samples were collected from a continuous water sampler at one location (K1-1). The following analyses were performed:

Gross Beta

Monthly samples from location K1-1 were analyzed for concentrations of gross beta (Tables C–III.1, Appendix C). Gross beta was detected in all 12 samples. The concentrations ranged from 2.1 to 8.3 pCi/l. Concentrations detected were consistent with those detected in previous years.

Iodine-131

Monthly samples from location K1-1 were analyzed for concentrations of I-131 (Tables C–III.1, Appendix C). Iodine-131 was not detected in any of the samples.

Tritium

Monthly samples from location K1-1 were analyzed for tritium activity (Table C–III.1, Appendix C). Tritium activity was detected in 11 of 12 samples. The concentrations ranged from 5,440 to

106,000 pCi/l. The elevated results were a result of TMI releasing radwaste treatment system effluent water under permitted discharges in accordance with NRC regulations. These results were from the liquid discharge mixing basin. The concentrations detected agree with those obtained from the TMINS Effluent Monitoring Program. The concentrations were well below any regulatory limits. (Figure C-4, Appendix C)

Strontium

Semiannual composite samples from location K1-1 were analyzed for Sr-89 and Sr-90 (Table C–III.1, Appendix C). No strontium activity was detected. The highest MDC was calculated at <4.0 pCi/l for Sr-89 and at <0.9 pCi/l for Sr-90.

Gamma Spectrometry

Samples from location K1-1 were analyzed for gamma emitting nuclides (Table C–III.2, Appendix C). All nuclides were less than the MDC.

4. Storm Water

Storm water results are now included in the Annual Radiological Groundwater Protection Program (ARGPPR), Appendix F.

5. Ground Water

Groundwater results are now included in the Annual Radiological Groundwater Protection Program (ARGPPR), Appendix F.

6. Fish

Fish samples comprised of bottom feeders and predators were collected at two locations (IND and BKG) semiannually. Location IND could be affected by TMINS' effluent releases. The following analyses were performed:

Strontium

The edible portions of fish samples from both locations were analyzed for Sr-90 (Table C–IV.1, Appendix C). No strontium activity was detected. The highest MDC was calculated at <4.2 pCi/kg wet for Sr-90.

Gamma Spectrometry

The edible portions of fish samples from both locations were analyzed for gamma emitting nuclides (Table C–IV.2, Appendix C). Naturally occurring K-40 was found in all fish samples and ranged from 1,439 to 4,283 pCi/kg wet and was consistent with levels detected in previous years. No fission or activation products were detected.

7. Sediment

Aquatic sediment samples were collected at three locations (A1-3, J2-1 and K1-3) semiannually. Of these locations two (J2-1 and K1-3) could be affected by TMINS' effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from all locations were analyzed for gamma emitting nuclides (Table C–V.1, Appendix C). Potassium-40 was found in all sediment samples and ranged from 5,753 to 14,700 pCi/kg dry. Cs-137 was found in one sample at a concentration of 211 pCi/kg dry. No other fission or activation products were detected. Cesium-137 is occasionally found in sediment at very low levels (just above LLD) and is not distinguishable from background levels (Figure C–5, Appendix C).

B. Atmospheric Environment

1. Airborne Particulates

a. Air Particulates

Continuous air particulate samples were collected from seven locations on a weekly basis. Six locations (A3-1, E1-2, F1-3, G2-1, H3-1 and M2-1) were indicator stations located in the highest D/Q sectors and the nearest communities to TMI. One sample (Q15-1) represents the control location at a remote distance from TMINS. The following analyses were performed:

Gross Beta

Weekly samples were analyzed for concentrations of beta emitters (Table C–VI.1 and C–VI.2, Appendix C).

Detectable gross beta activity was observed at all locations. Comparison of results aid in determining the effects, if any, resulting from the operation of TMINS. The results from the closest to the site boundary locations (Group I) ranged from 6 to 31 E–3 pCi/m^3 with a mean of 16 E–3 pCi/m^3. The results from the intermediate offsite locations (Group II) ranged from 6 to 41 E–3 pCi/m^3 with a mean of 17 E–3 pCi/m^3. The results from the Control location (Group III) ranged from 7 to 36 E–3 pCi/m^3 with a mean of 18 E–3 pCi/m^3. Comparison of the 2015 air particulate data with previous years' data indicate no effects from the operation of TMINS (Figure C–6, Appendix C). In addition a comparison of the weekly mean values for 2015 indicate no notable differences between indicator and control stations (Figure C-7, Appendix C).

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–VI.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in 26 samples. These concentrations ranged from 39 to 112 E–3 pCi/m3. All other nuclides were less than the MDC.

b. Airborne Iodine

Continuous air samples were collected from seven (A3-1, E1-2, F1-3, G2-1, H3-1, M2-1 and Q15-1) locations and analyzed weekly for I-131 (Table C–VII.1, Appendix C). All results were less than the MDC for I-131.

2. Terrestrial

a. Milk

Samples were collected from five locations (K15-3, E2-2, F4-1 G2-1 and P4-1) biweekly March through November and monthly December through February. The following analyses were performed:

Iodine–131

Milk samples from all locations were analyzed for

concentrations of I-131 (Table C-VIII.1, Appendix C). All results were less than the MDC.

Strontium

Milk samples from all locations were composited quarterly and analyzed for Sr-89 and Sr-90 (Table C–VIII.2, Appendix C). No Sr-89 or Sr-90 activity was detected. Occasionally Sr-90 is detected and is consistent with those detected in the pre–operational years (Figure C-8, Appendix C).

Gamma Spectrometry

Milk samples from all locations were analyzed for concentrations of gamma emitting nuclides (Table C-VIII.3, Appendix C).

Naturally occurring K-40 activity was found in all samples. The concentrations ranged from 703 to 1,657 pCi/L. All other nuclides were less than the MDC.

b. Food Products

Food products were collected monthly at three locations (B10-2, E1-2 and H1-2), in lieu of milk sampling, and annually from the four food product groups at two locations (B10-2, E1-2 and H1-2). B10-2 was the control location for both annual and monthly sampling. The following analyses were performed:

Strontium

Nineteen of 25 food product samples were analyzed for concentrations of Sr-90 (Table C-IX.1, Appendix C). Strontium-90 activity was detected in eight of 19 samples. The concentrations ranged from 3 to 11 pCi/kg wet.

Gamma Spectrometry

Each food product sample was analyzed for concentrations of gamma emitting nuclides (Table C–IX.1, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in 14 of 25 samples. These concentrations ranged from 153 to 1,965 pCi/kg. Naturally occurring K-40 activity was found in all samples. The concentrations ranged from

1,996 to 7,653 pCi/kg. All other nuclides were less than the MDC.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Optically Stimulated Luminescence Dosimeter (OSLD). Ninety OSLD locations were established around the site. Results of OSLD measurements are listed in Tables C–X.1 to C–X.3, Appendix C

All of the OSLD measurements were below 40 mR/quarter, with a range of 17.2 to 37.8 mR/standard quarter. A comparison of the Site Boundary and Indicator data to the Control Location data, indicate that the ambient gamma radiation levels from the Control Locations D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1 and R15-1 averaged higher than indicator stations. Locations D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1 and R15-1 have a historical high bias, and this bias is most likely due to radon and other naturally occurring nuclides, e.g. K-40, emanating from the ground.

D. Land Use Survey

A Land Use Survey conducted in the July through November 2015 growing season around the Three Mile Island Nuclear Station (TMINS) was performed by Normandeau Associates, RMC Environmental Services Division for Exelon to comply with Sections 8.2 of the Plant's Offsite Dose Calculation Manual (ODCM). The purpose of the survey was to document the nearest resident, milk-producing animal and garden of greater than 500 ft^2 in each of the sixteen 22 ½ degree sectors around the site. For 2015, a meat census was also performed. The results of these surveys are summarized below.

Distance in Miles from the TMINS Reactor Buildings					
Sector		Residence Miles	Garden Miles	Milk Farm Miles	Meat Animal Miles
1	N	1.1	1.6	2.1	2.1
2	NNE	0.7	1.2	-	2.4
3	NE	0.5	1.1	4.2	2.4
4	ENE	0.5	0.5	4.5	1.1
5	E	0.4	0.5	1.1	1.1
6	ESE	1.1	1.2	3.2	1.1
7	SE	0.7	1.6	1.4	1.4
8	SSE	0.7	0.8	-	1.8
9	S	2.3	2.5	-	3.3
10	SSW	0.6	1.6	4.9, 14.4	4.9
11	SW	0.5	1.0	-	-
12	WSW	0.5	1.3	-	-
13	W	0.7	1.4	-	-
14	WNW	0.4	1.7	3.7	2.4
15	NW	0.4	1.2	-	-
16	NNW	1.1	2.4	-	-

E. Radiological Impact of TMINS Operations

An assessment of potential radiological impact indicated that radiation doses to the public from 2015 operations at TMINS were well below all applicable regulatory limits and were significantly less than doses received from natural sources of radiation. The 2015 whole body dose potentially received by an assumed maximum exposed individual from TMI-1 and TMI-2 liquid and airborne effluents was conservatively calculated to be 0.12 mrem. This dose is equivalent to 0.04% of the dose that an individual living in the TMI area receives each year from natural background radiation.

1. Determination of Radiation Doses to the Public

Dose assessments can be performed by using either effluent data and an environmental transport model or environmental sample data. To the extent possible, doses to the public are based on the direct measurement of dose rates from external sources and the measurement of radionuclide concentrations in environmental media which may contribute to an internal dose of radiation. Optically Stimulated Luminescent Dosimetry (OSLDs) positioned in the environment around TMINS provide measurements to determine external radiation doses to humans. Samples of air, water and food products are used to determine internal doses.

The quantity of radioactive materials released during normal

operations are typically too small to be measured once distributed in the offsite environment. Therefore, the potential offsite doses are more effectively calculated for TMINS operations using a computerized model that predicts concentrations of radioactive materials in the environment and subsequent radiation doses based on measured effluents.

Doses are calculated using a model that incorporates the guidelines and methodology set forth by the USNRC in Regulatory Guide 1.109 and NUREG 0133. Due to the conservative assumptions that are used in the model, the calculated doses are generally higher than the doses based on actual environmental sample concentrations.

Therefore, the model predicts doses that are higher than actual doses received by people. The type and amount of radioactivity released from TMINS is calculated using measurements from effluent sample analyses.

Airborne releases are diluted and carried away from the site by atmospheric diffusion, which continuously acts to disperse radioactivity. Variables that affect atmospheric dispersion include wind speed, temperature at different elevations, terrain, and shift in wind direction. A weather station on the north end of TMI is linked to a data logger that records the meteorological data.

Computer models also are used to predict the downstream dilution and travel times for liquid releases into the Susquehanna River. Actual monthly Susquehanna River flows are obtained from the USGS Stream gauging station 01570500 located at Harrisburg, PA.

The human exposure pathways also are included in the model and are depicted in Figure 1. The exposure pathways that are considered for the discharge of TMINS liquid effluents are consumption of drinking water and fish. The exposure pathways considered for the discharge of TMINS airborne effluents are plume exposure, inhalation, cow milk consumption, fruit and vegetable consumption, and meat consumption.

When determining the dose to humans, it is necessary to consider all applicable pathways and all exposed tissues, summing the dose from each to provide the total dose for each organ as well as the whole body from a given radionuclide. Dose calculations involve determining the energy absorbed per unit mass in the various tissues. Thus, for radionuclides taken into the body, the metabolism of the radionuclide in the body must be known along with the

physical characteristics of the nuclide such as energies, types of radiations emitted and half-life. The dose assessment model also contains dose conversion factors for the radionuclides for each of four age groups (adults, teenagers, children and infants) and eight organs (total body, thyroid, liver, skin, kidney, lung, bone and GI tract).

2. Result of Dose Calculations

The maximum hypothetical doses due to 2015 TMI-1 and TMI-2 liquid and airborne effluents are summarized in Tables 1 and 2. Table 1 compares the calculated maximum hypothetical individual doses to the USNRC 10 CFR 50 App. I guidelines. This table also compares the calculated doses (to an individual of the public) from effluents and direct radiation to USEPA 40 CFR 190 dose limits. Table 2 presents the maximum hypothetical whole body doses to an individual. As shown in Table 1, the doses calculated for 2015 operations at TMINS were well below the Federal dose limits (USEPA 40 CFR 190) and the guidelines of USNRC 10 CFR 50 App. I. This conclusion was supported by radionuclide concentrations detected in actual environmental samples.

Doses from natural background radiation provide a baseline for assessing the potential public health significance of radioactive effluents. Natural background radiation from cosmic, terrestrial and natural radionuclides in the human body (not including radon), averages about 81 mrem/yr (Ref. 5). Additionally, the average individual living in the United States receives an annual dose of about 2,760 mrem to the lung from natural radon gas. This lung dose is considered to be equivalent to a whole (or total) body dose of 230 mrem (Ref. 5). Therefore, the average person in the United States receives a whole body dose of about 311 mrem/yr from natural background radiation sources.

As shown on Table 2, the maximum hypothetical whole body dose received by an individual from 2015 TMI-1 and TMI-2 liquid and airborne effluents combined was conservatively calculated to be 0.12 mrem. This dose is equivalent to 0.04% percent of the dose that an individual living in the TMI area receives each year from natural background radiation (311 mrem).

The low doses calculated for 2015 TMINS operations were the result of efforts to maintain releases "as low as reasonably achievable" (ALARA).

In conclusion, radioactive materials related to 2015 TMINS operations were detected in environmental samples, but the measured concentrations were low and consistent with measured effluents. The environmental sample results verified that the doses received by the public from TMINS effluents in 2015 were well below applicable dose limits and only a small fraction of the doses received from natural background radiation. Additionally, the results indicated that there was no permanent buildup of radioactive materials in the environment and no increase in background radiation levels.

Therefore, based on the results of the radiological environmental monitoring program (REMP) and the doses calculated from measured effluents, TMINS operations in 2015 did not have any adverse effects on the health of the public or on the environment.

TABLE 1

Calculated Maximum Hypothetical Doses to an Individual from 2015 TMI-1 and TMI-2 Liquid and Airborne Effluents

	Maximum Hypothetical Doses To An Individual		
	USNRC 10 CFR 50 APP. I Guidelines (mrem/yr)	**Calculated Dose (mrem/yr)**	
		TMI-1	**TMI-2**
From Radionuclides In Liquid Releases	3 total body, or	2.52E-2	4.17E-4
	10 any organ	2.62E-2	6.60E-4
From Radionuclides In Airborne Releases (Noble Gases)	5 total body, or	4.07E-4	0*
	15 skin	5.99E-4	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	15 any organ	3.88E-1	2.86E-5

*No noble gases were released from TMI-2.

	USEPA 40 CFR 190 Limits (mrem/yr)	**Calculated Dose (mrem/yr) TMI-1 and TMI-2 Combined****
Total from Site	75 thyroid	0.62
	25 total body or other organs	0.92

* *This sums together TMI-1 and TMI-2 maximum doses regardless of age group for different pathways. The combined doses include those due to radioactive effluents and direct radiation from TMINS. The direct radiation dose is calculated from environmental dosimeter data. For this calculation, exposure is assumed to be equal to dose.

The direct radiation dose from 2015 TMINS operations was 0.50 mrem. This dose was based on a maximum net fence-line exposure rate and a shoreline/fence-line occupancy factor of 67 hours (Regulatory Guide 1.109). The combination of the maximum organ dose from TMI-1 and TMI-2 effluents (0.42 mrem) and the dose from direct radiation (0.50 mrem) yielded a maximum hypothetical dose of 0.92 mrem.

TABLE 2

Calculated Whole Body Doses to the Maximum Individual From 2015 TMI-1 and TMI-2 Liquid and Airborne Effluents

	Calculated Maximum Individual Whole Body Dose (mrem/yr)	
	TMI-1	TMI-2
From Radionuclides In Liquid Releases	2.52E-2	4.17E-4
From Radionuclides in Airborne Releases (Noble Gases)	4.07E-4	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	9.83E-2	2.86E-5

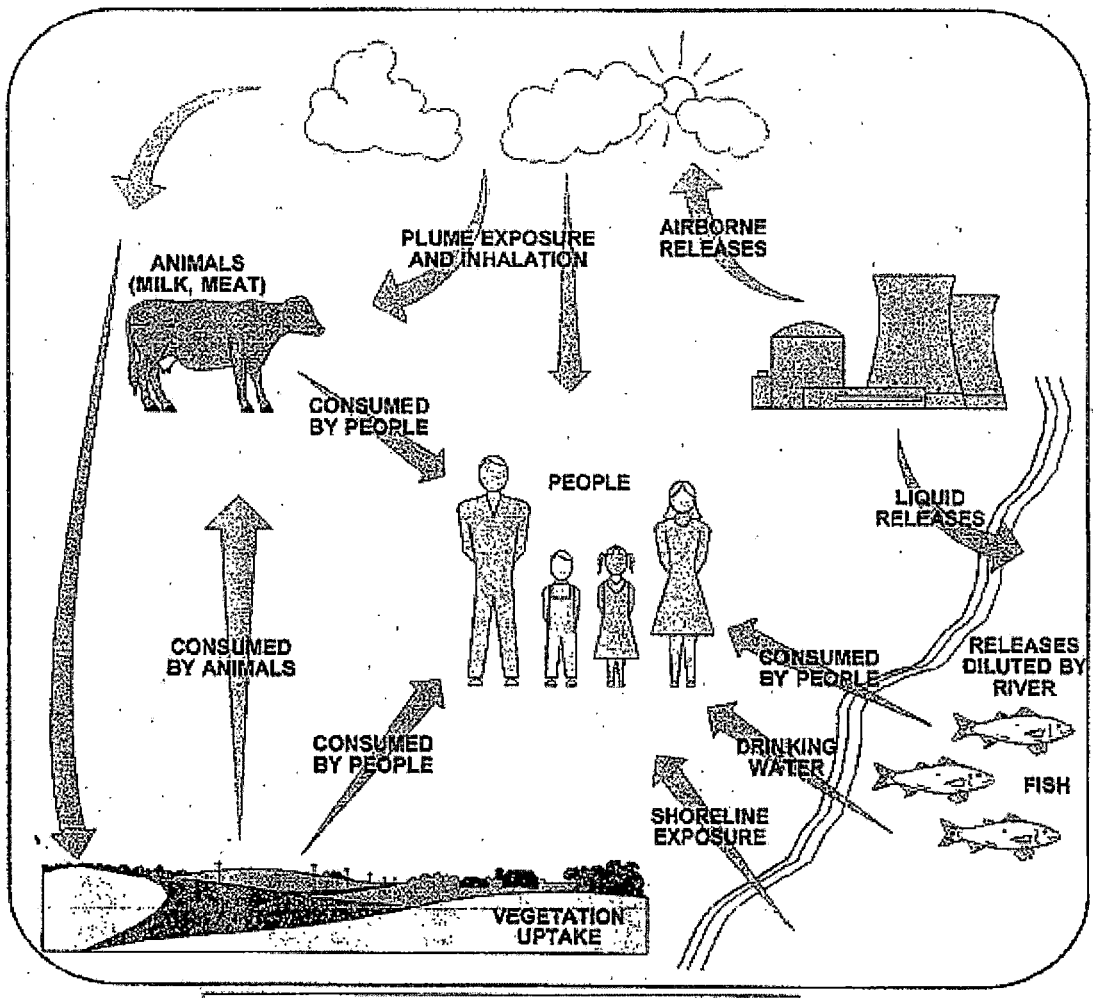
*No noble gases were released from TMI-2.

Individual Whole Body Dose Due to TMI-1 and TMI-2 Operations:	0.12 mrem/yr
Individual Whole Body Dose Due to Natural Background Radiation (1)	311 mrem/yr

(1) NCRP 160 – (2009)

Figure 1

Exposure Pathways For Radionuclides Routinely Released From TMINS



PREDOMINANT RADIONUCLIDES

NOBLE GASES (Xe,Kr)
Plume exposure

RADIOIODINES (I-131, I-133)
Inhalation and consumption of milk, water, fruits, and vegetables

RADIOSTRONTIUMS (Sr-89, Sr-90)
Consumption of milk, meat, fruits, and vegetables

ACTIVATION PRODUCTS (Co-60, Mn-54)
Shoreline exposure

RADIOCESIUMS (Cs-134, Cs-137)
Shoreline exposure and consumption of milk, meat, fish, water, fruits, and vegetables

TRITIUM (H-3)
Inhalation and consumption of water, milk, fruits, and vegetables

F. Errata Data

There is no errata data for 2015.

G. Summary of Results – Inter-Laboratory Comparison Program

The primary and secondary laboratories analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices (Appendix E). The PE samples, supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's 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-ES evaluates 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 per the USEPA, NELAC, state specific 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.

   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 bias is greater than 30%, the results are deemed not acceptable.

For the TBE laboratory, 129 out of 139 analyses performed met the specified acceptance criteria. Ten analyses (AP - Cr-51, U-234/233, Gr A, Sr-90; Soil Sr-90; Water - Ni-63, Sr-89/90, U natural; Vegetation Sr-90 samples) did not meet the specified acceptance criteria for the following reasons and were addressed through the TBE Corrective Action Program:

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.

1. Teledyne Brown Engineering's Analytics' June 2015 air particulate Cr-51 result of 323 ± 45.5 pCi was higher than the known value of 233 pCi with a ratio of 1.39. The upper ratio of 1.30 (acceptable with warning) was exceeded. The air particulate sample is counted at a distance above the surface of the detector to avoid detector summing which could alter the results. Chromium-51 has the shortest half-life (27.7 days) and the lowest gamma energy (320.08 keV) of this mixed nuclide sample. Additionally, Cr-51 has only one gamma energy and also has a low intensity (9.38 gamma photons produced per 100 disintegrations). This geometry produces a larger error for the Cr-51 and other gamma emitters as any distance from the detector decreases the counting rate and the probability of accurately detecting the nuclide energy. Taking into consideration the uncertainty, the activity of Cr-51 overlaps with the known value at a ratio of 1.19, which would statistically be considered acceptable. NCR 15-18

2. Teledyne Brown Engineering's MAPEP March 2015 soil Sr-90 result of 286 Total Bq/kg was lower than the known value of 653 Bq/kg, exceeding the lower acceptance range of 487 Bq/kg. The failure was due to incomplete digestion of the sample. Incomplete digestion of samples causes some of the sample to be left behind and is not present in the digested sample utilized for analysis. The procedure has been updated to include a more robust digestion using stirring during the heating phase. The MAPEP September 2014 soil Sr-90 series prior to this study was evaluated as acceptable with a result of 694 and an acceptance range of 601 – 1115 Bq/kg. The MAPEP September 2015 series soil Sr-90 after this study was evaluated as acceptable with a result of 429 and an acceptance range of 298 – 553 Bq/kg. This issue is specific to the March 2015 MAPEP sample. NCR 15-13

3. Teledyne Brown Engineering's MAPEP March 2015 air particulate U-234/233 result of 0.0211 ± 0.0120 Bq/sample was higher than the known value of 0.0155 Bq/sample, exceeding the upper

acceptance range of 0.0202 Bq/sample. Although evaluated as a failure, taking into consideration the uncertainty, TBE's result would overlap with the known value, which is statistically considered acceptable. MAPEP spiked the sample with significantly more U-238 activity (a found to known ratio of 0.96) than the normal U-234/233. Due to the extremely low activity, it was difficult to quantify the U-234/233. NCR 15-13

4. Teledyne Brown Engineering's MAPEP March 2015 air particulate gross alpha result of 0.448 Bq/sample was lower than the known value of 1.77 Bq/sample, exceeding the lower acceptance range of 0.53 Bq/sample. The instrument efficiency used for gross alpha is determined using a non-attenuated alpha standard. The MAPEP filter has the alphas embedded in the filter, requiring an attenuated efficiency. When samples contain alpha particles that are embedded in the sample media, due to the size of the alpha particle, some of the alpha particles are absorbed by the media and cannot escape to be counted. When the sample media absorbs the alpha particles this is known as self-absorption or attenuation. The calibration must include a similar configuration/media to correct for the attenuation. In order to correct the low bias, TBE will create an attenuated efficiency for MAPEP air particulate filters. The MAPEP September series air particulate gross alpha result of 0.47 Bq/sample was evaluated as acceptable with a range of 0.24 – 1.53 Bq/sample. Unlike the MAPEP samples, air particulate Gross alpha analyses for power plants are not evaluated as a direct count sample. Power plant air particulate filters for gross alpha go through an acid digestion process prior to counting and the digested material is analyzed. NCR 15-13

5. Teledyne Brown Engineering's MAPEP September water Ni-63 result of 11.8 ± 10.8 Bq/L was higher than the known value of 8.55 Bq/L, exceeding the upper acceptance range of 11.12 Bq/L. The Ni-63 half-life is approximately 100 years. Nickel-63 is considered to be a "soft" or low energy beta emitter, which means that the beta energy is very low. The maximum beta energy for Ni-63 is approximately 65 keV, much lower than other more common nuclides such as Co-60 (maximum beta energy of 1549 keV). The original sample was run with a 10 mL aliquot which was not sufficient for the low level of Ni-63 in the sample. The rerun aliquot of 30 mL produced an acceptable result of 8.81 Bq/L. NCR 15-21

6. Teledyne Brown Engineering's MAPEP September air particulate Sr-90 result of 1.48 Bq/sample was lower than the known value of 2.18 Bq/sample, exceeding the lower acceptance range of 1.53

Bq/sample. In the past, MAPEP has added substances (unusual compounds found in DOE complexes) to various matrices that have resulted in incomplete removal of the isotope of interest for the laboratories analyzing the cross checks. TBE suspects that this may be the cause of this error. Many compounds, if not properly accounted for or removed in the sample matrix, can cause interferences to either indicate lower activity or higher activity. TBE will no longer analyze the air particulate Sr-90 through MAPEP but will participate in the Analytics cross check program to perform both Sr-89 and Sr-90 in the air particulate matrix. NCR 15-21

7. Teledyne Brown Engineering's MAPEP September vegetation Sr-90 result of 0.386 Bq/sample was lower than the known value of 1.30 Bq/sample, exceeding the lower acceptance range of 0.91 Bq/sample. In the past, MAPEP has added substances (unusual compounds found in DOE complexes) to various matrices that have resulted in incomplete removal of the isotope of interest for the laboratories analyzing the cross checks. TBE suspects that this maybe the cause of this error. Many compounds, if not properly accounted for or removed in the sample matrix, can cause interferences to either indicate lower activity or higher activity. Results from previous performance evaluations were reviewed and shown to be acceptable. NCR 15-21

8. & 9. Teledyne Brown Engineering's ERA May water Sr-89/90 results of 45.2 and 28.0 pCi/L, respectively were lower than the known values of 63.2 and 41.9 pCi/L, respectively, exceeding the lower acceptance limits of 51.1 and 30.8 pCi/L, respectively. The yields were on the high side of the TBE acceptance range, which indicates the present of excess calcium contributed to the yield, resulting in low results. NCR 15-09

10. Teledyne Brown Engineering's ERA November water Uranium natural result of 146.9 pCi/L was higher than the known value of 56.2 pCi/L, exceeding the upper acceptance limit of 62.4 pCi/L. The technician failed to dilute the original sample, but used the entire 12 mL sample. When the results were recalculated without the dilution and using the 12 mL aliquot, the result of 57.16 agreed with the assigned value of 56.2. NCR 15-19

For the EIML laboratory, 90 of 94 analyses met the specified acceptance criteria. Four analyses (Water – Co-57, Fe-55; AP – Co-57; Soil – Sr-90) did not meet the specified acceptance criteria for the following reasons:

1. Environmental Inc., Midwest Laboratory's MAPEP February 2015 water Co-57 result of 10.2 Bq/L was lower than the known value of 29.9 Bq/L, exceeding the lower control limit of 20.9 Bq/L. The reported value should have been 27.84, which would have been evaluated as acceptable. A data entry error resulted in a non-acceptable result.

2. Environmental Inc., Midwest Laboratory's MAPEP February 2015 AP Co-57 result of 0.04 Bq/sample was lower than the known value of 1.51 Bq/ sample, exceeding the lower control limit of 1.06 Bq/sample. The reported value should have been 1.58 Bq/sample, which would have been evaluated as acceptable. A data entry error resulted in a non-acceptable result.

3. Environmental Inc., Midwest Laboratory's MAPEP August 2015 soil Sr-90 result of 231 Bq/kg was lower than the known value of 425 Bq/kg, exceeding the lower control limit of 298 Bq/kg. The incomplete separation of calcium from strontium caused a failed low result. The reanalysis result of 352 Bq/kg fell within acceptance criteria.

4. Environmental Inc., Midwest Laboratory's MAPEP August 2015 water Fe-55 result of 4.2 Bq/L was lower than the known value of 13.1 Bq/L, exceeding the lower control limit of 9.2 Bq/L. The known activity was below the routine laboratory detection limits for the available aliquot fraction.

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

V. References

1. Three Mile Island Nuclear Station, Unit 1, Technical Specifications, DPR 50.

2. Three Mile Island Nuclear Station, Unit 2, PDMS Technical Specifications, DPR 73.

3. Radiation Management Corporation. "Three Mile Island Nuclear Station, Preoperational Radiological Environmental Monitoring Program, January 1, 1974 – June 5, 1974." RMC-TR-75-17, January 1975.

4. Exelon. "Three Mile Island Nuclear Station Offsite Dose Calculation Manual (ODCM)."

5. National Council of Radiation Protection and Measurements Report No. 160. "Ionizing Radiation Exposure of the Population of the United States." 2009.

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APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2015

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320**

LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2015**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	H-3	24	2000	2307 (11/12) (454/6250)	<LLD	2307 (11/12) (454/6250)	TM-SW-J1-2 INDICATOR WEST SHORE; TMI 0.5 MILES S OF SITE	0
	I-131	12	1	NA	<LLD	-		0
	GAMMA	24						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0

THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUE
FRACTION OF DETECTABLE MEASUREMENT AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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SURFACE WATER (PCI/LITER)	ZR-95		30	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
DRINKING WATER (PCI/LITER)	GR-B	36	4	3.1 (17/24) (2.3/5.5)	2.7 (4/12) (2.0/3.7)	3.2 (10/12) (2.3/5.5)	TM-DW-G15-2 INDICATOR WRIGHTS WATER SUPPLY 13.3 MILES SE OF SITE	0
	I-131	36	1	<LLD	<LLD	-		0
	H-3	36	2000	455 (2/24) (288/621)	<LLD	455 (2/12) (288/621)	TM-DW-G15-3 INDICATOR LANCASTER WATER AUTHORITY 14.8 MILES SE OF SITE	0

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DRINKING WATER (PCI/LITER)	GAMMA	36						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0

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DRINKING WATER (PCI/LITER)	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
EFFLUENT WATER (PCI/LITER)	GR-B	12	4	4.6 (12/12) (2.1/8.3)	NA	4.6 (12/12) (2.1/8.3)	TM-EW-K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	I-131	12	1	<LLD	NA	-		0
	H-3	12	2000	31188 (11/12) (5440/106000)	NA	31188 (11/12) (5440/106000)	TM-EW-K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	SR-89	2	5	<LLD	NA	-		0
	SR-90	2	2	<LLD	NA	-		0

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FRACTION OF DETECTABLE MEASUREMENT AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2015

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320**

LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2015**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
EFFLUENT WATER (PCI/LITER)	GAMMA	12						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0

THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUE
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EFFLUENT WATER (PCI/LITER)	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
BOTTOM FEEDER (PCI/KG WET)	SR-90	4	10	<LLD	<LLD	-		0
	GAMMA	4						
	K-40		NA	2861 (2/2) (1439/4283)	2945 (2/2) (2863/3026)	2945 (2/2) (2863/3026)	BKGB CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0

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BOTTOM FEEDER (PCI/KG WET)	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
PREDATOR (PCI/KG WET)	SR-90	4	10	<LLD	<LLD	-		0
	GAMMA K-40	4	NA	3170 (2/2) (2493/3846)	3327 (2/2) (2869/3785)	3327 (2/2) (2869/3785)	BKGP CONTROL CITY ISLAND UPSTREAM OF DISCHARGE	0
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PREDATOR (PCI/KG WET)	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
SEDIMENT (PCI/KG DRY)	GAMMA	7						
	K-40		NA	11041 (5/5) (5753/14700)	12635 (2/2) (11580/13690)	14700 (1/1)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0

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SEDIMENT (PCI/KG DRY)	CO-60		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	211 (1/5)	<LLD	211 (1/1)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	362	10	17 (307/311) (6/41)	18 (51/51) (7/36)	18 (51/51) (7/36)	TM-AP-Q15-1 CONTROL WEST FAIRVIEW 13.5 MILES NW OF SITE	0
	GAMMA	28						
	BE-7		NA	66 (22/24) (39/112)	62 (4/4) (42/78)	74 (4/4) (44/103)	TM-AP-M2-1 INDICATOR FISHING CREEK; GOLDSBORO 1.3 MILES WSW OF SITE	0
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0

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AIR PARTICULATE (E-3 PCI/CU.METER)	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		50	<LLD	<LLD	-		0
	CS-137		60	<LLD	<LLD	-		0
AIR IODINE (PCI/CU.M)	GAMMA	362						
	I-131		70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	110	1	<LLD	<LLD	-		0
	SR-89	20	5	<LLD	<LLD	-		0
	SR-90	20	2	<LLD	<LLD	-		0

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MILK (PCI/LITER)	GAMMA	110						
	K-40		NA	1281 (88/88) (703/1657)	1267 (22/22) (1120/1477)	1418 (22/22) (1242/1657)	TM-M-F4-1 INDICATOR TURNPIKE ROAD FARM 3.0 MILES ESE OF SITE	0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
VEGETATION (PCI/KG WET)	SR-90	19	10	7 (4/10) (3/11)	7 (4/9) (4/8)	7 (4/9) (3/11)	H1-2 INDICATOR RED HILL MARKET 1.0 MILES SSE OF SITE	0
	GAMMA	25						
	BE-7		NA	891 (8/13) (263/1654)	737 (6/12) (153/1965)	981 (7/9) (499/1654)	H1-2 INDICATOR RED HILL MARKET 1.0 MILES SSE OF SITE	0
	K-40		NA	3872.2 (13/13) (2079/7428)	3912.8 (12/12) (1996/7653)	4163.3 (4/4) (2339/7428)	E1-2 INDICATOR TMI VISITOR'S CENTER 0.4 MILES E OF SITE	0

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
VEGETATION (PCI/KG WET)	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
DIRECT RADIATION (MILLIREM/STD.MO.)	OSLD-QUARTERLY	359	NA	22.4 (315/315) (12.1/37.8)	24.5 (44/44) (19.8/33.9)	33.1 (4/4) (30.1/37.8)	H8-1 INDICATOR SAGINAW ROAD 7.4 MILES SSE OF SITE	0

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APPENDIX B

LOCATION DESIGNATION, DISTANCE & DIRECTION, AND SAMPLE COLLECTION & ANALYTICAL METHODS

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TABLE B-1: Location Designation and Identification System for the Three Mile Island Nuclear Station

XYY-Z- General code for identification of locations, where:

X - Angular Sector of Sampling Location. The compass is divided into 16 sectors of 22 1/2 degrees each with center at Three Mile Island's Units 1 and 2 off-gas vents. Sector A is centered due North, and others are alphabetical in a clockwise direction.

YY - Radial Zone of Sampling Location in miles.

Z - Station's Numerical Designation within sector and zone, using 1, 2, 3... in each sector and zone.

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Station, 2015

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
AQS	A1-3	1	0.6	359°	N of site off north tip of TMI in Susquehanna River
ID	A1-4	1	0.3	6°	N of Reactor Building on W fence adjacent to North Weather Station, TMI
AP,AI,ID	A3-1	2	2.7	357°	N of site at Mill Street Substation
SW	A3-2	2	2.7	356°	N of site at Swatara Creek, Middletown
ID	A5-1	2	4.4	3°	N of site on Vine Street Exit off Route 283
ID	A9-3	3	8.0	2°	N of site at Duke Street Pumping Station, Hummelstown
ID	B1-1	1	0.6	25°	NNE of site on light pole in middle of North Bridge, TMI
ID	B1-2	1	0.4	24°	NNE of Reactor Building on top of dike, TMI
ID	B2-1	2	1.9	17°	NNE of site on Sunset Dr. (off Hillsdale Rd.)
ID	B5-1	2	4.9	19°	NNE of site at intersection of School House and Miller Roads
ID	B10-1	3	9.2	21°	NNE of site at intersection of West Areba Avenue and Mill Street, Hershey
FP	B10-2	3	10	31°	NNE of site at Milton Hershey School, Hershey
ID	C1-1	1	0.7	37°	NE of site along Route 441 N
ID	C1-2	1	0.3	50°	NE of Reactor Building on top of dike, TMI
ID	C2-1	2	1.5	44°	NE of site at Middletown Junction
ID	C5-1	2	4.7	43°	NE of site on Kennedy Lane
ID	C8-1	3	7.1	48°	NE of site at Schenk's Church on School House Road
AQF	Control	-	-	-	All locations where finfish are collected above Dock St. Dam, Harrisburg
ID	D1-1	1	0.2	76°	ENE of Reactor Building on top of dike, TMI
ID	D1-2	1	0.5	67°	ENE of site off Route 441 along lane between garden center and residence
ID	D2-2	2	1.6	74°	ENE of site along Hillsdale Rd. (S of Zion Rd.)
ID	D6-1	3	5.2	66°	ENE of site off Beagle Road
ID	D15-1	3	10.8	64°	ENE of site along Route 241, Lawn
AP, AI, ID, FP	E1-2	1	0.4	97°	E of site at TMI Visitor's Center
ID	E1-4	1	0.2	97°	E of Reactor Building on top of dike, TMI
M	E2-2	2	1.1	96°	E of site at farm on Pecks Road
ID	E2-3	2	2.0	97°	E of site along Hillsdale Rd. (N of Creek Rd.)
ID	E5-1	2	4.7	82°	E of site at intersection of North Market Street (Route 230) and Zeager Road
ID	E7-1	3	6.7	88°	E of site along Hummelstown Street, Elizabethtown
ID	F1-1	1	0.5	117°	ESE of site near entrance to 500 kV Substation
ID	F1-2	1	0.2	112°	ESE of Reactor Building on top of dike midway within ISWSF, TMI
AP, AI	F1-3	1	0.6	112°	ESE of site in 500 kV Substation
ID	F1-4	1	0.2	122°	ESE of Reactor Building on top of dike, TMI
ID	F2-1	2	1.3	119°	ESE of site along Engle Road
M	F4-1	2	3.2	104°	ESE of site at farm on Turnpike Road
ID	F5-1	2	4.7	109°	ESE of site along Amosite Road
ID	F10-1	3	9.4	112°	ESE of site along Donegal Springs Road, Donegal Springs
ID	F25-1	3	22	106°	ESE of site at intersection of Steel Way and Loop Roads, Lancaster
ID	G1-2	1	0.7	145°	SE of site along Route 441 S
ID	G1-3	1	0.2	130°	SE of Reactor Building on top of dike, TMI
ID	G1-5	1	0.3	143°	SE of Reactor Building on top of dike, TMI
ID	G1-6	1	0.3	139°	SE of Reactor Building on top of dike, TMI
AI, AP, M	G2-1	2	1.4	126°	SE of site at farm on Becker Road
ID	G2-4	2	1.7	138°	SE of site on Becker Road
ID	G5-1	2	4.8	131°	SE of site at intersection of Bainbridge and Risser Roads
ID	G10-1	3	9.7	128°	SE of site at farm along Engles Tollgate Road, Marietta
ID	G15-1	3	14.4	126°	SE of site at Columbia Water Treatment Plant
DW	G15-2	3	13.3	129°	SE of site at Wrightsville Water Treatment Plant
DW	G15-3	3	15.7	124°	SE of site at Lancaster Water Treatment Plant

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Station, 2015

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
ID	H1-1	1	0.5	167°	SSE of site, TMI
FP	H1-2	1	1.0	151°	SSE of site along Route 441, Red Hill Market
AP, AI, ID	H3-1	2	2.2	160°	SSE of site in Falmouth-Collins Substation
ID	H5-1	2	4.1	158°	SSE of site by Guard Shack at Brunner Island Steam Electric Station
ID	H8-1	3	7.4	163°	SSE of site along Saginaw Road, Starview
ID	H15-1	3	13.2	157°	SSE of site at intersection of Orchard and Stonewood Roads, Wilshire Hills
AQF	Indicator	-	-	-	All locations where finfish are collected downstream of the TMINS liquid discharge outfall
ID	J1-1	1	0.8	176°	S of site, TMI
SW	J1-2	1	0.5	188°	S of site downstream of the TMINS liquid discharge outfall in Susquehanna River
ID	J1-3	1	0.3	189°	S of Reactor Building just S of SOB, TMI
AQS	J2-1	2	1.4	179°	S of site in Susquehanna River just upstream of the York Haven Dam
ID	J3-1	2	2.7	179°	S of site at York Haven/Cly
ID	J5-1	2	4.9	181°	S of site along Canal Road, Conewago Heights
ID	J7-1	3	6.5	176°	S of site off of Maple Street, Manchester
ID	J15-1	3	12.6	183°	S of site in Met-Ed York Load Dispatch Station
EW	K1-1	1	0.2	211°	On site at RML-7 Main Station Discharge Building
AQS	K1-3	1	0.2	213°	SSW of site downstream of the TMINS liquid discharge outfall in the Susquehanna River
ID	K1-4	1	0.2	209°	SSW of Reactor Building on top of dike behind Warehouse 2, TMI
ID	K2-1	2	1.2	200°	SSW of site on S Shelley Island
ID	K3-1	2	2.0	206°	SSW of site along Rt. 262, N of Cly
ID	K5-1	2	4.9	202°	SSW of site along Conewago Creek Road, Strinestown
ID	K8-1	3	7.5	196°	SSW of site at intersection of Coppenhaffer Road and Route 295, Zions View
ID	K15-1	3	12.8	203°	SSW of site behind McDonald's and next to child care center, Weiglestown
M	K15-3	3	14.4	205°	SSW of site at farm along S Salem Church Rd, Dover
ID	L1-1	1	0.1	236°	SW of site on top of dike W of Mech. Draft Cooling Tower, TMI
ID	L1-2	1	0.5	221°	SW of site on Beech Island
ID	L2-1	2	1.8	224°	SW of site along Route 262
ID	L5-1	2	4.1	228°	SW of site at intersection of Stevens and Wilson Roads
ID	L8-1	3	8.0	225°	SW of site along Rohlers Church Rd., Andersontown
ID	L15-1	3	11.8	226°	SW of site on W side of Route 74, rear of church, Mt. Royal
ID	M1-1	1	0.1	249°	WSW of Reactor Building on SE corner of U-2 Screenhouse fence, TMI
ID	M1-2	1	0.4	252°	WSW of site on E side of Shelley Island, Lot #157
AP, AI, ID	M2-1	2	1.3	256°	WSW of site along Route 262 and adjacent to Fishing Creek, Goldsboro
ID	M5-1	2	4.3	249°	WSW of site at intersection of Lewisberry and Roxberry Roads, Newberrytown
ID	M9-1	3	8.7	243°	WSW of site along Alpine Road, Maytown
ID	N1-1	1	0.7	274°	W of site on W side of Shelley Island, between lots #13 and #14
ID	N1-3	1	0.1	274°	W of Reactor Building on fence adjacent to Screenhouse entrance gate, TMI
ID	N2-1	2	1.2	261°	W of site at Goldsboro Marina
ID	N5-1	2	4.9	268°	W of site off of Old York Road along Robin Hood Drive
ID	N8-1	3	7.7	262°	W of site along Route 382, 1/2 mile north of Lewisberry
ID	N15-2	3	10.4	275°	W of site at intersection of Lisburn Road and Main Street, Lisburn
ID	P1-1	1	0.4	303°	WNW of site on Shelley Island

TABLE B-2: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Three Mile Island Nuclear Station, 2015

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
ID	P1-2	1	0.1	292°	WNW of Reactor Building on fence N of Unit 1 Screenhouse, TMI
ID	P2-1	2	1.9	283°	WNW of site along Route 262
M	P4-1	2	3.6	295°	WNW of site at farm on Valley Road
ID	P5-1	2	5.0	284°	WNW of site at intersection of Valley Road (Route 262) and Beinhower Road
ID	P8-1	3	7.9	292°	WNW of site along Evergreen Road, Reesers Summit
ID	Q1-1	1	0.5	317°	NW of site on E side of Shelley Island
ID	Q1-2	1	0.2	321°	NW of Reactor Building on fence W of Warehouse 1, TMI
ID	Q2-1	2	1.9	310°	NW of site along access road along river
ID	Q5-1	2	5.0	317°	NW of site along Lumber Street, Highspire
SW, DW, ID	Q9-1	3	8.5	310°	NW of site at the Steelton Water Company
AP, AI, ID	Q15-1	3	13.4	309°	NW of site behind West Fairview Fire Dept. Social Hall (abandoned)
ID	R1-1	1	0.2	335°	NNW of Reactor Building along W fence, TMI
ID	R1-2	1	0.7	334°	NNW of site on central Henry Island
ID	R3-1	2	2.6	341°	NNW of site at Crawford Station, Middletown
ID	R5-1	2	4.9	339°	NNW of site at intersection of Spring Garden Drive and Route 441
ID	R9-1	3	8.0	341°	NNW of site at intersection of Derry and 66th Streets, Rutherford Heights
ID	R15-1	3	11.2	332°	NNW of site at intersection of Route 22 and Colonial Road, Colonial Park

IDENTIFICATION KEY

ID = Immersion Dose (OSLD)
SW = Surface Water
AI = Air Iodine
AP = Air Particulate
FP = Food Products (Green Leafy Vegetation, Fruits, Vegetables)
EW = Effluent Water
DW = Drinking Water
M = Milk (Cow)
AQF = Finfish
AQS = Aquatic Sediment

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2015

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Surface Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Surface Water	Iodine-131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Drinking Water	Gross Beta	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)
Drinking Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Drinking Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Drinking Water	Iodine-131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by an ion exchange
Effluent Water	Iodine-131	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by an ion exchange
Effluent Water	Gross Beta	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2015

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Effluent Water	Gamma Spectroscopy	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Effluent Water	Tritium	Monthly composite from a continuous water compositor.	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Effluent Water	Strontium-89/90	Semi-annual composite from monthly samples.	TBE, TBE-2023 Compositing of samples	2 gallon	TBE, TBE-2019 Radiostrontium analysis by ion exchange
Storm Water	Gamma Spectroscopy	Quarterly composite of monthly grab samples	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	1 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Storm Water	Tritium	Quarterly composite of monthly grab samples	ER-TMI-06 Collection of water samples for radiological analysis (Three Mile Island Nuclear Station)	1 gallon	TBE, TBE-2010 Tritium and carbon-14 analysis by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	ER-TMI-13 Collection of fish samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams (wet)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Fish	Strontium-90	Semi-annual samples collected via electroshocking or other techniques	ER-TMI-13 Collection of fish samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams (wet)	TBE, TBE-2019 Radiostrontium analysis by ion exchange Env. Inc., SR-05, Determination of Sr-89 and Sr-90 in Ashed Samples

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2015

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Sediment	Gamma Spectroscopy	Semi-annual grab samples	ER-TMI-03 Collection of sediment samples for radiological analysis (Three Mile Island Nuclear Station)	500 grams (dry)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	ER-TMI-14 Collection of air particulate and air iodine samples for radiological analysis (Three Mile Island Nuclear Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2008 Gross alpha and/or gross beta activity in various matrices Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2023 Compositing of samples Env. Inc., AP-03 Procedure for compositing air particulate filters for gamma spectroscopic analysis	13 filters (approximately 3600 cubic meters)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Iodine	Gamma Spectroscopy	One-week composite of continuous air sampling through charcoal filter	ER-TMI-14 Collection of air particulate and air iodine samples for radiological analysis (Three Mile Island Nuclear Station)	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., I-131-02 Determination of I-131 in charcoal canisters by gamma spectroscopy (batch method)
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by anion exchange
Milk	Strontium-89/90	Quarterly composite of Bi-weekly and monthly grab samples	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Station) TBE, TBE-2023 Compositing of samples	2 gallon	TBE, TBE-2019 Radiostrontium analysis by ion exchange Enc. Inc., SR-07, Determination of Sr-89 and Sr-90 in Milk (Ion Exchange Batch Method)
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	ER-TMI-01 Collection of milk samples for radiological analysis (Three Mile Island Nuclear Station)	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Vegetation	Gamma Spectroscopy	Monthly and annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy

TABLE B-3: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Three Mile Island Nuclear Station, 2015

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Vegetation	Strontium-89/90	Monthly and annual grab sample	ER-TMI-04 Collection of vegetation samples for radiological analysis (Three Mile Island Nuclear Station)	1000 grams	TBE, TBE-2019 Radiostrontium analysis by ion exchange Env. Inc., SR-05, Determination of Sr-89 and Sr-90 in Ashed Samples
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	ER-TMI-02 Collection of OSLD samples for radiological analysis (Three Mile Island Nuclear Station)	2 badges with 3 dosimeters	Landauer Incorporated

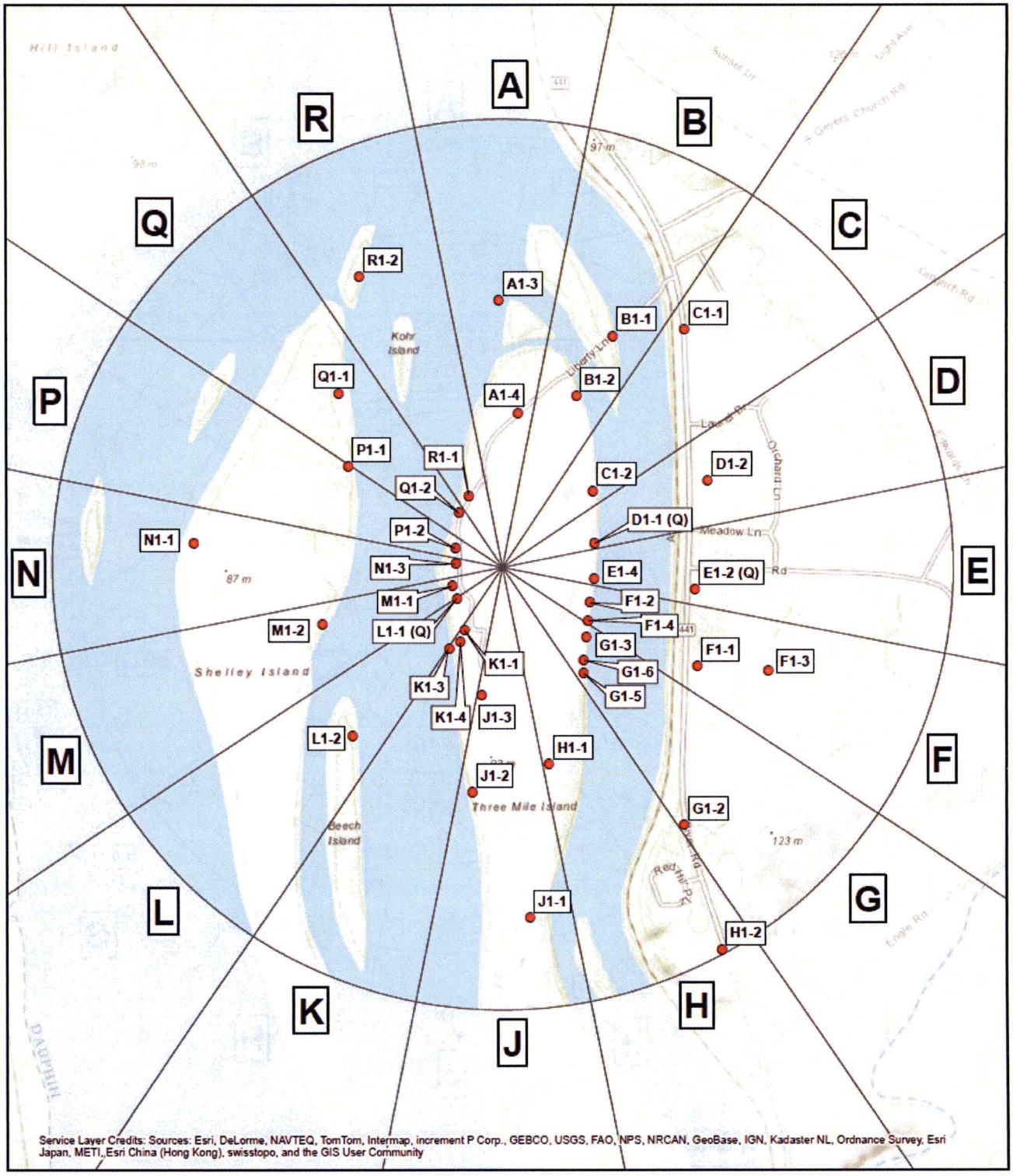

Figure B-1
Environmental Sampling Locations Within One Mile of the Three Mile Island Nuclear Station, 2015

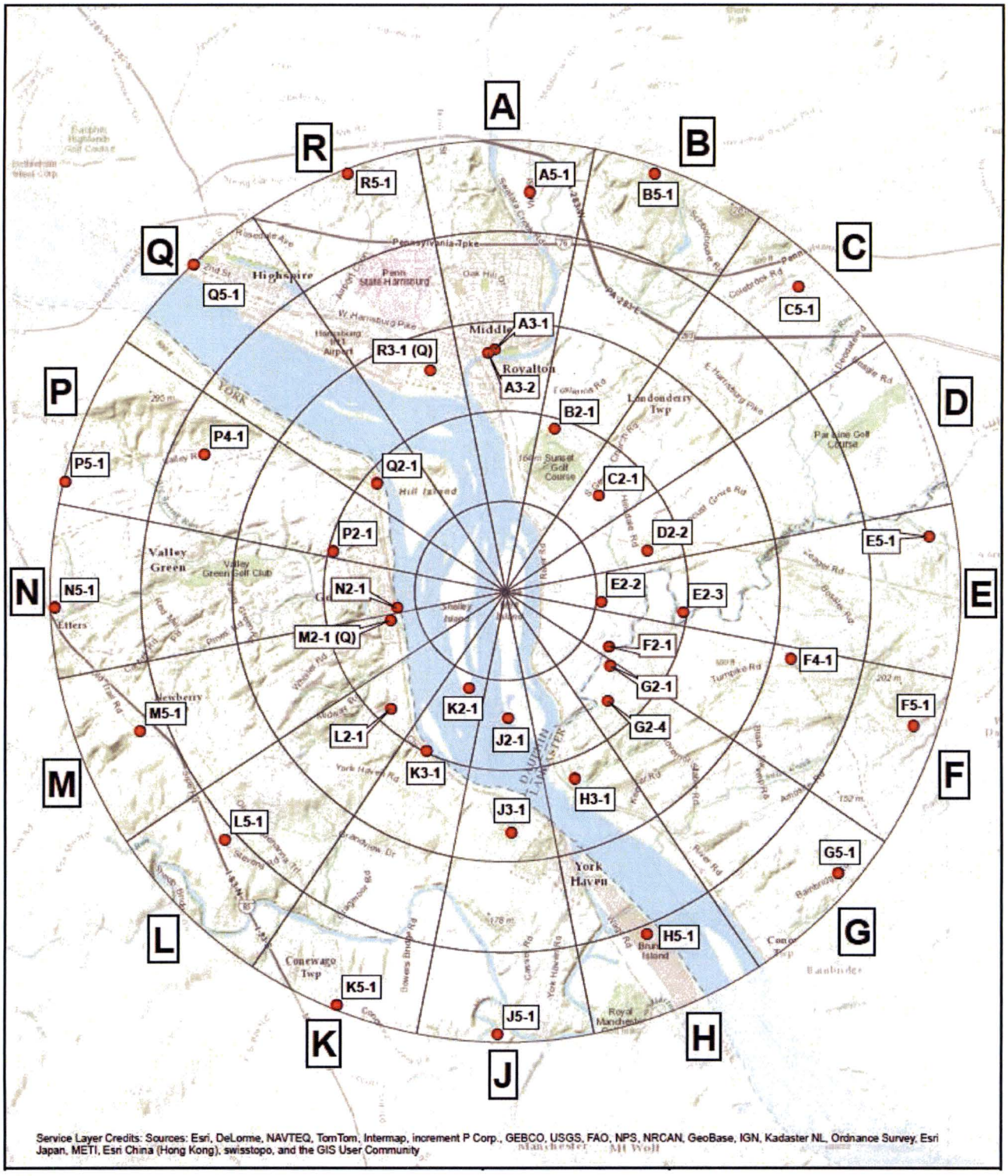

Figure B-2
Environmental Sampling Locations Between One and Five Miles of the Three Mile Island Nuclear Station, 2015

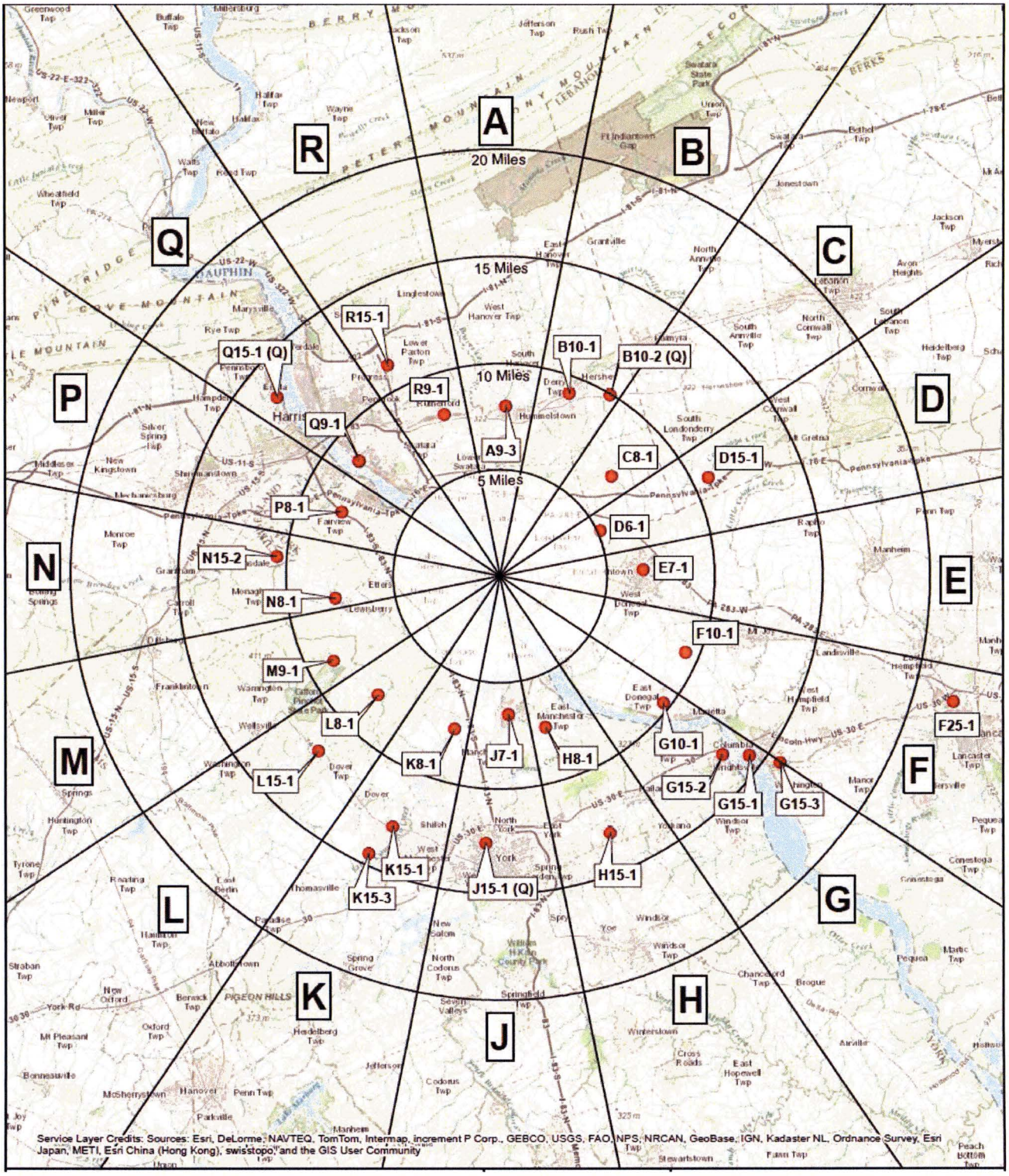

Figure B-3
Environmental Sampling Locations Greater than Five Miles of the Three Mile Island Nuclear Station, 2015

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APPENDIX C

DATA TABLES AND FIGURES - PRIMARY LABORATORY

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Table C-I.1 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	J1-2	Q9-1
12/30/14 - 02/03/15	4630 ± 501	< 172
02/03/15 - 03/03/15	5050 ± 547	< 177
03/03/15 - 03/31/15	876 ± 165	< 196
03/31/15 - 04/28/15	517 ± 148	< 193
04/28/15 - 06/02/15	6250 ± 668	< 185
06/02/15 - 06/30/15	2080 ± 261	< 187
06/30/15 - 07/28/15	679 ± 153	< 189
07/28/15 - 09/01/15	3130 ± 365	< 183
09/01/15 - 09/29/15	1170 ± 180	< 184
09/29/15 - 11/03/15	544 ± 142	< 189
11/03/15 - 12/01/15	< 194	< 194
12/01/15 - 12/29/15	454 ± 144	< 193
MEAN	2307 ± 4239	-

Table C-I.2 **CONCENTRATIONS OF I-131 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	A3-2
01/06/15 - 02/03/15	< 0.4
02/10/15 - 03/03/15	< 0.7
03/10/15 - 03/31/15	< 0.4
04/07/15 - 04/28/15	< 0.4
05/05/15 - 06/02/15	< 0.3
06/09/15 - 06/30/15	< 0.7
07/07/15 - 07/28/15	< 0.8
08/04/15 - 09/01/15	< 0.6
09/07/15 - 09/29/15	< 0.6
10/06/15 - 11/03/15	< 0.4
11/10/15 - 12/01/15	< 0.5
12/08/15 - 12/29/15	< 0.7
MEAN	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER + 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
J1-2	12/30/14 - 02/03/15	< 4	< 4	< 9	< 5	< 10	< 5	< 8	< 5	< 5	< 21	< 6
	02/03/15 - 03/03/15	< 4	< 4	< 8	< 4	< 9	< 5	< 7	< 4	< 5	< 28	< 8
	03/03/15 - 03/31/15	< 5	< 5	< 11	< 5	< 11	< 6	< 11	< 5	< 6	< 28	< 11
	03/31/15 - 04/28/15	< 9	< 8	< 14	< 8	< 15	< 7	< 11	< 7	< 8	< 35	< 10
	04/28/15 - 06/02/15	< 5	< 4	< 10	< 4	< 8	< 4	< 8	< 4	< 5	< 24	< 8
	06/02/15 - 06/30/15	< 5	< 6	< 12	< 6	< 12	< 6	< 7	< 5	< 7	< 34	< 10
	06/30/15 - 07/28/15	< 5	< 7	< 12	< 5	< 15	< 6	< 11	< 6	< 5	< 32	< 7
	07/28/15 - 09/01/15	< 7	< 7	< 16	< 8	< 16	< 9	< 15	< 8	< 7	< 30	< 11
	09/01/15 - 09/29/15	< 7	< 7	< 15	< 8	< 14	< 7	< 12	< 9	< 7	< 33	< 13
	09/29/15 - 11/03/15	< 3	< 3	< 7	< 4	< 7	< 3	< 6	< 3	< 3	< 17	< 6
	11/03/15 - 12/01/15	< 4	< 3	< 6	< 4	< 8	< 4	< 6	< 3	< 4	< 19	< 7
	12/01/15 - 12/29/15	< 5	< 5	< 10	< 4	< 7	< 5	< 6	< 4	< 5	< 29	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q9-1	12/30/14 - 02/03/15	< 2	< 3	< 7	< 3	< 6	< 3	< 6	< 3	< 3	< 24	< 7
	02/03/15 - 03/03/15	< 6	< 7	< 17	< 7	< 15	< 7	< 12	< 7	< 8	< 31	< 13
	03/03/15 - 03/31/15	< 6	< 6	< 15	< 6	< 11	< 6	< 10	< 5	< 6	< 33	< 11
	03/31/15 - 04/28/15	< 5	< 5	< 9	< 4	< 10	< 7	< 10	< 6	< 6	< 25	< 7
	04/28/15 - 06/02/15	< 4	< 4	< 9	< 3	< 7	< 4	< 6	< 4	< 4	< 20	< 7
	06/02/15 - 06/30/15	< 5	< 5	< 12	< 6	< 10	< 5	< 8	< 5	< 6	< 29	< 10
	06/30/15 - 07/28/15	< 7	< 4	< 17	< 8	< 12	< 5	< 11	< 5	< 8	< 29	< 12
	07/28/15 - 09/01/15	< 4	< 5	< 15	< 4	< 15	< 7	< 12	< 6	< 5	< 32	< 8
	09/01/15 - 09/29/15	< 7	< 7	< 14	< 7	< 10	< 6	< 10	< 5	< 6	< 27	< 10
	09/29/15 - 11/03/15	< 3	< 3	< 5	< 3	< 5	< 3	< 5	< 2	< 3	< 14	< 5
	11/03/15 - 12/01/15	< 4	< 6	< 12	< 6	< 11	< 6	< 11	< 5	< 6	< 35	< 10
	12/01/15 - 12/29/15	< 5	< 4	< 11	< 5	< 9	< 6	< 10	< 5	< 5	< 33	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-II.1 **CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/30/14 - 02/03/15	3.1 ± 1.5	2.7 ± 1.4	< 1.9
02/03/15 - 03/03/15	2.8 ± 1.5	< 2.1	< 2.0
03/03/15 - 03/31/15	< 2.2	< 2.1	< 2.0
03/31/15 - 04/28/15	< 2.2	< 2.0	< 2.0
04/28/15 - 06/02/15	3.2 ± 1.4	2.7 ± 1.4	2.1 ± 1.3
06/02/15 - 06/30/15	2.5 ± 1.5	2.5 ± 1.4	2.0 ± 1.4
06/30/15 - 07/28/15	2.7 ± 1.4	< 1.9	< 1.9
07/28/15 - 09/01/15	3.6 ± 1.6	2.7 ± 1.6	< 2.1
09/01/15 - 09/29/15	3.7 ± 1.5	4.0 ± 1.6	3.7 ± 1.6
09/29/15 - 11/03/15	5.5 ± 1.9	3.2 ± 1.7	< 2.0
11/03/15 - 12/01/15	2.3 ± 1.3	2.4 ± 1.3	2.9 ± 1.2
12/01/15 - 12/29/15	2.9 ± 1.5	< 1.9	< 1.8
MEAN	3.2 ± 1.8	2.9 ± 1.1	2.7 ± 1.6

Table C-II.2 **CONCENTRATIONS OF I-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/30/14 - 02/03/15	< 0.5	< 0.5	< 0.4
02/03/15 - 03/03/15	< 0.8	< 0.7	< 0.7
03/03/15 - 03/31/15	< 0.4	< 0.4	< 0.3
03/31/15 - 04/28/15	< 0.5	< 0.6	< 0.6
04/28/15 - 06/02/15	< 0.4	< 0.3	< 0.3
06/02/15 - 06/30/15	< 0.7	< 0.7	< 0.7
06/30/15 - 07/28/15	< 0.9	< 0.7	< 0.8
07/28/15 - 09/01/15	< 0.5	< 0.5	< 0.6
09/01/15 - 09/29/15	< 0.7	< 0.6	< 0.7
09/29/15 - 11/03/15	< 0.4	< 0.4	< 0.4
11/03/15 - 12/01/15	< 0.8	< 0.5	< 0.5
12/01/15 - 12/29/15	< 0.6	< 0.6	< 0.6
MEAN	-	-	-

Table C-II.3 **CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	G15-2	G15-3	Q9-1
12/30/14 - 02/03/15	< 168	288 ± 122	< 169
02/03/15 - 03/03/15	< 178	< 178	< 175
03/03/15 - 03/31/15	< 196	< 198	< 198
03/31/15 - 04/28/15	< 192	< 195	< 191
04/28/15 - 06/02/15	< 185	621 ± 152	< 184
06/02/15 - 06/30/15	< 189	< 183	< 190
06/30/15 - 07/28/15	< 186	< 186	< 188
07/28/15 - 09/01/15	< 180	< 191	< 182
09/01/15 - 09/29/15	< 184	< 184	< 184
09/29/15 - 11/03/15	< 191	< 191	< 187
11/03/15 - 12/01/15	< 195	< 194	< 194
12/01/15 - 12/29/15	< 192	< 193	< 195
MEAN	-	455 ± 471	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-II.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
G15-2	12/30/14 - 02/03/15	< 6	< 7	< 12	< 6	< 13	< 7	< 12	< 6	< 8	< 35	< 8
	02/03/15 - 03/03/15	< 7	< 8	< 15	< 4	< 13	< 6	< 12	< 6	< 5	< 31	< 12
	03/03/15 - 03/31/15	< 5	< 5	< 10	< 4	< 9	< 5	< 10	< 4	< 6	< 26	< 9
	03/31/15 - 04/28/15	< 5	< 6	< 11	< 6	< 9	< 6	< 10	< 5	< 6	< 30	< 7
	04/28/15 - 06/02/15	< 5	< 5	< 11	< 5	< 10	< 6	< 8	< 5	< 5	< 29	< 9
	06/02/15 - 06/30/15	< 8	< 8	< 14	< 6	< 15	< 7	< 13	< 7	< 6	< 42	< 12
	06/30/15 - 07/28/15	< 8	< 6	< 15	< 8	< 14	< 8	< 15	< 6	< 7	< 32	< 12
	07/28/15 - 09/01/15	< 8	< 7	< 16	< 8	< 15	< 6	< 10	< 7	< 7	< 34	< 10
	09/01/15 - 09/29/15	< 9	< 7	< 17	< 9	< 16	< 7	< 14	< 7	< 6	< 25	< 8
	09/29/15 - 11/03/15	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 3	< 3	< 17	< 5
	11/03/15 - 12/01/15	< 6	< 7	< 17	< 5	< 11	< 7	< 12	< 7	< 7	< 31	< 11
	12/01/15 - 12/29/15	< 4	< 5	< 11	< 5	< 9	< 5	< 7	< 4	< 5	< 21	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-
G15-3	12/30/14 - 02/03/15	< 6	< 5	< 12	< 5	< 13	< 6	< 9	< 5	< 6	< 28	< 9
	02/03/15 - 03/03/15	< 5	< 5	< 11	< 6	< 13	< 5	< 9	< 5	< 6	< 26	< 10
	03/03/15 - 03/31/15	< 4	< 3	< 8	< 5	< 9	< 4	< 8	< 4	< 4	< 24	< 8
	03/31/15 - 04/28/15	< 7	< 7	< 14	< 4	< 13	< 6	< 12	< 6	< 6	< 31	< 9
	04/28/15 - 06/02/15	< 4	< 5	< 10	< 4	< 8	< 5	< 6	< 4	< 4	< 20	< 6
	06/02/15 - 06/30/15	< 6	< 6	< 14	< 6	< 14	< 6	< 11	< 6	< 7	< 41	< 11
	06/30/15 - 07/28/15	< 6	< 7	< 13	< 8	< 14	< 8	< 13	< 6	< 7	< 32	< 15
	07/28/15 - 09/01/15	< 6	< 7	< 14	< 5	< 17	< 9	< 14	< 6	< 8	< 36	< 11
	09/01/15 - 09/29/15	< 6	< 6	< 11	< 7	< 13	< 7	< 10	< 6	< 6	< 23	< 6
	09/29/15 - 11/03/15	< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 3	< 3	< 15	< 4
	11/03/15 - 12/01/15	< 9	< 7	< 17	< 8	< 13	< 8	< 13	< 7	< 7	< 42	< 12
	12/01/15 - 12/29/15	< 5	< 5	< 9	< 5	< 9	< 5	< 9	< 4	< 5	< 27	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-II.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
Q9-1	12/30/14 - 02/03/15	< 7	< 7	< 14	< 4	< 15	< 7	< 12	< 6	< 8	< 34	< 11
	02/03/15 - 03/03/15	< 5	< 7	< 12	< 4	< 10	< 6	< 12	< 5	< 7	< 33	< 10
	03/03/15 - 03/31/15	< 5	< 4	< 12	< 5	< 9	< 4	< 8	< 4	< 5	< 26	< 10
	03/31/15 - 04/28/15	< 6	< 5	< 10	< 7	< 12	< 8	< 12	< 6	< 6	< 26	< 8
	04/28/15 - 06/02/15	< 3	< 3	< 6	< 4	< 7	< 3	< 6	< 3	< 3	< 18	< 6
	06/02/15 - 06/30/15	< 6	< 6	< 15	< 6	< 14	< 6	< 11	< 6	< 7	< 36	< 13
	06/30/15 - 07/28/15	< 7	< 6	< 18	< 8	< 15	< 7	< 12	< 6	< 6	< 35	< 10
	07/28/15 - 09/01/15	< 6	< 5	< 17	< 7	< 18	< 7	< 11	< 6	< 6	< 31	< 10
	09/01/15 - 09/29/15	< 10	< 8	< 19	< 5	< 16	< 9	< 13	< 7	< 7	< 30	< 8
	09/29/15 - 11/03/15	< 3	< 3	< 5	< 2	< 6	< 3	< 5	< 3	< 3	< 15	< 5
	11/03/15 - 12/01/15	< 8	< 8	< 20	< 7	< 17	< 8	< 15	< 7	< 8	< 39	< 13
	12/01/15 - 12/29/15	< 5	< 5	< 12	< 5	< 11	< 6	< 10	< 5	< 6	< 32	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1 **CONCENTRATIONS OF GROSS BETA, IODINE-131, TRITIUM, AND STRONTIUM IN EFFLUENT WATER SAMPLES FOR STATION K1-1 COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	GR-B	I-131	H-3	SR-89	SR-90
K1-1	12/30/14 - 02/03/15	2.5 ± 1.4	< 0.3	69900 ± 7000	< 4.0	< 0.7
	02/03/15 - 03/03/15	4.3 ± 1.7	< 0.8	38800 ± 3900		
	03/03/15 - 03/31/15	3.2 ± 1.6	< 0.5	9350 ± 983		
	03/31/15 - 04/28/15	2.6 ± 1.5	< 0.9	11600 ± 1210		
	04/28/15 - 06/02/15	4.7 ± 1.7	< 0.3	106000 ± 7590		
	06/02/15 - 06/30/15	4.3 ± 1.7	< 0.7	29700 ± 3010		
	06/30/15 - 07/28/15	2.1 ± 1.4	< 0.8	6860 ± 739	< 3.1	< 0.9
	07/28/15 - 09/01/15	6.7 ± 2.1	< 0.8	45800 ± 4620		
	09/01/15 - 09/29/15	6.7 ± 2.0	< 0.6	13900 ± 1440		
	09/29/15 - 11/03/15	8.3 ± 2.3	< 0.3	5720 ± 625		
	11/03/15 - 12/01/15	3.0 ± 1.3	< 0.5	< 198		
	12/01/15 - 12/29/15	6.2 ± 1.8	< 0.9	5440 ± 600		
	MEAN	4.6 ± 4.0	-	36685 ± 65243	-	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-III.2 **CONCENTRATIONS OF GAMMA EMITTERS IN EFFLUENT WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
K1-1	12/30/14 - 02/03/15	< 6	< 6	< 14	< 6	< 14	< 7	< 11	< 6	< 7	< 32	< 9
	02/03/15 - 03/03/15	< 5	< 5	< 9	< 5	< 10	< 7	< 13	< 5	< 6	< 34	< 12
	03/03/15 - 03/31/15	< 5	< 4	< 9	< 4	< 9	< 5	< 8	< 3	< 5	< 25	< 9
	03/31/15 - 04/28/15	< 6	< 8	< 15	< 11	< 19	< 9	< 14	< 7	< 9	< 41	< 15
	04/28/15 - 06/02/15	< 5	< 6	< 14	< 6	< 10	< 6	< 9	< 5	< 5	< 27	< 9
	06/02/15 - 06/30/15	< 5	< 4	< 11	< 5	< 9	< 6	< 9	< 4	< 5	< 31	< 6
	06/30/15 - 07/28/15	< 6	< 7	< 18	< 7	< 14	< 6	< 13	< 6	< 8	< 32	< 11
	07/28/15 - 09/01/15	< 6	< 6	< 12	< 5	< 10	< 6	< 9	< 5	< 6	< 28	< 6
	09/01/15 - 09/29/15	< 7	< 6	< 10	< 7	< 15	< 6	< 13	< 6	< 7	< 29	< 13
	09/29/15 - 11/03/15	< 9	< 7	< 9	< 7	< 13	< 6	< 11	< 5	< 7	< 33	< 13
	11/03/15 - 12/01/15	< 4	< 6	< 9	< 5	< 13	< 5	< 8	< 5	< 6	< 34	< 9
	12/01/15 - 12/29/15	< 7	< 7	< 14	< 7	< 12	< 7	< 13	< 6	< 6	< 39	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1 **CONCENTRATIONS OF STRONTIUM IN PREDATOR AND BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Sr-90
INDP	PREDATOR	
	06/10/15	< 3.2
	09/23/15	< 4.2
	MEAN	-
INDB	BOTTOM FEEDER	
	06/10/15	< 3.3
	09/23/15	< 3.9
	MEAN	-
BKGP	PREDATOR	
	06/11/15	< 3.9
	10/06/15	< 2.4
	MEAN	-
BKGB	BOTTOM FEEDER	
	06/11/15	< 2.1
	10/06/15	< 3.5
	MEAN	-

Table C-IV.2 **CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR AND BOTTOM FEEDER (FISH) SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
INDP	PREDATOR								
	06/11/15	2493 ± 818	< 45	< 44	< 114	< 42	< 103	< 44	< 48
	10/06/15	3846 ± 787	< 44	< 42	< 96	< 38	< 87	< 42	< 49
	MEAN	3170 ± 1913	-	-	-	-	-	-	-
INDB	BOTTOM FEEDER								
	06/11/15	4283 ± 1253	< 105	< 114	< 232	< 82	< 237	< 88	< 97
	10/06/15	1439 ± 1004	< 74	< 85	< 168	< 66	< 127	< 66	< 70
	MEAN	2861 ± 4022	-	-	-	-	-	-	-
BKGP	PREDATOR								
	06/11/15	3785 ± 756	< 59	< 67	< 141	< 60	< 132	< 54	< 69
	10/06/15	2869 ± 1097	< 74	< 58	< 155	< 58	< 178	< 73	< 72
	MEAN	3327 ± 1295	-	-	-	-	-	-	-
BKGB	BOTTOM FEEDER								
	06/11/15	2863 ± 1027	< 62	< 76	< 162	< 74	< 130	< 77	< 68
	10/06/15	3026 ± 326	< 27	< 60	< 209	< 20	< 59	< 22	< 22
		2945 ± 231	-	-	-	-	-	-	

Table C-V.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Mn-54	Co-58	Co-60	Cs-134	Cs-137
A1-3	06/12/15	13690 ± 1842	< 97	< 85	< 93	< 83	< 106
	10/29/15	11580 ± 1417	< 75	< 53	< 73	< 69	< 86
	MEAN	12635 ± 2984	-	-	-	-	-
EDCB	10/29/15	14700 ± 1708	< 84	< 70	< 88	< 76	211 ± 84
	MEAN	14700 ± 0	-	-	-	-	211 ± 0
J2-1	06/12/15	13980 ± 2067	< 113	< 113	< 103	< 98	< 137
	10/29/15	14640 ± 1705	< 81	< 71	< 81	< 68	< 93
	MEAN	14310 ± 933	-	-	-	-	-
K1-3	06/12/15	6131 ± 765	< 41	< 52	< 42	< 38	< 46
	10/29/15	5753 ± 1033	< 68	< 67	< 77	< 69	< 86
	MEAN	5942 ± 535	-	-	-	-	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-VI.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I		GROUP II				GROUP III
	E1-2	F1-3	A3-1	G2-1	H3-1	M2-1	Q15-1
01/01/15 - 01/08/15	17 ± 5	20 ± 5	23 ± 6	18 ± 5	20 ± 6	20 ± 6	23 ± 6
01/08/15 - 01/15/15	23 ± 5	19 ± 5	15 ± 5	16 ± 5	17 ± 5	14 ± 5	21 ± 5
01/15/15 - 01/22/15	21 ± 6	17 ± 5	19 ± 5	22 ± 6	19 ± 5	22 ± 6	23 ± 6
01/22/15 - 01/29/15	13 ± 5	17 ± 5	15 ± 5	16 ± 5	14 ± 5	16 ± 5	15 ± 5
01/29/15 - 02/05/15	13 ± 5	11 ± 5	12 ± 5	14 ± 5	13 ± 5	11 ± 5	14 ± 5
02/05/15 - 02/12/15	17 ± 5	21 ± 5	16 ± 5	18 ± 5	21 ± 6	21 ± 6	(1)
02/12/15 - 02/19/15	23 ± 5	21 ± 5	18 ± 5	22 ± 5	24 ± 5	24 ± 5	25 ± 7
02/19/15 - 02/26/15	25 ± 5	26 ± 5	23 ± 5	25 ± 5	23 ± 5	27 ± 6	28 ± 6
02/26/15 - 03/05/15	20 ± 5	18 ± 5	24 ± 6	25 ± 6	23 ± 6	20 ± 5	22 ± 5
03/05/15 - 03/12/15	16 ± 5	17 ± 5	15 ± 5	18 ± 5	18 ± 5	19 ± 5	18 ± 5
03/12/15 - 03/18/15	17 ± 6	11 ± 5	13 ± 5	12 ± 5	16 ± 6	15 ± 6	14 ± 5
03/18/15 - 03/26/15	17 ± 5	13 ± 4	18 ± 5	15 ± 5	14 ± 4	18 ± 5	14 ± 4
03/26/15 - 04/02/15	15 ± 5	10 ± 5	12 ± 5	12 ± 5	14 ± 5	12 ± 5	15 ± 5
04/02/15 - 04/09/15	16 ± 5	12 ± 5	13 ± 5	14 ± 5	13 ± 5	14 ± 5	14 ± 5
04/09/15 - 04/16/15	14 ± 5	16 ± 5	12 ± 4	13 ± 5	13 ± 5	12 ± 5	13 ± 5
04/16/15 - 04/23/15	8 ± 5	12 ± 5	8 ± 5	8 ± 5	< 7	10 ± 5	10 ± 5
04/23/15 - 04/30/15	11 ± 4	11 ± 4	9 ± 4	13 ± 5	12 ± 4	12 ± 4	11 ± 4
04/30/15 - 05/07/15	12 ± 5	14 ± 5	15 ± 5	12 ± 5	12 ± 4	12 ± 5	16 ± 5
05/07/15 - 05/14/15	16 ± 5	15 ± 5	14 ± 5	17 ± 5	15 ± 5	14 ± 5	17 ± 5
05/14/15 - 05/21/15	13 ± 5	13 ± 5	10 ± 4	14 ± 5	10 ± 6	12 ± 5	11 ± 5
05/21/15 - 05/28/15	18 ± 5	18 ± 5	15 ± 5	18 ± 5	13 ± 7	21 ± 5	19 ± 5
05/28/15 - 06/04/15	< 7	8 ± 5	10 ± 5	9 ± 5	8 ± 5	10 ± 5	10 ± 5
06/04/15 - 06/10/15	11 ± 5	< 7	13 ± 5	14 ± 5	9 ± 5	15 ± 6	13 ± 6
06/10/15 - 06/18/15	12 ± 4	13 ± 4	9 ± 4	12 ± 4	10 ± 4	14 ± 4	13 ± 4
06/18/15 - 06/25/15	15 ± 5	11 ± 5	12 ± 5	10 ± 4	(1)	12 ± 5	11 ± 5
06/25/15 - 07/02/15	9 ± 5	8 ± 5	9 ± 5	7 ± 4	< 8	13 ± 5	9 ± 5
07/02/15 - 07/09/15	19 ± 5	18 ± 5	19 ± 5	15 ± 5	21 ± 5	17 ± 5	22 ± 5
07/09/15 - 07/16/15	13 ± 5	16 ± 5	16 ± 5	16 ± 5	15 ± 5	16 ± 5	16 ± 5
07/16/15 - 07/23/15	16 ± 5	15 ± 5	14 ± 4	12 ± 4	18 ± 5	17 ± 5	17 ± 5
07/23/15 - 07/30/15	7 ± 5	16 ± 5	15 ± 5	15 ± 6	11 ± 5	16 ± 5	12 ± 5
07/30/15 - 08/06/15	9 ± 5	12 ± 5	16 ± 5	16 ± 5	17 ± 5	14 ± 5	9 ± 5
08/06/15 - 08/13/15	10 ± 4	9 ± 4	14 ± 4	11 ± 4	17 ± 5	16 ± 5	14 ± 5
08/13/15 - 08/19/15	24 ± 6	16 ± 6	23 ± 6	23 ± 6	28 ± 6	21 ± 6	25 ± 6
08/19/15 - 08/27/15	15 ± 4	16 ± 4	15 ± 4	18 ± 4	16 ± 4	18 ± 4	16 ± 4
08/27/15 - 09/03/15	31 ± 5	27 ± 5	32 ± 5	36 ± 6	32 ± 6	34 ± 6	32 ± 5
09/03/15 - 09/10/15	27 ± 6	25 ± 6	28 ± 6	28 ± 6	28 ± 6	29 ± 6	30 ± 6
09/10/15 - 09/16/15	16 ± 6	18 ± 6	15 ± 6	18 ± 6	14 ± 6	25 ± 6	21 ± 6
09/16/15 - 09/24/15	21 ± 4	17 ± 4	23 ± 4	22 ± 4	20 ± 4	22 ± 4	22 ± 4
09/24/15 - 10/01/15	15 ± 5	16 ± 5	19 ± 5	17 ± 5	16 ± 5	20 ± 5	14 ± 5
10/01/15 - 10/08/15	14 ± 5	11 ± 4	11 ± 4	11 ± 4	12 ± 5	10 ± 4	11 ± 4
10/08/15 - 10/15/15	17 ± 5	16 ± 5	19 ± 5	19 ± 5	15 ± 5	14 ± 5	23 ± 5
10/15/15 - 10/22/15	17 ± 5	16 ± 5	18 ± 5	18 ± 5	17 ± 5	14 ± 5	20 ± 5
10/22/15 - 10/29/15	14 ± 5	13 ± 5	18 ± 5	14 ± 5	12 ± 5	14 ± 5	13 ± 5
10/29/15 - 11/05/15	22 ± 5	20 ± 5	18 ± 5	22 ± 5	21 ± 5	17 ± 5	23 ± 5
11/05/15 - 11/12/15	14 ± 5	14 ± 5	18 ± 5	10 ± 4	14 ± 5	18 ± 5	13 ± 5
11/12/15 - 11/19/15	14 ± 5	16 ± 5	19 ± 5	18 ± 5	17 ± 5	19 ± 5	19 ± 5
11/19/15 - 11/25/15	12 ± 5	10 ± 5	18 ± 5	13 ± 5	16 ± 5	14 ± 5	19 ± 5
11/25/15 - 12/03/15	15 ± 4	12 ± 4	12 ± 4	17 ± 4	14 ± 4	15 ± 4	13 ± 4
12/03/15 - 12/10/15	29 ± 9	27 ± 6	39 ± 6	41 ± 6	39 ± 6	41 ± 6	36 ± 6
12/10/15 - 12/17/15	31 ± 6	26 ± 6	28 ± 6	25 ± 5	29 ± 6	26 ± 6	34 ± 6
12/17/15 - 12/23/15	23 ± 6	15 ± 6	23 ± 6	20 ± 6	21 ± 6	22 ± 6	18 ± 6
12/23/15 - 12/31/15	8 ± 4	6 ± 4	10 ± 4	9 ± 4	8 ± 4	6 ± 4	7 ± 4
MEAN	17 ± 11	16 ± 10	17 ± 12	17 ± 13	17 ± 13	17 ± 13	18 ± 13

(1) SEE PROGRAM EXCEPTIONS SECTION FOR INFORMATION
THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-VI.2 **MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

GROUP I - CLOSEST TO THE SITE BOUNDARY				GROUP II - INTERMEDIATE OFFSITE				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
01/01/15 - 01/29/15	13	23	18 ± 6	01/01/15 - 01/29/15	14	23	18 ± 6	01/01/15 - 01/29/15	15	23	20 ± 8
01/29/15 - 02/26/15	11	26	20 ± 11	01/29/15 - 02/26/15	11	27	19 ± 10	01/29/15 - 02/26/15	14	28	23 ± 15
02/26/15 - 04/02/15	10	20	15 ± 6	02/26/15 - 04/02/15	12	25	17 ± 8	02/26/15 - 04/02/15	14	22	17 ± 7
04/02/15 - 04/30/15	8	16	12 ± 5	04/02/15 - 04/30/15	8	14	12 ± 4	04/02/15 - 04/30/15	10	14	12 ± 3
04/30/15 - 05/28/15	12	18	15 ± 5	04/30/15 - 05/28/15	10	21	14 ± 6	04/30/15 - 05/28/15	11	19	16 ± 7
05/28/15 - 07/02/15	8	15	11 ± 5	05/28/15 - 07/02/15	7	15	11 ± 5	05/28/15 - 07/02/15	9	13	11 ± 4
07/02/15 - 07/30/15	7	19	15 ± 7	07/02/15 - 07/30/15	11	21	16 ± 5	07/02/15 - 07/30/15	12	22	17 ± 9
07/30/15 - 09/03/15	9	31	17 ± 16	07/30/15 - 09/03/15	11	36	21 ± 15	07/30/15 - 09/03/15	9	32	19 ± 18
09/03/15 - 10/01/15	15	27	20 ± 9	09/03/15 - 10/01/15	14	29	21 ± 10	09/03/15 - 10/01/15	14	30	22 ± 13
10/01/15 - 10/29/15	11	17	15 ± 4	10/01/15 - 10/29/15	10	19	15 ± 6	10/01/15 - 10/29/15	11	23	17 ± 11
10/29/15 - 12/03/15	10	22	15 ± 7	10/29/15 - 12/03/15	10	22	16 ± 6	10/29/15 - 12/03/15	13	23	17 ± 8
12/03/15 - 12/31/15	6	31	21 ± 19	12/03/15 - 12/31/15	6	41	24 ± 24	12/03/15 - 12/31/15	7	36	24 ± 28
01/01/15 - 12/31/15	6	31	16 ± 11	01/01/15 - 12/31/15	6	41	17 ± 12	01/01/15 - 12/31/15	7	36	18 ± 13

Table C-VI.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	Mn-54	Co-58	Co-60	Nb-95	Zr-95	Cs-134	Cs-137
A3-1	01/01/15 - 04/02/15	81 ± 46	< 6	< 7	< 3	< 6	< 9	< 5	< 4
	04/02/15 - 07/02/15	76 ± 28	< 3	< 4	< 4	< 4	< 6	< 3	< 3
	07/02/15 - 10/01/15	53 ± 39	< 3	< 3	< 2	< 4	< 6	< 3	< 3
	10/01/15 - 12/31/15	41 ± 20	< 2	< 2	< 3	< 3	< 4	< 2	< 2
	MEAN	63 ± 38	-	-	-	-	-	-	-
E1-2	01/01/15 - 04/02/15	68 ± 37	< 4	< 5	< 4	< 6	< 8	< 3	< 3
	04/02/15 - 07/02/15	62 ± 32	< 3	< 4	< 3	< 5	< 6	< 3	< 2
	07/02/15 - 10/01/15	80 ± 28	< 3	< 3	< 2	< 4	< 5	< 3	< 2
	10/01/15 - 12/31/15	42 ± 21	< 3	< 4	< 2	< 3	< 6	< 3	< 3
	MEAN	63 ± 32	-	-	-	-	-	-	-
F1-3	01/01/15 - 04/02/15	< 69	< 6	< 9	< 7	< 7	< 13	< 4	< 4
	04/02/15 - 07/02/15	67 ± 32	< 5	< 4	< 4	< 5	< 10	< 5	< 5
	07/02/15 - 10/01/15	68 ± 36	< 3	< 4	< 4	< 5	< 9	< 4	< 3
	10/01/15 - 12/31/15	63 ± 21	< 2	< 3	< 4	< 4	< 5	< 2	< 3
	MEAN	66 ± 5	-	-	-	-	-	-	-
G2-1	01/01/15 - 04/02/15	64 ± 38	< 3	< 5	< 3	< 4	< 9	< 4	< 3
	04/02/15 - 07/02/15	74 ± 28	< 2	< 3	< 4	< 4	< 6	< 3	< 3
	07/02/15 - 10/01/15	63 ± 37	< 3	< 4	< 3	< 5	< 7	< 3	< 2
	10/01/15 - 12/31/15	49 ± 28	< 4	< 3	< 6	< 5	< 8	< 4	< 3
	MEAN	62 ± 20	-	-	-	-	-	-	-
H3-1	01/01/15 - 04/02/15	< 94	< 5	< 9	< 5	< 9	< 14	< 5	< 6
	04/02/15 - 07/02/15	112 ± 52	< 5	< 9	< 2	< 7	< 13	< 5	< 6
	07/02/15 - 10/01/15	54 ± 26	< 2	< 3	< 2	< 3	< 5	< 3	< 2
	10/01/15 - 12/31/15	39 ± 24	< 2	< 3	< 3	< 3	< 7	< 2	< 3
	MEAN	68 ± 77	-	-	-	-	-	-	-
M2-1	01/01/15 - 04/02/15	85 ± 37	< 4	< 4	< 2	< 4	< 10	< 2	< 2
	04/02/15 - 07/02/15	65 ± 30	< 4	< 4	< 3	< 6	< 9	< 4	< 3
	07/02/15 - 10/01/15	103 ± 28	< 2	< 4	< 2	< 4	< 8	< 2	< 2
	10/01/15 - 12/31/15	44 ± 22	< 2	< 3	< 2	< 3	< 5	< 3	< 3
	MEAN	74 ± 51	-	-	-	-	-	-	-
Q15-1	01/01/15 - 04/02/15	78 ± 34	< 3	< 5	< 4	< 5	< 9	< 4	< 4
	04/02/15 - 07/02/15	53 ± 28	< 3	< 2	< 3	< 1	< 6	< 4	< 3
	07/02/15 - 10/01/15	75 ± 30	< 3	< 4	< 4	< 4	< 8	< 3	< 3
	10/01/15 - 12/31/15	42 ± 28	< 4	< 4	< 3	< 4	< 9	< 4	< 3
	MEAN	62 ± 35	-	-	-	-	-	-	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-VII.1 **CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I		GROUP II				GROUP III
	E1-2	F1-3	A3-1	G2-1	H3-1	M2-1	Q15-1
01/01/15 - 01/08/15	< 29	< 29	< 29	< 30	< 30	< 30	< 29
01/08/15 - 01/15/15	< 43	< 42	< 26	< 43	< 48	< 48	< 47
01/15/15 - 01/22/15	< 47	< 18	< 43	< 48	< 47	< 44	< 42
01/22/15 - 01/29/15	< 26	< 57	< 52	< 60	< 59	< 53	< 53
01/29/15 - 02/05/15	< 63	< 61	< 67	< 23	< 63	< 69	< 68
02/05/15 - 02/12/15	< 64	< 63	< 69	< 66	< 25	< 70	(1)
02/12/15 - 02/19/15	< 52	< 52	< 60	< 54	< 53	< 61	< 42
02/19/15 - 02/26/15	< 62	< 61	< 48	< 64	< 49	< 20	< 48
02/26/15 - 03/05/15	< 26	< 26	< 23	< 27	< 27	< 23	< 23
03/05/15 - 03/12/15	< 69	< 68	< 54	< 70	< 70	< 23	< 54
03/12/15 - 03/18/15	< 44	< 43	< 60	< 45	< 61	< 24	< 60
03/18/15 - 03/26/15	< 46	< 45	< 38	< 47	< 46	< 39	< 38
03/26/15 - 04/02/15	< 64	< 24	< 67	< 68	< 64	< 63	< 67
04/02/15 - 04/09/15	< 29	< 10	< 26	< 30	< 30	< 26	< 26
04/09/15 - 04/16/15	< 64	< 63	< 64	< 64	< 64	< 65	< 64
04/16/15 - 04/23/15	< 67	< 66	< 55	< 69	< 68	< 56	< 55
04/23/15 - 04/30/15	< 45	< 44	< 42	< 46	< 45	< 43	< 42
04/30/15 - 05/07/15	< 55	< 53	< 43	< 22	< 55	< 54	< 43
05/07/15 - 05/14/15	< 43	< 42	< 66	< 44	< 43	< 67	< 66
05/14/15 - 05/21/15	< 58	< 57	< 62	< 60	< 56	< 63	< 62
05/21/15 - 05/28/15	< 41	< 41	< 38	< 43	< 62	< 38	< 38
05/28/15 - 06/04/15	< 59	< 59	< 58	< 66	< 68	< 66	< 58
06/04/15 - 06/10/15	< 59	< 59	< 33	< 58	< 59	< 33	< 33
06/10/15 - 06/18/15	< 47	< 47	< 13	< 46	< 36	< 35	< 35
06/18/15 - 06/25/15	< 48	< 48	< 45	< 48	(1)	< 45	< 45
06/25/15 - 07/02/15	< 43	< 43	< 60	< 42	< 51	< 60	< 61
07/02/15 - 07/09/15	< 35	< 35	< 15	< 35	< 36	< 35	< 36
07/09/15 - 07/16/15	< 54	< 55	< 40	< 56	< 55	< 40	< 40
07/16/15 - 07/23/15	< 42	< 42	< 39	< 41	< 41	< 40	< 40
07/23/15 - 07/30/15	< 41	< 41	< 43	< 47	< 45	< 44	< 44
07/30/15 - 08/06/15	< 49	< 49	< 64	< 48	< 49	< 65	< 65
08/06/15 - 08/13/15	< 51	< 52	< 55	< 51	< 52	< 55	< 55
08/13/15 - 08/19/15	< 43	< 43	< 51	< 44	< 42	< 50	< 50
08/19/15 - 08/27/15	< 43	< 44	< 28	< 43	< 44	< 67	< 68
08/27/15 - 09/03/15	< 43	< 43	< 22	< 42	< 43	< 53	< 53
09/03/15 - 09/10/15	< 41	< 41	< 57	< 16	< 42	< 57	< 58
09/10/15 - 09/16/15	< 27	< 65	< 68	< 28	< 66	< 68	< 68
09/16/15 - 09/24/15	< 38	< 38	< 27	< 37	< 67	< 65	< 66
09/24/15 - 10/01/15	< 68	< 68	< 58	< 67	< 69	< 59	< 59
10/01/15 - 10/08/15	< 47	< 47	< 55	< 46	< 47	< 55	< 56
10/08/15 - 10/15/15	< 17	< 17	< 15	< 17	< 17	< 15	< 15
10/15/15 - 10/22/15	< 55	< 55	< 43	< 23	< 55	< 43	< 44
10/22/15 - 10/29/15	< 33	< 33	< 42	< 33	< 34	< 43	< 46
10/29/15 - 11/05/15	< 37	< 37	< 29	< 36	< 37	< 29	< 29
11/05/15 - 11/12/15	< 62	< 62	< 61	< 24	< 63	< 61	< 61
11/12/15 - 11/19/15	< 69	< 69	< 60	< 68	< 62	< 60	< 61
11/19/15 - 11/25/15	< 69	< 69	< 51	< 68	< 54	< 52	< 52
11/25/15 - 12/03/15	< 54	< 54	< 47	< 53	< 54	< 47	< 47
12/03/15 - 12/10/15	< 61	< 38	< 54	< 37	< 38	< 54	< 55
12/10/15 - 12/17/15	< 61	< 62	< 55	< 23	< 62	< 55	< 56
12/17/15 - 12/23/15	< 29	< 29	< 36	< 11	< 29	< 37	< 37
12/23/15 - 12/31/15	< 45	< 45	< 24	< 44	< 49	< 47	< 48
MEAN	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR INFORMATION

Table C-VIII.1 **CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	CONTROL FARM	INDICATOR FARM			
COLLECTION PERIOD	TM-M-K15-3	TM-M-E2-2	TM-M-F4-1	TM-M-G2-1	TM-M-P4-1
01/07/15	< 0.6	< 0.4	< 0.5	< 0.5	< 0.5
02/11/15	< 0.4	< 0.5	< 0.5	< 0.8	< 0.5
03/11/15	< 0.4	< 0.6	< 0.4	< 0.5	< 0.5
03/25/15	< 0.3	< 0.4	< 0.2	< 0.4	< 0.3
04/08/15	< 0.6	< 0.6	< 0.7	< 0.6	< 0.6
04/22/15	< 0.3	< 0.5	< 0.7	< 0.4	< 0.4
05/06/15	< 0.5	< 0.9	< 0.5	< 0.8	< 0.9
05/20/15	< 0.6	< 0.7	< 0.7	< 0.7	< 0.6
06/03/15	< 0.7	< 0.9	< 0.6	< 0.7	< 0.5
06/17/15	< 0.4	< 0.7	< 0.6	< 0.6	< 0.7
07/01/15	< 0.5	< 0.7	< 0.5	< 0.7	< 0.6
07/15/15	< 0.9	< 0.8	< 0.8	< 0.8	< 0.7
07/29/15	< 0.7	< 0.8	< 0.9	< 0.9	< 0.9
08/12/15	< 0.6	< 0.6	< 0.6	< 0.5	< 0.5
08/26/15	< 0.5	< 0.7	< 0.5	< 0.7	< 0.7
09/09/15	< 0.3	< 0.5	< 0.4	< 0.6	< 0.6
09/23/15	< 0.6	< 0.5	< 0.5	< 0.5	< 0.4
10/07/15	< 0.4	< 0.5	< 0.6	< 0.5	< 0.7
10/21/15	< 0.6	< 0.4	< 0.6	< 0.5	< 0.4
11/04/15	< 0.4	< 0.6	< 0.6	< 0.7	< 0.6
11/18/15	< 0.8	< 0.8	< 0.9	< 0.6	< 0.9
12/02/15	< 0.9	< 1.0	< 0.6	< 0.8	< 1.0
MEAN	-	-	-	-	-

Table C-VIII.2 **CONCENTRATIONS OF STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER + 2 SIGMA

COLLECTION	CONTROL FARM		INDICATOR FARM							
	K15-3		P4-1		E2-2		F4-1		G2-1	
PERIOD	SR-89	SR-90	SR-89	SR-90	SR-89	SR-90	SR-89	SR-90	SR-89	SR-90
01/07/15 - 03/25/15	< 4.0	< 0.4	< 2.1	< 0.4	< 2.0	< 0.4	< 3.6	< 0.4	< 4.6	< 0.4
04/08/15 - 06/17/15	< 3.9	< 0.6	< 3.5	< 0.7	< 4.3	< 0.7	< 4.2	< 0.6	< 4.9	< 0.7
07/01/15 - 09/23/15	< 3.5	< 0.3	< 3.6	< 0.7	< 3.6	< 0.3	< 3.5	< 0.4	< 3.7	< 0.4
10/07/15 - 12/02/15	< 3.9	< 0.7	< 4.2	< 0.4	< 2.6	< 0.5	< 3.0	< 0.7	< 3.9	< 0.6
MEAN	-	-	-	-	-	-	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
E2-2	01/07/15	1343 ± 148	< 6	< 8	< 34	< 7
	02/11/15	1355 ± 187	< 7	< 6	< 48	< 15
	03/11/15	1362 ± 191	< 8	< 9	< 49	< 14
	03/25/15	1276 ± 134	< 5	< 6	< 55	< 13
	04/08/15	1172 ± 155	< 6	< 7	< 42	< 13
	04/22/15	1309 ± 98	< 4	< 4	< 41	< 13
	05/06/15	1197 ± 213	< 7	< 11	< 38	< 14
	05/20/15	1045 ± 172	< 6	< 7	< 40	< 10
	06/03/15	1409 ± 185	< 7	< 7	< 35	< 7
	06/17/15	1505 ± 174	< 8	< 7	< 42	< 12
	07/01/15	1200 ± 206	< 10	< 10	< 48	< 13
	07/15/15	1343 ± 173	< 5	< 6	< 43	< 10
	07/29/15	1447 ± 161	< 7	< 7	< 35	< 12
	08/12/15	1369 ± 278	< 7	< 11	< 58	< 14
	08/26/15	1310 ± 197	< 8	< 12	< 40	< 13
	09/09/15	1408 ± 165	< 7	< 9	< 37	< 9
	09/23/15	1422 ± 194	< 7	< 7	< 27	< 12
	10/07/15	1296 ± 184	< 9	< 12	< 35	< 10
	10/21/15	1340 ± 214	< 8	< 12	< 29	< 9
	11/04/15	1063 ± 216	< 9	< 10	< 47	< 15
	11/18/15	1321 ± 161	< 7	< 6	< 27	< 7
	12/02/15	1260 ± 140	< 7	< 6	< 36	< 13
	MEAN	1307 ± 231	-	-	-	-
F4-1	01/07/15	1396 ± 160	< 7	< 7	< 29	< 12
	02/11/15	1522 ± 175	< 6	< 7	< 45	< 15
	03/11/15	1360 ± 187	< 8	< 8	< 34	< 11
	03/25/15	1431 ± 101	< 4	< 5	< 42	< 12
	04/08/15	1657 ± 175	< 6	< 7	< 42	< 9
	04/22/15	1367 ± 89	< 3	< 4	< 37	< 10
	05/06/15	1395 ± 198	< 5	< 7	< 35	< 11
	05/20/15	1390 ± 98	< 6	< 5	< 28	< 8
	06/03/15	1464 ± 162	< 8	< 8	< 39	< 11
	06/17/15	1433 ± 177	< 5	< 9	< 32	< 11
	07/01/15	1404 ± 217	< 7	< 7	< 46	< 13
	07/15/15	1266 ± 135	< 5	< 6	< 36	< 7
	07/29/15	1330 ± 149	< 6	< 7	< 30	< 9
	08/12/15	1479 ± 243	< 10	< 8	< 46	< 12
	08/26/15	1242 ± 199	< 7	< 10	< 46	< 7
	09/09/15	1381 ± 156	< 6	< 7	< 24	< 8
	09/23/15	1346 ± 199	< 10	< 11	< 37	< 14
	10/07/15	1487 ± 184	< 7	< 7	< 26	< 9
	10/21/15	1617 ± 251	< 10	< 9	< 32	< 12
	11/04/15	1395 ± 216	< 9	< 9	< 40	< 9
	11/18/15	1477 ± 146	< 10	< 10	< 35	< 10
	12/02/15	1347 ± 165	< 7	< 6	< 38	< 11
	MEAN	1418 ± 197	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
G2-1	01/07/15	1146 ± 157	< 7	< 7	< 34	< 9
	02/11/15	975 ± 153	< 7	< 8	< 36	< 9
	03/11/15	1151 ± 181	< 6	< 9	< 42	< 14
	03/25/15	1065 ± 112	< 5	< 6	< 49	< 13
	04/08/15	773 ± 123	< 6	< 7	< 47	< 15
	04/22/15	859 ± 88	< 4	< 5	< 46	< 15
	05/06/15	703 ± 141	< 9	< 10	< 49	< 12
	05/20/15	1387 ± 169	< 7	< 8	< 43	< 9
	06/03/15	1089 ± 147	< 6	< 7	< 36	< 13
	06/17/15	831 ± 121	< 7	< 7	< 35	< 14
	07/01/15	829 ± 155	< 10	< 10	< 47	< 14
	07/15/15	1115 ± 151	< 7	< 6	< 42	< 15
	07/29/15	1074 ± 124	< 7	< 7	< 36	< 11
	08/12/15	895 ± 159	< 8	< 9	< 47	< 15
	08/26/15	1012 ± 148	< 8	< 9	< 40	< 10
	09/09/15	1077 ± 147	< 7	< 8	< 31	< 7
	09/23/15	827 ± 164	< 9	< 9	< 37	< 13
	10/07/15	1021 ± 155	< 6	< 6	< 19	< 8
	10/21/15	777 ± 134	< 8	< 8	< 37	< 13
	11/04/15	934 ± 165	< 9	< 9	< 41	< 10
	11/18/15	1239 ± 130	< 6	< 6	< 20	< 6
	12/02/15	885 ± 175	< 7	< 9	< 40	< 8
	MEAN	985 ± 341	-	-	-	-
K15-3	01/07/15	1204 ± 133	< 5	< 5	< 27	< 6
	02/11/15	1319 ± 166	< 7	< 7	< 45	< 11
	03/11/15	1202 ± 160	< 7	< 8	< 36	< 10
	03/25/15	1330 ± 126	< 5	< 5	< 54	< 13
	04/08/15	1247 ± 141	< 5	< 6	< 35	< 10
	04/22/15	1477 ± 161	< 5	< 5	< 52	< 13
	05/06/15	1216 ± 175	< 7	< 7	< 46	< 12
	05/20/15	1214 ± 128	< 4	< 6	< 26	< 9
	06/03/15	1267 ± 125	< 5	< 5	< 23	< 9
	06/17/15	1334 ± 150	< 6	< 6	< 31	< 8
	07/01/15	1157 ± 173	< 7	< 8	< 43	< 14
	07/15/15	1120 ± 121	< 5	< 6	< 37	< 8
	07/29/15	1360 ± 147	< 5	< 5	< 24	< 9
	08/12/15	1366 ± 233	< 8	< 9	< 51	< 11
	08/26/15	1368 ± 149	< 7	< 6	< 26	< 9
	09/09/15	1335 ± 177	< 6	< 6	< 26	< 9
	09/23/15	1248 ± 140	< 7	< 7	< 28	< 5
	10/07/15	1222 ± 126	< 5	< 5	< 18	< 6
	10/21/15	1234 ± 239	< 7	< 13	< 40	< 8
	11/04/15	1220 ± 188	< 7	< 10	< 46	< 13
	11/18/15	1147 ± 143	< 4	< 6	< 19	< 2
	12/02/15	1282 ± 193	< 12	< 10	< 56	< 12
	MEAN	1267 ± 173	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
P4-1	01/07/15	1389 ± 163	< 6	< 7	< 29	< 9
	02/11/15	1478 ± 187	< 7	< 7	< 45	< 14
	03/11/15	1526 ± 160	< 9	< 10	< 48	< 12
	03/25/15	1271 ± 120	< 4	< 5	< 34	< 13
	04/08/15	1375 ± 143	< 5	< 6	< 37	< 8
	04/22/15	1487 ± 101	< 4	< 4	< 38	< 12
	05/06/15	1491 ± 200	< 8	< 8	< 44	< 12
	05/20/15	1485 ± 195	< 11	< 12	< 56	< 14
	06/03/15	1367 ± 205	< 7	< 8	< 41	< 9
	06/17/15	1396 ± 139	< 5	< 7	< 27	< 7
	07/01/15	1315 ± 150	< 5	< 6	< 27	< 9
	07/15/15	1421 ± 164	< 6	< 7	< 47	< 14
	07/29/15	1346 ± 134	< 4	< 5	< 24	< 6
	08/12/15	1332 ± 241	< 9	< 11	< 54	< 10
	08/26/15	1508 ± 201	< 8	< 10	< 35	< 10
	09/09/15	1501 ± 195	< 9	< 8	< 34	< 11
	09/23/15	1493 ± 140	< 6	< 6	< 23	< 6
	10/07/15	1475 ± 166	< 5	< 8	< 24	< 6
	10/21/15	1484 ± 193	< 7	< 8	< 27	< 8
	11/04/15	1193 ± 221	< 4	< 7	< 27	< 14
	11/18/15	1382 ± 128	< 5	< 5	< 18	< 4
	12/02/15	1382 ± 200	< 7	< 9	< 42	< 11
	MEAN	1414 ± 175	-	-	-	-

Table C-IX.1 **CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	SR-90	Be-7	K-40	I-131	Cs-134	Cs-137
B10-2							
Brocolli Leaves	06/29/15	8 ± 2	395 ± 227	4272 ± 544	< 58	< 25	< 29
Cabbage (& Leaves)	06/29/15	< 1	160 ± 77	3661 ± 193	< 17	< 8	< 9
Sunflower Leaves	06/29/15	8 ± 2	1965 ± 326	6947 ± 690	< 53	< 19	< 27
Cabbage (& Leaves)	07/20/15	< 4	153 ± 128	2261 ± 333	< 44	< 15	< 19
Brocolli Leaves	07/27/15	7 ± 2	296 ± 58	4532 ± 166	< 38	< 6	< 6
Cabbage (& Leaves)	07/27/15	< 2	< 86	3123 ± 174	< 50	< 8	< 8
Sunflower Leaves	07/27/15	< 3	1452 ± 114	7653 ± 234	< 52	< 8	< 9
Sweet Corn	08/03/15	-	< 122	2175 ± 271	< 50	< 9	< 13
Tomatoes	08/03/15	-	< 117	1996 ± 252	< 53	< 10	< 12
Cabbage (& Leaves)	08/31/15	4 ± 2	< 389	3164 ± 901	< 51	< 50	< 55
Cabbage (& Leaves)	09/28/15	< 3	< 202	3640 ± 557	< 46	< 24	< 29
Sweet Potatoes	10/05/15	-	< 137	3530 ± 482	< 22	< 18	< 21
	MEAN	7 ± 3	737 ± 1550	3913 ± 3547	-	-	-
E1-2							
Cabbage (& Leaves)	07/20/15	< 3	263 ± 254	7428 ± 576	< 47	< 18	< 19
Sweet Corn	08/03/15	-	< 124	2339 ± 318	< 56	< 13	< 14
Tomatoes	08/03/15	-	< 103	3406 ± 243	< 51	< 10	< 10
Sweet Potatoes	10/05/15	-	< 100	3480 ± 369	< 17	< 12	< 14
	MEAN	-	263 ± 0	4163 ± 4476	-	-	-
H1-2							
Eggplant Leaves	07/27/15	< 3	996 ± 106	6136 ± 210	< 49	< 7	< 8
Squash Leaves	07/27/15	3 ± 2	1019 ± 101	4172 ± 167	< 40	< 6	< 6
Zuchinni Leaves	07/27/15	< 3	860 ± 85	3662 ± 180	< 47	< 7	< 8
Eggplant Leaves	08/31/15	10 ± 5	1212 ± 499	4681 ± 1382	< 47	< 30	< 38
Squash Leaves	08/31/15	< 5	627 ± 265	3355 ± 892	< 57	< 39	< 49
Zuchinni Leaves	08/31/15	11 ± 4	< 475	3026 ± 914	< 52	< 46	< 54
Squash Leaves	09/28/15	< 3	1654 ± 271	2715 ± 474	< 43	< 22	< 26
Turnip Greens	09/28/15	6 ± 3	< 306	3860 ± 558	< 54	< 25	< 27
Zuchinni Leaves	09/28/15	< 4	499 ± 215	2079 ± 408	< 40	< 18	< 24
	MEAN	7 ± 8	981 ± 766	3743 ± 2377	-	-	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-X.1 QUARTERLY OSLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF MILLIREM/QUARTER

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
A1-4	19.9 ± 2.9	18.1	19.3	21.5	20.5
A3-1	19.7 ± 2.6	18.6	18.8	21.4	20.1
A5-1	23.6 ± 3.0	23.0	22.2	25.7	23.5
A9-3	20.5 ± 3.1	18.7	19.7	22.1	21.4
B1-1	20.4 ± 3.5	19.0	18.8	21.6	22.2
B1-2	20.6 ± 2.2	19.4	20.0	22.0	20.8
B2-1	20.3 ± 3.3	18.9	18.9	22.3	20.9
B5-1	23.1 ± 3.2	21.9	21.6	24.6	24.4
C1-1	23.2 ± 2.5	21.6	23.3	24.6	23.3
C1-2	19.7 ± 1.3	19.1	19.2	20.4	20.1
C2-1	22.6 ± 4.2	21.5	20.7	25.5	22.5
C5-1	23.9 ± 4.0	22.0	22.4	26.2	24.8
C8-1	24.3 ± 5.0	21.3	23.1	26.5	26.2
D1-1	20.3 ± 2.6	19.7	18.8	21.6	21.1
D1-2	21.3 ± 3.1	19.8	20.1	22.6	22.6
D2-2	26.1 ± 4.1	24.3	25.4	29.0	25.5
D6-1	26.0 ± 4.6	22.8	26.0	28.3	26.7
E1-2	20.7 ± 2.3	20.0	19.7	22.2	21.0
E1-4	20.0 ± 3.7	18.3	18.4	21.2	21.9
E2-3	24.4 ± 3.4	22.3	23.8	26.2	25.2
E5-1	25.9 ± 2.8	24.3	26.2	27.6	25.4
E7-1	23.7 ± 4.8	21.3	22.6	26.9	23.9
F1-1	22.3 ± 1.9	21.3	21.9	23.5	22.6
F1-2	21.0 ± 3.1	19.8	19.5	22.6	21.9
F1-4	20.3 ± 3.7	19.3	18.2	21.3	22.3
F2-1	25.1 ± 3.5	23.8	24.1	27.6	25.0
F5-1	25.6 ± 4.6	23.3	24.6	28.7	25.9
G1-2	23.3 ± 4.1	21.1	22.3	25.8	24.1
G1-3	19.6 ± 2.0	18.6	19.0	20.8	20.0
G1-5	20.0 ± 2.0	18.6	19.9	20.7	20.7
G1-6	20.5 ± 2.4	19.0	20.1	21.5	21.4
G2-4	27.0 ± 3.9	24.6	26.8	29.4	27.0
G5-1	23.0 ± 3.8	20.7	22.1	24.7	24.3
H1-1	22.3 ± 2.1	21.1	21.6	23.0	23.3
H3-1	19.6 ± 2.1	19.1	18.5	20.0	20.9
H5-1	19.1 ± 2.6	17.8	18.4	20.8	19.3
H8-1	33.1 ± 6.9	30.1	31.0	37.8	33.3
J1-1	20.4 ± 2.1	19.4	19.8	21.7	20.8
J1-3	18.1 ± 1.8	17.6	17.2	19.1	18.6
J3-1	22.6 ± 4.2	21.0	20.6	24.4	24.5
J5-1	25.2 ± 4.4	22.6	24.3	27.6	26.2
J7-1	26.1 ± 4.9	24.0	24.6	29.5	26.2
K1-4	20.3 ± 2.4	18.9	19.9	21.7	20.8
K2-1	24.5 ± 3.6	22.5	24.4	26.9	24.3
K3-1	20.4 ± 2.8	19.0	19.4	21.7	21.5
K5-1	23.9 ± 2.3	22.5	23.4	24.3	25.2
K8-1	23.5 ± 3.3	23.1	21.4	24.5	25.1

Table C-X.1 QUARTERLY OSLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF MILLIREM/QUARTER

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
L1-1	21.2 ± 4.7	19.3	19.8	24.5	21.3
L1-2	21.0 ± 2.5	19.8	20.2	22.4	21.7
L2-1	22.9 ± 2.9		21.2	24.0	23.4
L5-1	20.4 ± 2.7	20.0	18.7	21.7	21.2
L8-1	22.8 ± 3.8	20.4	22.1	24.5	24.1
M1-1	20.0 ± 3.8	17.7	19.2	21.9	21.2
M1-2	22.2 ± 2.6	21.2	21.4	24.1	22.2
M2-1	20.5 ± 2.4	19.3	19.6	21.2	21.8
M5-1	22.2 ± 2.9	21.0	20.9	23.1	23.8
M9-1	26.7 ± 5.2	23.1	26.3	28.8	28.4
N1-1	21.6 ± 3.3	20.3	20.4	23.8	21.7
N1-3	22.2 ± 5.0	19.7	21.4	25.6	22.1
N2-1	22.9 ± 2.6	21.4	22.2	24.2	23.7
N5-1	20.1 ± 3.9	18.2	19.0	20.4	22.6
N8-1	23.2 ± 2.9	21.7	22.7	25.2	23.3
P1-1	21.2 ± 4.2	19.1	19.9	23.7	22.2
P1-2	24.7 ± 13.0	18.0	23.5	33.6	23.8
P2-1	25.6 ± 3.3	23.9	24.5	27.2	26.8
P5-1	22.6 ± 3.2	20.7	21.7	23.8	24.0
P8-1	20.3 ± 2.3	19.8	19.0	21.7	20.6
Q1-1	21.8 ± 4.4	19.5	20.5	24.4	22.7
Q1-2	19.6 ± 4.6	17.2	18.7	22.6	19.9
Q2-1	20.0 ± 1.8	18.8	19.7	20.9	20.4
Q5-1	21.4 ± 2.5	21.1	20.0	23.0	21.4
Q9-1	21.8 ± 2.2	21.2	20.5	22.7	22.7
R1-1	20.6 ± 4.6	17.7	20.0	23.1	21.4
R1-2	20.2 ± 2.3	19.0	19.5	20.9	21.4
R3-1	25.0 ± 4.0	22.7	24.0	26.9	26.5
R5-1	24.4 ± 3.1	22.9	23.3	25.9	25.6
R9-1	24.1 ± 2.7	22.6	23.3	25.0	25.5
B10-1	23.2 ± 3.0	22.8	21.7	25.3	22.8
D15-1	23.3 ± 2.9	21.8	22.4	24.8	24.2
F10-1	26.9 ± 4.7	24.1	25.8	29.0	28.6
F25-1	24.0 ± 1.9	23.5	23.2	25.3	24.1
G10-1	31.0 ± 4.2	28.8	30.7	33.9	30.7
G15-1	26.3 ± 4.0	24.4	25.9	29.1	25.6
H15-1	22.6 ± 3.5	20.9	21.3	24.4	23.7
J15-1	27.2 ± 4.9	24.5	25.9	29.9	28.5
K15-1	21.7 ± 3.4	19.8	20.8	23.1	23.2
L15-1	22.9 ± 3.0	20.9	22.9	24.5	23.2
N15-2	24.4 ± 2.1	22.9	24.2	25.3	25.0
Q15-1	24.6 ± 3.4	22.4	24.5	26.5	25.1
R15-1	22.1 ± 2.9	20.5	21.4	23.8	22.6

(1) SEE PROGRAM EXCEPTIONS SECTION FOR INFORMATION

TABLE C-X.2 MEAN QUARTERLY OSLD RESULTS FOR THE SITE BOUNDARY, INDICATOR AND CONTROL LOCATIONS FOR THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF MILLIREM/QUARTER ± 2 STANDARD DEVIATIONS OF THE STATION DATA

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INDICATOR	CONTROL
JAN-MAR	18.8 ± 1.9	21.4 ± 4.3	22.8 ± 5.1
APR-JUN	19.7 ± 2.8	22.0 ± 5.1	23.9 ± 5.7
JUL-SEP	22.6 ± 6.1	24.8 ± 6.1	26.4 ± 6.5
OCT-DEC	21.2 ± 2.4	23.7 ± 5.0	25.1 ± 4.9

TABLE C-X.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF MILLIREMQUARTER

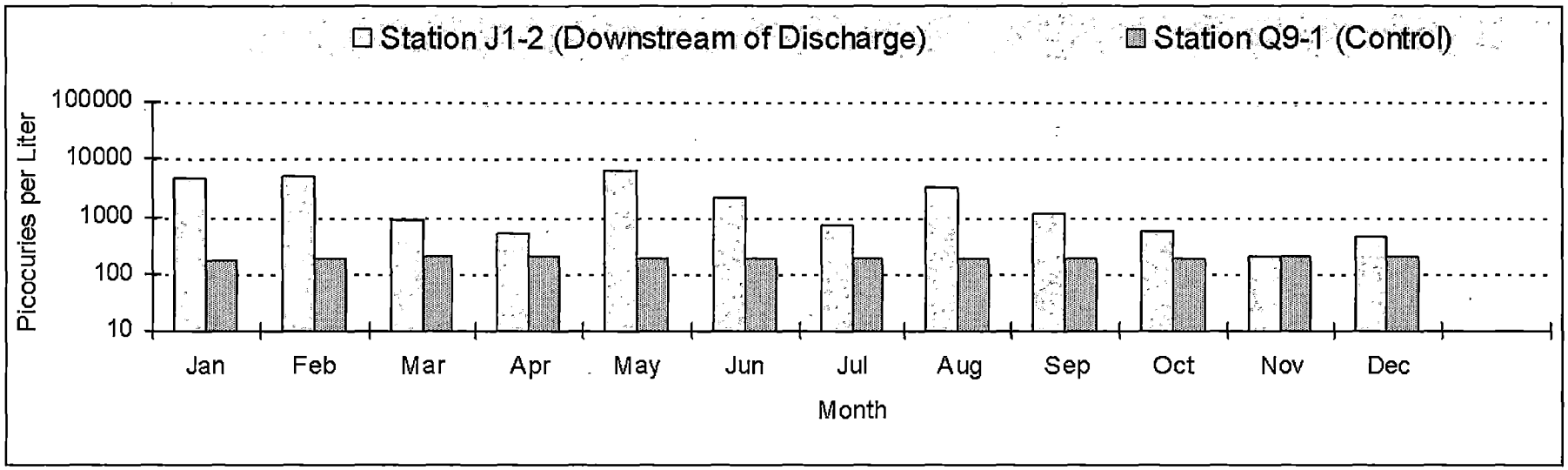
LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
SITE BOUNDARY	76	17.2	33.6	20.6 ± 4.6
INDICATOR	239	17.8	37.8	23.0 ± 5.8
CONTROL	44	19.8	33.9	24.5 ± 6.0

SITE BOUNDARY STATIONS - A1-4, B1-2, C1-2, D1-1, E1-4, F1-2, F1-4, G1-3, G1-5, G1-6, H1-1, J1-3, K1-4, L1-1, M1-1, N1-3, P1-2, Q1-2, R1-1

INDICATOR STATIONS - A3-1, A5-1, A9-3, B1-1, B10-1, B2-1, B5-1, C1-1, C2-1, C5-1, C8-1, D1-2, D2-2, D6-1, E1-2, E2-3, E5-1, E7-1, F1-1, F10-1, F2-1, F5-1, G1-2, G2-4, G5-1, H3-1, H5-1, H8-1, J1-1, J3-1, J5-1, J7-1, K2-1, K3-1, K5-1, K8-1, L1-2, L2-1, L5-1, L8-1, M1-2, M2-1, M5-1, M9-1, N1-1, N2-1, N5-1, N8-1, P1-1, P2-1, P5-1, P8-1, Q1-1, Q2-1, Q5-1, Q9-1, R1-2, R3-1, R5-1, R9-1

CONTROL STATIONS - D15-1, F25-1, G10-1, G15-1, H15-1, J15-1, K15-1, L15-1, N15-2, Q15-1, R15-1

FIGURE C-1
Monthly Tritium Concentrations in Surface Water and Effluent Water
Three Mile Island Nuclear Station, 2015



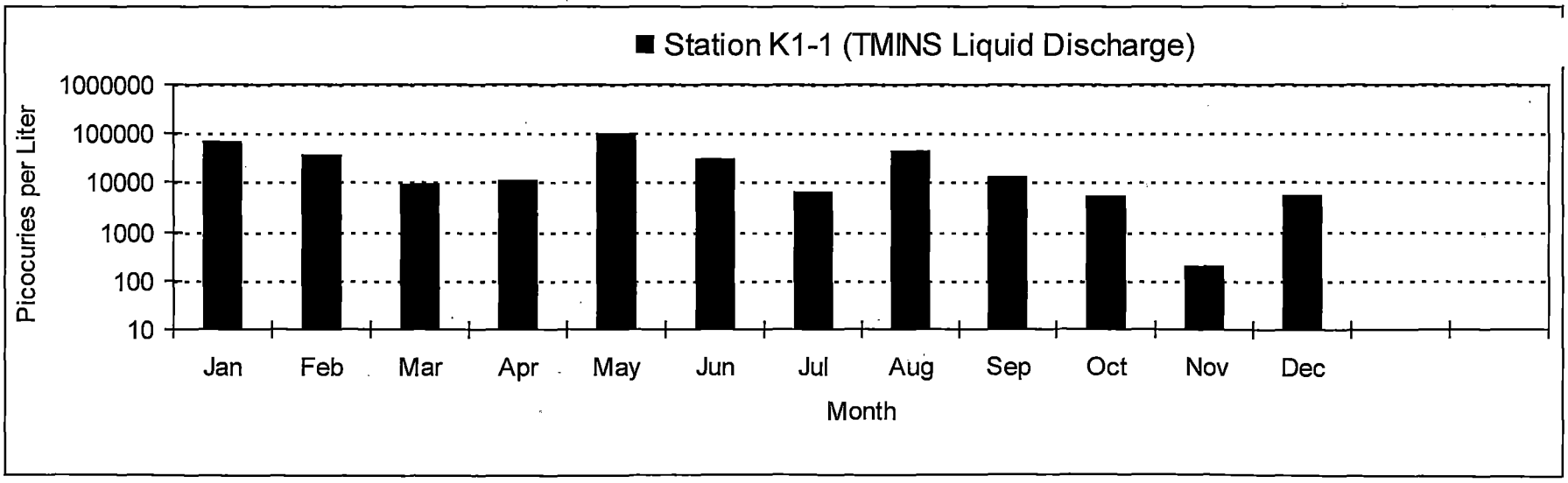


FIGURE C-2
Mean Quarterly Tritium Concentrations in Surface Water
Three Mile Island Nuclear Station, 1974 - 2015

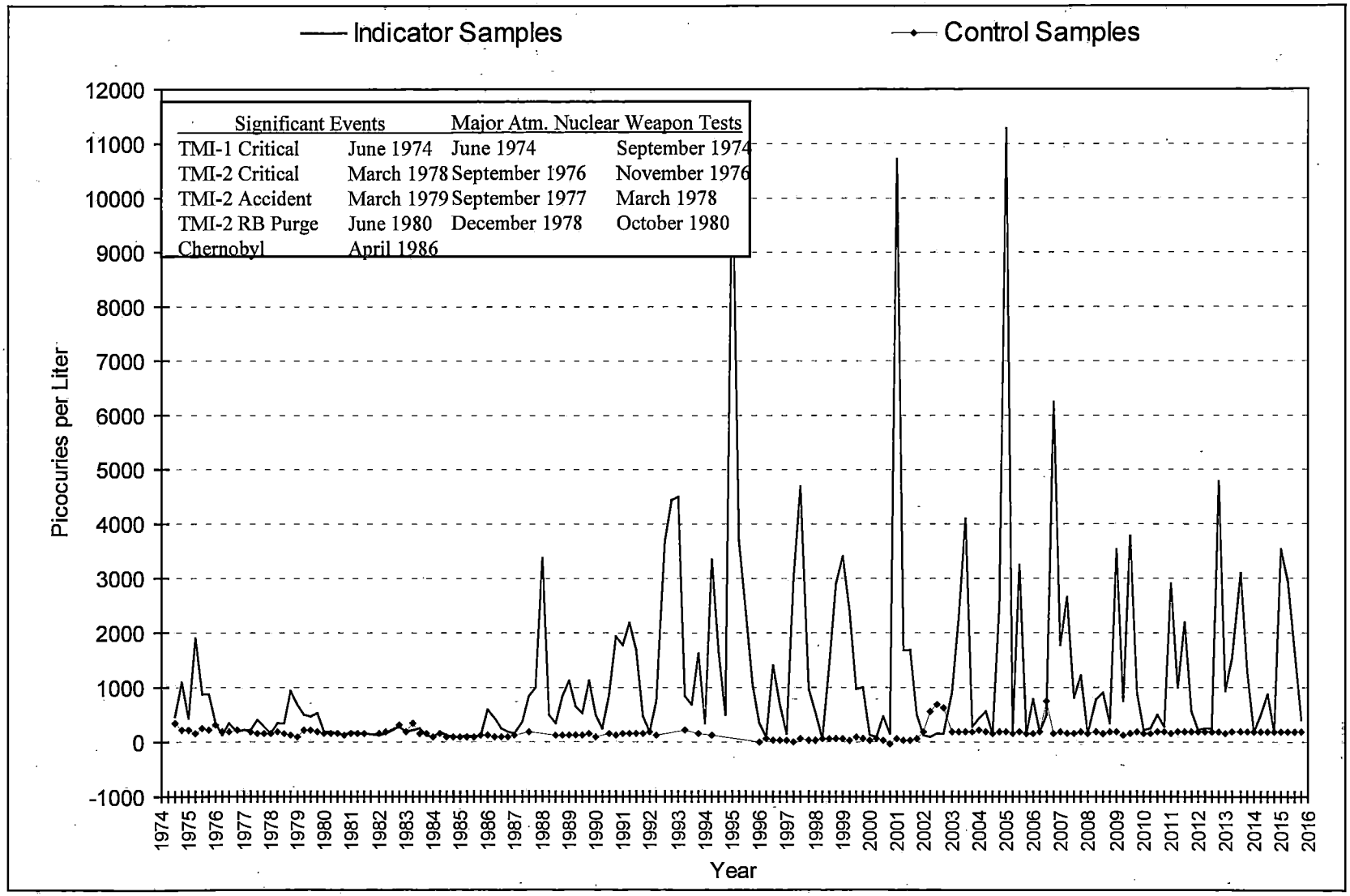


FIGURE C-3
Mean Monthly Gross Beta Concentrations in Drinking Water
Three Mile Island Nuclear Station, 2015

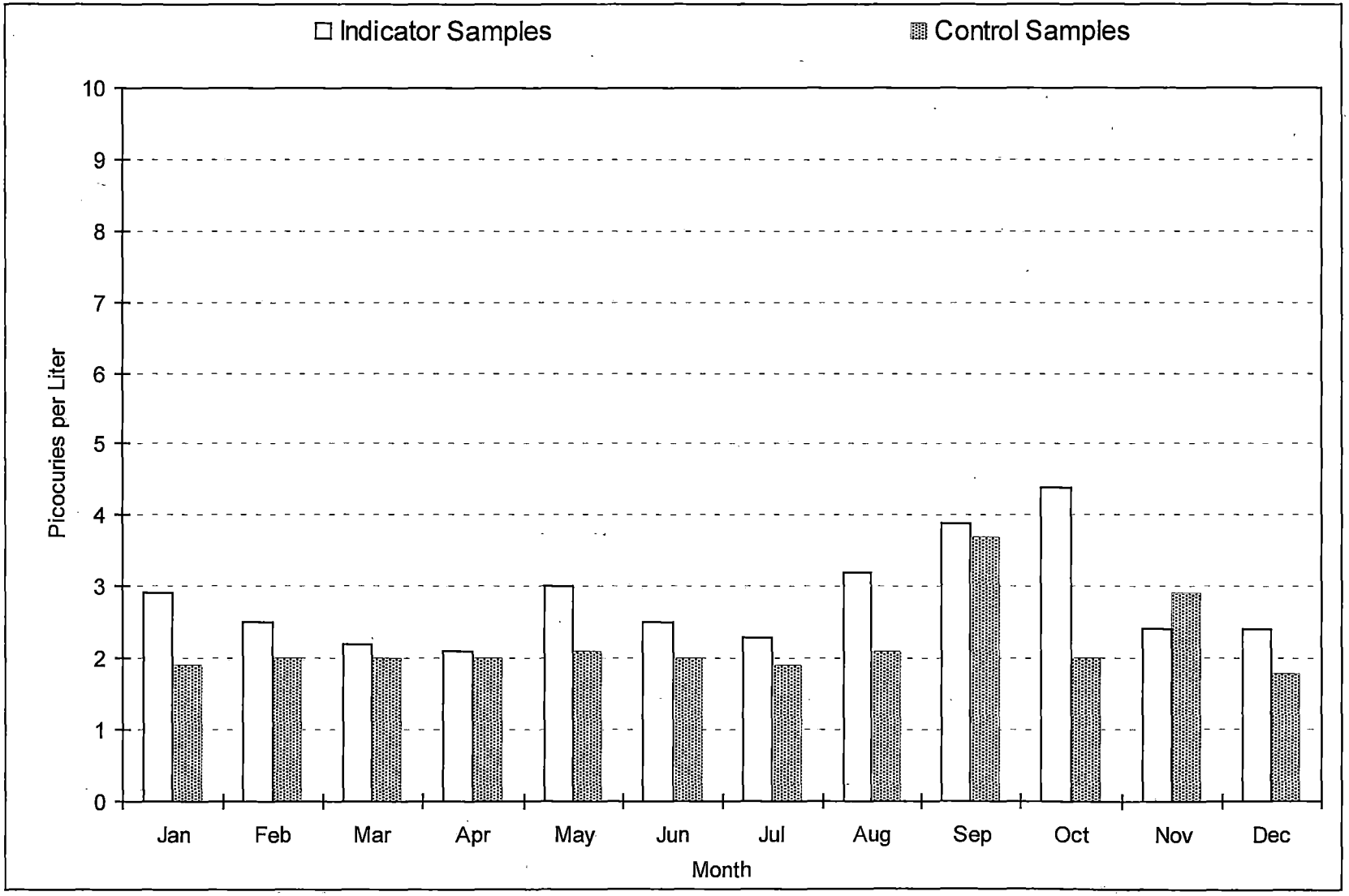
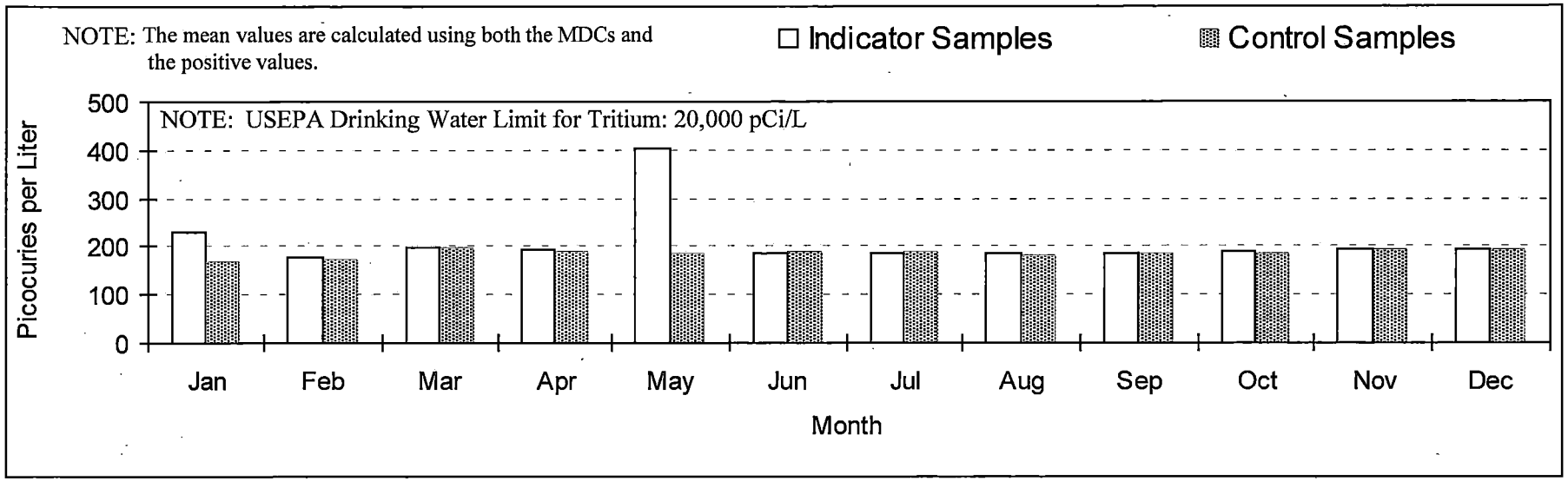


FIGURE C-4
Mean Monthly Tritium Concentrations in Drinking Water and Effluent Water
Three Mile Island Nuclear Station, 2015



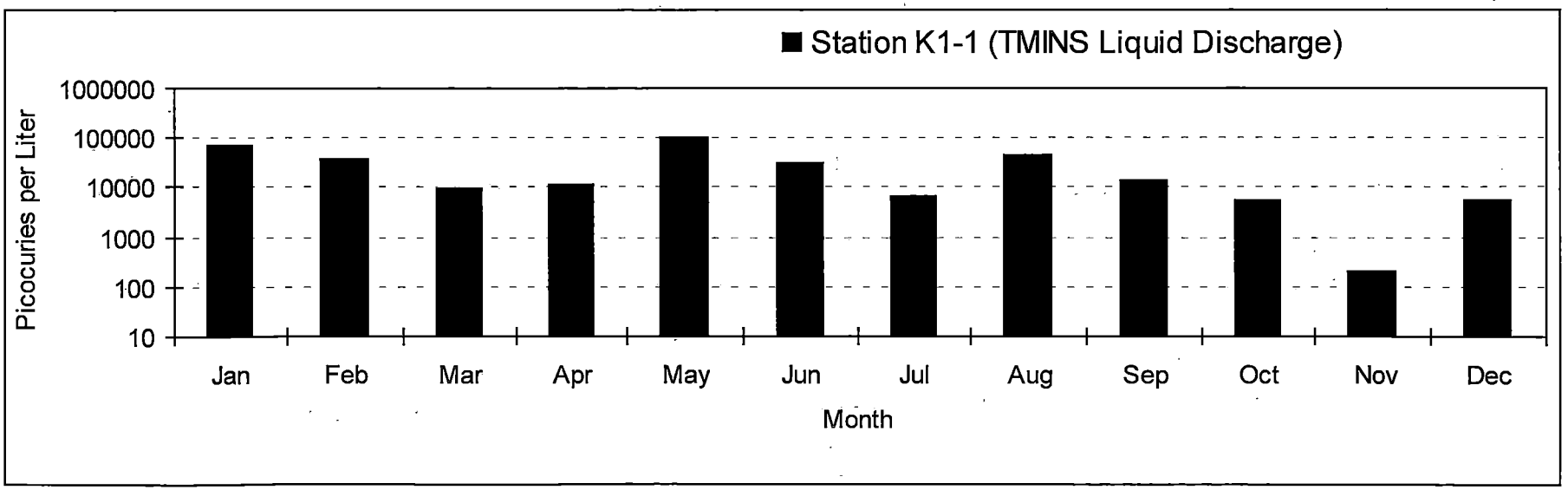


FIGURE C-5
Mean Cesium-137 Concentrations in Aquatic Sediments
Three Mile Island Nuclear Station, 1984 – 2015

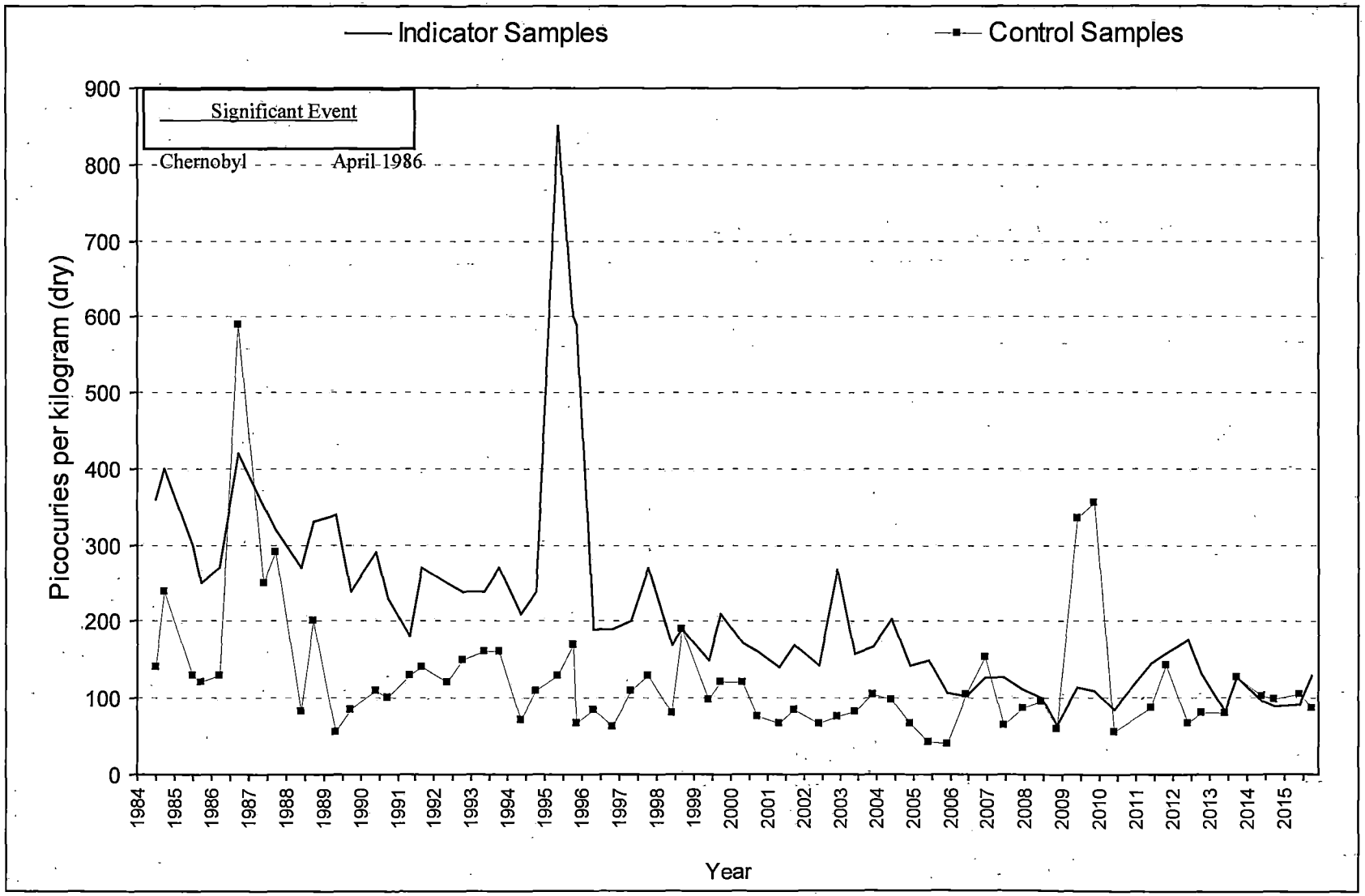


FIGURE C-6
Mean Quarterly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 1972 - 2015

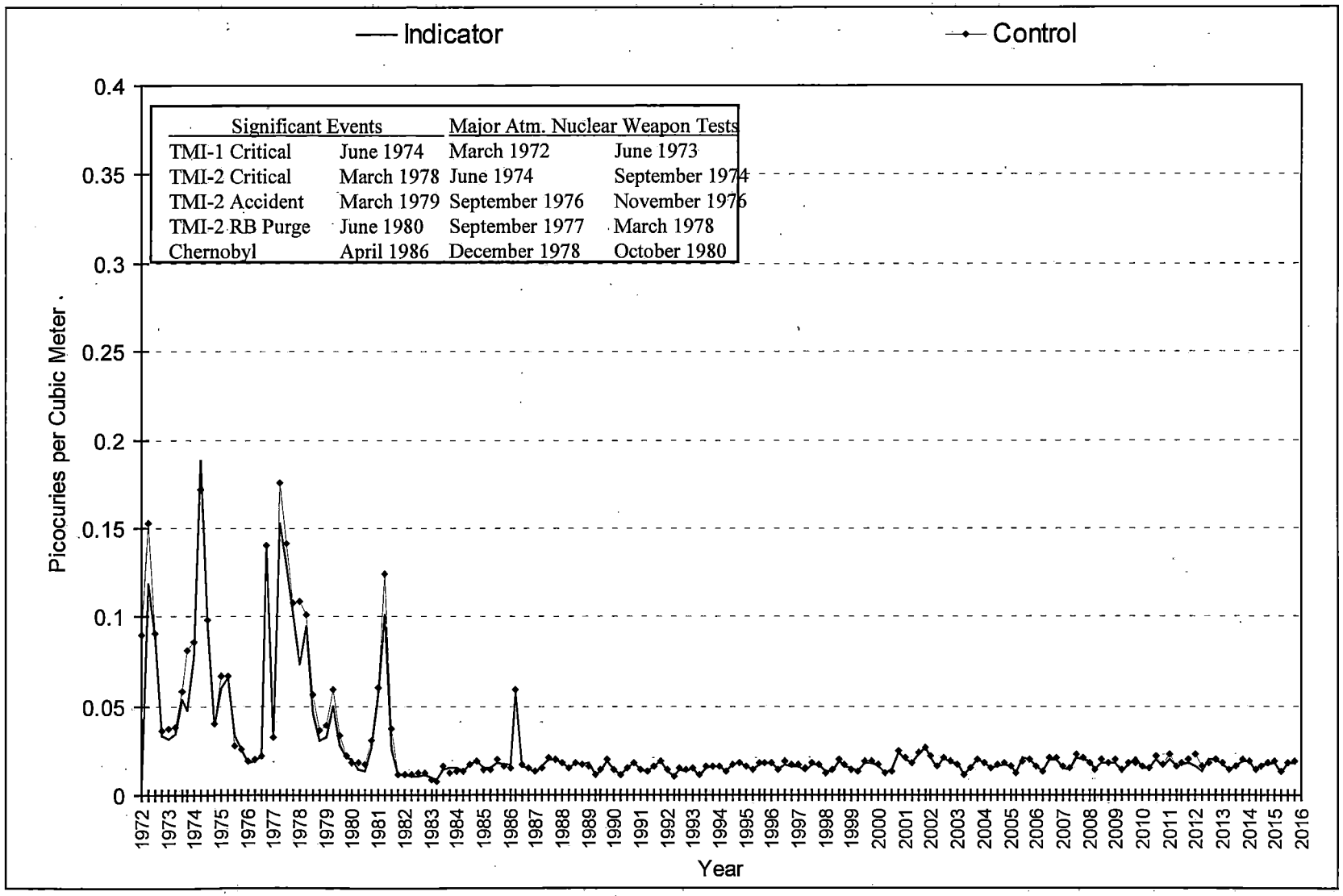
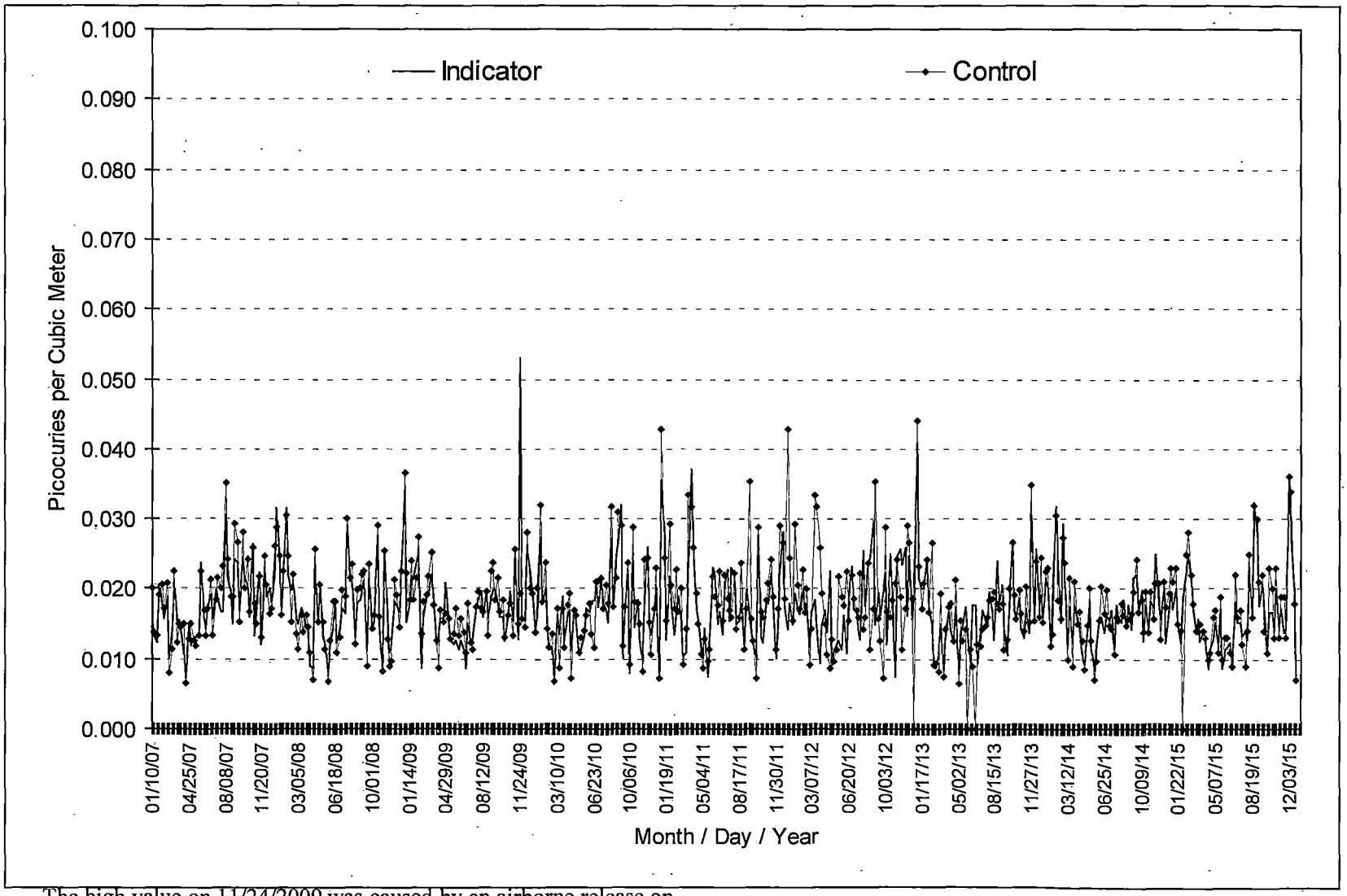


FIGURE C-7
Mean Weekly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 2007 - 2015

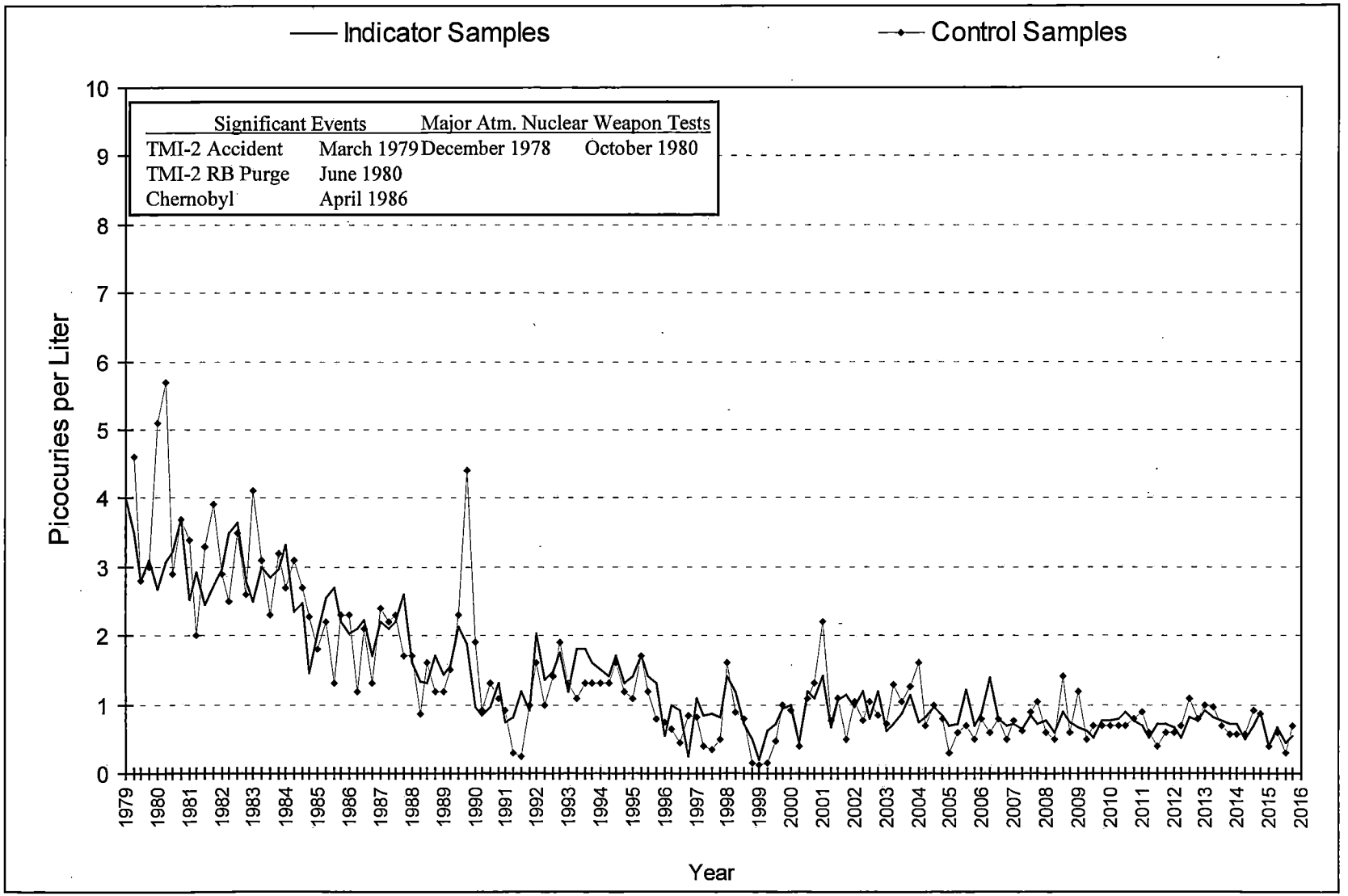


The high value on 11/24/2009 was caused by an airborne release on 11/21/2009

FIGURE C-8

Mean Quarterly Strontium-90 Concentrations in Cow Milk

Three Mile Island Nuclear Station, 1979 - 2015



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APPENDIX D

DATA TABLES AND FIGURES
COMPARISON LABORATORY

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The following section presents the results of data analysis performed by the QC laboratory, Environmental Inc. Duplicate samples were obtained from several locations and media and split between the primary laboratory, Teledyne Brown Engineering (TBE) and the QC laboratory. Comparison of the results for most media were within expected ranges.

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TABLE D-I.1 **CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/30/14 - 02/03/15	1.4 ± 0.7
02/03/15 - 03/03/15	1.2 ± 0.5
03/03/15 - 03/31/15	< 1.8
03/31/15 - 04/28/15	< 1.7
04/28/15 - 06/02/15	1.8 ± 0.7
06/02/15 - 06/30/15	< 0.9
06/30/15 - 07/28/15	1.0 ± 0.5
07/28/15 - 09/01/15	< 0.9
09/01/15 - 09/29/15	1.6 ± 0.6
09/29/15 - 11/03/15	2.1 ± 1.0
11/03/15 - 12/01/15	< 0.9
12/01/15 - 12/29/15	2.4 ± 1
MEAN	1.6 ± 1.0

TABLE D-I.2 **CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/30/14 - 02/03/15	< 189
02/03/15 - 03/03/15	< 151
03/03/15 - 03/31/15	< 149
03/31/15 - 04/28/15	< 147
04/28/15 - 06/02/15	< 155
06/02/15 - 06/30/15	< 149
06/30/15 - 07/28/15	< 146
07/28/15 - 09/01/15	< 149
09/01/15 - 09/29/15	< 149
09/29/15 - 11/03/15	< 148
11/03/15 - 12/01/15	< 144
12/01/15 - 12/29/15	< 144
MEAN	-

TABLE D-I.3 **CONCENTRATIONS OF IODINE-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/30/14 - 02/03/15	< 0.4
02/03/15 - 03/03/15	< 0.4
03/03/15 - 03/31/15	< 0.4
03/31/15 - 04/28/15	< 0.2
04/28/15 - 06/02/15	< 0.4
06/02/15 - 06/30/15	< 0.3
06/30/15 - 07/28/15	< 0.3
07/28/15 - 09/01/15	< 0.4
09/01/15 - 09/29/15	< 0.3
09/29/15 - 11/03/15	< 0.5
11/03/15 - 12/01/15	< 0.4
12/01/15 - 12/29/15	< 0.3
MEAN	-

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE D-I.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
Q9-1Q	12/30/14 - 02/03/15	< 1	< 3	< 1	< 1	< 2	< 2	< 1	< 1	< 1	< 8	< 3
	02/03/15 - 03/03/15	< 4	< 7	< 3	< 3	< 6	< 4	< 4	< 2	< 5	< 11	< 3
	03/03/15 - 03/31/15	< 2	< 4	< 1	< 2	< 2	< 3	< 1	< 1	< 1	< 12	< 6
	03/31/15 - 04/28/15	< 1	< 5	< 2	< 2	< 4	< 3	< 4	< 2	< 2	< 25	< 2
	04/28/15 - 06/02/15	< 5	< 10	< 5	< 4	< 6	< 8	< 4	< 4	< 6	< 31	< 8
	06/02/15 - 06/30/15	< 3	< 4	< 2	< 1	< 3	< 5	< 3	< 3	< 3	< 20	< 2
	06/30/15 - 07/28/15	< 4	< 6	< 5	< 5	< 9	< 6	< 3	< 4	< 3	< 17	< 8
	07/28/15 - 09/01/15	< 2	< 3	< 2	< 2	< 4	< 5	< 3	< 2	< 1	< 20	< 4
	09/01/15 - 09/29/15	< 1	< 6	< 2	< 2	< 4	< 4	< 3	< 3	< 4	< 19	< 3
	09/29/15 - 11/03/15	< 1	< 2	< 1	< 1	< 2	< 2	< 1	< 1	< 1	< 11	< 3
	11/03/15 - 12/01/15	< 4	< 4	< 5	< 4	< 3	< 8	< 3	< 3	< 6	< 24	< 6
	12/01/15 - 12/29/15	< 3	< 10	< 5	< 4	< 11	< 9	< 4	< 4	< 6	< 26	< 6

TABLE D-II.1 **CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Sr-89	Sr-90	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
INDP	10/08/15	< 12	< 5	3350 ± 410	< 10	< 19	< 40	< 10	< 29	< 20	< 15

TABLE D-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137
J2-1	10/29/15	13750 ± 736	< 19	56 ± 20
MEAN		13750 ± 0		

TABLE D-IV.1 CONCENTRATIONS OF GAMMA EMITTERS AND STRONTIUM IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	I-131	Cs-134	Cs-137	Sr-89	Sr-90
H1-2Q	07/27/15	4010 ± 370	< 13	< 9	< 16	< 9	35 ± 5
B10-2Q	07/20/15	2330 ± 290	< 15	< 9	< 11	< 4	2 ± 1
MEAN		3170 ± 2376	-	-	-	-	19 ± 47

TABLE D-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE AND I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	E1-2Q GROSS BETA	E1-2Q I-131
01/01/15 - 01/08/15	30 ± 5	< 19
01/08/15 - 01/15/15	28 ± 4	< 16
01/15/15 - 01/22/15	27 ± 5	< 11
01/22/15 - 01/29/15	19 ± 4	< 13
01/29/15 - 02/05/15	19 ± 4	< 16
02/05/15 - 02/12/15	24 ± 4	< 17
02/15/15 - 02/19/15	31 ± 4	< 27
02/19/15 - 02/26/15	42 ± 6	< 21
02/26/15 - 03/05/15	29 ± 5	< 11
03/05/15 - 03/12/15	23 ± 5	< 27
03/12/15 - 03/18/15	17 ± 5	< 17
03/18/15 - 03/26/15	26 ± 4	< 18
03/26/15 - 04/02/15	21 ± 5	< 21
04/02/15 - 04/09/15	23 ± 5	< 12
04/09/15 - 04/16/15	18 ± 4	< 25
04/16/15 - 04/23/15	16 ± 4	< 20
04/23/15 - 04/30/15	13 ± 4	< 16
04/30/15 - 05/07/15	23 ± 5	< 14
05/07/15 - 05/14/15	22 ± 4	< 20
05/14/15 - 05/21/15	21 ± 4	< 28
05/21/15 - 05/28/15	26 ± 5	< 24
05/15/15 - 06/04/15	16 ± 4	< 18
06/04/15 - 06/10/15	20 ± 5	< 33
06/10/15 - 06/18/15	18 ± 4	< 26
06/18/15 - 06/25/15	25 ± 5	< 15
06/25/15 - 07/02/15	18 ± 5	< 16
07/02/15 - 07/09/15	23 ± 5	< 18
07/09/15 - 07/16/15	23 ± 5	< 17
07/16/15 - 07/23/15	24 ± 5	< 26
07/23/15 - 07/30/15	34 ± 5	< 24
07/30/15 - 08/06/15	29 ± 5	< 21
08/06/15 - 08/13/15	23 ± 5	< 52
08/13/15 - 08/19/15	40 ± 6	< 25
08/19/15 - 08/27/15	28 ± 4	< 22
08/27/15 - 09/03/15	56 ± 6	< 25
09/03/15 - 09/10/15	47 ± 6	< 20
09/10/15 - 09/16/15	32 ± 6	< 12
09/16/15 - 09/24/15	36 ± 5	< 20
09/24/15 - 10/01/15	21 ± 5	< 14
10/01/15 - 10/08/15	15 ± 5	< 26
10/08/15 - 10/15/15	26 ± 5	< 16
10/15/15 - 10/22/15	28 ± 5	< 19
10/22/15 - 10/29/15	23 ± 5	< 23
10/29/15 - 11/05/15	32 ± 5	< 18
11/05/15 - 11/12/15	24 ± 5	< 22
11/12/15 - 11/19/15	31 ± 5	< 22
11/19/15 - 11/25/15	20 ± 5	< 35
11/25/15 - 12/03/15	29 ± 4	< 11
12/03/15 - 12/10/15	69 ± 6	< 20
12/10/15 - 12/17/15	50 ± 6	< 21
12/17/15 - 12/23/15	32 ± 6	< 24
12/23/15 - 12/31/15	16 ± 4	< 20
MEAN	27 ± 21	-

TABLE D-V.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	Cs-134	Cs-137
E1-2Q	01/01/15 - 04/02/15	79 ± 13	< 0.8	< 0.7
	04/02/15 - 07/02/15	88 ± 16	< 0.7	< 0.8
	07/02/15 - 10/01/15	98 ± 19	< 0.8	< 1.0
	10/01/15 - 12/31/15	62 ± 16	< 0.5	< 0.5
	MEAN	82 ± 31	-	-

TABLE D-VI.1 CONCENTRATIONS OF I-131 BY CHEMICAL SEPARATION, GAMMA EMITTERS, AND STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	I-131	K-40	Cs-134	Cs-137	Ba-140	La-140	Sr-89	Sr-90
G2-1Q	01/07/15	< 0.2	1106 ± 94	< 2	< 4	< 31	< 5		
	02/11/15	< 0.4	1026 ± 90	< 2	< 3	< 31	< 6		
	03/11/15	< 0.5	1059 ± 86	< 2	< 3	< 22	< 3		
	03/25/15	< 0.2	1136 ± 88	< 3	< 3	< 23	< 5	< 0.6	< 0.6
	04/08/15	< 0.4	966 ± 77	< 2	< 3	< 26	< 4		
	04/22/15	< 0.4	837 ± 75	< 2	< 3	< 25	< 6		
	05/06/15	< 0.2	863 ± 66	< 2	< 2	< 30	< 5		
	05/20/15	< 0.4	1389 ± 101	< 2	< 3	< 16	< 4		
	06/03/15	< 0.3	740 ± 80	< 3	< 2	< 38	< 8		
	06/17/15	< 0.4	1009 ± 106	< 4	< 4	< 18	< 5	< 0.5	< 0.6
	07/01/15	< 0.5	1065 ± 118	< 6	< 7	< 19	< 8		
	07/15/15	< 0.4	1108 ± 100	< 3	< 3	< 27	< 4		
	07/29/15	< 0.3	1308 ± 150	< 6	< 6	< 24	< 6		
	08/12/15	< 0.2	1084 ± 85	< 2	< 4	< 49	< 12		
	08/26/15	< 0.4	1130 ± 109	< 3	< 3	< 35	< 9		
	09/09/15	< 0.4	1122 ± 78	< 2	< 2	< 39	< 5		
	09/23/15	< 0.4	777 ± 75	< 3	< 3	< 27	< 7	< 0.6	< 0.5
	10/07/15	< 0.5	998 ± 85	< 3	< 3	< 28	< 14		
	10/21/15	< 0.3	927 ± 86	< 3	< 3	< 43	< 6		
	11/04/15	< 0.2	895 ± 36	< 1	< 2	< 11	< 5		
	11/18/15	< 0.4	1473 ± 98	< 3	< 4	< 31	< 4		
	12/02/15	< 0.4	1328 ± 137	< 5	< 5	< 27	< 5	< 0.5	< 0.4
	MEAN		1061 ± 382	-	-	-	-	-	-

FIGURE D-1
MONTHLY GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED FROM TMINS LOCATION Q9-1Q, 2015

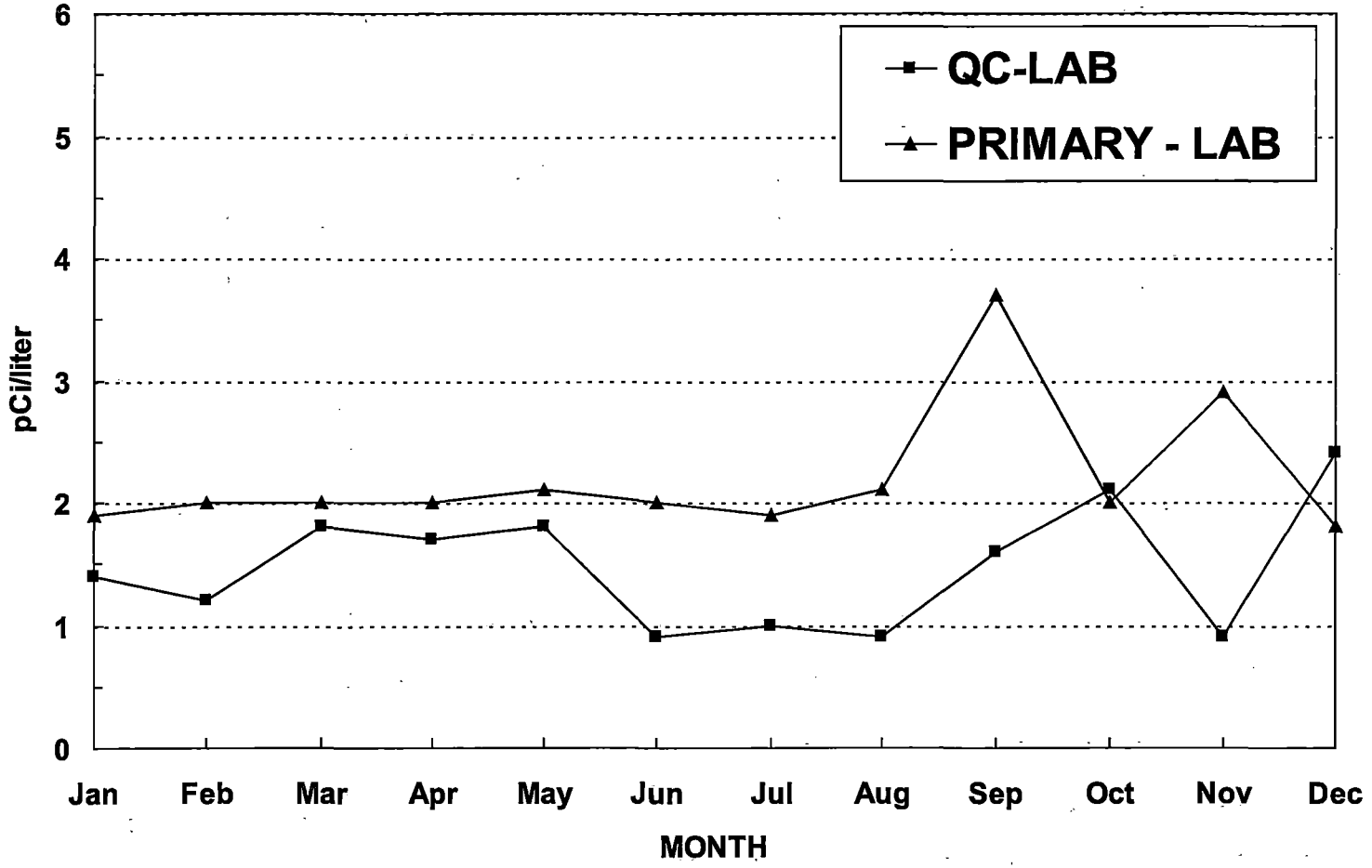
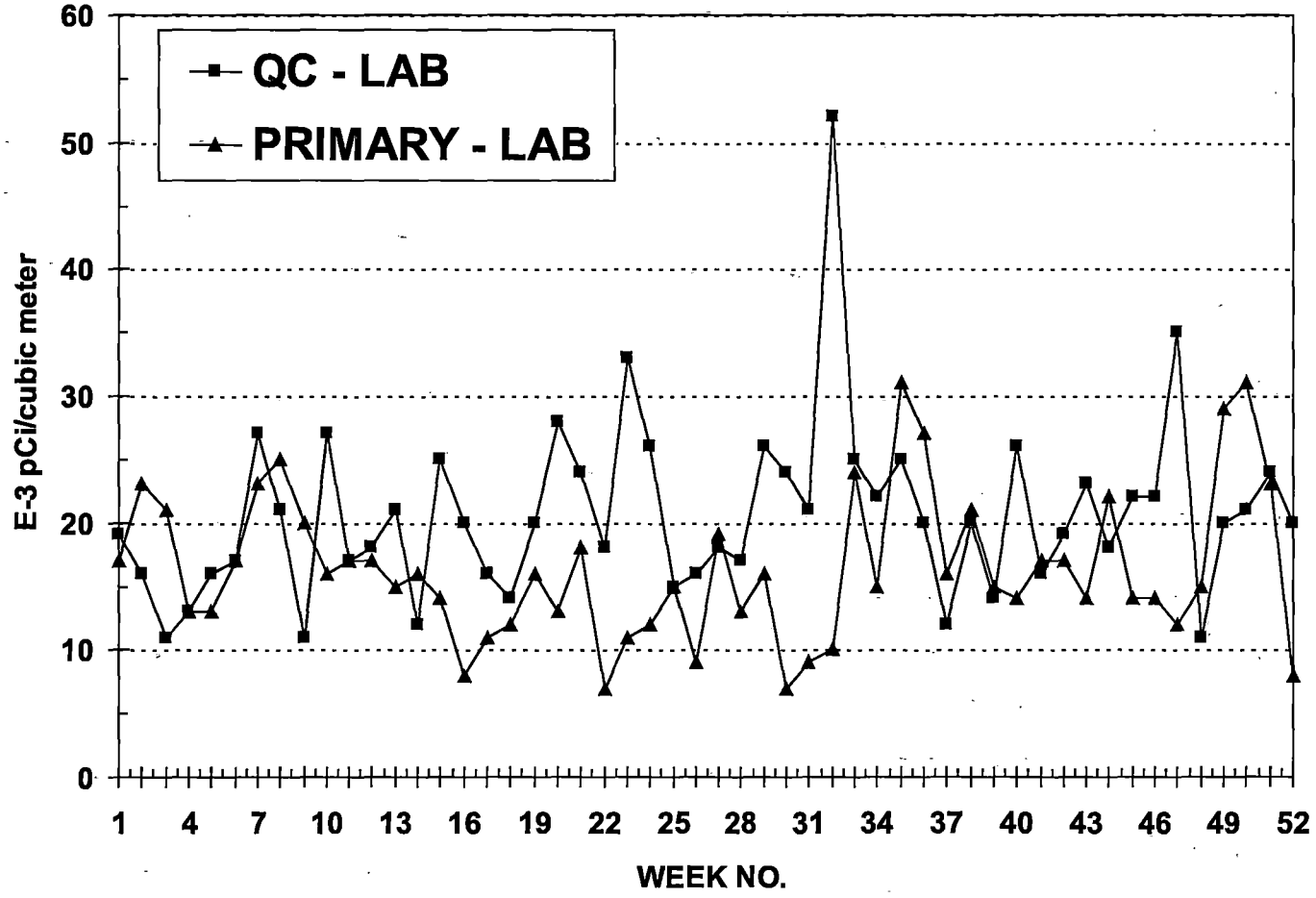


FIGURE D-2
WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM TMINS LOCATION E1-2Q, 2015



APPENDIX E

INTER-LABORATORY COMPARISON PROGRAM

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TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2015
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2015	E11181	Milk	Sr-89	pCi/L	88.9	97.2	0.91	A
			Sr-90	pCi/L	12.2	17.4	0.70	W
	E11182	Milk	I-131	pCi/L	61.3	65.1	0.94	A
			Ce-141	pCi/L	104	113	0.92	A
			Cr-51	pCi/L	265	276	0.96	A
			Cs-134	pCi/L	138	154	0.90	A
			Cs-137	pCi/L	205	207	0.99	A
			Co-58	pCi/L	178	183	0.97	A
			Mn-54	pCi/L	187	188	0.99	A
			Fe-59	pCi/L	182	177	1.03	A
			Zn-65	pCi/L	345	351	0.98	A
			Co-60	pCi/L	379	405	0.94	A
	E11184	AP	Ce-141	pCi	107	85.0	1.26	W
			Cr-51	pCi	261	224	1.17	A
			Cs-134	pCi	74.6	77.0	0.97	A
			Cs-137	pCi	99.6	102	0.98	A
			Co-58	pCi	99.8	110	0.91	A
			Mn-54	pCi	99.2	96.9	1.02	A
			Fe-59	pCi	109	119	0.92	A
			Zn-65	pCi	188	183	1.03	A
			Co-60	pCi	200	201	1.00	A
	E11183	Charcoal	I-131	pCi	82.9	85.4	0.97	A
	E11185	Water	Fe-55	pCi/L	1950	1900	1.03	A
June 2015	E11234	Milk	Sr-89	pCi/L	94.9	92.6	1.02	A
			Sr-90	pCi/L	14.3	12.7	1.13	A
	E11238	Milk	I-131	pCi/L	93.2	95.9	0.97	A
			Ce-141	pCi/L	Not provided for this study			
			Cr-51	pCi/L	349	276	1.26	W
			Cs-134	pCi/L	165	163	1.01	A
			Cs-137	pCi/L	143	125	1.14	A
			Co-58	pCi/L	82.0	68.4	1.20	A
			Mn-54	pCi/L	113	101	1.12	A
			Fe-59	pCi/L	184	151	1.22	W
			Zn-65	pCi/L	269	248	1.08	A
			Co-60	pCi/L	208	193	1.08	A
	E11237	AP	Ce-141	pCi	Not provided for this study			
			Cr-51	pCi	323	233	1.39	N (1)
			Cs-134	pCi	139	138	1.01	A
			Cs-137	pCi	111	106	1.05	A
			Co-58	pCi	54.0	57.8	0.93	A
			Mn-54	pCi	96.8	84.9	1.14	A
			Fe-59	pCi	162	128	1.27	W
			Zn-65	pCi	198	210	0.94	A
			Co-60	pCi	178	163	1.09	A
	E11236	Charcoal	I-131	pCi	93.9	80	1.17	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2015
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2015	E11238	Water	Fe-55	pCi/L	1890	1790	1.06	A
September 2015	E11289	Milk	Sr-89	pCi/L	95.7	99.1	0.97	A
			Sr-90	pCi/L	15.4	16.4	0.94	A
	E11290	Milk	I-131	pCi/L	94.9	99.9	0.95	A
			Ce-141	pCi/L	228	213	1.07	A
			Cr-51	pCi/L	499	538	0.93	A
			Cs-134	pCi/L	208	212	0.98	A
			Cs-137	pCi/L	270	255	1.06	A
			Co-58	pCi/L	275	263	1.05	A
			Mn-54	pCi/L	320	290	1.10	A
			Fe-59	pCi/L	255	226	1.13	A
			Zn-65	pCi/L	392	353	1.11	A
			Co-60	pCi/L	350	330	1.06	A
	E11292	AP	Ce-141	pCi	104	85.1	1.22	W
			Cr-51	pCi	262	215	1.22	W
			Cs-134	pCi	86.1	84.6	1.02	A
			Cs-137	pCi	93	102	0.91	A
			Co-58	pCi	106	105	1.01	A
			Mn-54	pCi	117	116	1.01	A
			Fe-59	pCi	94.8	90.2	1.05	A
			Zn-65	pCi	160	141	1.13	A
			Co-60	pCi	146	132	1.11	A
	E11291	Charcoal	I-131	pCi	85.9	81.7	1.05	A
	E11293	Water	Fe-55	pCi/L	2090	1800	1.16	A
	E11294	Soil	Ce-141	pCi/kg	209	222	0.94	A
			Cr-51	pCi/kg	463	560	0.83	A
			Cs-134	pCi/kg	231	221	1.05	A
			Cs-137	pCi/kg	311	344	0.90	A
			Co-58	pCi/kg	245	274	0.89	A
			Mn-54	pCi/kg	297	302	0.98	A
			Fe-59	pCi/kg	248	235	1.06	A
			Zn-65	pCi/kg	347	368	0.94	A
			Co-60	pCi/kg	328	344	0.95	A
December 2015	E11354	Milk	Sr-89	pCi/L	96.2	86.8	1.11	A
			Sr-90	pCi/L	14.8	12.5	1.18	A
	E11355	Milk	I-131	pCi/L	95.1	91.2	1.04	A
			Ce-141	pCi/L	117	129	0.91	A
			Cr-51	pCi/L	265	281	0.94	A
			Cs-134	pCi/L	153	160	0.96	A
			Cs-137	pCi/L	119	115	1.03	A
			Co-58	pCi/L	107	110	0.97	A
			Mn-54	pCi/L	153	145	1.06	A
			Fe-59	pCi/L	117	108	1.08	A
			Zn-65	pCi/L	261	248	1.05	A
			Co-60	pCi/L	212	213	1.00	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2015
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2015	E11357	AP	Ce-141	pCi	89.9	84.0	1.07	A
			Cr-51	pCi	215	184	1.17	A
			Cs-134	pCi	103	105	0.98	A
			Cs-137	pCi	76.6	74.8	1.02	A
			Co-58	pCi	76.2	71.9	1.06	A
			Mn-54	pCi	91.4	94.4	0.97	A
			Fe-59	pCi	78.6	70.3	1.12	A
			Zn-65	pCi	173	162	1.07	A
			Co-60	pCi	138	139	0.99	A
	E11422	AP	Sr-89	pCi	98.0	96.9	1.01	A
			Sr-90	pCi	10.0	14.0	0.71	W
	E11356	Charcoal	I-131	pCi	74.9	75.2	1.00	A
	E11358	Water	Fe-55	pCi/L	2160	1710	1.26	W
	E11353	Soil	Ce-141	pCi/kg	252	222	1.14	A
			Cr-51	pCi/kg	485	485	1.00	A
			Cs-134	pCi/kg	319	277	1.15	A
			Cs-137	pCi/kg	292	276	1.06	A
			Co-58	pCi/kg	193	190	1.02	A
			Mn-54	pCi/kg	258	250	1.03	A
			Fe-59	pCi/kg	218	186	1.17	A
			Zn-65	pCi/kg	457	429	1.07	A
			Co-60	pCi/kg	381	368	1.04	A

(1) AP Cr-51 - Cr-51 has the shortest half-life and the weakest gamma energy of the mixed nuclide sample, which produces a large error. Taking into account the error, the lowest value would be 119% of the reference value, which would be considered acceptable. NCR 15-18

(a) Teledyne Brown Engineering reported result.

(b) 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.

(c) Ratio of Teledyne Brown Engineering to Analytics results.

(d) 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 E-2 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2015
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide*	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2015	15-MaW32	Water	Am-241	Bq/L	0.632	0.654	0.458 - 0.850	A
			Ni-63	Bq/L	2.5		(1)	A
			Pu-238	Bq/L	0.0204	0.0089	(2)	A
			Pu-239/240	Bq/L	0.9	0.8	0.582 - 1.082	A
	15-MaS32	Soil	Ni-63	Bq/kg	392	448.0	314 - 582	A
			Sr-90	Bq/kg	286	653	487 - 849	N (3)
	15-RdF32	AP	Sr-90	Bq/sample	-0.0991		(1)	A
			U-234/233	Bq/sample	0.0211	0.0155	0.0109 - 0.0202	N (3)
			U-238	Bq/sample	0.095	0.099	0.069 - 0.129	A
	15-GrF32	AP	Gr-A	Bq/sample	0.448	1.77	0.53 - 3.01	N (3)
			Gr-B	Bq/sample	0.7580	0.75	0.38 - 1.13	A
	15-RdV32	Vegetation	Cs-134	Bq/sample	8.08	7.32	5.12 - 9.52	A
			Cs-137	Bq/sample	11.6	9.18	6.43 - 11.93	W
			Co-57	Bq/sample	-0.0096		(1)	A
			Co-60	Bq/sample	6.53	5.55	3.89 - 7.22	A
			Mn-54	Bq/sample	0.0058		(1)	A
			Sr-90	Bq/sample	0.999	1.08	0.76 - 1.40	A
			Zn-65	Bq/sample	-0.108		(1)	A
September 2015	15-MaW33	Water	Am-241	Bq/L	1.012	1.055	0.739 - 1.372	A
			Ni-63	Bq/L	11.8	8.55	5.99 - 11.12	N (4)
			Pu-238	Bq/L	0.727	0.681	0.477 - 0.885	A
			Pu-239/240	Bq/L	0.830	0.900	0.630 - 1.170	A
	15-MaS33	Soil	Ni-63	Bq/kg	635	682	477 - 887	A
			Sr-90	Bq/kg	429	425	298 - 553	A
	15-RdF33	AP	Sr-90	Bq/sample	1.48	2.18	1.53 - 2.83	N (4)
			U-234/233	Bq/sample	0.143	0.143	0.100 - 0.186	A
			U-238	Bq/sample	0.149	0.148	0.104 - 0.192	A
	15-GrF33	AP	Gr-A	Bq/sample	0.497	0.90	0.27 - 1.53	A
			Gr-B	Bq/sample	1.34	1.56	0.78 - 2.34	A
	15-RdV33	Vegetation	Cs-134	Bq/sample	6.10	5.80	4.06 - 7.54	A
			Cs-137	Bq/sample	0.0002		(1)	A
			Co-57	Bq/sample	8.01	6.62	4.63 - 8.61	W
			Co-60	Bq/sample	4.97	4.56	3.19 - 5.93	A
			Mn-54	Bq/sample	8.33	7.68	5.38 - 9.98	A
			Sr-90	Bq/sample	0.386	1.30	0.91 - 1.69	N (4)
			Zn-65	Bq/sample	6.07	5.46	3.82 - 7.10	A

(1) False positive test.

(2) Sensitivity evaluation.

(3) Soil Sr-90 - incomplete digestion of the sample resulted in low results; AP U-234/233 - extremely low activity was difficult to quantify AP Gr-A - the MAPEP filter has the activity embedded in the filter. To corrected the low bias, TBE will create an attenuated efficiency for MAPEP samples. NCR 15-13

(4) Water Ni-63 extremely low activity was difficult to quantify; AP & Vegetation Sr-90 was lost during separation, possible from substance added by MAPEP NCR 15-21.

(a) Teledyne Brown Engineering reported result.

(b) The MAPEP 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.

(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

TABLE E-3 **ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2015
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2015	RAD-101	Water	Sr-89	pCi/L	45.2	63.2	51.1 - 71.2	N (1)
			Sr-90	pCi/L	28.0	41.9	30.8 - 48.1	N (1)
			Ba-133	pCi/L	80.6	82.5	63.9 - 90.8	A
			Cs-134	pCi/L	71.7	75.7	61.8 - 83.3	A
			Cs-137	pCi/L	187	189	170 - 210	A
			Co-60	pCi/L	85.7	84.5	76.0 - 95.3	A
			Zn-65	pCi/L	197	203	183 - 238	A
			Gr-A	pCi/L	26.1	42.6	22.1 - 54.0	A
			Gr-B	pCi/L	28.8	32.9	21.3 - 40.6	A
			I-131	pCi/L	23.5	23.8	19.7 - 28.3	A
			U-Nat	pCi/L	6.19	6.59	4.99 - 7.83	A
			H-3	pCi/L	3145	3280	2770 - 3620	A
November 2015	RAD-103	Water	Sr-89	pCi/L	40.9	35.7	26.7 - 42.5	A
			Sr-90	pCi/L	29.3	31.1	22.7 - 36.1	A
			Ba-133	pCi/L	31.5	32.5	25.9 - 36.7	A
			Cs-134	pCi/L	59.65	62.3	50.6 - 68.5	A
			Cs-137	pCi/L	156	157	141 - 175	A
			Co-60	pCi/L	70.6	71.1	64.0 - 80.7	A
			Zn-65	pCi/L	145	126	113 - 149	A
			Gr-A	pCi/L	38.2	51.6	26.9 - 64.7	A
			Gr-B	pCi/L	42.0	36.6	24.1 - 44.2	A
			I-131	pCi/L	24.8	26.3	21.9 - 31.0	A
			U-Nat	pCi/L	146.90	56.2	45.7 - 62.4	N (2)
			H-3	pCi/L	21100	21300	18700 - 23400	A

(1) Yield on the high side of our acceptance range indicates possibility of calcium interference. NCR 15-09

(2) Technician failed to dilute original sample. If dilulted, the result would have been 57.1, which fell within the acceptance limits. NCR 15-19

(a) Teledyne Brown Engineering reported result.

(b) The ERA 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.

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. Reported result falls within the Control Limits and outside of the Warning Limit.

TABLE E-4 **ERA (a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**
ENVIRONMENTAL, INC., 2015

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result [b]	ERA Result [c]	Control Limits	Acceptance
ERW-1444	04/06/15	Sr-89	59.71 ± 5.44	63.20	51.10 - 71.20	Pass
ERW-1444	04/06/15	Sr-90	43.41 ± 2.43	41.90	30.80 - 48.10	Pass
ERW-1448	04/06/15	Ba-133	77.75 ± 4.69	82.50	69.30 - 90.80	Pass
ERW-1448	04/06/15	Cs-134	68.82 ± 3.08	75.70	61.80 - 83.30	Pass
ERW-1448	04/06/15	Cs-137	- 191.92 ± 5.9	189	- 170.00 - 210.0	Pass
ERW-1448	04/06/15	Co-60	85.05 ± 4.59	84.50	76.00 - 95.30	Pass
ERW-1448	04/06/15	Zn-65	- 195.97 ± 12.0	203	- 183.00 - 238.0	Pass
ERW-1450	04/06/15	Gr. Alpha	34.05 ± 1.90	42.60	22.10 - 54.00	Pass
ERW-1450	04/06/15	G. Beta	26.93 ± 1.12	32.90	21.30 - 40.60	Pass
ERW-1453	04/06/15	I-131	22.47 ± 0.83	23.80	19.70 - 28.30	Pass
ERW-1456	04/06/15	Uranium	5.98 ± 0.31	6.59	4.99 - 7.83	Pass
ERW-1461	04/06/15	H-3	3,254 ± 180	3280	2,770 - 3620	Pass
ERW-5528	10/05/15	Sr-89	34.76 ± 0.06	35.70	26.70 - 42.50	Pass
ERW-5528	10/05/15	Sr-90	29.23 ± 0.06	31.10	22.70 - 36.10	Pass
ERW-5531	10/05/15	Ba-133	30.91 ± 0.53	32.50	25.90 - 36.70	Pass
ERW-5531	10/05/15	Cs-134	57.40 ± 2.57	62.30	50.69 - 68.50	Pass
ERW-5531	10/05/15	Cs-137	- 163.12 ± 4.8	157	- 141.00 - 175.0	Pass
ERW-5531	10/05/15	Co-60	73.41 ± 1.72	71.10	64.00 - 80.70	Pass
ERW-5531	10/05/15	Zn-65	- 138.94 ± 5.7	126	- 113.00 - 149.0	Pass
ERW-5534	10/05/15	Gr. Alpha	29.99 ± 0.08	51.60	26.90 - 64.70	Pass
ERW-5534	10/05/15	G. Beta	27.52 ± 0.04	36.60	24.10 - 44.20	Pass
ERW-5537	10/05/15	I-131	25.54 ± 0.60	26.30	21.90 - 31.00	Pass
ERW-5540	10/05/15	Uranium	53.30 ± 0.55	56.20	45.70 - 62.40	Pass
ERW-5543	10/05/15	H-3	21,260 ± 351	21,300	18,700 - 23400.0	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).

[b] Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

[c] Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

TABLE E-5 **DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)**
ENVIRONMENTAL, INC., 2015

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MASO-975	02/01/15	Ni-63	341 ± 18	448	314 - 582	Pass
MASO-975	02/01/15	Sr-90	523 ± 12	653	457 - 849	Pass
MASO-975	02/01/15	Cs-134	533 ± 6	678	475 - 881	Pass
MASO-975	02/01/15	Cs-137	0.8 ± 2.5	0.0	NA [c]	Pass
MASO-975	02/01/15	Co-57	0.5 ± 1	0.0	NA [c]	Pass
MASO-975	02/01/15	Co-60	741 ± 8	817	572 - 1062	Pass
MASO-975	02/01/15	Mn-54	1,153 ± 9	1,198	839 - 1557	Pass
MASO-975	02/01/15	Zn-65	892 ± 18	1064	745 - 1383	Pass
MAW-969	02/01/15	Am-241	0.650 ± 0.078	0.654	0.458 - 0.850	Pass
MAW-969	02/01/15	Cs-134	21.09 ± 0.25	23.5	16.5 - 30.6	Pass
MAW-969	02/01/15	Cs-137	19.63 ± 0.34	19.1	13.4 - 24.8	Pass
MAW-969 [d]	02/01/15	Co-57	10.2 ± 0.4	29.9	20.9 - 38.9	Fail
MAW-969	02/01/15	Co-60	0.02 ± 0.05	0.00	NA [c]	Pass
MAW-969	02/01/15	H-3	569 ± 13	563	394 - 732	Pass
MAW-969	02/01/15	Fe-55	6.00 ± 6.60	6.88	4.82 - 8.94	Pass
MAW-969	02/01/15	Mn-54	0.02 ± 0.07	0.00	NA [c]	Pass
MAW-969	02/01/15	Ni-63	2.9 ± 3	0.00	NA [c]	Pass
MAW-969	02/01/15	Zn-65	16.54 ± 0.85	18.3	12.8 - 23.8	Pass
MAW-969	02/01/15	Pu-238	0.02 ± 0.03	0.01	NA [e]	Pass
MAW-969	02/01/15	Pu-239/240	0.81 ± 0.10	0.83	0.58 - 1.08	Pass
MAW-969	02/01/15	Sr-90	9.40 ± 1.30	9.48	6.64 - 12.32	Pass
MAW-950	02/01/15	Gr. Alpha	0.66 ± 0.05	1.07	0.32 - 1.81	Pass
MAW-950	02/01/15	Gr. Beta	2.72 ± 0.06	2.79	1.40 - 4.19	Pass
MAAP-978	02/01/15	Cs-134	1.00 ± 0.04	1.15	0.81 - 1.50	Pass
MAAP-978	02/01/15	Cs-137	0.004 ± 0.023	0.00	NA [c]	Pass
MAAP-978 [e]	02/01/15	Co-57	0.04 ± 0.04	1.51	1.06 - 1.96	Fail
MAAP-978	02/01/15	Co-60	0.01 ± 0.02	0.00	NA [c]	Pass
MAAP-978	02/01/15	Mn-54	1.11 ± 0.08	1.02	0.71 - 1.33	Pass
MAAP-978	02/01/15	Zn-65	0.83 ± 0.10	0.83	0.58 - 1.08	Pass
MAAP-981	02/01/15	Sr-89	38.12 ± 1.01	47.5	33.3 - 61.8	Pass
MAAP-981	02/01/15	Sr-90	1.22 ± 0.13	1.06	0.74 - 1.38	Pass
MAAP-984	02/01/15	Gr. Alpha	0.59 ± 0.06	1.77	0.53 - 3.01	Pass
MAAP-984	02/01/15	Gr. Beta	0.95 ± 0.07	0.75	0.38 - 1.13	Pass
MAVE-972	02/01/15	Cs-134	6.98 ± 0.13	7.32	5.12 - 9.52	Pass
MAVE-972	02/01/15	Cs-137	9.73 ± 0.21	9.18	6.43 - 11.93	Pass
MAVE-972	02/01/15	Co-57	0.01 ± 0.04	0.00	NA [c]	Pass
MAVE-972	02/01/15	Co-60	3.89 ± 0.20	5.55	3.89 - 7.22	Pass
MAVE-972	02/01/15	Mn-54	0.04 ± 0.07	0.00	NA [c]	Pass
MAVE-972	02/01/15	Zn-65	0.09 ± 0.12	0.00	NA [c]	Pass

TABLE E-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) ENVIRONMENTAL, INC., 2015

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MASO-4903	08/01/15	Ni-63	556 ± 18	682	477 - 887	Pass
MASO-4903 f	08/01/15	Sr-90	231 ± 7	425	298 - 553	Fail
MASO-4903 f	08/01/15	Sr-90	352 ± 10	425	298 - 553	Pass
MASO-4903	08/01/15	Cs-134	833 ± 10	1,010	707 - 1313	Pass
MASO-4903	08/01/15	Cs-137	808 ± 11	809.00	566 - 1052	Pass
MASO-4903	08/01/15	Co-57	1,052 ± 10	1,180	826 - 1534	Pass
MASO-4903	08/01/15	Co-60	2 ± 2	1.3	NA [e]	Pass
MASO-4903	08/01/15	Mn-54	1,331 ± 13	1,340	938 - 1742	Pass
MASO-4903	08/01/15	Zn-65	686 ± 15	662	463 - 861	Pass
MAW-5007	08/01/15	Cs-134	16.7 ± 0.4	23.1	16.2 - 30	Pass
MAW-5007	08/01/15	Cs-137	-0.36 ± 0.13	0	NA [c]	Pass
MAW-5007	08/01/15	Co-57	21.8 ± 0.4	20.8	14.6 - 27	Pass
MAW-5007	08/01/15	Co-60	17.3 ± 0.3	17.1	12 - 22.2	Pass
MAW-5007	08/01/15	H-3	227.5 ± 8.9	216	151 - 281	Pass
MAW-5007 g	08/01/15	Fe-55	4.2 ± 14.1	13.1	9.2 - 17	Fail
MAW-5007	08/01/15	Mn-54	16.6 ± 0.5	15.6	10.9 - 20.3	Pass
MAW-5007	08/01/15	Ni-63	9.1 ± 2.6	8.55	5.99 - 11.12	Pass
MAW-5007	08/01/15	Zn-65	15.5 ± 0.9	13.9	9.7 - 18.1	Pass
MAW-5007	08/01/15	Sr-90	4.80 ± 0.50	4.80	3.36 - 6.24	Pass
MAW-5007	08/01/15	Gr. Alpha	0.41 ± 0.04	0.43	0.13 - 0.73	Pass
MAW-5007	08/01/15	Gr. Beta	3.45 ± 0.07	3.52	1.76 - 5.28	Pass
MAAP-4911	08/01/15	Sr-89	3.55 ± 0.67	3.98	2.79 - 5.17	Pass
MAAP-4911	08/01/15	Sr-90	0.94 ± 0.16	1.05	0.74 - 1.37	Pass
MAAP-4907	08/01/15	Gr. Alpha	0.30 ± 0.04	0.90	0.27 - 1.53	Pass
MAAP-4907	08/01/15	Gr. Beta	1.85 ± 0.09	1.56	0.78 - 2.34	Pass
MAVE-4901	08/01/15	Cs-134	5.56 ± 0.16	5.80	4.06 - 7.54	Pass
MAVE-4901	08/01/15	Cs-137	-0.02 ± 0.06	0.00	NA [c]	Pass
MAVE-4901	08/01/15	Co-57	7.74 ± 0.18	6.62	4.63 - 8.61	Pass
MAVE-4901	08/01/15	Co-60	4.84 ± 0.15	4.56	3.19 - 5.93	Pass
MAVE-4901	08/01/15	Mn-54	8.25 ± 0.25	7.68	5.38 - 9.98	Pass
MAVE-4901	08/01/15	Zn-65	5.78 ± 0.29	5.46	3.82 - 7.10	Pass

[a] Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

[b] Laboratory codes as follows: MAW (water), MAAP (air filter), MASO (soil), MAVE (vegetation).

[c] MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP. A known value of "zero" indicates an analysis was included in the testing series as a "false positive". MAPEP does not provide control limits.

[d] Lab result was 27.84. Data entry error resulted in a non-acceptable result.

[e] Lab result was 1.58. Data entry error resulted in a non-acceptable result.

f The incomplete separation of calcium from strontium caused a failed low result. The result of reanalysis acceptable.

g The known activity was below the routine laboratory detection limits for the available aliquot fraction.

APPENDIX F

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

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Docket No: 50-289
50-320

THREE MILE ISLAND NUCLEAR STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report (ARGPPR)

1 January Through 31 December 2015

Prepared By

Teledyne Brown Engineering
Environmental Services

Three Mile Island Nuclear Station
Middletown, PA 17057

April 2016

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Appendices

I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive program to evaluate the impact of station operations on groundwater and surface water in the vicinity of Three Mile Island Nuclear Station. At Three Mile Island Nuclear, 31 new permanent groundwater monitoring wells were installed in 2006. The results for all TMI wells are included in this report. This report covers groundwater, surface water, storm water and precipitation samples collected from the environment, both on and off station property in 2015. During that time period 617 analyses were performed on 377 samples from 68 locations.

In assessing all the data gathered for this report, it was concluded that the operation of Three Mile Island Nuclear Station had no adverse radiological impact on the environment.

Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) as specified in the Offsite Dose Calculation Manual (ODCM) in any of the groundwater, surface water, storm water and precipitation samples. In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation.

Strontium-89 and strontium-90 were not detected at a concentration greater than their respective LLD of 10 and 1 picoCurie per liter (pCi/L) in the groundwater samples tested.

Tritium was not detected in any surface water, storm water or precipitation water samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Tritium was detected in groundwater samples above the 20,000 pCi/L limit at 2 locations ranging from 6,150 to 37,200 pCi/L.

Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L in 33 of 58 groundwater monitoring locations. The groundwater tritium concentrations ranged from 203 ± 128 pCi/L to 37,200 ± 3,740 pCi/L. Tritium that was detected in groundwater at the Station is believed to be the result of a tank leakage, historical releases, the recapture of gaseous tritium releases via rainwater and/or background from external sources greater than 200 pCi/L. Tritium was not detected at any surface water location. Tritium was detected in two of four storm water samples at concentrations of 316 ± 135 pCi/L to 424 ± 146 pCi/L. Tritium was detected in five of six precipitation water locations. The concentration ranged from 192 ± 125 to 8,170 ± 870 pCi/L.

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples during the second quarter sampling in 2015.

Gross Alpha (dissolved) was not detected at any of the groundwater locations.

Gross Alpha (suspended) was detected at two of 25 groundwater locations. The concentrations ranged from 1.9 to 6.9 pCi/L.

Gross Beta (dissolved) was detected at 25 of 25 groundwater locations. The concentrations ranged from 1.5 to 11.0 pCi/L.

Gross Beta (suspended) was not detected in any of the 25 groundwater locations.

Hard-To-Detect analyses, which include Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238, were not analyzed in 2015.

II. Introduction

The Three Mile Island Nuclear Station (TMINS) established a revised and more comprehensive groundwater monitoring program in 2006 as part of an Exelon Nuclear fleetwide assessment.

Conestoga Rovers & Associates (CRA) performed the initial assessment. CRA prepared a Hydrogeologic Investigation Report (HIR) for Exelon to determine whether groundwater at and near TMINS has been adversely impacted by any releases of radionuclides. The CRA report documents the results of the May 2006 Hydrogeologic Investigation Work Plan. CRA assessed groundwater quality at the Station and identified locations designated as Areas for Further Evaluation. The results and conclusions of this Phase 1 study were made available to state and federal regulators, as well as the public on an Exelon web site for station specific reports.

As a result of the Phase 1 study, the Radiological Groundwater Protection Program (RGPP) was revised to a long term monitoring program. This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. (Midwest Labs) on well water, surface water, precipitation water and storm water samples collected in 2015. TMINS groundwater movement is into the Susquehanna River which surrounds the station on all sides.

In September 2015, GHD completed an additional five-year update hydrogeologic investigation report for the Station (*NEI 07-07, Hydrogeologic Investigation Report*). The referenced report summarized station activities since the 2006 hydrogeologic investigation report, including changes at the Station as well as RGPP sampling activities and groundwater flow. Relevant conclusions from the report are:

- None of the Areas of Further Evaluation (AFEs) identified in 2006 indicate current impacts to groundwater and are no longer considered AFEs.
- One new AFE, AFE-TMI-6-BWST, was identified based on laboratory analytical data.
- In July 2012, elevated tritium concentrations were noted for a sample collected from an electric vault west of MS-22. The source of this elevated tritium concentration is believed to be the BWST.
- Tritium is not migrating off of the Station property at concentrations greater than the USEPA Drinking Water Standard of 20,000 pCi/L.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs.
- Strontium 89 or 90 were not detected at concentrations greater than their respective LLDs.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. (Midwest Labs) on samples collected in 2015.

A. Objective of the RGPP

The long-term objectives of the Radiological Groundwater Protection Program (RGPP) are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from station operations before significant radiological impact to the environment and potential drinking water sources.

2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface.

3. Perform routine water sampling and radiological analysis of water from selected locations.

4. Notify stakeholders in a timely manner for new leaks, spills, or other detections with potential radiological significance.
5. Regularly assess analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Three Mile Island Nuclear Station as discussed below:

1. Three Mile Island Nuclear Station continues to sample and monitor the groundwater at the station in accordance with station procedures. Sample frequencies and locations are adjusted based on monitoring results and investigations.

2. The Three Mile Island Nuclear Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements.

3. Three Mile Island Nuclear Station will continue to perform routine sampling and radiological analysis of water from selected locations.

4. Three Mile Island Nuclear Station has implemented procedures to identify and report leaks, spills, or other detections with potential

radiological significance in a timely manner.

5. Three Mile Island Nuclear Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

1. Sample Collection

Sample locations can be found in Table A-1 and Figures A-1 and A-2, Appendix A.

Groundwater, Surface Water, Storm Water, and Precipitation

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures. Groundwater, surface water, storm water and precipitation are collected. Sample locations, sample collection frequencies and analytical frequencies are controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management and shipment of samples, as well as in documentation of sampling events. For split samples, collectors will periodically collect samples that are sent to Midwest Labs to confirm that TBE is producing comparable data. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

Analytical data results are reviewed by both station personnel and an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. Tritium is produced naturally in the upper atmosphere

when cosmic rays strike air molecules. This "cosmogenic" tritium combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium and strontium-90 comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased significantly during the 1950s and early 1960s and later with additional testing, resulting in the release of significant amounts of tritium to the atmosphere. The Canadian heavy water nuclear power reactors, other commercial power reactors, nuclear research and weapons production continue to influence tritium concentrations in the environment.

The chemical properties of tritium are essentially those of ordinary hydrogen. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. Within one month or so after ingestion, all tritium is essentially cleared. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium has a radiological half-life of approximately 12.3 years. It decays spontaneously to helium-3 (He-3). This radioactive decay releases a beta particle (low-energy electron). The radioactive decay of tritium is the source of the health risk from exposure to tritium. Tritium is one of the least dangerous radionuclides, because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE and Midwest Labs to analyze the environmental samples for radioactivity

for the Three Mile Island Nuclear Station RGPP in 2015.

In order to achieve the stated objectives, the current program includes the following analyses, as applicable:

1. Concentrations of gamma emitters in groundwater, surface water and storm water.

2. Concentrations of strontium in groundwater.

3. Concentrations of tritium in groundwater, surface water, precipitation water and storm water.

4. Concentrations of Am-241 in groundwater.

5. Concentrations of Cm-242 and Cm-243/244 in groundwater.

6. Concentrations of Pu-238 and PU-239/240 in groundwater.

7. Concentrations of U-234, U-235 and U-238 in groundwater.

8. Concentrations of Fe-55 in groundwater.

9. Concentrations of Ni-63 in groundwater.

10. Concentrations of Gross Alpha and Gross Beta (Dissolved and Suspended) in groundwater.

B. Data Interpretation

1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical parameter.

2. Laboratory Measurements Uncertainty

The estimated uncertainty in measurement of tritium in environmental samples is frequently on the order of 50% of the measurement value.

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes

from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error).

Analytical uncertainties are reported at the 95% confidence level in this report for reporting consistency with the AREOR.

Gamma spectroscopy results for each type of sample were grouped as follows:

For groundwater, surface water, and storm water 13 nuclides, Be-7, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

The radio-analytical laboratory is counting tritium results to an LLD of 200 pCi/L. Typically, the lowest positive measurement will be reported within a range of 40 – 240 pCi/L or 140 ± 100 pCi/L. Clearly, these sample results cannot be distinguished as different from background at this concentration.

IV. Results and Discussion

A. Groundwater Results

Samples were collected from on and off-site wells in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Samples from 58 locations were analyzed for tritium activity. Tritium values ranged from the detection limit to 37,200 pCi/L (Table B-I.1, Appendix B).

Tritium Split Samples

Tritium values ranged from 143 to 952 pCi/L (Table C-I.1, Appendix C).

Strontium

Strontium-89 and strontium-90 were not detected above their required detection limit of 10 and 1.0 pCi/L, respectively (Table

B-I.1, Appendix B).

Strontium Split Samples

Strontium-89 and Strontium-90 were not detected above the required detection limit (Table C-I.1, Appendix C).

Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples during the second quarter sampling in 2015.

Gross Alpha (dissolved) was not detected at any of the groundwater locations.

Gross Alpha (suspended) was detected at two of 25 groundwater locations. The concentrations ranged from 1.9 to 6.9 pCi/L.

Gross Beta (dissolved) was detected at 25 of 25 groundwater locations. The concentrations ranged from 1.5 to 11.0 pCi/L.

Gross Beta (suspended) was not detected in any of the 25 groundwater locations. (Table B-I.1, Appendix B).

Gross Alpha and Gross Beta Split Samples

Two split samples were analyzed for Gross Alpha and Gross Beta in 2015. Gross Alpha was not detected at either groundwater location. Gross beta was detected in one sample analyzed. The concentration was 2.5 pCi/L (Table C-I.3, Appendix C).

Gamma Emitters

Potassium-40 was detected in three of 63 samples with concentrations ranging from 74 pCi/L to 139 pCi/L. No other gamma-emitting nuclides were detected (Table B-I.2, Appendix B).

Gamma Emitters Split Samples

Five locations were analyzed for gamma-emitting nuclides in 2015. Potassium-40 was detected in one of five samples with a concentration of 94 pCi/L. No other gamma-emitting nuclides were detected in any split samples (Table C-I.2, Appendix C).

Hard-To-Detect

Hard-To-Detect analyses, which include Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238, were not analyzed in 2015 (Table B-I.3, Appendix B).

Hard-To-Detect Split Samples

Hard to detects were not analyzed on any split samples in 2015 (Table C-I.3, Appendix C).

B. Surface Water Results

Samples were collected from surface water locations in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Three locations were analyzed for tritium in 2015. Tritium was not detected above the required detection limit of 200 pCi/L in any of the 13 samples analyzed (Table B-II.1, Appendix B).

Tritium Split Samples

One location was analyzed for tritium in 2015. Tritium was not detected above the required detection limit of 200 pCi/L in the sample analyzed (Table C-II.1, Appendix C).

Gamma Emitters

Three locations were analyzed for gamma-emitting nuclides in 2015. None of the three samples detected gamma-emitting nuclides (Table B–II.2, Appendix B).

Gamma Emitters Split Samples

Surface water samples were not analyzed for gamma-emitting nuclides in 2015 (Table C–II.2, Appendix C).

C. Storm Water Results

Samples were collected from storm water locations in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

One location was analyzed for tritium. Tritium was detected in two of four samples above the required detection limit of 200 pCi/L at concentrations of 316 and 424 pCi/L (Table B–III.1, Appendix B).

Gamma Emitters

Samples from one location were analyzed for gamma-emitting nuclides. No gamma emitting nuclides were detected (Table B–III.2, Appendix B).

D. Precipitation Water Results

Samples were collected at six locations. The following analyses were performed:

Tritium

Samples from six locations were analyzed for tritium activity. Tritium activity was detected at five of six locations. The concentrations ranged from 192 to 8,170 pCi/L (Table B–IV.1, Appendix B).

Tritium Split Samples

Samples from one location were analyzed for tritium activity. Tritium activity was detected in two of four samples. The concentrations ranged from 235 to 1,073 pCi/L (Table C–III.1, Appendix C).

Gamma Emitters

Precipitation water was not analyzed for Gamma Emitters in 2015.

Gamma Emitters Split Samples

No gamma-emitting nuclides were analyzed in 2015.

E. Leaks, Spills, and Releases

A potential leak was identified at TMI in 2012 due to elevated MS-22 tritium concentration readings. TMI continues to monitor MS-22 and surrounding wells, in addition to tritium plumes from previous years, and reports the activity and dose to the public in the ARERR. The elevated MS-22 well tritium concentrations were voluntarily reported under the reporting requirements for the NEI Groundwater Protection Initiative (GPI)

as implemented in Exelon's Reportability procedure LS-AA-1120, RAD 1.34 (IR 1385497/1515261).

In May and June 2015, it was determined that multiple Borated Water Storage Tank (BWST) connections (10 of 13 bolted flange connections) had evidence of leakage in the form of boron deposits in addition to the main 24-inch flange (IR 1670674/2427517/2508405/2509685).

F. Actions Taken

1. Compensatory/Corrective Actions

Fully encapsulating enclosures were installed around all BWST connections including the 24-inch main outlet flange. Each enclosure was fitted with a tygon tubing discharge point, connected to a water collection bottle to prevent tritiated water from reaching the ground surface. The outlet flange and leaking connections were repaired during the TMI refueling outage in November 2015.

TMI has an extensive groundwater monitoring program with over 50 monitoring wells. No monitoring wells outside the BWST investigation area have seen elevated tritium concentrations. TMI continues to monitor the BWST area wells closely. The leakage has been mitigated by repairing the leaking flanges.

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APPENDIX A

LOCATION DESIGNATION & DISTANCE

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TABLE A-1: **Radiological Groundwater Protection Program - Sampling Locations and Distance, Three Mile Island Nuclear Station, 2015**

Site	Site Type
#3	Monitoring Well
48N	Monitoring Well
48S	Production Potable Well
E1-2	Monitoring Well, Offsite
EDCB	Storm Water
GP-12	Monitoring Well
GP-6	Monitoring Well
GP-8	Monitoring Well
GP-9	Monitoring Well
MS-1	Monitoring Well
MS-19	Monitoring Well
MS-2	Monitoring Well
MS-20	Monitoring Well
MS-21	Monitoring Well
MS-22	Monitoring Well
MS-3	Monitoring Well
MS-4	Monitoring Well
MS-5	Monitoring Well
MS-6	Monitoring Well
MS-7	Monitoring Well
MS-8	Monitoring Well
MW-1	Monitoring Well
MW-2	Monitoring Well
MW-3	Monitoring Well
MW-4	Monitoring Well
N2-1	Monitoring Well, Offsite
NW-A	Production Well
NW-B	Production Well
NW-C	Production Well
NW-CW	Clearwell
OS-13B	Monitoring Well
OS-14	Monitoring Well
OS-16	Monitoring Well
OS-17	Monitoring Well
OS-18	Monitoring Well
OSF	Production Potable Well
RW-1	Monitoring Well
RW-2	Monitoring Well
SW-E-1	Surface Water
SW-E-2	Surface Water
SW-E-3	Surface Water
MW-TMI-9S*	Monitoring Well
MW-TMI-10D	Monitoring Well
MW-TMI-10I	Monitoring Well
MW-TMI-10S	Monitoring Well
MW-TMI-11S*	Monitoring Well
MW-TMI-12S	Monitoring Well
MW-TMI-13I	Monitoring Well
MW-TMI-13S	Monitoring Well
MW-TMI-14D	Monitoring Well
MW-TMI-14I	Monitoring Well
MW-TMI-14S	Monitoring Well
MW-TMI-16D	Monitoring Well
MW-TMI-16I	Monitoring Well
MW-TMI-17D	Monitoring Well
MW-TMI-17I	Monitoring Well
MW-TMI-18D	Monitoring Well
MW-TMI-19D	Monitoring Well
MW-TMI-19I	Monitoring Well
MW-TMI-1D	Monitoring Well
MW-TMI-20D**	Monitoring Well

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations and Distance, Three Mile Island Nuclear Station, 2015

Site	Site Type
MW-TMI-20I**	Monitoring Well
MW-TMI-21D**	Monitoring Well
MW-TMI-21I**	Monitoring Well
MW-TMI-21S**	Monitoring Well
MW-TMI-22D**	Monitoring Well
MW-TMI-22I**	Monitoring Well
MW-TMI-22S**	Monitoring Well
MW-TMI-2D	Monitoring Well
MW-TMI-3I	Monitoring Well
MW-TMI-4I	Monitoring Well
MW-TMI-4S	Monitoring Well
MW-TMI-5D	Monitoring Well
MW-TMI-6D	Monitoring Well
MW-TMI-6I	Monitoring Well
MW-TMI-7S	Monitoring Well
MW-TMI-8S	Monitoring Well
MW-TMI-9I	Monitoring Well
MW-TMI-9S	Monitoring Well
TRAINING CENTER	Offsite Monitoring Well
TM-PR-ESE	Precipitation Water
TM-PR-MS-1	Precipitation Water
TM-PR-MS-2	Precipitation Water
TM-PR-MS-20	Precipitation Water
TM-PR-MS-22	Precipitation Water
TM-PR-MS-4	Precipitation Water
TM-PR-NW-B	Precipitation Water

* NO WATER PRESENT TO SAMPLE
** NEW WELLS INSTALLED 2014

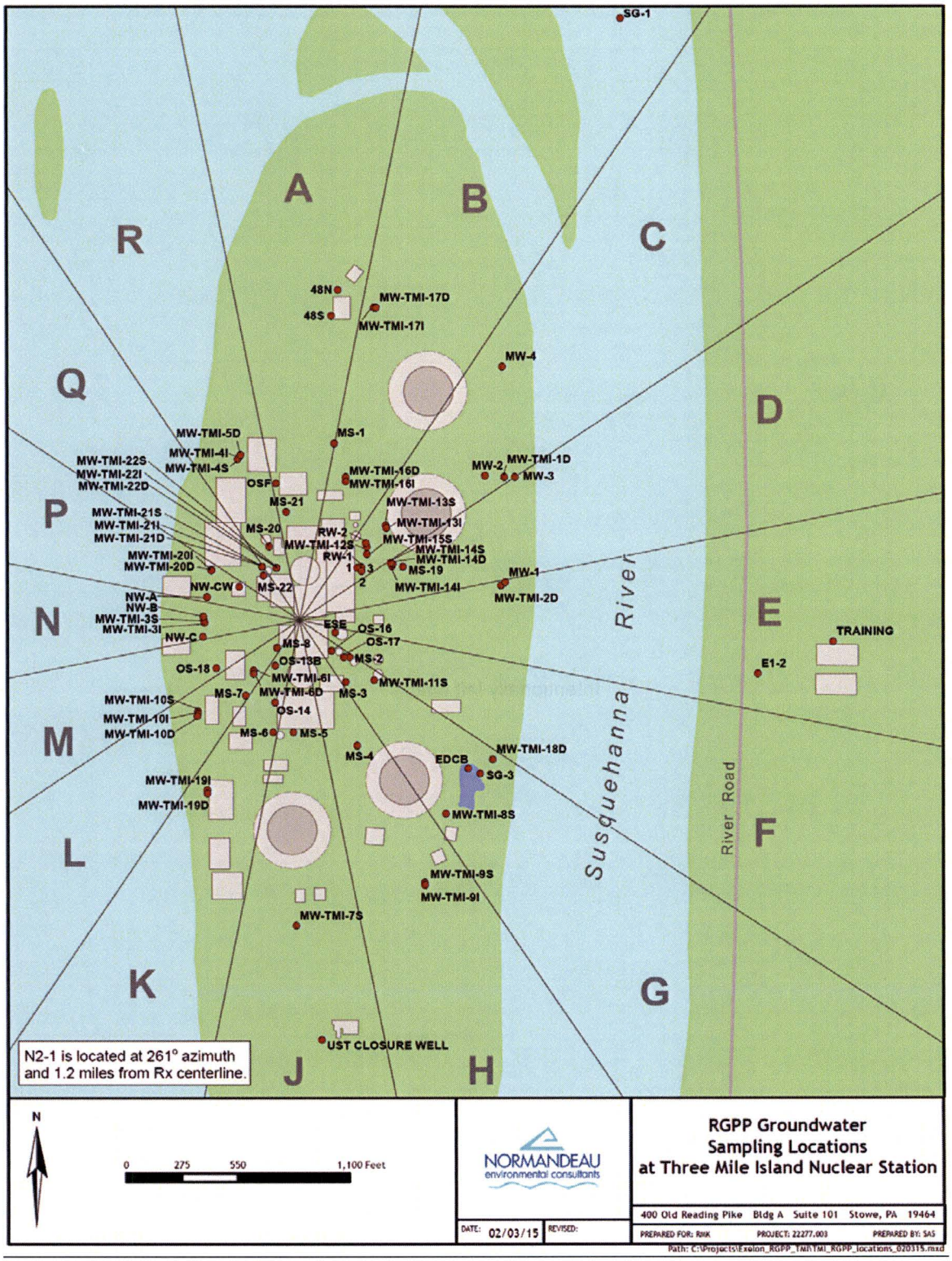

Figure A – 1
Sampling Locations at the Three Mile Island Nuclear Station, 2015

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APPENDIX B

DATA TABLES

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TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
48S	01/29/15		< 182						
48S	04/17/15		< 194	< 7.7	< 0.7	< 6.4	< 0.5	4.1 ± 1.5	< 1.5
48S	07/28/15		< 187						
48S	10/06/15	Original	397 ± 140						
48S	10/06/15	Recount	387 ± 135						
48S	10/06/15	Reanalysis	311 ± 137						
MS-1	01/29/15		< 187						
MS-1	04/23/15		< 197	< 6.9	< 0.6	< 4.6	< 0.5	4.8 ± 2.8	< 1.5
MS-1	07/28/15		< 190						
MS-1	10/06/15	Original	326 ± 136						
MS-1	10/06/15	Recount	276 ± 132						
MS-1	10/06/15	Reanalysis	311 ± 131						
MS-2	01/28/15		< 186						
MS-2	04/22/15		328 ± 141	< 6.4	< 0.6	< 1.1	< 0.7	2.8 ± 0.8	< 1.6
MS-2	07/28/15		280 ± 133						
MS-2	10/06/15		203 ± 128						
MS-20	01/27/15		495 ± 142						
MS-20	02/26/15		456 ± 140						
MS-20	04/21/15		578 ± 152	< 5.8	< 0.7	< 1.9	< 0.7	6.6 ± 1.2	< 2.2
MS-20	07/27/15		384 ± 141						
MS-20	07/27/15		453 ± 148						
MS-20	10/06/15		425 ± 139						
MS-21	01/27/15		< 153						
MS-21	01/27/15		< 187						
MS-21	04/21/15		< 189	< 5.5	< 0.6	< 0.8	< 0.5	2.0 ± 0.7	< 1.5
MS-21	07/27/15		< 199						
MS-21	10/07/15		< 195						
MS-21	10/07/15		< 196						
MS-22	01/27/15		1330 ± 189						
MS-22	02/03/15		6060 ± 645						
MS-22	02/12/15		10200 ± 1060						
MS-22	02/18/15		11100 ± 1150						
MS-22	03/10/15		2370 ± 289						
MS-22	03/25/15		9110 ± 957						
MS-22	04/09/15		16900 ± 1720						
MS-22	04/21/15		15600 ± 1610	< 7.0	< 0.9	< 0.6	< 0.5	6.0 ± 1.0	< 1.6
MS-22	05/07/15		17800 ± 1830						
MS-22	05/21/15		14700 ± 1510						
MS-22	06/02/15		14500 ± 1490						
MS-22	06/16/15	Original	6990 ± 753						
MS-22	06/16/15	Recount	7370 ± 786						
MS-22	06/16/15	Reanalysis	7250 ± 764						
MS-22	06/30/15		2250 ± 274						
MS-22	07/16/15		5230 ± 556						
MS-22	07/27/15		7980 ± 850						
MS-22	08/11/15	Original	8560 ± 887						
MS-22	08/11/15	Recount	8330 ± 885						
MS-22	08/11/15	Reanalysis	7650 ± 815						
MS-22	08/25/15	Original	2940 ± 346						
MS-22	08/25/15	Recount	2580 ± 318						
MS-22	08/25/15	Reanalysis	2420 ± 302						
MS-22	09/09/15	Original	6960 ± 750						
MS-22	09/09/15	Recount	6850 ± 730						
MS-22	09/21/15		2830 ± 338						
MS-22	10/05/15	Original	720 ± 149						
MS-22	10/05/15	Recount	710 ± 156						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MS-22	10/05/15	Reanalysis	609 ± 147						
MS-22	10/20/15	Original	3300 ± 387						
MS-22	10/20/15	Recount	3700 ± 428						
MS-22	11/17/15		2500 ± 307						
MS-22	12/04/15		4270 ± 480						
MS-22	12/21/15		3850 ± 443						
MS-3	01/28/15		306 ± 114						
MS-3	04/22/15		347 ± 143	< 6.1	< 0.5	< 1.5	< 0.7	10.1 ± 1.3	< 1.6
MS-3	07/28/15		279 ± 131						
MS-3	10/06/15		225 ± 131						
MS-4	04/22/15		261 ± 137						
MS-5	01/28/15		< 185						
MS-5	04/22/15		< 200	< 8.5	< 1.0	< 1.4	< 0.5	7.0 ± 1.2	< 1.5
MS-5	07/28/15		< 193						
MS-5	10/06/15		< 192						
MS-7	01/29/15		< 188						
MS-7	04/22/15		< 196	< 5.5	< 0.6	< 1.1	< 0.5	4.6 ± 1.0	< 1.5
MS-7	07/28/15		< 187						
MS-7	10/06/15		< 194						
MS-7	10/06/15	Original	206 ± 131						
MS-7	10/06/15	Recount	205 ± 125						
MS-7	10/06/15	Reanalysis	204 ± 131						
MS-8	01/27/15		< 188						
MS-8	04/22/15		260 ± 131	< 5.5	< 0.5	< 1.1	6.9 ± 1.6	4.0 ± 0.8	< 4.1
MS-8	07/28/15		< 185						
MS-8	10/06/15		< 189						
MW-1	04/21/15		< 194						
MW-2	04/21/15		< 194						
MW-TMI-10D	04/22/15		336 ± 139						
MW-TMI-10I	01/29/15		779 ± 158						
MW-TMI-10I	04/22/15		903 ± 170						
MW-TMI-10I	04/22/15		1000 ± 175						
MW-TMI-10I	07/28/15		793 ± 158						
MW-TMI-10I	10/07/15		691 ± 151						
MW-TMI-10I	10/07/15		576 ± 148						
MW-TMI-10S	01/29/15		1470 ± 202						
MW-TMI-10S	04/22/15		1260 ± 189	< 6.0	< 0.6	< 1.4	< 0.5	6.8 ± 1.3	< 1.5
MW-TMI-10S	07/29/15		1540 ± 216						
MW-TMI-10S	10/07/15		1410 ± 209						
MW-TMI-12S	01/28/15		< 162						
MW-TMI-12S	04/22/15		< 195	< 6.2	< 0.6	< 0.9	< 0.5	5.6 ± 0.9	< 1.5
MW-TMI-12S	07/28/15		< 192						
MW-TMI-12S	10/07/15		< 193						
MW-TMI-13I	01/29/15		< 188						
MW-TMI-13I	04/21/15		< 194						
MW-TMI-13I	07/28/15		< 189						
MW-TMI-13I	10/06/15		< 196						
MW-TMI-14D	01/29/15		251 ± 129						
MW-TMI-14D	01/29/15		262 ± 131						
MW-TMI-14D	04/21/15		253 ± 136						
MW-TMI-14D	07/28/15		333 ± 135						
MW-TMI-14D	10/07/15		367 ± 138						
MW-TMI-14D	10/07/15		329 ± 134						
MW-TMI-14I	01/29/15		< 178						
MW-TMI-14I	04/21/15		286 ± 137						
MW-TMI-14I	07/28/15		209 ± 126						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-TMI-14I	07/28/15	231 ± 131						
MW-TMI-14I	10/07/15	287 ± 134						
MW-TMI-16D	04/23/15	595 ± 154						
MW-TMI-17I	04/23/15	< 191						
MW-TMI-18D	04/21/15	286 ± 135						
MW-TMI-19I	04/22/15	< 197						
MW-TMI-1D	04/21/15	247 ± 136						
MW-TMI-20I	04/22/15	445 ± 148						
MW-TMI-20I	04/22/15	415 ± 144						
MW-TMI-21D	01/27/15	3890 ± 431						
MW-TMI-21D	02/03/15	4440 ± 483						
MW-TMI-21D	02/12/15	3410 ± 382						
MW-TMI-21D	02/18/15	4210 ± 466						
MW-TMI-21D	02/26/15	4240 ± 470						
MW-TMI-21D	03/10/15	4210 ± 469						
MW-TMI-21D	03/25/15	4260 ± 474						
MW-TMI-21D	04/09/15	4670 ± 514						
MW-TMI-21D	04/21/15	4540 ± 503						
MW-TMI-21D	05/07/15	3980 ± 441						
MW-TMI-21D	05/21/15	5210 ± 559						
MW-TMI-21D	06/02/15	4840 ± 535						
MW-TMI-21D	06/16/15	4440 ± 499						
MW-TMI-21D	06/30/15	5240 ± 567						
MW-TMI-21D	07/16/15	4690 ± 503						
MW-TMI-21D	07/27/15	4740 ± 527						
MW-TMI-21D	08/11/15	5660 ± 599						
MW-TMI-21D	08/25/15	5620 ± 611						
MW-TMI-21D	09/09/15	5440 ± 597						
MW-TMI-21D	09/21/15	4930 ± 545						
MW-TMI-21D	10/05/15	5040 ± 550						
MW-TMI-21D	10/20/15	5130 ± 568						
MW-TMI-21D	11/17/15	6240 ± 675						
MW-TMI-21D	12/04/15	5750 ± 628						
MW-TMI-21D	12/21/15	5260 ± 583						
MW-TMI-21I	01/27/15	8500 ± 891						
MW-TMI-21I	02/03/15	7800 ± 815						
MW-TMI-21I	02/12/15	5930 ± 631						
MW-TMI-21I	02/18/15	5190 ± 564						
MW-TMI-21I	02/26/15	8820 ± 926						
MW-TMI-21I	03/10/15	10700 ± 1120						
MW-TMI-21I	03/25/15	8540 ± 900						
MW-TMI-21I	04/09/15	8200 ± 864						
MW-TMI-21I	04/21/15	10200 ± 1060						
MW-TMI-21I	05/07/15	6720 ± 713						
MW-TMI-21I	05/21/15	5270 ± 569						
MW-TMI-21I	06/02/15	5140 ± 566						
MW-TMI-21I	06/16/15	3900 ± 446						
MW-TMI-21I	06/30/15	4600 ± 499						
MW-TMI-21I	07/16/15	6700 ± 702						
MW-TMI-21I	07/27/15	6040 ± 656						
MW-TMI-21I	08/11/15	6230 ± 656						
MW-TMI-21I	08/25/15	5780 ± 626						
MW-TMI-21I	09/09/15	5770 ± 630						
MW-TMI-21I	09/21/15	5750 ± 629						
MW-TMI-21I	10/05/15	4680 ± 513						
MW-TMI-21I	10/20/15	4750 ± 529						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-TMI-21I	11/17/15	5120 ± 564						
MW-TMI-21I	12/04/15	5520 ± 604						
MW-TMI-21I	12/21/15	4430 ± 500						
MW-TMI-21S	01/27/15	692 ± 151						
MW-TMI-21S	02/03/15	648 ± 147						
MW-TMI-21S	02/12/15	544 ± 132						
MW-TMI-21S	02/18/15	489 ± 144						
MW-TMI-21S	02/26/15	6580 ± 702						
MW-TMI-21S	03/10/15	527 ± 142						
MW-TMI-21S	03/25/15	521 ± 142						
MW-TMI-21S	04/09/15	658 ± 152						
MW-TMI-21S	04/21/15	753 ± 158	< 8.0	< 0.8	< 0.8	< 0.5	11.0 ± 1.5	< 1.6
MW-TMI-21S	05/07/15	647 ± 142						
MW-TMI-21S	05/21/15	678 ± 148						
MW-TMI-21S	06/02/15	310 ± 139						
MW-TMI-21S	06/16/15	500 ± 147						
MW-TMI-21S	06/30/15	491 ± 141						
MW-TMI-21S	07/16/15	677 ± 135						
MW-TMI-21S	07/27/15	476 ± 144						
MW-TMI-21S	08/11/15	624 ± 127						
MW-TMI-21S	08/25/15	580 ± 140						
MW-TMI-21S	09/09/15	675 ± 151						
MW-TMI-21S	09/21/15	451 ± 144						
MW-TMI-21S	10/05/15	431 ± 133						
MW-TMI-21S	10/20/15	614 ± 147						
MW-TMI-21S	11/17/15	728 ± 154						
MW-TMI-21S	12/04/15	548 ± 143						
MW-TMI-21S	12/21/15	937 ± 164						
MW-TMI-22D	01/27/15	4990 ± 543						
MW-TMI-22D	02/03/15	5900 ± 627						
MW-TMI-22D	02/12/15	4070 ± 446						
MW-TMI-22D	02/18/15	5760 ± 621						
MW-TMI-22D	02/26/15	5590 ± 602						
MW-TMI-22D	03/10/15	5070 ± 553						
MW-TMI-22D	03/25/15	4780 ± 526						
MW-TMI-22D	04/09/15	7390 ± 784						
MW-TMI-22D	04/21/15	6050 ± 650						
MW-TMI-22D	05/07/15	5320 ± 574						
MW-TMI-22D	05/21/15	5160 ± 556						
MW-TMI-22D	06/02/15	8600 ± 909						
MW-TMI-22D	06/16/15	6870 ± 740						
MW-TMI-22D	06/30/15	6920 ± 747						
MW-TMI-22D	07/16/15	7130 ± 745						
MW-TMI-22D	07/27/15	7260 ± 777						
MW-TMI-22D	08/11/15	7060 ± 738						
MW-TMI-22D	08/25/15	7210 ± 769						
MW-TMI-22D	09/09/15	8300 ± 882						
MW-TMI-22D	09/21/15	7340 ± 782						
MW-TMI-22D	10/05/15	6540 ± 696						
MW-TMI-22D	10/20/15	7340 ± 787						
MW-TMI-22D	11/17/15	5630 ± 615						
MW-TMI-22D	12/04/15	6070 ± 659						
MW-TMI-22D	12/21/15	4380 ± 496						
MW-TMI-22I	01/27/15	8420 ± 883						
MW-TMI-22I	02/03/15	8990 ± 937						
MW-TMI-22I	02/12/15	8080 ± 844						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-TMI-22I	02/18/15		9470 ± 991						
MW-TMI-22I	02/26/15		11300 ± 1170						
MW-TMI-22I	03/10/15		9290 ± 973						
MW-TMI-22I	03/25/15		8680 ± 914						
MW-TMI-22I	04/09/15		11400 ± 1190						
MW-TMI-22I	04/21/15	Original	19500 ± 1990						
MW-TMI-22I	04/21/15	Reanalysis	16200 ± 1660						
MW-TMI-22I	05/07/15		24500 ± 2480						
MW-TMI-22I	05/21/15		27400 ± 2770						
MW-TMI-22I	06/02/15		26000 ± 2640						
MW-TMI-22I	06/16/15		23400 ± 2380						
MW-TMI-22I	06/30/15		21900 ± 2240						
MW-TMI-22I	07/16/15		21200 ± 2150						
MW-TMI-22I	07/27/15		22900 ± 2340						
MW-TMI-22I	08/11/15		23400 ± 2370						
MW-TMI-22I	08/25/15		21700 ± 2190						
MW-TMI-22I	09/09/15		23100 ± 2360						
MW-TMI-22I	09/21/15		19000 ± 1950						
MW-TMI-22I	10/05/15		17000 ± 1730						
MW-TMI-22I	10/20/15		17700 ± 1820						
MW-TMI-22I	10/20/15		18500 ± 1900						
MW-TMI-22I	11/17/15		21200 ± 2160						
MW-TMI-22I	12/04/15		18500 ± 1890						
MW-TMI-22I	12/21/15		17000 ± 1750						
MW-TMI-22S	01/27/15		16600 ± 1690						
MW-TMI-22S	01/29/15		28200 ± 2850						
MW-TMI-22S	02/03/15		23100 ± 2350						
MW-TMI-22S	02/12/15		24700 ± 2500						
MW-TMI-22S	02/18/15		25500 ± 2580						
MW-TMI-22S	02/26/15		8560 ± 897						
MW-TMI-22S	03/10/15		11000 ± 1140						
MW-TMI-22S	03/25/15		6150 ± 659						
MW-TMI-22S	04/09/15		27000 ± 2740						
MW-TMI-22S	04/21/15	Original	37200 ± 3740	< 6.5	< 0.6	< 1.5	< 0.5	8.0 ± 1.4	< 1.6
MW-TMI-22S	04/21/15	Reanalysis	36900 ± 3710						
MW-TMI-22S	05/07/15		30300 ± 3070						
MW-TMI-22S	05/21/15		5580 ± 599						
MW-TMI-22S	06/02/15		8010 ± 852						
MW-TMI-22S	06/16/15		7610 ± 812						
MW-TMI-22S	06/30/15	Original	15400 ± 1590						
MW-TMI-22S	06/30/15	Recount	14600 ± 1510						
MW-TMI-22S	06/30/15	Reanalysis	14900 ± 1530						
MW-TMI-22S	07/16/15		7560 ± 788						
MW-TMI-22S	07/27/15		13500 ± 1400						
MW-TMI-22S	08/11/15		14000 ± 1430						
MW-TMI-22S	08/25/15		12600 ± 1290						
MW-TMI-22S	09/09/15		14500 ± 1500						
MW-TMI-22S	09/21/15		10900 ± 1130						
MW-TMI-22S	10/05/15		8780 ± 921						
MW-TMI-22S	10/20/15		7720 ± 824						
MW-TMI-22S	11/17/15		6380 ± 689						
MW-TMI-22S	12/04/15		6170 ± 668						
MW-TMI-22S	12/21/15		5470 ± 602						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-TMI-2D	04/21/15		206 ± 134						
MW-TMI-2D	04/21/15		274 ± 135						
MW-TMI-3I	01/29/15		< 186						
MW-TMI-3I	04/23/15		< 199	< 6.6	< 0.6	< 2.1	< 0.7	6.8 ± 1.6	< 1.6
MW-TMI-3I	04/23/15		< 194	< 7.0	< 0.6	< 2.0	< 0.7	6.8 ± 1.6	< 1.6
MW-TMI-3I	07/29/15		< 191						
MW-TMI-3I	10/07/15	Original	251 ± 131						
MW-TMI-3I	10/07/15	Recount	220 ± 128						
MW-TMI-3I	10/07/15	Reanalysis	279 ± 139						
MW-TMI-4I	04/23/15		< 198						
MW-TMI-4S	04/22/15		< 199						
MW-TMI-6D	01/29/15		< 189						
MW-TMI-6D	04/22/15		< 186	< 4.2	< 0.5	< 1.6	< 0.5	2.9 ± 0.9	< 1.5
MW-TMI-6D	07/28/15		< 190						
MW-TMI-6D	10/06/15		< 188						
MW-TMI-6I	01/29/15		< 184						
MW-TMI-6I	01/29/15		< 185						
MW-TMI-6I	04/22/15		< 189	< 7.1	< 0.6	< 1.3	1.9 ± 1.0	3.6 ± 1.1	< 2.0
MW-TMI-6I	07/28/15		< 190						
MW-TMI-6I	10/06/15		< 194						
MW-TMI-7S	04/22/15		< 199						
MW-TMI-8S	04/21/15		< 191						
MW-TMI-9I	04/21/15		< 196						
MW-TMI-9I	04/21/15		217 ± 131						
N2-1	04/20/15		< 195						
NW-A	01/29/15		870 ± 159						
NW-A	04/23/15		1290 ± 186	< 4.3	< 0.6	< 0.8	< 0.6	3.8 ± 0.9	< 1.5
NW-A	07/28/15		1000 ± 169						
NW-A	10/06/15		791 ± 157						
NW-B	01/29/15		233 ± 129						
NW-B	04/23/15		319 ± 133	< 4.3	< 0.6	< 1.0	< 0.6	1.5 ± 1.0	< 1.5
NW-B	07/28/15		259 ± 135						
NW-B	10/06/15		240 ± 132						
NW-C	01/29/15		911 ± 164						
NW-C	04/23/15		1250 ± 179	< 5.1	< 0.7	< 0.8	< 0.6	2.4 ± 0.8	< 1.5
NW-C	07/28/15		1050 ± 172						
NW-C	10/14/15		1110 ± 177						
NW-CW	01/29/15		388 ± 138						
NW-CW	04/17/15		611 ± 155	< 7.2	< 0.6	< 1.7	< 0.5	1.9 ± 0.9	< 1.5
NW-CW	07/28/15		671 ± 154						
NW-CW	07/28/15		820 ± 160						
NW-CW	10/06/15		663 ± 160						
OS-14	01/27/15		< 188						
OS-14	04/22/15		< 197	< 5.5	< 0.6	< 2.1	< 0.7	10.8 ± 1.6	< 1.6

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
OS-14	07/28/15	< 197						
OS-14	10/06/15	< 188						
OS-16	01/28/15	246 ± 130						
OS-16	04/22/15	382 ± 143	< 7.8	< 0.6	< 0.9	< 0.7	5.4 ± 0.8	< 1.6
OS-16	07/28/15	326 ± 133						
OS-16	10/07/15	305 ± 132						
OS-18	04/22/15	258 ± 134						
OSF	01/29/15	332 ± 134						
OSF	04/17/15	376 ± 146	< 6.5	< 0.7	< 4.8	< 0.5	8.1 ± 1.8	< 1.5
OSF	07/28/15	269 ± 131						
OSF	10/06/15	282 ± 133						
RW-1	01/28/15	< 178						
RW-1	01/28/15	< 164						
RW-1	04/21/15	< 193	< 8.5	< 0.7	< 0.8	< 0.7	10.5 ± 1.5	< 1.6
RW-1	07/28/15	< 191						
RW-1	10/07/15	< 193						
TRAINING CENTER	04/20/15	< 190						

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
48S	04/17/15	< 18	< 17	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 16	< 5
MS-1	04/23/15	< 43	< 103	< 5	< 5	< 9	< 4	< 8	< 5	< 8	< 4	< 5	< 27	< 11
MS-2	04/22/15	< 35	< 29	< 4	< 4	< 8	< 4	< 8	< 4	< 7	< 3	< 4	< 23	< 9
MS-20	04/21/15	< 31	< 51	< 3	< 4	< 9	< 3	< 7	< 4	< 7	< 3	< 4	< 25	< 8
MS-21	04/21/15	< 35	< 47	< 3	< 4	< 8	< 3	< 7	< 4	< 7	< 3	< 3	< 26	< 7
MS-22	04/21/15	< 22	< 17	< 2	< 3	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 21	< 8
MS-3	01/28/15	< 59	< 138	< 6	< 7	< 14	< 6	< 11	< 6	< 11	< 6	< 7	< 33	< 12
MS-3	04/22/15	< 40	< 94	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 31	< 9
MS-3	07/28/15	< 36	< 74	< 4	< 4	< 7	< 4	< 9	< 4	< 7	< 4	< 4	< 22	< 7
MS-3	10/06/15	< 51	< 35	< 6	< 5	< 8	< 7	< 10	< 6	< 7	< 6	< 5	< 31	< 8
MS-4	04/22/15	< 45	< 89	< 5	< 5	< 11	< 5	< 11	< 5	< 8	< 4	< 6	< 31	< 11
MS-5	01/28/15	< 63	117 ± 62	< 7	< 7	< 13	< 6	< 14	< 7	< 12	< 8	< 7	< 38	< 11
MS-5	04/22/15	< 31	< 25	< 3	< 4	< 6	< 3	< 5	< 3	< 5	< 3	< 3	< 21	< 6
MS-5	07/28/15	< 29	< 28	< 3	< 4	< 8	< 3	< 7	< 3	< 6	< 3	< 3	< 19	< 6
MS-5	10/06/15	< 58	< 105	< 7	< 7	< 15	< 13	< 14	< 8	< 14	< 7	< 7	< 32	< 14
MS-7	04/22/15	< 37	< 35	< 4	< 4	< 9	< 4	< 7	< 4	< 7	< 3	< 4	< 27	< 7
MS-8	01/27/15	< 44	< 52	< 5	< 4	< 11	< 3	< 10	< 5	< 8	< 4	< 5	< 26	< 8
MS-8	04/22/15	< 40	< 41	< 4	< 4	< 10	< 4	< 9	< 5	< 8	< 4	< 5	< 33	< 9
MS-8	07/28/15	< 34	< 29	< 4	< 4	< 7	< 4	< 7	< 4	< 6	< 4	< 3	< 21	< 6
MS-8	10/06/15	< 44	< 81	< 4	< 3	< 8	< 4	< 5	< 5	< 9	< 4	< 6	< 20	< 8
MW-1	04/21/15	< 36	< 34	< 4	< 4	< 9	< 4	< 7	< 5	< 8	< 4	< 4	< 30	< 9
MW-2	04/21/15	< 35	< 36	< 4	< 3	< 7	< 4	< 7	< 4	< 6	< 4	< 4	< 27	< 6
MW-TMI-10D	04/22/15	< 33	< 42	< 4	< 3	< 8	< 5	< 8	< 4	< 8	< 4	< 4	< 28	< 8
MW-TMI-10S	04/22/15	< 33	< 38	< 4	< 4	< 9	< 4	< 8	< 4	< 7	< 3	< 4	< 24	< 7
MW-TMI-12S	04/22/15	< 33	< 72	< 3	< 3	< 7	< 4	< 6	< 3	< 6	< 3	< 4	< 24	< 7
MW-TMI-16D	04/23/15	< 53	< 48	< 6	< 6	< 13	< 6	< 11	< 6	< 11	< 6	< 6	< 34	< 11
MW-TMI-17I	04/23/15	< 27	< 27	< 3	< 3	< 7	< 2	< 6	< 3	< 5	< 3	< 4	< 23	< 6
MW-TMI-18D	04/21/15	< 35	< 54	< 3	< 4	< 8	< 4	< 7	< 4	< 7	< 3	< 4	< 29	< 11
MW-TMI-19I	04/22/15	< 39	< 73	< 4	< 5	< 10	< 4	< 9	< 5	< 8	< 4	< 4	< 28	< 10
MW-TMI-1D	04/21/15	< 31	< 50	< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 3	< 3	< 23	< 8
MW-TMI-20I	04/22/15	< 44	< 42	< 4	< 5	< 10	< 5	< 9	< 6	< 9	< 4	< 5	< 32	< 12
MW-TMI-20I	04/22/15	< 43	139 ± 90	< 5	< 5	< 10	< 5	< 10	< 5	< 9	< 5	< 4	< 32	< 12
MW-TMI-21S	04/21/15	< 24	74 ± 33	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 2	< 2	< 23	< 7
MW-TMI-22S	04/21/15	< 25	< 48	< 2	< 3	< 7	< 2	< 5	< 3	< 5	< 2	< 3	< 26	< 9
MW-TMI-2D	04/21/15	< 31	< 28	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 3	< 3	< 22	< 7
MW-TMI-2D	04/21/15	< 27	< 25	< 3	< 3	< 6	< 3	< 5	< 3	< 6	< 3	< 3	< 23	< 7
MW-TMI-3I	04/23/15	< 38	< 37	< 4	< 5	< 10	< 4	< 10	< 5	< 8	< 4	< 4	< 32	< 11
MW-TMI-3I	04/23/15	< 41	< 95	< 4	< 4	< 8	< 4	< 7	< 5	< 8	< 4	< 4	< 30	< 9
MW-TMI-4I	04/23/15	< 48	< 41	< 5	< 5	< 12	< 5	< 11	< 6	< 10	< 5	< 6	< 36	< 11
MW-TMI-4S	04/22/15	< 40	< 71	< 4	< 4	< 9	< 5	< 9	< 5	< 7	< 4	< 4	< 28	< 11

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
MW-TMI-6D	04/22/15	< 39	< 74	< 5	< 4	< 9	< 4	< 8	< 4	< 7	< 4	< 4	< 27	< 9
MW-TMI-6I	04/22/15	< 33	< 68	< 3	< 4	< 9	< 3	< 7	< 4	< 7	< 4	< 4	< 24	< 7
MW-TMI-7S	04/22/15	< 33	< 27	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 3	< 4	< 29	< 8
MW-TMI-8S	04/21/15	< 26	< 43	< 3	< 3	< 6	< 2	< 4	< 3	< 4	< 3	< 2	< 21	< 7
MW-TMI-9I	04/21/15	< 27	< 21	< 2	< 2	< 7	< 2	< 5	< 2	< 4	< 2	< 3	< 23	< 6
MW-TMI-9I	04/21/15	< 30	< 65	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 3	< 3	< 25	< 8
N2-1	04/20/15	< 37	< 38	< 4	< 4	< 7	< 4	< 9	< 5	< 8	< 4	< 4	< 29	< 9
NW-A	04/23/15	< 9	< 19	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 1	< 1	< 14	< 5
NW-B	04/23/15	< 11	< 8	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 1	< 1	< 18	< 4
NW-C	04/23/15	< 7	< 5	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 1	< 14	< 4
NW-CW	04/17/15	< 20	< 19	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 18	< 6
OS-14	01/27/15	< 49	< 59	< 6	< 6	< 13	< 5	< 12	< 7	< 10	< 6	< 6	< 30	< 9
OS-14	04/22/15	< 39	< 44	< 3	< 4	< 9	< 4	< 8	< 5	< 8	< 4	< 4	< 31	< 8
OS-14	07/28/15	< 41	< 50	< 5	< 5	< 11	< 5	< 12	< 5	< 9	< 4	< 5	< 26	< 9
OS-14	10/06/15	< 51	< 107	< 5	< 6	< 12	< 5	< 8	< 6	< 7	< 5	< 5	< 23	< 7
OS-16	01/28/15	< 45	< 47	< 6	< 5	< 9	< 5	< 8	< 5	< 8	< 5	< 5	< 26	< 6
OS-16	04/22/15	< 33	< 34	< 3	< 4	< 8	< 4	< 8	< 4	< 7	< 3	< 4	< 27	< 9
OS-16	07/28/15	< 28	< 34	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 3	< 3	< 19	< 6
OS-16	10/07/15	< 54	< 131	< 6	< 7	< 14	< 7	< 13	< 6	< 11	< 6	< 6	< 28	< 9
OS-18	04/22/15	< 39	< 66	< 4	< 4	< 9	< 5	< 7	< 5	< 8	< 4	< 4	< 28	< 8
OSF	04/17/15	< 18	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 16	< 5
RW-1	04/21/15	< 32	< 31	< 3	< 4	< 8	< 4	< 7	< 4	< 7	< 3	< 4	< 31	< 10
TRAINING CENTER	04/20/15	< 32	< 26	< 3	< 3	< 8	< 3	< 6	< 3	< 6	< 3	< 3	< 22	< 8

TABLE B-I.3 CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63

There were no hard to detect analyses analyzed in 2015

TABLE B-II.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
SW-E-1	01/28/15	< 184
SW-E-1	04/21/15	< 192
SW-E-1	07/29/15	< 195
SW-E-1	10/07/15	< 192
SW-E-2	01/28/15	< 184
SW-E-2	04/21/15	< 192
SW-E-2	07/29/15	< 193
SW-E-2	07/29/15	< 190
SW-E-2	10/07/15	< 196
SW-E-3	01/28/15	< 184
SW-E-3	04/21/15	< 194
SW-E-3	07/29/15	< 191
SW-E-3	10/07/15	< 195

TABLE B-II.2 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
SW-E-1	04/21/15	< 34	< 33	< 3	< 3	< 9	< 4	< 8	< 4	< 7	< 3	< 3	< 25	< 9
SW-E-2	04/21/15	< 37	< 24	< 3	< 4	< 7	< 3	< 6	< 4	< 7	< 4	< 4	< 28	< 6
SW-E-3	04/21/15	< 43	< 35	< 4	< 4	< 8	< 4	< 9	< 5	< 7	< 4	< 5	< 31	< 9

TABLE B-III.1 CONCENTRATIONS OF TRITIUM IN STORM WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM PROGRAM - THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
EDCB	02/06/15	424 ± 146
EDCB	04/28/15	< 189
EDCB	07/28/15	< 186
EDCB	11/03/15	316 ± 135

TABLE B-III.2 CONCENTRATIONS OF GAMMA EMITTERS IN STORM WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
EDCB	02/06/15	< 32	< 59	< 4	< 3	< 7	< 4	< 6	< 4	< 6	< 4	< 4	< 28	< 9
EDCB	04/28/15	< 31	< 90	< 5	< 5	< 11	< 4	< 8	< 6	< 10	< 4	< 5	< 33	< 5
EDCB	07/28/15	< 97	< 221	< 9	< 9	< 19	< 10	< 18	< 9	< 14	< 11	< 9	< 35	< 12
EDCB	11/03/15	< 45	< 87	< 6	< 6	< 12	< 6	< 14	< 5	< 9	< 5	< 6	< 29	< 9

TABLE B-IV.1 **CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3
TM-PR-ESE	03/09/15		380 ± 135
TM-PR-ESE	05/11/15		266 ± 130
TM-PR-ESE	07/20/15		< 181
TM-PR-ESE	10/09/15	Original	1290 ± 193
TM-PR-ESE	10/09/15	Recount	1310 ± 203
TM-PR-ESE	10/09/15	Rerun	1220 ± 186
TM-PR-MS-1	03/09/15		< 183
TM-PR-MS-1	05/11/15		< 183
TM-PR-MS-1	07/20/15		< 179
TM-PR-MS-1	10/09/15		< 187
TM-PR-MS-2	03/09/15		401 ± 134
TM-PR-MS-2	05/11/15		< 186
TM-PR-MS-2	07/20/15		< 178
TM-PR-MS-2	10/09/15	Original	1220 ± 186
TM-PR-MS-2	10/09/15	Recount	988 ± 172
TM-PR-MS-2	10/09/15	Rerun	908 ± 162
TM-PR-MS-22	05/07/15	Original	3110 ± 355
TM-PR-MS-22	05/07/15	Rerun	3260 ± 370
TM-PR-MS-22	05/07/15	Rerun/recount	2770 ± 321
TM-PR-MS-4	03/09/15		373 ± 133
TM-PR-MS-4	05/11/15		192 ± 125
TM-PR-MS-4	07/20/15		< 178
TM-PR-MS-4	10/09/15	Original	544 ± 142
TM-PR-MS-4	10/09/15	Recount	466 ± 144
TM-PR-MS-4	10/09/15	Rerun	637 ± 154
TM-PR-MW-22S	05/21/15		560 ± 146
TM-PR-MW-22S	06/02/15		461 ± 144
TM-PR-MW-22S	06/16/15		< 175
TM-PR-MW-22S	06/30/15		1270 ± 182
TM-PR-MW-22S	07/16/15	Original	2640 ± 322
TM-PR-MW-22S	07/16/15	Recount	3140 ± 367
TM-PR-MW-22S	07/16/15	Rerun/recount	3110 ± 369
TM-PR-MW-22S	07/27/15		5940 ± 644
TM-PR-MW-22S	08/11/15	Original	< 185
TM-PR-MW-22S	08/11/15	Recount	< 190
TM-PR-MW-22S	08/11/15	Rerun	< 197
TM-PR-MW-22S	08/25/15		823 ± 161
TM-PR-MW-22S	09/21/15		665 ± 155
TM-PR-MW-22S	10/05/15		650 ± 153
TM-PR-MW-22S	10/20/15		256 ± 131
TM-PR-MW-22S	11/17/15	Original	7680 ± 819
TM-PR-MW-22S	11/17/15	Recount	8020 ± 854
TM-PR-MW-22S	11/17/15	Rerun	8170 ± 870
TM-PR-MW-22S	12/04/15		2970 ± 354
TM-PR-MW-22S	12/21/15		4110 ± 474

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APPENDIX C

DATA TABLES – COMPARISON

TABLE C-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A	Gr-B
MS-20	07/27/15	484 ± 101				
MS-21	01/27/15	222 ± 104				
MS-21	10/07/15	186 ± 81				
MS-7	10/06/15	< 149				
MW-TMI-10I	04/22/15	952 ± 120				
MW-TMI-10I	10/07/15	580 ± 99				
MW-TMI-14D	01/29/15	262 ± 106				
MW-TMI-14D	10/07/15	184 ± 81				
MW-TMI-14I	07/28/15	143 ± 86				
MW-TMI-20I	04/22/15	382 ± 98				
MW-TMI-2D	04/21/15	162 ± 88				
MW-TMI-3I	04/23/15	243 ± 92	< 0.5	< 0.4	< 2.4	< 1.6
MW-TMI-6I	01/29/15	< 180				
MW-TMI-9I	04/21/15	162 ± 88				
NW-CW	07/28/15	721 ± 110				
OSF	04/17/15	296 ± 95	< 0.5	< 0.5	< 2.9	2.5 ± 1.4
RW-1	01/28/15	< 180				

TABLE C-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
MW-TMI-20I	04/22/15	< 26	94 ± 50	< 4	< 4	< 3	< 2	< 5	< 5	< 3	< 2	< 2	< 22	< 3
MW-TMI-2D	04/21/15	< 35	70	< 3	< 3	< 2	< 2	< 7	< 6	< 2	< 2	< 3	< 25	< 4
MW-TMI-3I	04/23/15	< 30	61	< 2	< 3	< 2	< 2	< 3	< 3	< 3	< 2	< 1	< 13	< 4
MW-TMI-9I	04/21/15	< 26	43	< 3	< 3	< 2	< 2	< 4	< 4	< 2	< 2	< 3	< 20	< 3
OSF	04/17/15	< 29	40	< 2	< 5	< 3	< 1	< 4	< 5	< 2	< 2	< 2	< 16	< 4

TABLE C-I.3 CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-233/234	U-235	U-238	Fe-55	Ni-63

NONE FOR 2015

TABLE C-II.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
SW-E-2	07/29/15	< 150

TABLE C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Be-7	K-40	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140

NONE FOR 2015

TABLE C-III.1 CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SPLIT SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, THREE MILE ISLAND NUCLEAR STATION, 2015

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
TM-PR-MS-2Q	03/30/15	< 149
TM-PR-MS-2Q	06/24/15	235 ± 83
TM-PR-MS-2Q	09/02/15	< 147
TM-PR-MS-2Q	11/16/15	1073 ± 122