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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
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THREE MILE ISLAND NUCLEAR STATION UNIT 1 AND UNIT 2
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DOCKET NOS. 50-289 AND 50-320

SUBJECT: 2014 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REPORT

In accordance with TMI Technical Specification 6.9.3.1, TMI-2 Technical Specifications 6.8.1.1, enclosed is the Annual Radiological Environmental Operating Report covering the time period of January 1 through December 31, 2014, for the Three Mile Island Nuclear Station.

Please contact Laura Weber of TMI-Chemistry at (717) 948-8947 if you have questions regarding this submittal.

Sincerely,

Thomas P. Haaf
Plant Manager

TPH/LKW/dam

Attachments/Enclosures

cc: Region 1 Administrator
TMI Senior Resident Inspector
TMI-1 Senior Project Manager
TMI-2 Project Manager
GPU Nuclear Cognizant Officer
Department of Environmental Protection, Bureau of Radiation Protection

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THREE MILE ISLAND NUCLEAR STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2014

Prepared By
Teledyne Brown Engineering
Environmental Services

Three Mile Island Nuclear Station
Middletown, PA 17057

April 2015

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Table Of Contents

Appendices

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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 2014 through 31 December 2014. During that time period, 1,931 analyses were performed on 1,325 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 G. No Sr-89 and Sr-90 activities were detected. Iodine-131 and gross beta concentrations detected were consistent with those detected in previous years. Tritium activity in four surface water samples and 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 not detected in any sediment samples. 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. One milk sample was initially positive for I-131. Upon further investigation, recounting the sample twice showed an increase in activity, which is not congruent with I-131 decay. Additionally, a gamma spectroscopy analysis was performed on the I-131 sample, which determined that K-40 was the interfering isotope. No Sr-89, 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. No Sr-90 was detected in milk samples for this year.

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 2014 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 2014 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 2014 through 31 December 2014.

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 2014. 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 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. Five different kinds of vegetation samples and ten 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 2014. 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 2014 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:

<u>AIR</u>

E2-1, E2-1Q

1. During the sampling period 2/7/14 to 2/14/14, the E1-2 pump malfunctioned but the timer continued to operate. Per procedure, the sample was invalid. The QC sample was sent to the primary lab for analysis. Station E1-2 pump was replaced on 2/14/14. (IR 1662133)

M2-1

2. During the sampling period 3/6/14 to 3/12/14, the pump malfunctioned but the timer continued to operate. Per procedure, the sample was invalid. The pump was repaired and installed on 3/13/14. (IR 1662133)

H3-1

3. For the sampling period 5/7/14 to 5/15/14, the sampler had a low run time and air volume due to power interruptions from a breaker trip. Per procedure, sample was still valid and sent to the lab for analysis. Offsite lab still achieved required LLD for iodine sampling and particulate results were normal. (IR 488572)

A3-1

4. For the sampling period 6/5/14 to 6/11/14, the timer was found reset for unknown reason. Per procedure, the sample was not valid and was not sent for analysis. The timer is currently functioning and the sampler was returned to service. (IR 1670228)
   For the sampling period 6/11/14 to 6/19/14, the sample volume was lower than expected probably due to power interruptions from thunderstorms. Per procedure the sample was still valid and was sent for analysis. (IR 1670228)

F1-3

5. For the sampling period 6/25/14-7/3/14, the sampler was found not operating with the breaker tripped. The pump and timer were not operating. The sample volume was insufficient. The samples were not valid and were not sent for analysis. The pump was replaced on 7/4/14 and the sampler was returned to service. (IR 2115414)
   For the sampling period 7/3/14-7/10/14, there was a lower volume due to pump replacement on 7/4/14. Samples were valid and sent for analysis.(IR 2115414)

E1-2Q

6. For the sampling period 7/17/14-7/24/14, the sampler was found with the air intake coupler sheared off due to a fallen tree limb. Per procedure, the sample volume was insufficient, and the samples were not valid. They were not sent for analysis. The sample station was repaired and the sampler was returned to service.(IR 2423641)

A3-1

7. For the sampling periods 8/21/14-8/28/14 and 8/29/14-9/4/14, the air samples had low volumes due to a breaker tripped due to a pump malfunction. Per procedure, samples were valid and sent to lab for analysis. The pump was replaced on 8/29/14 and returned to service. (IR 2423641)

M2-1

8. The sampler was found not running and did not operate due to a faulty breaker which required repair. This impacted two sampling periods. For 11/20/14 to 11/26/14, the sample volume collected was sufficient per procedure, and the samples were valid and sent for analysis. For 11/26/14 to 12/4/14, the sample volume was insufficient, and the samples were not valid per procedure. They were not sent to the laboratory for analysis. The sampler was repaired and returned to service on 12/4/14. (IR 2458509)

WATER

1. J1-2
   Numerous hourly samples missed due to ice in the sampling tubing and river ice dislodging/submerging sample tubing anchor and buoy. (IR 1617591/1662133)

   12/31/13-1/7/14, 38 samples missed, sufficient volume, no grab required
   1/7/14-1/14/14, 44 samples missed, sufficient volume, no grab required
   1/14/14-1/21/14, 22 samples missed, sufficient volume, no grab required
   1/21/14-1/28/14, all but 1 sample missed, insufficient sample, grab sample required
   1/28/14-2/4/14, 3L of sample collected, no grab sample taken due to hazardous conditions
   2/4/14-2/11/14, all but 29 samples missed, insufficient sample, grab sample required
   2/11/14-2/18/14, 77 samples missed, sufficient volume, no grab required
   2/18/14-2/25/14, 21 samples missed, sufficient volume, no grab required
   2/25/14-3/5/14, 117 samples missed, sufficient volume, no grab required
   3/5/14-3/11/14, 17 samples missed, sufficient volume, no grab required
   3/11/14-3/18/14, 30 samples missed, sufficient volume, no grab required
   3/18/14-3/25/14, 20 samples missed, sufficient volume, no grab required
   3/25/14-4/1/14, 27 samples missed, sufficient volume, no grab required

2. G15-2
   During sampling period 2/25/14 to 3/5/14, sampler had an error, per data logger FLOAT/WEIGHT TRIPPED, 119 samples were collected. Sufficient sample volume was collected and no grab sample required. During sampling period 3/5/14 to 3/11/14, sampler was found with no LCD on ISCO and unable to retrieve data from data logger. The cause for the malfunction is not known. The electronics were replaced and the unit was calibrated on 3/11/14. Sufficient sample volume was collected and no grab sample required. (IR 1662133)

3. A3-2
   Due to Swatara Creek being frozen over could not break ice and collect grab sample for 1/21/14-1/28/14 sampling period. January composite will consist of 3 rather than 4 samples. (IR 1617591)

4. Q9-1 Drinking Water
   For the sampling period 6/24/14-7/1/14, No weekly sample was available and a grab sample was collected. The suction strainer was found not submerged in the source bucket. Suspect strainer did not reseat in source water bucket after sample collection on 6/24/14. During previous weekly sample collection the regular TMI REMP sampler was on vacation. Backup sampler was coached to self check and ensure first sample after collection operates correctly. A supplier FMS observation was submitted to document inadequate human performance. (IR 2115414)

5. G15-2
   For the sampling periods 7/22/14-7/29/14 and 7/29/14-8/5/14, there were low collection volumes in the compositor. Sufficient sample was collected for analyses and no grab samples were required. The lost volume was due to ISCO hose problems and the hose was replaced on 7/30/14. (IR 2423641)

Milk

1. K15-3 Control
   The 7/23/14 sample initially showed activity for I-131. The sample was recounted two days later and again the next day. Both recounts showed an increase in activity. These results are not congruent with normal I-131 decay. A gamma scan was then performed and K-40 was detected. The non-decaying activity was attributed to this naturally occurring isotope. No I-131 analysis result is available for this sample.

Dosimeter

1. A5-1
   New pole recently installed. Old pole still standing but third quarter dosimeters not attached/found. The dosimeters were presumably removed and discarded by utility personnel during new pole installation. Fourth quarter dosimeters mounted on newly installed pole. (IR 2384588)

2. E5-1
   New pole recently installed. Per personnel (who were present) old pole will be removed. Fourth quarter dosimeters mounted on newly installed pole instead. (IR 2384588)

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 indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

E. Program Changes

No program changes for 2014.

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 four of 12 samples at location J1-2 which is located immediately downstream of the TMINS effluent outfall. The concentrations ranged from 291 to 2,280 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 from location A3-2 were analyzed for I-131 activity (Table C–I.2, Appendix C). 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.

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 22 of 36 samples. The concentrations ranged from 1.9 to 4.2 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 not detected in any samples (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 2.8 to 7.0 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 4 of 12 samples. The concentrations ranged from 2,300 to 27,000

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 <4.6 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 <3.7 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 2,411 to 3,869 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 8,369 to 17,610 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 8 to 32 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 38 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 9 to 31 E–3 pCi/m^3 with a mean of 17 E–3 pCi/m^3. Comparison of the 2014 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 2014 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 37 to 102 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). The

K15-3 sample collected on 07/23/14 initially showed activity for I-131. The sample was recounted two days later and again the next day. Both recounts showed an increase in activity. These results are not congruent with normal I-131 decay. A gamma scan was then performed and K-40 was detected. The non-decaying activity was attributed to this naturally occurring isotope. No I-131 analysis result is available for this sample. All other 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 636 to 1,517 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

Twenty-six of 32 food product samples were analyzed for concentrations of Sr-90 (Table C-IX.1, Appendix C). Strontium-90 activity was detected in 11 of 26 samples. The concentrations ranged from 2 to 18 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 32 samples. These concentrations ranged from 353 to 2,515 pCi/l. Naturally occurring K-40 activity was found in all samples. The concentrations ranged from 1,672 to 8,693 pCi/l. 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 16.2 to 37.4 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, but tracked with the data from all three groups 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 2014 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 2014, 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	1.9	2.1	2.1
2	NNE	0.7	1.2	-	2.4
3	NE	0.5	0.7	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	2.7	-	3.3
10	SSW	0.6	2.5	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 2014 operations at TMINS were well below all applicable regulatory limits and were significantly less than doses received from natural sources of radiation. The 2014 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 2014 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 2014 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 2014 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 2014 TMINS operations were the result of efforts to maintain releases "as low as reasonably achievable" (ALARA).

In conclusion, radioactive materials related to 2014 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 2014 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 2014 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 2014 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	4.57E-3	3.87E-4
	10 any organ	4.63E-3	6.15E-4
From Radionuclides In Airborne Releases (Noble Gases)	5 total body, or	1.85E-4	0*
	15 skin	2.72E-4	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	15 any organ	1.10E-1	5.63E-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	0.69
	25 total body or other organs	0.77

* *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 2014 TMINS operations was 0.65 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 (0.12 mrem) and the dose from direct radiation (0.65 mrem) yielded a maximum hypothetical dose of 0.77 mrem.

TABLE 2

Calculated Whole Body Doses to the Maximum Individual From 2014 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	4.57E-3	3.87E-4
From Radionuclides in Airborne Releases (Noble Gases)	1.85E-4	0*
From Radionuclides In Airborne Releases (Iodines, Tritium and Particulates)	3.03E-2	5.63E-5

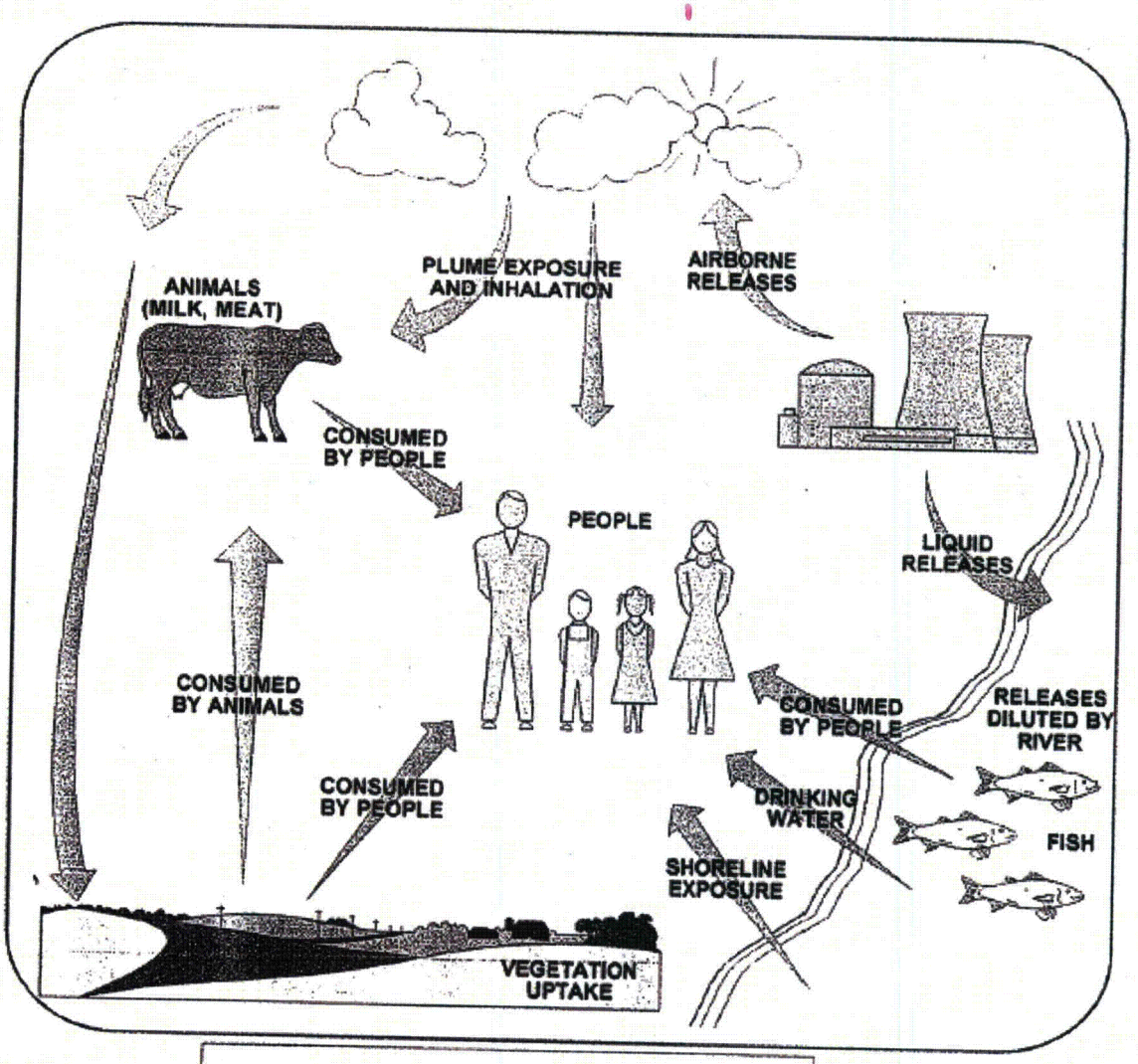
*No noble gases were released from TMI-2.

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 2014.

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.

   In reviewing our environmental inter-laboratory crosscheck

programs, we identified 1) duplication of efforts on some matrices and isotopes and 2) that we are performing crosscheck samples on some matrices and isotopes that we do not perform for clients. Since the DOE MAPEP is designed to evaluate the ability of analytical facilities to correctly analyze for radiological constituents representative of those at DOE sites, the needed changes were made to the MAPEP program. Therefore, the following isotopes were removed from the MAPEP program:

Soil – gamma – will be provided by Analytics twice per year, starting in 2015. For 2014, one soil gamma is provided by MAPEP, the 2nd soil gamma is provided by Analytics.

AP – gamma – is currently provided by Analytics.

Water – gamma, H-3, Sr-90, uranium, gross alpha and gross beta currently provided by ERA.

MAPEP evaluates non-reported (NR) analyses as failed if they were reported in the previous series.

For the TBE laboratory, 163 out of 169 analyses performed met the specified acceptance criteria. Six analyses (Ni-63, K-40 and I-131 in water, and two Sr-90s and one Gross Alpha in AP samples) did not meet the specified acceptance criteria for the following reasons:

1. Teledyne Brown Engineering's MAPEP March 2014 Ni-63 in water result of 32.7 ± 1.69 Bq/L was overlooked when reporting the data but would have passed the acceptance range of 23.9 – 44.2 Bq/L. NCR 14-04

2. Teledyne Brown Engineering's MAPEP March 2014 K-40 in water result of 1.63 ± 2.49 Bq/L was overlooked when reporting the data but would have passed the false positive test. NCR 14-04

3. Teledyne Brown Engineering's ERA November 2014 I-131 in water result of 15.8 pCi/L was lower than the known value of 20.3 pCi/L, failing below the lower acceptance limit of 16.8. The result was evaluated as failed with a found to known ratio of 0.778. No cause could be found for the slightly low result. All ERA I-131 evaluations since 2004 have been acceptable. NCR 14-08

4. Teledyne Brown Engineering's MAPEP March 2014 Sr-90 in AP result of 0.822 Bq/sample was lower than the known value of 1.18 Bq/sample, failing below the lower acceptance limit of 0.83 Bq/sample. The rerun result was still low, but fell within the lower acceptance range of 0.836. The rerun result was statistically the same number as the original

result. No cause could be found for the slightly low results. NCR 14-04

5. Teledyne Brown Engineering's MAPEP September 2014 Sr-90 in AP result of 0.310 Bq/sample was lower than the known value of 0.703 Bq/sample. The gravimetric yield of 117% was very high (we normally see yields of 60% to 70 %) and could account for the low activity. NCR 14-09

6. Teledyne Brown Engineering's MAPEP September 2014 Gr-Alpha in AP result of 0.153 Bq/sample was lower than the known value of 0.53 Bq/sample. The AP sample was counted on the wrong side. The AP was flipped over and recounted with acceptable results. NCR 14-09

For the EIML laboratory, 85 of 90 analyses met the specified acceptance criteria. Five analyses (Water – Pu-238, Pu-239, Fe-55; AP - Co-57; Soil, Cs134) did not meet the specified acceptance criteria for the following reasons:

1. Environmental Inc., Midwest Laboratory's MAPEP February 2014 water Pu-238 result of 1.28 Bq/L was higher than the known value of 0.83 Bq/L, exceeding the upper control limit of 1.08 Bq/L. The high bias on the plutonium was traced to contamination from a newly purchased standard. The result of the reanalysis with the new tracer was 0.68, which fell within the acceptance criteria.

2. Environmental Inc., Midwest Laboratory's MAPEP February 2014 water Pu-239/240 result of 0.91 Bq/L was higher than the known value of 0.68 Bq/L, exceeding the upper control limit of 0.88 Bq/L. The high bias on the plutonium was traced to contamination from a newly purchased standard. The result of reanalysis with the new tracer was 0.66 Bq/L, which fell within the acceptance criteria.

3. Environmental Inc., Midwest Laboratory's MAPEP February 2014 AP Co-57 result of 1.60 ± 0.05 Bq/total sample failed the false positive test. Interference from the Eu-152 resulted in the misidentification of Co-57.

4. Environmental Inc., Midwest Laboratory's MAPEP February 2014 soil Cs-134 result of 6.10 ± 1.80 Bq/kg failed the false positive test. Long sample counting time lead to interference from naturally occurring Bi-214 in the sample matrix with a close spectral energy.

5. Environmental Inc., Midwest Laboratory's MAPEP August 2014 water Fe-55 result of 55.10 ± 14.80 Bq/L was higher than the known value of 31.50 Bq/L, exceeding the upper control limit of 41.00 Bq/L. The result of the reanalysis of Fe-55 was 32.63 ± 16.30 Bq/L, which fell within the acceptance criteria.

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.

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, 2014

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320**
LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2014**

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	935 (4/12) (291/2280)	<LLD	935 (4/12) (291/2280)	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
	ZR-95		30	<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)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2014

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320**
LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2014**

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	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	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 (16/24) (2.3/4.2)	2.1 (6/12) (1.9/2.3)	3.1 (11/12) (2.3/4.2)	G15-2 INDICATOR WRIGHTS WATER SUPPLY 13.3 MILES SE OF SITE	0
	I-131	36	1	<LLD	<LLD	-		0
	H-3	36	2000	<LLD	<LLD	-		0
	GAMMA MN-54	36	15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		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, 2014

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320**
LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2014**

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
DRINKING WATER (PCI/LITER)	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
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		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)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2014

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER: 50-289 & 50-320 2014**

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

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)	GR-B	12	4	5.3 (12/12) (2.8/7.0)	NA	5.3 (12/12) (2.8/7.0)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	I-131	12	1	<LLD	NA	-		0
	H-3	12	2000	11593 (4/12) (2300/27000)	NA	11593 (4/12) (2300/27000)	K1-1 INDICATOR MAIN STATION LIQ. DISCHARGE ONSITE	0
	SR-89	2	5	<LLD	NA	-		0
	SR-90	2	2	<LLD	NA	-		0
	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

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)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE THREE MILE ISLAND NUCLEAR STATION, 2014

NAME OF FACILITY: THREE MILE ISLAND NUCLEAR STATION **DOCKET NUMBER:** 50-289 & 50-320
LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD:** 2014

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)	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	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	3451 (2/2) (3032/3869)	3188 (2/2) (2512/3864)	3451 (2/2) (3032/3869)	INDB INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	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
BOTTOM FEEDER (PCI/KG WET)	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	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
PREDATOR (PCI/KG WET)	SR-90	4	10	<LLD	<LLD	-		0
	GAMMA K-40	4	NA	3119 (2/2) (2434/3804)	2809 (2/2) (2411/3206)	3119 (2/2) (2434/3804)	INDP INDICATOR YORK HAVEN DAM DOWNSTREAM OF DISCHARGE	0

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LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2014**

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)	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	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	12573 (5/5) (8369/17610)	13155 (2/2) (11700/14610)	17610 (1/1)	EDCB INDICATOR STORM WATER BASIN 0.2 MILES SE OF SITE	0
	MN-54		NA	<LLD	<LLD	-		0

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LOCATION OF FACILITY: MIDDLETOWN COUNTY PA **REPORTING PERIOD: 2014**

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SEDIMENT (PCI/KG DRY)	CO-58		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	<LLD	<LLD	-		0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	360	10	17 (305/308) (6/38)	17 (50/52) (9/31)	18 (51/51) (8/35)	A3-1 INDICATOR MIDDLETOWN 2.6 MILES N OF SITE	0
	GAMMA BE-7	28	NA	68 (22/24) (37/102)	63 (4/4) (49/95)	82 (4/4) (68/95)	A3-1 INDICATOR MIDDLETOWN 2.6 MILES N 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 I-131	360	70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	114	1	<LLD	<LLD	-		0
	SR-89	20	5	<LLD	<LLD	-		0
	SR-90	20	2	<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
MILK (PCI/LITER)	GAMMA	115						
	K-40		NA	1265 (92/92) (636/1517)	1251 (23/23) (1028/1448)	1371 (23/23) (1049/1517)	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	26	10	7 (8/13) (2/13)	12 (3/13) (4/18)	12 (3/13) (4/18)	B10-2 CONTROL MILTON HERSHEY SCHOOL 10.1 MILES NNE OF SITE	0
	GAMMA	32						
	BE-7		NA	859 (8/16) (353/1944)	1431 (6/16) (795/2515)	1431 (6/16) (795/2515)	B10-2 CONTROL MILTON HERSHEY SCHOOL 10.1 MILES NNE OF SITE	0
	K-40		NA	4244 (16/16) (2680/6885)	4257 (16/16) (1672/8693)	4531 (12/12) (2738/6885)	H1-2 INDICATOR RED HILL MARKET, ALONG ROUTE 441 1.0 MILES SSE OF SITE	0
	I-131		60	<LLD	<LLD	-		0

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VEGETATION (PCI/KG WET)	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
DIRECT RADIATION (MILLI-ROENTGEN/STD.MO.)	OSLD-QUARTERLY	359	NA	22.1 (315/315) (16.2/37.4)	23.6 (44/44) (19.1/31.8)	35.6 (4/4) (32.8/37.4)	F1-2 INDICATOR REACTOR BUILDING ON TOP OF DYKE MIDWAY 0.5 MILES ESE 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, 2014

Sample Medium	Station Code	Map Number	Distance (miles)	Azimuth	Description
AQS	A1-3	1	0.5	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	23°	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, 2014

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	210°	On site at RML-7 Main Station Discharge Building
AQS	K1-3	1	0.2	212°	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	250°	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	5.0	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, 2014

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	2.0	283°	WNW of site along Route 262
M	P4-1	2	3.7	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	8.0	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	3	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, 2014

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, 2014

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, 2014

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, 2014

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

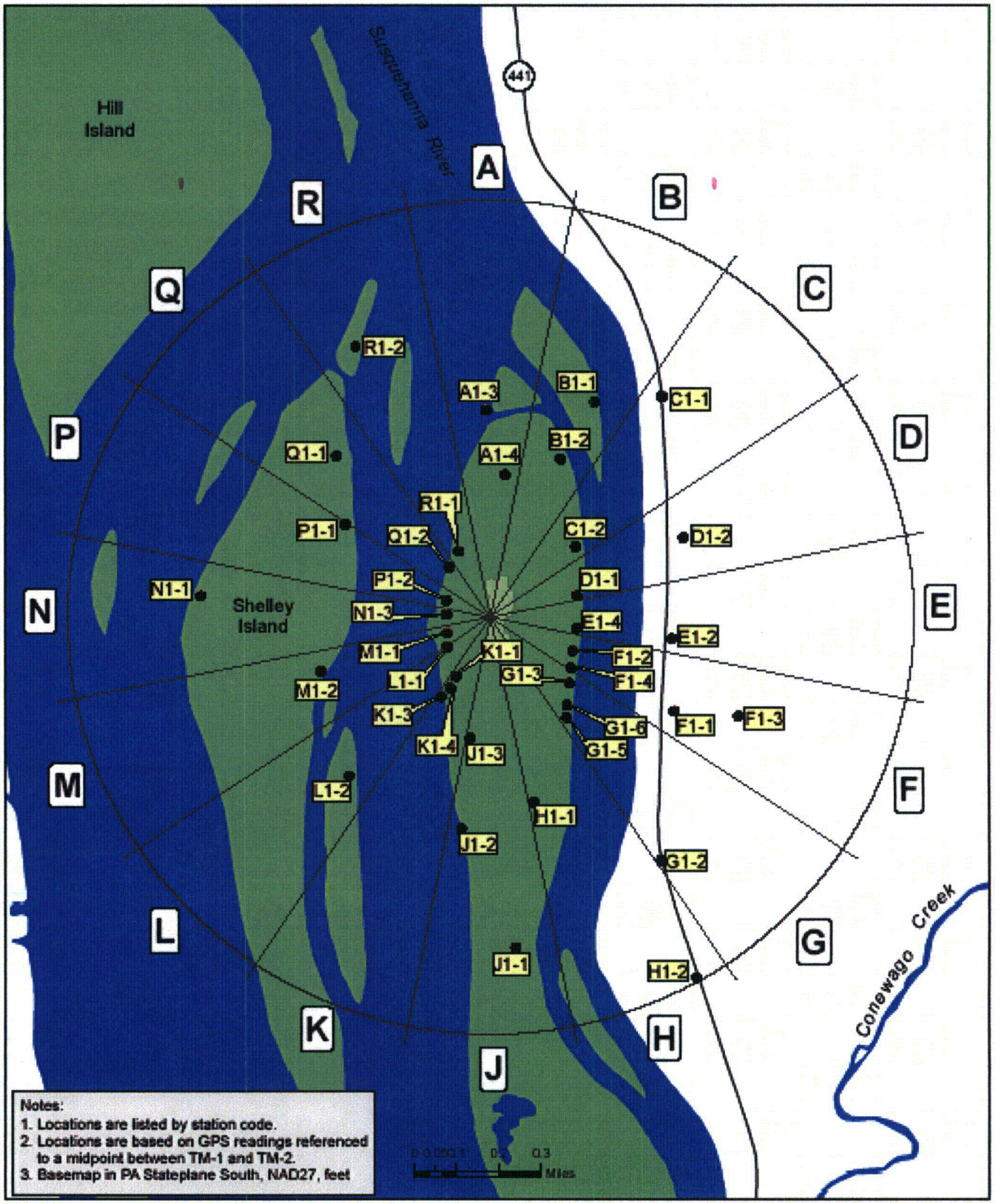

Figure B-1
Environmental Sampling Locations Within One Mile of the Three Mile Island Nuclear Station, 2014

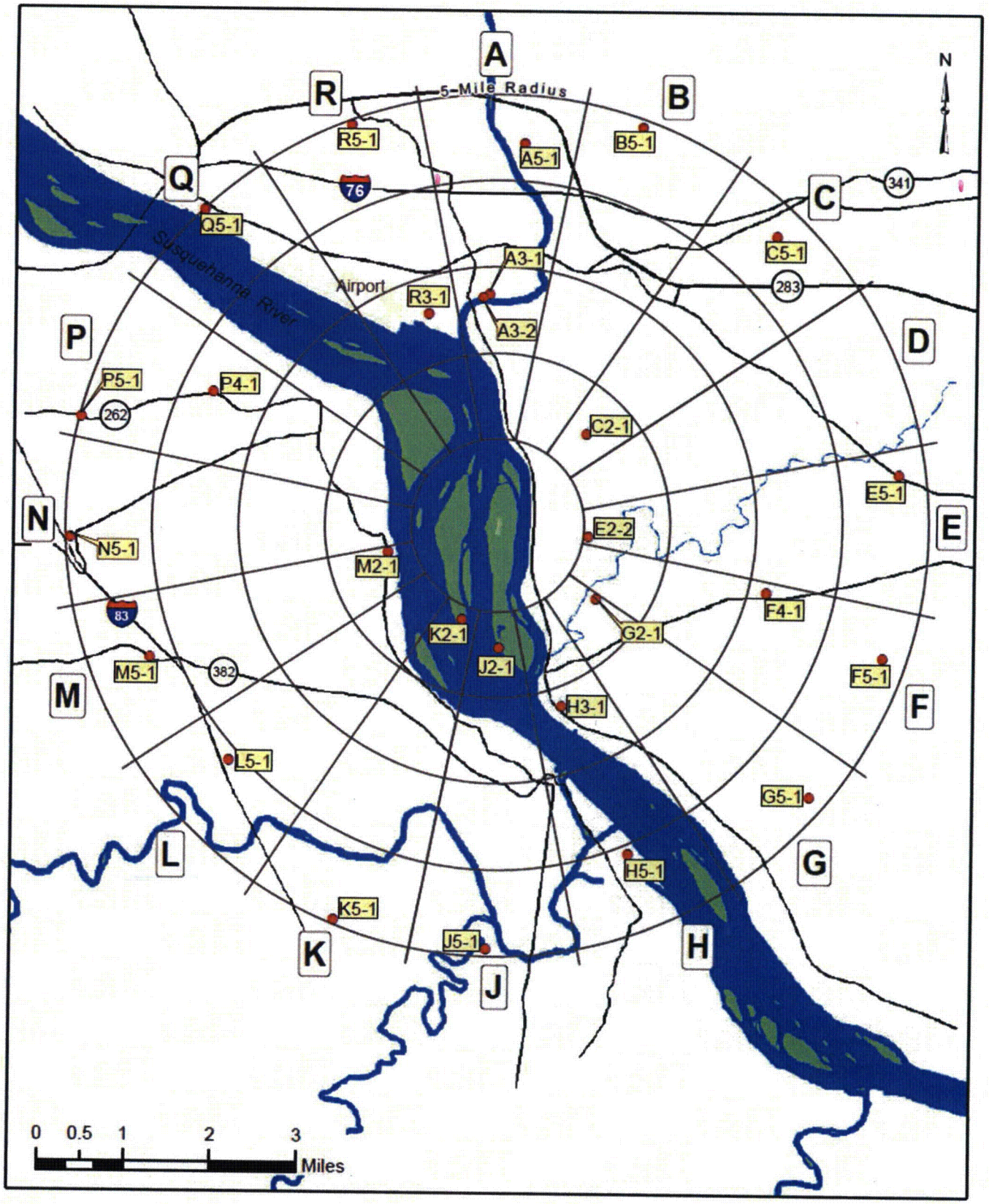

Figure B-2
Environmental Sampling Locations Between One and Five Miles of the Three Mile Island Nuclear Station, 2014

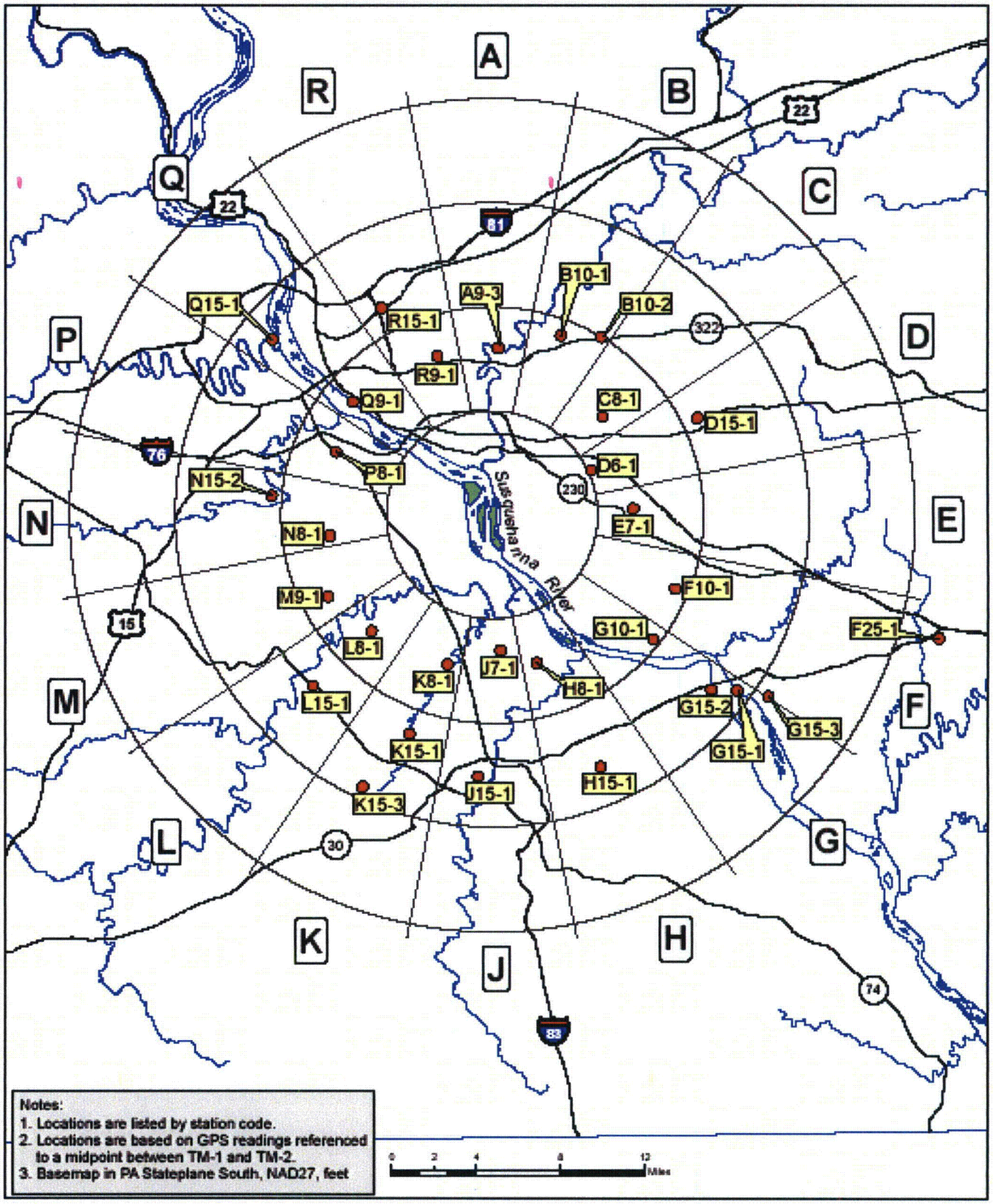

Figure B-3
Environmental Sampling Locations Greater than Five Miles of the Three Mile Island Nuclear Station, 2014

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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, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD		J1-2	Q9-1
12/31/13 - 01/28/14	(1)	< 193	< 188
01/28/14 - 02/25/14	(1)	< 160	< 161
02/25/14 - 04/01/14	(1)	< 166	< 167
04/01/14 - 04/29/14		291 ± 133	< 185
04/29/14 - 06/03/14		700 ± 157	< 190
06/03/14 - 07/01/14		467 ± 131	< 171
07/01/14 - 07/29/14		2280 ± 277	< 164
07/29/14 - 09/02/14		< 188	< 192
09/02/14 - 09/30/14		< 180	< 184
09/30/14 - 10/28/14		< 166	< 167
10/28/14 - 12/02/14		< 184	< 189
12/02/14 - 12/30/14		< 168	< 170
MEAN		935 ± 1825	-

Table C-I.2 **CONCENTRATIONS OF I-131 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD		A3-2
01/06/14 - 01/21/14	(1)	< 0.6
02/04/14 - 02/25/14		< 0.8
03/05/14 - 04/01/14		< 0.7
04/08/14 - 04/29/14		< 0.6
05/06/14 - 06/03/14		< 0.7
06/10/14 - 07/01/14		< 0.7
07/08/14 - 07/29/14		< 0.7
08/05/14 - 09/02/14		< 0.7
09/09/14 - 09/30/14		< 0.7
10/07/14 - 10/28/14		< 0.6
11/04/14 - 12/02/14		< 0.6
12/09/14 - 12/30/14		< 0.4
MEAN		-

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	12/31/13 - 01/28/14	(1)	< 5	< 6	< 12	< 5	< 12	< 6	< 10	< 6	< 6	< 32	< 9
	01/28/14 - 02/25/14	(1)	< 5	< 5	< 10	< 5	< 10	< 5	< 10	< 5	< 6	< 28	< 9
	02/25/14 - 04/01/14	(1)	< 4	< 4	< 9	< 4	< 9	< 4	< 7	< 3	< 4	< 27	< 7
	04/01/14 - 04/29/14		< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 12	< 3
	04/29/14 - 06/03/14		< 6	< 6	< 12	< 5	< 9	< 6	< 12	< 6	< 6	< 29	< 10
	06/03/14 - 07/01/14		< 5	< 4	< 10	< 4	< 11	< 5	< 9	< 5	< 6	< 25	< 9
	07/01/14 - 07/29/14		< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 3	< 3	< 16	< 5
	07/29/14 - 09/02/14		< 5	< 5	< 15	< 6	< 11	< 7	< 9	< 5	< 7	< 33	< 6
	09/02/14 - 09/30/14		< 4	< 4	< 9	< 4	< 9	< 4	< 6	< 4	< 5	< 26	< 9
	09/30/14 - 10/28/14		< 5	< 4	< 8	< 6	< 11	< 5	< 9	< 4	< 5	< 25	< 8
	10/28/14 - 12/02/14		< 3	< 4	< 7	< 4	< 7	< 4	< 6	< 3	< 3	< 19	< 6
	12/02/14 - 12/30/14		< 6	< 6	< 14	< 5	< 10	< 6	< 10	< 6	< 6	< 30	< 11
	MEAN		-	-	-	-	-	-	-	-	-	-	-
Q9-1	12/31/13 - 01/28/14		< 6	< 6	< 10	< 5	< 12	< 6	< 9	< 5	< 7	< 30	< 11
	01/28/14 - 02/25/14		< 5	< 6	< 11	< 5	< 10	< 6	< 10	< 6	< 6	< 27	< 8
	02/25/14 - 04/01/14		< 5	< 4	< 9	< 4	< 8	< 5	< 8	< 5	< 5	< 30	< 8
	04/01/14 - 04/29/14		< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 12	< 4
	04/29/14 - 06/03/14		< 5	< 6	< 16	< 7	< 13	< 6	< 9	< 6	< 7	< 27	< 12
	06/03/14 - 07/01/14		< 4	< 4	< 7	< 4	< 8	< 4	< 7	< 4	< 4	< 23	< 6
	07/01/14 - 07/29/14		< 4	< 4	< 8	< 4	< 6	< 4	< 6	< 6	< 6	< 30	< 3
	07/29/14 - 09/02/14		< 5	< 4	< 8	< 4	< 8	< 6	< 9	< 5	< 5	< 26	< 7
	09/02/14 - 09/30/14		< 5	< 6	< 11	< 6	< 11	< 7	< 11	< 5	< 5	< 35	< 11
	09/30/14 - 10/28/14		< 5	< 5	< 12	< 4	< 10	< 5	< 8	< 5	< 5	< 21	< 8
	10/28/14 - 12/02/14		< 3	< 4	< 7	< 4	< 6	< 3	< 7	< 3	< 3	< 18	< 7
	12/02/14 - 12/30/14		< 6	< 7	< 14	< 5	< 14	< 7	< 12	< 6	< 8	< 36	< 7
	MEAN		-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-II.1 **CONCENTRATIONS OF GROSS BETA IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD		G15-2	G15-3	Q9-1	
12/31/13 - 01/28/14	(1)	3.9 ± 1.6	2.4 ± 1.4	2.0 ± 1.3	
01/28/14 - 02/25/14		2.3 ± 1.4	3.8 ± 1.6	< 1.9	
02/25/14 - 04/01/14		2.7 ± 1.5	< 2.1	2.0 ± 1.4	
04/01/14 - 04/29/14		2.6 ± 1.4	< 1.8	1.9 ± 1.2	
04/29/14 - 06/03/14		2.9 ± 1.5	< 2.0	< 1.9	
06/03/14 - 07/01/14		2.8 ± 1.5	< 2.2	< 2.1	(1)
07/01/14 - 07/29/14	(1)	< 2.2	< 2.2	< 2.1	
07/29/14 - 09/02/14	(1)	2.9 ± 1.5	3.3 ± 1.5	< 1.9	
09/02/14 - 09/30/14		3.5 ± 1.5	3.1 ± 1.6	2.3 ± 1.6	
09/30/14 - 10/28/14		2.9 ± 1.6	< 2.3	< 2.2	
10/28/14 - 12/02/14		3.4 ± 1.6	< 2.2	2.3 ± 1.5	
12/02/14 - 12/30/14		4.2 ± 1.5	2.4 ± 1.3	2.1 ± 1.3	
MEAN		3.1 ± 1.2	3.0 ± 1.2	2.1 ± 0.3	

Table C-II.2 **CONCENTRATIONS OF I-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD		G15-2	G15-3	Q9-1	
12/31/13 - 01/28/14	(1)	< 0.8	< 0.8	< 0.8	
01/28/14 - 02/25/14		< 0.7	< 0.8	< 0.9	
02/25/14 - 04/01/14		< 0.8	< 1.0	< 0.8	
04/01/14 - 04/29/14		< 0.5	< 0.7	< 0.6	
04/29/14 - 06/03/14		< 0.7	< 0.7	< 0.6	
06/03/14 - 07/01/14		< 0.7	< 0.8	< 0.7	(1)
07/01/14 - 07/29/14	(1)	< 0.6	< 0.5	< 0.6	
07/29/14 - 09/02/14	(1)	< 0.8	< 0.8	< 0.8	
09/02/14 - 09/30/14		< 0.6	< 0.6	< 0.6	
09/30/14 - 10/28/14		< 0.5	< 0.7	< 0.6	
10/28/14 - 12/02/14		< 0.8	< 0.5	< 0.6	
12/02/14 - 12/30/14		< 0.4	< 0.6	< 0.5	
MEAN		-	-	-	

Table C-II.3 **CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD		G15-2	G15-3	Q9-1	
12/31/13 - 01/28/14	(1)	< 193	< 179	< 190	
01/28/14 - 02/25/14		< 166	< 162	< 164	
02/25/14 - 04/01/14		< 170	< 175	< 169	
04/01/14 - 04/29/14		< 186	< 191	< 186	
04/29/14 - 06/03/14		< 191	< 190	< 189	
06/03/14 - 07/01/14		< 173	< 169	< 173	(1)
07/01/14 - 07/29/14	(1)	< 171	< 168	< 164	
07/29/14 - 09/02/14	(1)	< 191	< 192	< 193	
09/02/14 - 09/30/14		< 182	< 183	< 185	
09/30/14 - 10/28/14		< 165	< 165	< 171	
10/28/14 - 12/02/14		< 188	< 186	< 185	
12/02/14 - 12/30/14		< 168	< 165	< 166	
MEAN		-	-	-	

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

Table C-II.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	12/31/13 - 01/28/14	(1)	< 5	< 7	< 13	< 6	< 11	< 5	< 10	< 6	< 6	< 35	< 11
	01/28/14 - 02/25/14		< 5	< 7	< 11	< 6	< 12	< 7	< 10	< 6	< 6	< 26	< 9
	02/25/14 - 04/01/14		< 4	< 3	< 9	< 4	< 7	< 4	< 6	< 3	< 4	< 26	< 7
	04/01/14 - 04/29/14		< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 15	< 4
	04/29/14 - 06/03/14		< 4	< 3	< 8	< 5	< 8	< 4	< 9	< 4	< 4	< 21	< 6
	06/03/14 - 07/01/14		< 4	< 5	< 11	< 5	< 9	< 5	< 9	< 5	< 4	< 27	< 9
	07/01/14 - 07/29/14	(1)	< 4	< 3	< 8	< 4	< 6	< 4	< 6	< 4	< 4	< 17	< 5
	07/29/14 - 09/02/14	(1)	< 4	< 4	< 7	< 4	< 9	< 4	< 7	< 4	< 4	< 17	< 6
	09/02/14 - 09/30/14		< 5	< 6	< 9	< 4	< 11	< 5	< 6	< 4	< 5	< 25	< 6
	09/30/14 - 10/28/14		< 6	< 6	< 13	< 6	< 12	< 7	< 10	< 5	< 6	< 28	< 10
	10/28/14 - 12/02/14		< 6	< 7	< 12	< 7	< 11	< 6	< 11	< 6	< 6	< 34	< 11
	12/02/14 - 12/30/14		< 5	< 5	< 13	< 3	< 11	< 6	< 8	< 6	< 6	< 27	< 6
	MEAN		-	-	-	-	-	-	-	-	-	-	-
G15-3	12/31/13 - 01/28/14		< 7	< 8	< 16	< 9	< 15	< 7	< 15	< 6	< 7	< 38	< 8
	01/28/14 - 02/25/14		< 5	< 5	< 12	< 7	< 14	< 6	< 12	< 6	< 6	< 31	< 12
	02/25/14 - 04/01/14		< 3	< 4	< 6	< 4	< 6	< 3	< 6	< 3	< 3	< 25	< 8
	04/01/14 - 04/29/14		< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 2	< 2	< 13	< 4
	04/29/14 - 06/03/14		< 6	< 6	< 12	< 6	< 16	< 7	< 12	< 5	< 6	< 31	< 9
	06/03/14 - 07/01/14		< 6	< 5	< 13	< 5	< 10	< 5	< 9	< 6	< 7	< 31	< 14
	07/01/14 - 07/29/14		< 5	< 5	< 9	< 4	< 10	< 5	< 8	< 4	< 5	< 19	< 7
	07/29/14 - 09/02/14		< 5	< 6	< 12	< 5	< 13	< 5	< 10	< 6	< 6	< 21	< 8
	09/02/14 - 09/30/14		< 6	< 6	< 11	< 7	< 10	< 6	< 10	< 5	< 6	< 35	< 9
	09/30/14 - 10/28/14		< 7	< 7	< 14	< 8	< 18	< 7	< 11	< 6	< 7	< 29	< 10
	10/28/14 - 12/02/14		< 7	< 7	< 15	< 8	< 14	< 7	< 12	< 6	< 6	< 34	< 14
	12/02/14 - 12/30/14		< 4	< 4	< 10	< 5	< 9	< 5	< 8	< 4	< 5	< 24	< 8
	MEAN		-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-II.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	12/31/13 - 01/28/14	< 5	< 5	< 10	< 7	< 10	< 5	< 11	< 5	< 6	< 34	< 9
	01/28/14 - 02/25/14	< 5	< 5	< 11	< 4	< 10	< 5	< 10	< 5	< 6	< 23	< 5
	02/25/14 - 04/01/14	< 4	< 4	< 10	< 5	< 7	< 4	< 9	< 4	< 4	< 29	< 9
	04/01/14 - 04/29/14	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 2	< 2	< 15	< 6
	04/29/14 - 06/03/14	< 6	< 5	< 9	< 6	< 10	< 5	< 10	< 6	< 6	< 28	< 5
	06/03/14 - 07/01/14 (1)	< 6	< 6	< 12	< 6	< 9	< 5	< 10	< 6	< 7	< 34	< 9
	07/01/14 - 07/29/14	< 5	< 5	< 9	< 5	< 10	< 6	< 9	< 5	< 5	< 27	< 6
	07/29/14 - 09/02/14	< 6	< 6	< 13	< 7	< 13	< 7	< 12	< 7	< 7	< 34	< 10
	09/02/14 - 09/30/14	< 5	< 5	< 15	< 6	< 10	< 7	< 12	< 6	< 7	< 34	< 14
	09/30/14 - 10/28/14	< 6	< 4	< 12	< 6	< 12	< 6	< 11	< 6	< 7	< 33	< 9
	10/28/14 - 12/02/14	< 5	< 4	< 11	< 5	< 10	< 5	< 8	< 5	< 5	< 31	< 7
	12/02/14 - 12/30/14	< 8	< 8	< 15	< 9	< 21	< 9	< 12	< 7	< 7	< 41	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

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, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	GR-B	I-131	H-3	SR-89	SR-90
K1-1	12/31/13 - 01/28/14	5.7 ± 1.6	< 0.8	< 187		
	12/31/13 - 07/01/14				< 4.4	< 0.9
	01/28/14 - 02/25/14	6.5 ± 1.8	< 0.8	< 160		
	02/25/14 - 04/01/14	3.6 ± 1.5	< 0.8	< 167		
	04/01/14 - 04/29/14	2.8 ± 1.4	< 0.6	2300 ± 282		
	04/29/14 - 06/03/14	3.4 ± 1.6	< 0.7	9780 ± 1020		
	06/03/14 - 07/01/14	4.6 ± 1.9	< 0.7	7290 ± 775		
	07/01/14 - 07/29/14	7.0 ± 2.1	< 0.5	27000 ± 2740		
	07/01/14 - 12/30/14				< 4.6	< 0.7
	07/29/14 - 09/02/14	5.9 ± 2.0	< 0.7	< 197		
	09/02/14 - 09/30/14	6.4 ± 2.1	< 0.5	< 182		
	09/30/14 - 10/28/14	6.2 ± 2.1	< 0.5	< 167		
	10/28/14 - 12/02/14	6.3 ± 2.1	< 0.6	< 186		
	12/02/14 - 12/30/14	5.6 ± 1.6	< 0.5	< 188		
	MEAN	5.3 ± 2.8	-	11593 ± 21464	-	-

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, 2014**

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	12/31/13 - 01/28/14	< 5	< 5	< 13	< 6	< 12	< 5	< 9	< 5	< 8	< 24	< 10
	01/28/14 - 02/25/14	< 4	< 5	< 9	< 4	< 8	< 5	< 7	< 6	< 5	< 24	< 8
	02/25/14 - 04/01/14	< 4	< 4	< 10	< 4	< 8	< 4	< 7	< 4	< 4	< 31	< 7
	04/01/14 - 04/29/14	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 13	< 3
	04/29/14 - 06/03/14	< 5	< 5	< 15	< 8	< 11	< 6	< 10	< 5	< 5	< 33	< 8
	06/03/14 - 07/01/14	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 3	< 3	< 18	< 7
	07/01/14 - 07/29/14	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 3	< 3	< 15	< 5
	07/29/14 - 09/02/14	< 4	< 4	< 9	< 4	< 9	< 7	< 9	< 6	< 6	< 22	< 9
	09/02/14 - 09/30/14	< 5	< 6	< 10	< 3	< 11	< 5	< 9	< 4	< 5	< 29	< 8
	09/30/14 - 10/28/14	< 5	< 6	< 11	< 5	< 12	< 6	< 8	< 6	< 6	< 28	< 6
	10/28/14 - 12/02/14	< 5	< 5	< 10	< 4	< 9	< 5	< 10	< 4	< 6	< 32	< 9
	12/02/14 - 12/30/14	< 6	< 7	< 13	< 6	< 10	< 7	< 11	< 6	< 7	< 32	< 1
	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, 2014**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Sr-90
INDP	PREDATOR	
	06/13/14	< 2.1
	09/24/14	< 2.3
	MEAN	-
INDB	BOTTOM FEEDER	
	06/13/14	< 2.5
	09/24/14	< 1.4
	MEAN	-
BKGP	PREDATOR	
	06/19/14	< 1.7
	09/30/14	< 2.3
	MEAN	-
BKGB	BOTTOM FEEDER	
	06/19/14	< 1.9
	09/30/14	< 3.7
	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, 2014**

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
BKGB	BOTTOM FEEDER								
	06/19/14	2512 ± 875	< 51	< 78	< 133	< 60	< 101	< 62	< 78
	09/30/14	3864 ± 997	< 61	< 61	< 140	< 67	< 130	< 55	< 67
	MEAN	3188 ± 1912	-	-	-	-	-	-	-
BKGP	PREDATOR								
	06/19/14	2411 ± 758	< 65	< 67	< 140	< 60	< 123	< 72	< 75
	09/30/14	3206 ± 1103	< 77	< 88	< 174	< 97	< 143	< 75	< 76
	MEAN	2809 ± 1124	-	-	-	-	-	-	-
INDB	BOTTOM FEEDER								
	06/13/14	3032 ± 763	< 49	< 48	< 120	< 69	< 129	< 48	< 59
	09/24/14	3869 ± 954	< 68	< 60	< 168	< 57	< 148	< 59	< 69
	MEAN	3451 ± 1184	-	-	-	-	-	-	-
INDP	PREDATOR								
	06/13/14	3804 ± 1259	< 81	< 80	< 152	< 75	< 202	< 86	< 98
	09/24/14	2434 ± 1075	< 68	< 91	< 196	< 67	< 152	< 84	< 79
	MEAN	3119 ± 1937	-	-	-	-	-	-	-

Table C-V.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014

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	06/13/14	14610 ± 1576	< 83	< 78	< 85	< 83	< 103
	10/31/14	11700 ± 1544	< 87	< 99	< 93	< 94	< 98
	MEAN	13155 ± 4115	-	-	-	-	-
EDCB	10/31/14	17610 ± 1344	< 43	< 45	< 40	< 42	< 69
	MEAN	-	-	-	-	-	-
J2-1	06/13/14	16770 ± 1773	< 102	< 98	< 79	< 81	< 110
	10/31/14	11150 ± 1510	< 93	< 97	< 81	< 113	< 111
	MEAN	13960 ± 7948	-	-	-	-	-
K1-3	06/13/14	8369 ± 1161	< 77	< 67	< 72	< 73	< 81
	10/31/14	8965 ± 1349	< 86	< 92	< 71	< 75	< 88
	MEAN	8667 ± 843	-	-	-	-	-

Table C-VI.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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
01/02/14 - 01/09/14	17 ± 5	16 ± 5	16 ± 5	16 ± 5	14 ± 5	16 ± 5	15 ± 5
01/09/14 - 01/15/14	18 ± 6	20 ± 6	27 ± 6	20 ± 6	19 ± 6	26 ± 6	23 ± 6
01/15/14 - 01/23/14	18 ± 5	22 ± 5	20 ± 5	19 ± 5	21 ± 5	21 ± 5	23 ± 5
01/23/14 - 01/30/14	10 ± 5	12 ± 5	15 ± 5	14 ± 5	14 ± 5	9 ± 5	12 ± 5
01/30/14 - 02/06/14	12 ± 5	22 ± 5	23 ± 5	17 ± 5	22 ± 6	22 ± 5	14 ± 5
02/06/14 - 02/12/14	32 ± 7 (1)	31 ± 7	30 ± 7	37 ± 7	38 ± 7	23 ± 6	31 ± 7
02/12/14 - 02/20/14	26 ± 6	20 ± 5	26 ± 5	22 ± 5	25 ± 5	27 ± 5	19 ± 5
02/20/14 - 02/27/14	13 ± 6	14 ± 5	15 ± 5	16 ± 5	17 ± 5	16 ± 5	16 ± 5
02/27/14 - 03/06/14	32 ± 6	23 ± 6	35 ± 6	29 ± 6	29 ± 6	27 ± 6	27 ± 6
03/06/14 - 03/12/14	25 ± 6	19 ± 6	22 ± 6	19 ± 6	25 ± 6	(1)	24 ± 6
03/12/14 - 03/20/14	12 ± 4	11 ± 4	10 ± 4	12 ± 4	14 ± 5	12 ± 5	10 ± 4
03/20/14 - 03/27/14	20 ± 5	16 ± 5	18 ± 5	19 ± 5	16 ± 5	16 ± 5	22 ± 5
03/27/14 - 04/03/14	13 ± 5	11 ± 5	17 ± 5	15 ± 5	11 ± 5	8 ± 5	9 ± 5
04/03/14 - 04/10/14	18 ± 4	14 ± 5	21 ± 4	19 ± 4	17 ± 4	17 ± 4	21 ± 4
04/10/14 - 04/17/14	14 ± 5	15 ± 5	17 ± 5	14 ± 5	15 ± 5	18 ± 5	15 ± 5
04/17/14 - 04/23/14	19 ± 6	16 ± 6	15 ± 6	13 ± 6	12 ± 6	15 ± 6	17 ± 6
04/23/14 - 05/01/14	10 ± 4	9 ± 4	12 ± 4	9 ± 4	13 ± 5	6 ± 4	13 ± 4
05/01/14 - 05/07/14	11 ± 6	8 ± 6	10 ± 6	< 8	9 ± 6	< 8	< 8
05/07/14 - 05/15/14	16 ± 5	10 ± 4	13 ± 5	17 ± 5	16 ± 5	(1) 15 ± 5	15 ± 5
05/15/14 - 05/22/14	17 ± 5	17 ± 5	17 ± 5	20 ± 5	21 ± 5	18 ± 5	20 ± 5
05/22/14 - 05/29/14	11 ± 5	8 ± 4	14 ± 5	12 ± 5	12 ± 5	13 ± 5	13 ± 5
05/29/14 - 06/05/14	8 ± 5	8 ± 5	8 ± 5	9 ± 5	11 ± 5	< 7	< 7
06/05/14 - 06/11/14	12 ± 5	10 ± 5	(1)	13 ± 6	11 ± 5	9 ± 5	10 ± 5
06/11/14 - 06/19/14	20 ± 5	14 ± 4	18 ± 5	16 ± 4	16 ± 4	13 ± 4	15 ± 4
06/19/14 - 06/25/14	17 ± 6	12 ± 5	17 ± 5	13 ± 5	19 ± 6	17 ± 6	20 ± 6
06/25/14 - 07/03/14	9 ± 4	(1)	14 ± 5	18 ± 5	14 ± 5	14 ± 5	16 ± 5
07/03/14 - 07/10/14	10 ± 5	22 ± 6 (1)	17 ± 5	18 ± 5	11 ± 5	20 ± 5	20 ± 5
07/10/14 - 07/17/14	16 ± 5	11 ± 5	20 ± 5	15 ± 5	14 ± 5	18 ± 5	15 ± 5
07/17/14 - 07/24/14	17 ± 5	18 ± 5	19 ± 5	17 ± 5	16 ± 5	15 ± 5	14 ± 5
07/24/14 - 07/31/14	9 ± 5	12 ± 5	12 ± 5	14 ± 5	10 ± 5	12 ± 5	11 ± 5
07/31/14 - 08/07/14	17 ± 5	15 ± 5	19 ± 5	17 ± 5	19 ± 5	19 ± 5	16 ± 5
08/07/14 - 08/14/14	17 ± 5	12 ± 5	17 ± 5	15 ± 5	17 ± 5	19 ± 5	15 ± 5
08/14/14 - 08/21/14	16 ± 5	13 ± 5	13 ± 5	17 ± 5	16 ± 5	16 ± 5	18 ± 5
08/21/14 - 08/28/14	17 ± 5	21 ± 5	21 ± 7 (1)	14 ± 5	18 ± 5	18 ± 5	16 ± 5
08/28/14 - 09/04/14	9 ± 5	20 ± 6	20 ± 6	12 ± 5	15 ± 5	14 ± 5	15 ± 5
09/04/14 - 09/10/14	17 ± 6	19 ± 6	23 ± 6	17 ± 6	16 ± 6	15 ± 6	16 ± 6
09/10/14 - 09/18/14	10 ± 4	12 ± 4	17 ± 5	15 ± 5	15 ± 5	15 ± 5	17 ± 5
09/18/14 - 09/25/14	17 ± 5	24 ± 5	20 ± 5	20 ± 5	23 ± 5	24 ± 6	20 ± 5
09/25/14 - 10/02/14	24 ± 6	20 ± 5	24 ± 6	26 ± 6	19 ± 5	20 ± 5	24 ± 6
10/02/14 - 10/09/14	18 ± 5	13 ± 5	19 ± 5	19 ± 5	18 ± 5	16 ± 5	17 ± 5
10/09/14 - 10/16/14	21 ± 5	21 ± 5	19 ± 5	20 ± 5	20 ± 5	20 ± 5	18 ± 5
10/16/14 - 10/23/14	12 ± 5	10 ± 5	14 ± 5	13 ± 5	15 ± 5	11 ± 5	14 ± 5
10/23/14 - 10/30/14	16 ± 5	16 ± 5	19 ± 6	17 ± 5	20 ± 6	19 ± 6	20 ± 6
10/30/14 - 11/06/14	15 ± 5	16 ± 5	13 ± 5	15 ± 5	13 ± 5	16 ± 5	14 ± 5
11/06/14 - 11/13/14	19 ± 5	17 ± 5	18 ± 5	18 ± 5	17 ± 5	20 ± 5	20 ± 5
11/13/14 - 11/20/14	17 ± 5	19 ± 5	15 ± 5	19 ± 5	18 ± 5	16 ± 5	16 ± 5
11/20/14 - 11/26/14	26 ± 6	22 ± 6	22 ± 6	28 ± 7	26 ± 6	25 ± 9 (1)	21 ± 6
11/26/14 - 12/04/14	18 ± 5	16 ± 4	17 ± 5	18 ± 5	21 ± 5	(1)	21 ± 5
12/04/14 - 12/11/14	19 ± 6	14 ± 5	14 ± 5	15 ± 5	14 ± 5	17 ± 5	13 ± 5
12/11/14 - 12/17/14	25 ± 6	19 ± 6	21 ± 6	19 ± 6	20 ± 6	17 ± 6	21 ± 6
12/17/14 - 12/24/14	8 ± 4	11 ± 4	14 ± 5	14 ± 5	12 ± 5	16 ± 5	17 ± 5
12/24/14 - 01/01/15	19 ± 5	16 ± 4	20 ± 5	17 ± 5	17 ± 5	14 ± 4	19 ± 5
MEAN	16 ± 11	16 ± 10	18 ± 10	17 ± 10	17 ± 11	17 ± 9	17 ± 9

(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, 2014**

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
01/02/14 - 01/30/14	10	22	17 ± 8	01/02/14 - 01/30/14	9	27	18 ± 9	01/02/14 - 01/30/14	12	23	18 ± 11
01/30/14 - 02/27/14	12	32	21 ± 16	01/30/14 - 02/27/14	15	38	24 ± 14	01/30/14 - 02/27/14	14	31	20 ± 15
02/27/14 - 04/03/14	11	32	18 ± 14	02/27/14 - 04/03/14	8	35	19 ± 15	02/27/14 - 04/03/14	9	27	18 ± 17
04/03/14 - 05/01/14	9	19	14 ± 7	04/03/14 - 05/01/14	6	21	15 ± 7	04/03/14 - 05/01/14	13	21	16 ± 7
05/01/14 - 05/29/14	8	17	12 ± 8	05/01/14 - 05/29/14	9	21	15 ± 7	05/07/14 - 05/29/14	13	20	16 ± 8
05/29/14 - 07/03/14	8	20	12 ± 8	05/29/14 - 07/03/14	8	19	14 ± 7	06/05/14 - 07/03/14	10	20	15 ± 9
07/03/14 - 07/31/14	9	22	14 ± 9	07/03/14 - 07/31/14	10	20	15 ± 6	07/03/14 - 07/31/14	11	20	15 ± 8
07/31/14 - 09/04/14	9	21	16 ± 8	07/31/14 - 09/04/14	12	21	17 ± 5	07/31/14 - 09/04/14	15	18	16 ± 2
09/04/14 - 10/02/14	10	24	18 ± 10	09/04/14 - 10/02/14	15	26	19 ± 7	09/04/14 - 10/02/14	16	24	19 ± 8
10/02/14 - 10/30/14	10	21	16 ± 8	10/02/14 - 10/30/14	11	20	17 ± 5	10/02/14 - 10/30/14	14	20	17 ± 5
10/30/14 - 12/04/14	15	26	18 ± 7	10/30/14 - 12/04/14	13	28	19 ± 9	10/30/14 - 12/04/14	14	21	18 ± 6
12/04/14 - 01/01/15	8	25	16 ± 11	12/04/14 - 01/01/15	12	21	16 ± 6	12/04/14 - 01/01/15	13	21	18 ± 7
01/02/14 - 01/01/15	8	32	16 ± 10	01/02/14 - 01/01/15	6	38	17 ± 10	01/02/14 - 01/01/15	9	31	17 ± 9

Table C-VI.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	01/02/14 - 04/03/14	68 ± 38	< 4	< 4	< 4	< 4	< 8	< 4	< 4
	04/03/14 - 07/03/14	87 ± 31	< 4	< 5	< 4	< 6	< 10	< 4	< 4
	07/03/14 - 10/02/14	79 ± 27	< 3	< 4	< 3	< 4	< 8	< 3	< 3
	10/02/14 - 01/01/15	95 ± 23	< 3	< 3	< 3	< 3	< 6	< 3	< 4
	MEAN	82 ± 23	-	-	-	-	-	-	-
E1-2	01/02/14 - 04/03/14	57 ± 20	< 3	< 3	< 3	< 3	< 5	< 3	< 3
	04/03/14 - 07/03/14	73 ± 26	< 3	< 3	< 2	< 3	< 6	< 3	< 2
	07/03/14 - 10/02/14	50 ± 33	< 3	< 4	< 4	< 5	< 8	< 2	< 3
	10/02/14 - 01/01/15	< 46	< 4	< 6	< 5	< 5	< 8	< 4	< 3
	MEAN	60 ± 24	-	-	-	-	-	-	-
F1-3	01/02/14 - 04/03/14	69 ± 30	< 3	< 4	< 2	< 4	< 9	< 4	< 4
	04/03/14 - 07/03/14	50 ± 17	< 2	< 3	< 3	< 3	< 5	< 2	< 2
	07/04/14 - 10/02/14	60 ± 39	< 4	< 6	< 4	< 6	< 10	< 4	< 4
	10/02/14 - 01/01/15	46 ± 16	< 1	< 3	< 2	< 2	< 4	< 2	< 2
	MEAN	56 ± 21	-	-	-	-	-	-	-
G2-1	01/02/14 - 04/03/14	99 ± 37	< 7	< 9	< 5	< 8	< 16	< 6	< 8
	04/03/14 - 07/03/14	62 ± 21	< 2	< 3	< 2	< 3	< 5	< 2	< 3
	07/03/14 - 10/02/14	< 61	< 4	< 6	< 4	< 7	< 12	< 5	< 3
	10/02/14 - 01/01/15	44 ± 21	< 2	< 3	< 3	< 3	< 5	< 2	< 2
	MEAN	68 ± 56	-	-	-	-	-	-	-
H3-1	01/02/14 - 04/03/14	69 ± 20	< 3	< 4	< 2	< 3	< 6	< 2	< 3
	04/03/14 - 07/03/14	69 ± 25	< 3	< 4	< 2	< 4	< 6	< 2	< 2
	07/03/14 - 10/02/14	94 ± 29	< 3	< 4	< 3	< 3	< 5	< 2	< 2
	10/02/14 - 01/01/15	37 ± 20	< 2	< 3	< 2	< 4	< 6	< 2	< 3
	MEAN	67 ± 47	-	-	-	-	-	-	-
M2-1	01/02/14 - 04/03/14	63 ± 22	< 3	< 5	< 3	< 5	< 8	< 3	< 3
	04/03/14 - 07/03/14	54 ± 23	< 2	< 3	< 2	< 3	< 6	< 3	< 2
	07/03/14 - 10/02/14	70 ± 22	< 2	< 3	< 1	< 3	< 6	< 2	< 2
	10/02/14 - 01/01/15	102 ± 22	< 3	< 4	< 3	< 4	< 7	< 3	< 3
	MEAN	72 ± 42	-	-	-	-	-	-	-
Q15-1	01/02/14 - 04/03/14	55 ± 26	< 4	< 4	< 5	< 5	< 10	< 4	< 4
	04/03/14 - 07/03/14	95 ± 29	< 3	< 3	< 3	< 4	< 6	< 2	< 3
	07/03/14 - 10/02/14	49 ± 28	< 4	< 5	< 2	< 4	< 6	< 2	< 3
	10/02/14 - 01/01/15	53 ± 29	< 4	< 5	< 4	< 5	< 7	< 4	< 3
	MEAN	63 ± 43	-	-	-	-	-	-	-

Table C-VII.1 **CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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
01/02/14 - 01/09/14	< 55	< 53	< 51	< 54	< 56	< 52	< 53
01/09/14 - 01/15/14	< 65	< 64	< 56	< 64	< 67	< 56	< 57
01/15/14 - 01/23/14	< 60	< 58	< 53	< 59	< 56	< 54	< 54
01/23/14 - 01/30/14	< 53	< 51	< 69	< 52	< 54	< 69	< 69
01/30/14 - 02/06/14	< 61	< 59	< 56	< 60	< 62	< 57	< 58
02/06/14 - 02/12/14	< 62 (1)	< 60	< 58	< 26	< 63	< 58	< 59
02/12/14 - 02/20/14	< 61	< 44	< 62	< 45	< 46	< 63	< 63
02/20/14 - 02/27/14	< 56	< 49	< 48	< 51	< 18	< 49	< 49
02/27/14 - 03/06/14	< 65	< 64	< 48	< 65	< 67	< 48	< 50
03/06/14 - 03/12/14	< 57	< 55	< 41	< 56	< 43	(1)	< 42
03/12/14 - 03/20/14	< 43	< 43	< 46	< 43	< 49	< 53	< 20
03/20/14 - 03/27/14	< 61	< 58	< 16	< 59	< 46	< 44	< 45
03/27/14 - 04/03/14	< 68	< 66	< 64	< 67	< 69	< 65	< 65
04/03/14 - 04/10/14	< 54	< 22	< 55	< 54	< 55	< 53	< 54
04/10/14 - 04/17/14	< 57	< 55	< 57	< 56	< 58	< 57	< 57
04/17/14 - 04/23/14	< 53	< 52	< 51	< 52	< 54	< 51	< 52
04/23/14 - 05/01/14	< 25	< 63	< 61	< 64	< 66	< 62	< 62
05/01/14 - 05/07/14	< 67	< 66	< 66	< 66	< 69	< 67	< 67
05/07/14 - 05/15/14	< 60	< 58	< 56	< 37	< 50 (1)	< 56	< 57
05/15/14 - 05/22/14	< 68	< 66	< 61	< 67	< 29	< 61	< 62
05/22/14 - 05/29/14	< 23	< 22	< 23	< 23	< 23	< 24	< 24
05/29/14 - 06/05/14	< 28	< 27	< 26	< 29	< 27	< 11	< 26
06/05/14 - 06/11/14	< 41	< 40	(1)	< 42	< 42	< 41	< 41
06/11/14 - 06/19/14	< 33	< 33	< 48	< 34	< 34	< 38	< 37
06/19/14 - 06/25/14	< 69	< 68	< 61	< 70	< 68	< 61	< 59
06/25/14 - 07/03/14	< 23	(1)	< 23	< 24	< 24	< 24	< 24
07/03/14 - 07/10/14	< 51	< 56 (1)	< 48	< 52	< 49	< 48	< 48
07/10/14 - 07/17/14	< 41	< 41	< 39	< 43	< 42	< 39	< 39
07/17/14 - 07/24/14	< 27	< 27	< 27	< 28	< 28	< 28	< 27
07/24/14 - 07/31/14	< 19	< 54	< 62	< 56	< 55	< 63	< 62
07/31/14 - 08/07/14	< 25	< 25	< 25	< 26	< 26	< 26	< 25
08/07/14 - 08/14/14	< 30	< 29	< 29	< 12	< 30	< 29	< 29
08/14/14 - 08/21/14	< 57	< 56	< 56	< 59	< 58	< 57	< 57
08/21/14 - 08/28/14	< 60	< 59	< 63 (1)	< 61	< 23	< 39	< 39
08/28/14 - 09/04/14	< 59	< 58	< 67	< 61	< 60	< 61	< 60
09/04/14 - 09/10/14	< 53	< 52	< 53	< 54	< 53	< 53	< 53
09/10/14 - 09/18/14	< 64	< 63	< 67	< 66	< 65	< 28	< 67
09/18/14 - 09/25/14	< 67	< 66	< 59	< 68	< 67	< 61	< 60
09/25/14 - 10/02/14	< 66	< 65	< 60	< 68	< 66	< 60	< 60
10/02/14 - 10/09/14	< 59	< 58	< 58	< 60	< 59	< 55	< 54
10/09/14 - 10/16/14	< 38	< 37	< 38	< 39	< 38	< 39	< 38
10/16/14 - 10/23/14	< 30	< 12	< 30	< 31	< 31	< 30	< 30
10/23/14 - 10/30/14	< 40	< 39	< 41	< 41	< 40	< 42	< 41
10/30/14 - 11/06/14	< 69	< 68	< 64	< 65	< 70	< 65	< 64
11/06/14 - 11/13/14	< 25	< 25	< 28	< 26	< 26	< 28	< 28
11/13/14 - 11/20/14	< 68	< 67	< 19	< 38	< 69	< 19	< 19
11/20/14 - 11/26/14	< 67	< 65	< 43	< 68	< 67	< 68 (1)	< 43
11/26/14 - 12/04/14	< 67	< 68	< 67	< 69	< 70	(1)	< 67
12/04/14 - 12/11/14	< 57	< 56	< 43	< 59	< 58	< 42	< 43
12/11/14 - 12/17/14	< 66	< 65	< 68	< 68	< 67	< 69	< 69
12/17/14 - 12/24/14	< 67	< 66	< 61	< 69	< 68	< 63	< 61
12/24/14 - 01/01/15	< 31	< 31	< 38	< 32	< 39	< 15	< 38
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, 2014**

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
01/08/14	< 0.8	< 0.6	< 0.6	< 0.7	< 0.8
02/05/14	< 0.8	< 0.7	< 0.8	< 0.7	< 0.6
03/05/14	< 0.8	< 0.9	< 0.7	< 0.9	< 0.7
03/19/14	< 0.8	< 0.8	< 0.5	< 0.7	< 0.8
04/02/14	< 0.6	< 0.8	< 0.6	< 0.9	< 0.9
04/16/14	< 0.7	< 0.6	< 0.6	< 0.8	< 0.6
04/30/14	< 0.7	< 0.7	< 0.8	< 0.9	< 0.7
05/14/14	< 0.6	< 0.9	< 0.6	< 0.7	< 0.7
05/28/14	< 0.6	< 0.7	< 0.7	< 0.9	< 0.8
06/11/14	< 0.6	< 0.6	< 0.7	< 0.7	< 0.6
06/25/14	< 0.6	< 0.6	< 0.5	< 0.6	< 0.6
07/09/14	< 0.6	< 0.6	< 0.6	< 0.7	< 0.6
07/23/14	(1)	< 0.4	< 0.5	< 0.4	< 0.5
08/06/14	< 0.6	< 0.6	< 0.6	< 0.6	< 0.7
08/20/14	< 0.7	< 0.9	< 0.7	< 0.9	< 0.8
09/03/14	< 0.9	< 0.7	< 0.6	< 0.7	< 0.7
09/17/14	< 0.5	< 0.6	< 0.5	< 0.5	< 0.6
10/01/14	< 0.5	< 0.6	< 0.5	< 0.7	< 0.5
10/15/14	< 0.8	< 0.5	< 0.6	< 0.7	< 0.7
10/29/14	< 0.8	< 0.7	< 0.8	< 0.7	< 0.6
11/12/14	< 0.3	< 0.8	< 0.9	< 0.4	< 0.6
11/25/14	< 0.6	< 0.7	< 0.7	< 0.6	< 0.7
12/10/14	< 0.7	< 0.8	< 0.6	< 0.6	< 0.8
MEAN	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR INFORMATION

Table C-VIII.2 **CONCENTRATIONS OF STRONTIUM IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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
01/08/14 - 03/19/14	< 3.6	< 0.6	< 4.7	< 0.7	< 3.8	< 0.6	< 3.9	< 0.8	< 4.9	< 0.8
04/02/14 - 06/25/14	< 3.8	< 0.6	< 4.6	< 0.3	< 4.3	< 0.4	< 4.0	< 0.6	< 3.4	< 0.6
07/09/14 - 09/17/14	< 3.2	< 0.9	< 3.5	< 1.0	< 1.7	< 0.5	< 3.2	< 0.8	< 2.4	< 0.6
10/01/14 - 12/10/14	< 2.8	< 0.9	< 2.6	< 0.7	< 3.5	< 1.0	< 2.8	< 1.0	< 2.9	< 0.9
MEAN	-	-	-	-	-	-	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
E2-2	01/08/14	1168 ± 151	< 6	< 7	< 37	< 10
	02/05/14	1294 ± 160	< 6	< 6	< 44	< 12
	03/05/14	1442 ± 170	< 6	< 7	< 38	< 8
	03/19/14	1171 ± 106	< 5	< 5	< 21	< 6
	04/02/14	1409 ± 166	< 7	< 8	< 37	< 12
	04/16/14	1309 ± 145	< 6	< 6	< 34	< 10
	04/30/14	1260 ± 131	< 5	< 6	< 36	< 13
	05/14/14	1347 ± 168	< 7	< 8	< 24	< 5
	05/28/14	1302 ± 147	< 7	< 8	< 32	< 10
	06/11/14	1473 ± 151	< 6	< 7	< 34	< 7
	06/25/14	1258 ± 134	< 6	< 7	< 26	< 8
	07/09/14	1511 ± 203	< 7	< 10	< 43	< 11
	07/23/14	1347 ± 126	< 5	< 6	< 24	< 6
	08/06/14	1343 ± 183	< 6	< 8	< 38	< 6
	08/20/14	1292 ± 128	< 5	< 5	< 22	< 8
	09/03/14	1300 ± 163	< 8	< 8	< 59	< 10
	09/17/14	1156 ± 153	< 5	< 6	< 28	< 8
	10/01/14	1388 ± 125	< 4	< 6	< 27	< 8
	10/15/14	1191 ± 111	< 4	< 4	< 45	< 12
	10/29/14	1411 ± 169	< 7	< 7	< 42	< 13
	11/12/14	1292 ± 182	< 6	< 7	< 38	< 10
	11/25/14	1340 ± 173	< 6	< 9	< 43	< 14
	12/10/14	1325 ± 113	< 5	< 5	< 24	< 7
	MEAN	1319 ± 189	-	-	-	-
F4-1	01/08/14	1049 ± 157	< 8	< 9	< 42	< 13
	02/05/14	1348 ± 139	< 5	< 6	< 33	< 12
	03/05/14	1443 ± 178	< 5	< 7	< 36	< 11
	03/19/14	1335 ± 93	< 4	< 4	< 20	< 6
	04/02/14	1500 ± 172	< 5	< 5	< 26	< 5
	04/16/14	1333 ± 135	< 6	< 6	< 28	< 7
	04/30/14	1306 ± 141	< 6	< 6	< 41	< 12
	05/14/14	1322 ± 132	< 5	< 6	< 23	< 6
	05/28/14	1382 ± 175	< 8	< 8	< 43	< 12
	06/11/14	1343 ± 128	< 7	< 7	< 37	< 9
	06/25/14	1224 ± 159	< 5	< 7	< 31	< 6
	07/09/14	1478 ± 174	< 7	< 8	< 31	< 10
	07/23/14	1259 ± 118	< 4	< 4	< 23	< 6
	08/06/14	1341 ± 169	< 7	< 7	< 36	< 9
	08/20/14	1456 ± 148	< 4	< 6	< 22	< 7
	09/03/14	1318 ± 156	< 6	< 8	< 49	< 11
	09/17/14	1468 ± 156	< 4	< 6	< 25	< 3
	10/01/14	1507 ± 208	< 8	< 7	< 43	< 11
	10/15/14	1473 ± 130	< 5	< 5	< 46	< 14
	10/29/14	1517 ± 138	< 8	< 8	< 46	< 11
	11/12/14	1263 ± 158	< 7	< 7	< 33	< 8
	11/25/14	1483 ± 176	< 6	< 8	< 40	< 10
	12/10/14	1396 ± 114	< 4	< 5	< 22	< 6
	MEAN	1371 ± 225	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
G2-1	01/08/14	1090 ± 158	< 5	< 7	< 38	< 12
	02/05/14	1195 ± 118	< 6	< 7	< 43	< 11
	03/05/14	985 ± 105	< 5	< 6	< 30	< 7
	03/19/14	1218 ± 115	< 4	< 5	< 24	< 6
	04/02/14	1127 ± 149	< 7	< 7	< 43	< 14
	04/16/14	971 ± 135	< 6	< 8	< 39	< 11
	04/30/14	915 ± 130	< 6	< 6	< 42	< 15
	05/14/14	770 ± 139	< 8	< 8	< 40	< 12
	05/28/14	1240 ± 150	< 7	< 8	< 37	< 12
	06/11/14	963 ± 103	< 5	< 6	< 28	< 10
	06/25/14	802 ± 131	< 8	< 9	< 35	< 9
	07/09/14	1296 ± 215	< 7	< 8	< 37	< 14
	07/23/14	957 ± 133	< 5	< 6	< 32	< 9
	08/06/14	636 ± 161	< 8	< 7	< 42	< 14
	08/20/14	1072 ± 184	< 7	< 8	< 29	< 12
	09/03/14	1289 ± 169	< 6	< 8	< 51	< 15
	09/17/14	851 ± 143	< 7	< 8	< 33	< 9
	10/01/14	907 ± 171	< 9	< 9	< 44	< 13
	10/15/14	1126 ± 110	< 4	< 6	< 44	< 15
	10/29/14	756 ± 120	< 5	< 5	< 43	< 12
	11/12/14	824 ± 150	< 12	< 10	< 51	< 12
	11/25/14	973 ± 133	< 5	< 7	< 33	< 8
	12/10/14	1133 ± 142	< 7	< 7	< 35	< 11
	MEAN	1004 ± 366	-	-	-	-
K15-3	01/08/14	1293 ± 164	< 6	< 8	< 42	< 14
	02/05/14	1332 ± 122	< 5	< 6	< 39	< 9
	3/5/2014	1101 ± 166	< 7	< 7	< 43	< 10
	03/19/14	1028 ± 105	< 4	< 5	< 22	< 8
	4/2/2014	1392 ± 188	< 7	< 8	< 37	< 11
	04/16/14	1448 ± 130	< 6	< 6	< 31	< 7
	04/30/14	1295 ± 136	< 4	< 5	< 34	< 11
	05/14/14	1292 ± 172	< 5	< 8	< 30	< 5
	05/28/14	1384 ± 182	< 7	< 8	< 34	< 9
	06/11/14	1254 ± 129	< 5	< 6	< 26	< 8
	06/25/14	1060 ± 139	< 6	< 7	< 31	< 7
	07/09/14	1222 ± 171	< 6	< 6	< 34	< 9
	07/23/14	1244 ± 118	< 4	< 4	< 19	< 5
	08/06/14	1282 ± 156	< 6	< 7	< 28	< 12
	08/20/14	1275 ± 151	< 5	< 6	< 26	< 8
	09/03/14	1333 ± 148	< 5	< 6	< 42	< 15
	09/17/14	1231 ± 140	< 6	< 7	< 29	< 8
	10/01/14	1068 ± 183	< 8	< 10	< 48	< 13
	10/15/14	1369 ± 116	< 4	< 5	< 44	< 14
	10/29/14	1174 ± 132	< 6	< 6	< 41	< 11
	11/12/14	1335 ± 194	< 7	< 9	< 42	< 11
	11/25/14	1077 ± 157	< 6	< 6	< 35	< 10
	12/10/14	1275 ± 108	< 4	< 4	< 22	< 6
	MEAN	1251 ± 233	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
P4-1	01/08/14	1318 ± 123	< 5	< 6	< 30	< 10
	02/05/14	1339 ± 171	< 6	< 6	< 41	< 12
	03/05/14	1290 ± 133	< 5	< 6	< 26	< 7
	03/19/14	1465 ± 107	< 4	< 5	< 19	< 6
	04/02/14	1487 ± 124	< 5	< 5	< 23	< 7
	04/16/14	1390 ± 105	< 4	< 4	< 19	< 5
	04/30/14	1378 ± 140	< 5	< 5	< 38	< 13
	05/14/14	1430 ± 124	< 5	< 5	< 20	< 6
	05/28/14	1482 ± 155	< 5	< 6	< 26	< 8
	06/11/14	1388 ± 116	< 4	< 4	< 18	< 6
	06/25/14	1363 ± 181	< 7	< 7	< 27	< 10
	07/09/14	1219 ± 183	< 8	< 9	< 36	< 8
	07/23/14	1467 ± 128	< 4	< 5	< 23	< 6
	08/06/14	1438 ± 184	< 7	< 8	< 35	< 12
	08/20/14	1398 ± 182	< 7	< 7	< 27	< 5
	09/03/14	1350 ± 136	< 5	< 4	< 34	< 7
	09/17/14	1206 ± 118	< 4	< 5	< 16	< 6
	10/01/14	1117 ± 184	< 7	< 6	< 34	< 10
	10/15/14	1188 ± 121	< 5	< 5	< 47	< 15
	10/29/14	1366 ± 162	< 6	< 7	< 42	< 15
	11/12/14	1450 ± 177	< 11	< 9	< 50	< 14
	11/25/14	1492 ± 168	< 7	< 8	< 38	< 15
	12/10/14	1411 ± 167	< 3	< 2	< 16	< 4
	MEAN	1367 ± 206	-	-	-	-

Table C-IX.1 **CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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							
Broccoli Leaves	06/30/14	< 3	< 244	3697 ± 616	< 55	< 26	< 29
Cabbage & Leaves	06/30/14	< 3	< 185	4292 ± 458	< 44	< 19	< 24
Cauliflower Leaves	06/30/14	< 4	< 282	5720 ± 608	< 58	< 23	< 29
Cabbage	07/23/14	< 2	< 186	2865 ± 409	< 36	< 20	< 20
Cabbage	07/30/14	< 4	< 218	2559 ± 529	< 49	< 22	< 21
Sunflower Leaves	07/30/14	14 ± 3	1595 ± 268	6073 ± 550	< 41	< 19	< 22
Sweet Corn Leaves	07/30/14	< 3	1096 ± 229	3642 ± 398	< 39	< 20	< 22
Sweet Corn	08/04/14	-	< 133	2449 ± 376	< 18	< 15	< 16
Tomatoes	08/04/14	-	< 95	1672 ± 258	< 16	< 10	< 11
Cabbage	08/27/14	18 ± 3	< 162	2450 ± 335	< 59	< 14	< 19
Neck Pumpkin Leaves	08/27/14	< 2	2515 ± 224	5745 ± 416	< 52	< 12	< 16
Sunflower Leaves	08/27/14	< 3	1088 ± 190	8693 ± 438	< 58	< 14	< 16
Cabbage	09/24/14	< 2	< 108	2744 ± 217	< 51	< 10	< 11
Neck Pumpkin Leaves	09/24/14	< 2	1497 ± 90	5150 ± 174	< 44	< 7	< 8
Sunflower Leaves	09/24/14	4 ± 3	795 ± 84	6838 ± 214	< 30	< 5	< 6
Sweet Potatoes	10/08/14	-	< 176	3518 ± 460	< 37	< 21	< 21
	MEAN	12 ± 14	1431 ± 1214	4257 ± 3877	-	-	-
E1-2							
Cabbage	07/23/14	< 1	< 122	2680 ± 279	< 22	< 12	< 14
Sweet Corn	08/04/14	-	< 179	2976 ± 368	< 30	< 22	< 23
Tomatoes	08/04/14	-	< 148	3008 ± 363	< 24	< 18	< 18
Sweet Potatoes	10/08/14	-	< 171	4872 ± 546	< 32	< 19	< 21
	MEAN	-	-	3384 ± 2006	-	-	-
H1-2							
Eggplant Leaves	06/30/14	< 4	403 ± 201	6885 ± 497	< 37	< 19	< 19
Squash Leaves	06/30/14	8 ± 2	353 ± 196	4753 ± 579	< 51	< 23	< 22
Zucchini Leaves	06/30/14	4 ± 2	< 278	5055 ± 591	< 46	< 20	< 24
Eggplant Leaves	07/30/14	< 3	940 ± 230	4196 ± 533	< 50	< 22	< 27
Squash Leaves	07/30/14	8 ± 2	1944 ± 270	5062 ± 504	< 51	< 20	< 24
Zucchini Leaves	07/30/14	10 ± 2	1055 ± 178	4452 ± 379	< 29	< 15	< 14
Cucumber Leaves	08/27/14	< 2	1129 ± 207	2970 ± 322	< 58	< 14	< 15
Squash Leaves	08/27/14	13 ± 3	488 ± 131	2900 ± 270	< 47	< 11	< 12
Zucchini Leaves	08/27/14	10 ± 2	563 ± 139	4499 ± 375	< 59	< 14	< 14
Broccoli Leaves	09/24/14	4 ± 1	< 108	3979 ± 241	< 52	< 10	< 10
Cauliflower Leaves	09/24/14	< 2	< 110	2738 ± 205	< 50	< 10	< 10
Turnip Greens	09/24/14	2 ± 1	< 82	6877 ± 240	< 43	< 8	< 9
	MEAN	7 ± 7	859 ± 1065	4531 ± 2723	-	-	-

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, 2014

RESULTS IN UNITS OF MILLIREM/QUARTER

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC	
A1-4	18.7 ± 3.4	16.2	18.8	19.9	19.8	
A3-1	18.6 ± 2.6	16.8	18.7	19.7	19.4	
A5-1	23.3 ± 5.2	20.9	23.0	(1)	26.1	
A9-3	19.8 ± 3.6	17.6	19.6	20.3	21.9	
B1-1	19.7 ± 2.8	18.0	19.2	20.7	20.9	
B1-2	19.2 ± 3.0	17.1	19.3	20.5	20.1	
B2-1	19.0 ± 2.6	17.5	18.5	20.6	19.3	
B5-1	22.4 ± 4.0	19.6	22.4	24.1	23.5	
C1-1	22.1 ± 3.2	19.9	21.9	23.3	23.2	
C1-2	19.8 ± 2.9	18.4	18.7	21.3	20.8	
C2-1	20.9 ± 3.8	18.9	20.2	23.4	21.3	
C5-1	23.0 ± 3.4	20.7	22.8	24.5	24.2	
C8-1	22.5 ± 3.9	19.7	22.7	23.7	24.0	
D1-1	21.8 ± 2.8	20.3	21.3	23.6	21.9	
D1-2	20.8 ± 3.6	18.4	20.7	22.5	21.8	
D2-2	25.2 ± 5.1	21.8	24.8	26.9	27.3	
D6-1	24.1 ± 5.7	20.6	23.1	26.9	26.0	
E1-2	20.5 ± 3.0	18.8	20.1	22.3	21.0	
E1-4	27.9 ± 1.4	27.1	27.6	28.5	28.4	
E2-3	23.7 ± 4.2	20.9	23.4	25.6	25.0	
E5-1	22.9 ± 4.3	19.9	22.7	24.2	24.7	(1)
E7-1	22.6 ± 3.6	20.2	22.2	24.2	23.8	
F1-1	21.8 ± 3.1	19.9	21.2	22.9	23.1	
F1-2	35.6 ± 4.2	37.0	35.3	37.4	32.8	
F1-4	35.3 ± 4.6	37.1	35.4	36.6	32.0	
F2-1	23.9 ± 4.1	21.2	24.0	26.1	24.3	
F5-1	25.3 ± 5.2	21.6	25.6	27.5	26.5	
G1-2	22.3 ± 3.1	20.1	22.2	23.4	23.5	
G1-3	28.0 ± 3.1	28.4	27.6	29.9	26.2	
G1-5	21.7 ± 3.2	20.1	20.9	23.8	22.1	
G1-6	23.6 ± 2.7	23.2	21.8	24.7	24.5	
G2-4	25.9 ± 5.2	22.6	25.4	28.6	27.1	
G5-1	21.7 ± 3.3	19.8	20.9	23.7	22.3	
H1-1	21.5 ± 2.9	19.6	21.2	22.4	22.8	
H3-1	18.2 ± 1.8	17.0	18.2	18.5	19.1	
H5-1	18.0 ± 2.6	16.5	17.6	19.5	18.5	
H8-1	32.6 ± 7.8	27.7	31.7	36.8	34.4	
J1-1	19.5 ± 3.6	17.2	18.9	20.8	21.0	
J1-3	18.0 ± 2.1	16.9	17.4	19.1	18.7	
J3-1	21.5 ± 4.4	18.7	21.0	22.8	23.7	
J5-1	23.5 ± 6.1	20.0	22.1	25.9	26.2	
J7-1	25.5 ± 5.0	22.4	24.6	27.2	27.8	
K1-4	19.7 ± 2.9	18.3	18.7	21.2	20.7	
K2-1	23.6 ± 4.3	20.7	23.2	25.1	25.4	
K3-1	19.6 ± 3.9	17.6	18.4	21.9	20.4	
K5-1	23.2 ± 4.7	20.2	23.0	23.8	25.8	
K8-1	23.0 ± 3.8	20.5	22.6	24.7	24.3	
L1-1	20.4 ± 3.0	18.4	20.3	21.7	21.2	

(1) SEE PROGRAM EXCEPTIONS SECTION FOR INFORMATION

Table C-X.1 QUARTERLY OSLD RESULTS FOR THREE MILE ISLAND NUCLEAR STATION, 2014

RESULTS IN UNITS OF MILLIREM/QUARTER

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
L1-2	19.9 ± 2.5	18.4	19.4	21.1	20.7
L2-1	21.8 ± 2.8	19.9	21.5	22.8	22.9
L5-1	20.4 ± 2.4	18.9	20.0	21.4	21.3
L8-1	22.0 ± 4.7	18.8	21.7	24.1	23.4
M1-1	18.1 ± 2.3	16.5	18.1	19.2	18.5
M1-2	21.3 ± 4.9	18.5	20.2	23.7	23.0
M2-1	19.3 ± 3.2	17.5	18.7	21.3	19.6
M5-1	21.3 ± 3.5	19.0	21.0	22.8	22.6
M9-1	26.0 ± 4.8	23.1	25.1	28.6	27.2
N1-1	20.8 ± 4.2	18.3	19.9	22.9	22.1
N1-3	20.5 ± 3.0	19.0	19.8	22.4	21.0
N2-1	22.3 ± 4.4	19.7	21.3	23.5	24.7
N5-1	18.7 ± 3.6	16.5	18.3	20.8	19.1
N8-1	22.7 ± 3.0	20.8	22.5	24.1	23.7
P1-1	20.5 ± 3.2	18.3	20.6	21.7	21.7
P1-2	19.0 ± 2.4	17.7	18.5	20.4	19.6
P2-1	25.2 ± 5.0	21.9	25.0	26.3	27.7
P5-1	22.4 ± 4.4	19.6	21.9	24.8	23.3
P8-1	19.1 ± 3.7	16.8	18.7	21.0	20.1
Q1-1	20.9 ± 3.6	18.8	20.1	22.3	22.4
Q1-2	17.7 ± 2.4	16.2	17.3	18.5	18.8
Q2-1	19.4 ± 4.0	16.8	19.0	21.4	20.5
Q5-1	20.2 ± 2.8	18.6	19.6	21.4	21.3
Q9-1	20.9 ± 4.3	17.9	20.8	22.3	22.7
R1-1	18.5 ± 2.4	16.9	18.4	19.9	18.8
R1-2	19.2 ± 2.7	17.6	18.7	20.6	20.0
R3-1	24.3 ± 4.2	21.3	24.3	25.8	25.7
R5-1	22.9 ± 4.5	19.6	23.2	24.4	24.3
R9-1	23.2 ± 2.6	21.5	23.3	24.5	23.6
B10-1	21.3 ± 2.8	19.2	21.8	22.2	22.2
D15-1	21.8 ± 3.9	19.5	21.1	24.0	22.7
F10-1	25.4 ± 5.0	22.4	24.5	27.8	27.1
F25-1	23.1 ± 3.2	20.9	23.2	23.6	24.7
G10-1	29.5 ± 5.9	25.2	30.2	30.8	31.8
G15-1	26.1 ± 2.0	24.7	27.0	26.7	26.0
H15-1	22.4 ± 4.0	19.7	22.5	24.4	23.3
J15-1	24.8 ± 4.3	22.4	23.7	26.9	26.4
K15-1	21.0 ± 2.9	19.7	19.9	22.7	21.9
L15-1	21.7 ± 4.2	19.1	21.3	24.1	22.4
N15-2	23.7 ± 4.2	21.1	23.1	25.7	25.1
Q15-1	23.8 ± 4.6	21.0	23.0	25.5	25.9
R15-1	21.3 ± 2.1	19.9	21.1	22.4	21.6

TABLE C-X.2 MEAN QUARTERLY OSLD RESULTS FOR THE SITE BOUNDARY, INDICATOR AND CONTROL LOCATIONS FOR THREE MILE ISLAND NUCLEAR STATION, 2014

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

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INDICATOR	CONTROL
JAN-MAR	21.3 ± 13.0	19.5 ± 4.0	21.2 ± 4.2
APR-JUN	21.9 ± 11.1	21.6 ± 5.0	23.3 ± 5.9
JUL-SEP	23.7 ± 11.1	23.6 ± 5.8	25.2 ± 4.8
OCT-DEC	22.5 ± 8.7	23.3 ± 5.7	24.7 ± 5.8

TABLE C-X.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR THREE MILE ISLAND NUCLEAR STATION, 2014

RESULTS IN UNITS OF MILLIREMQUARTER

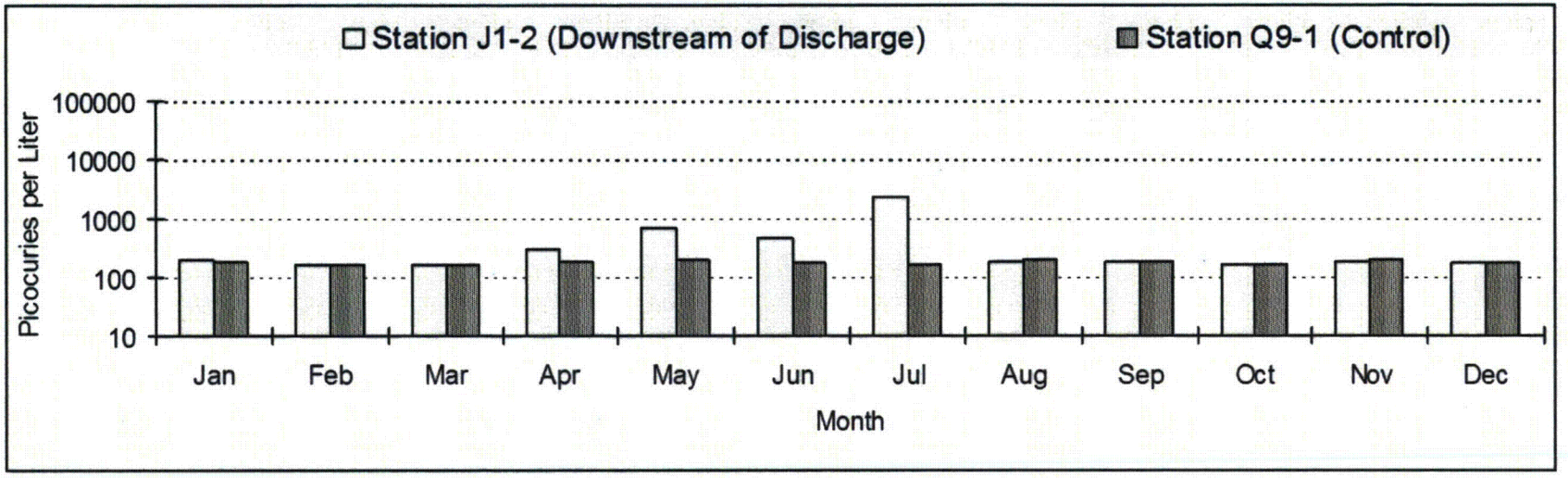
LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
SITE BOUNDARY	76	16.2	37.4	22.4 ± 11.0
INDICATOR	239	16.5	36.8	22.0 ± 6.1
CONTROL	44	19.1	31.8	23.6 ± 5.9

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, 2014



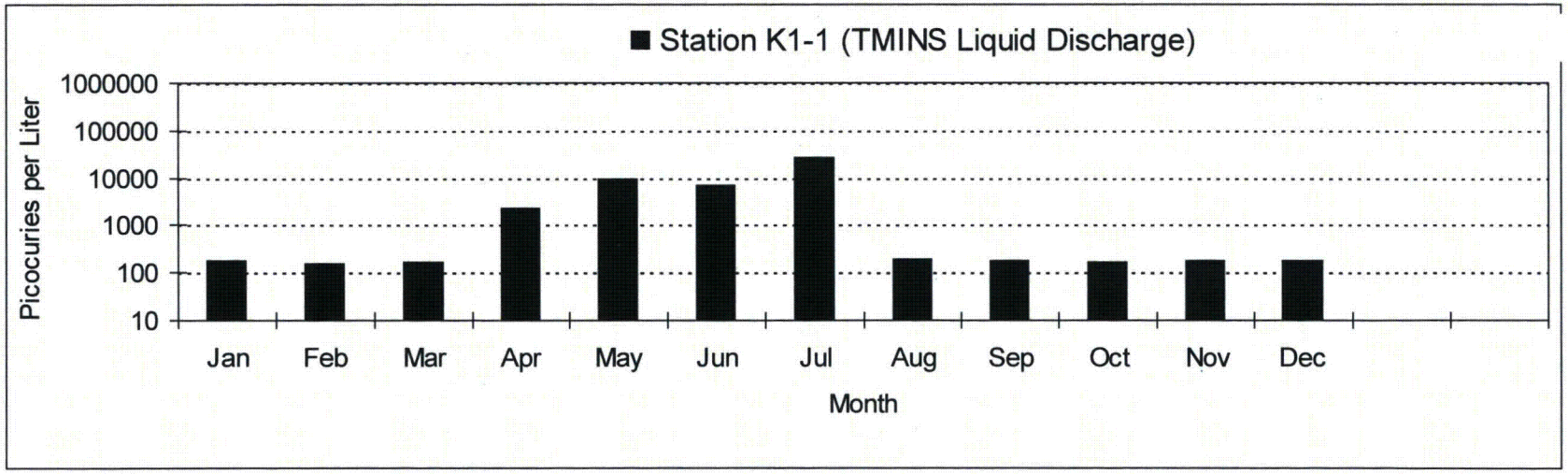


FIGURE C-2
Mean Quarterly Tritium Concentrations in Surface Water
Three Mile Island Nuclear Station, 1974 - 2014

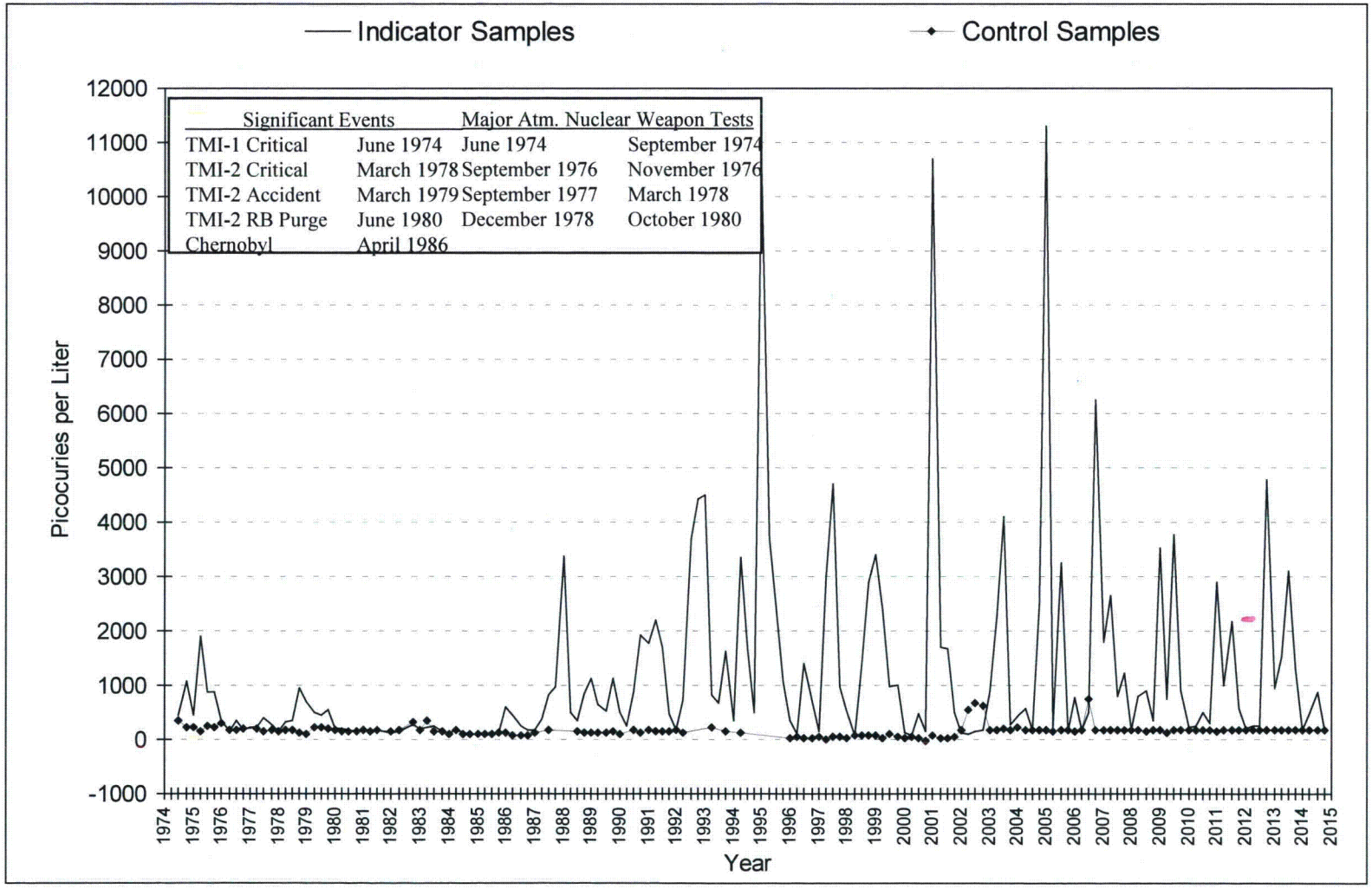


FIGURE C-3
Mean Monthly Gross Beta Concentrations in Drinking Water
Three Mile Island Nuclear Station, 2014

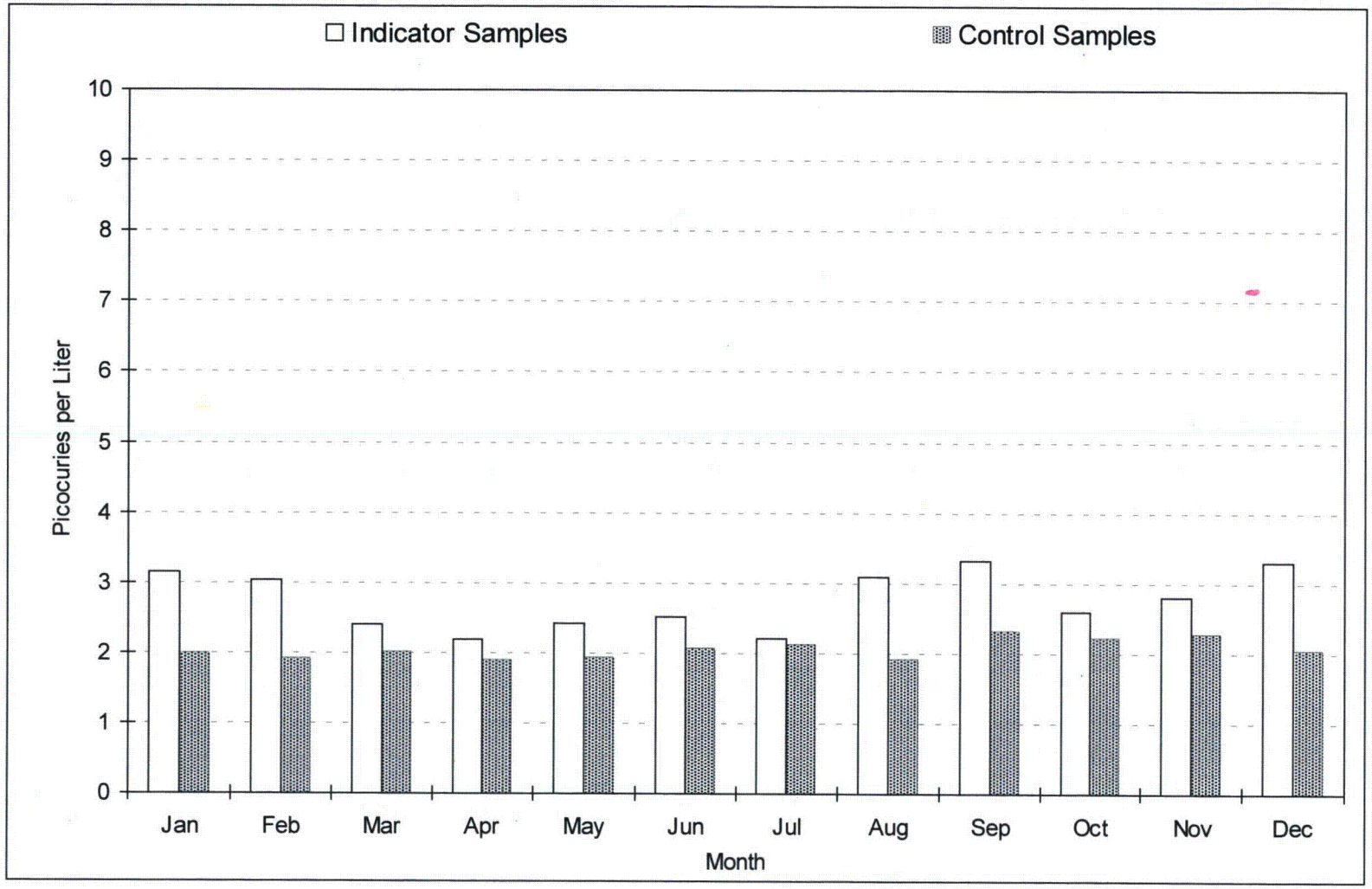
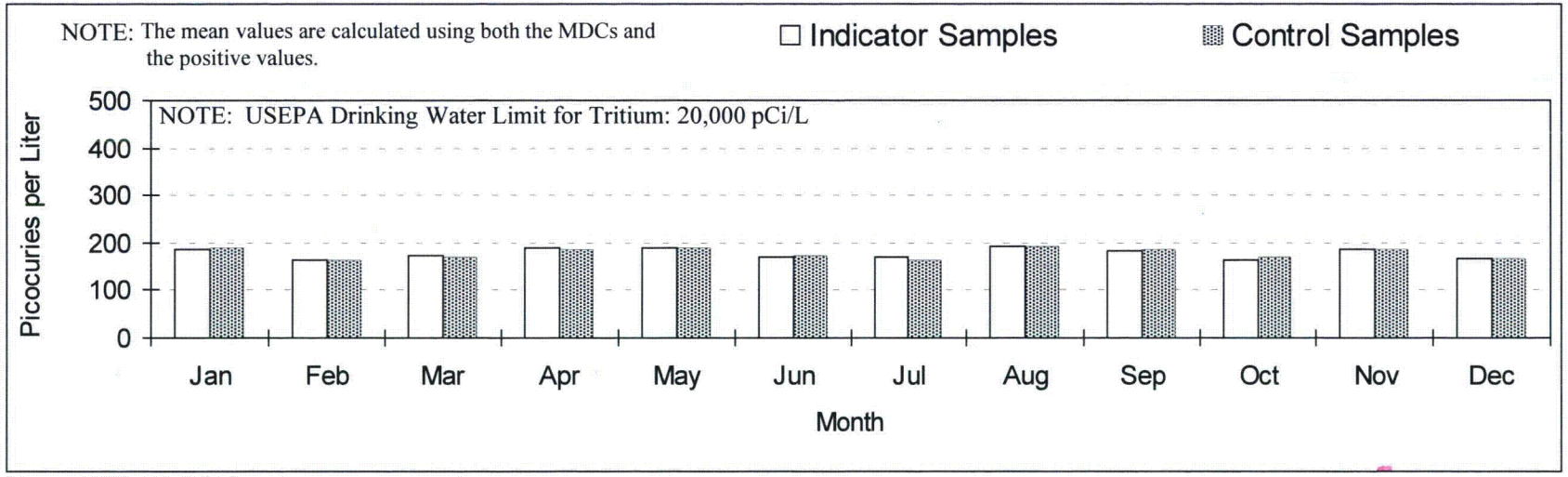


FIGURE C-4
Mean Monthly Tritium Concentrations in Drinking Water and Effluent Water
Three Mile Island Nuclear Station, 2014



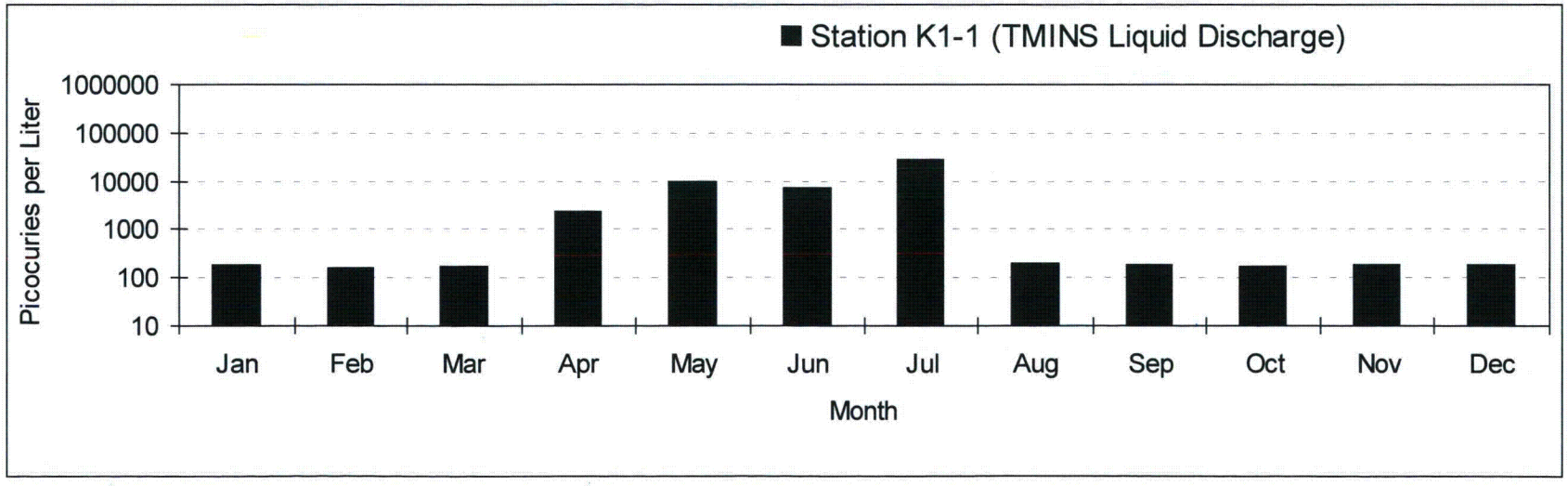


FIGURE C-5
Mean Cesium-137 Concentrations in Aquatic Sediments
Three Mile Island Nuclear Station, 1984 – 2014

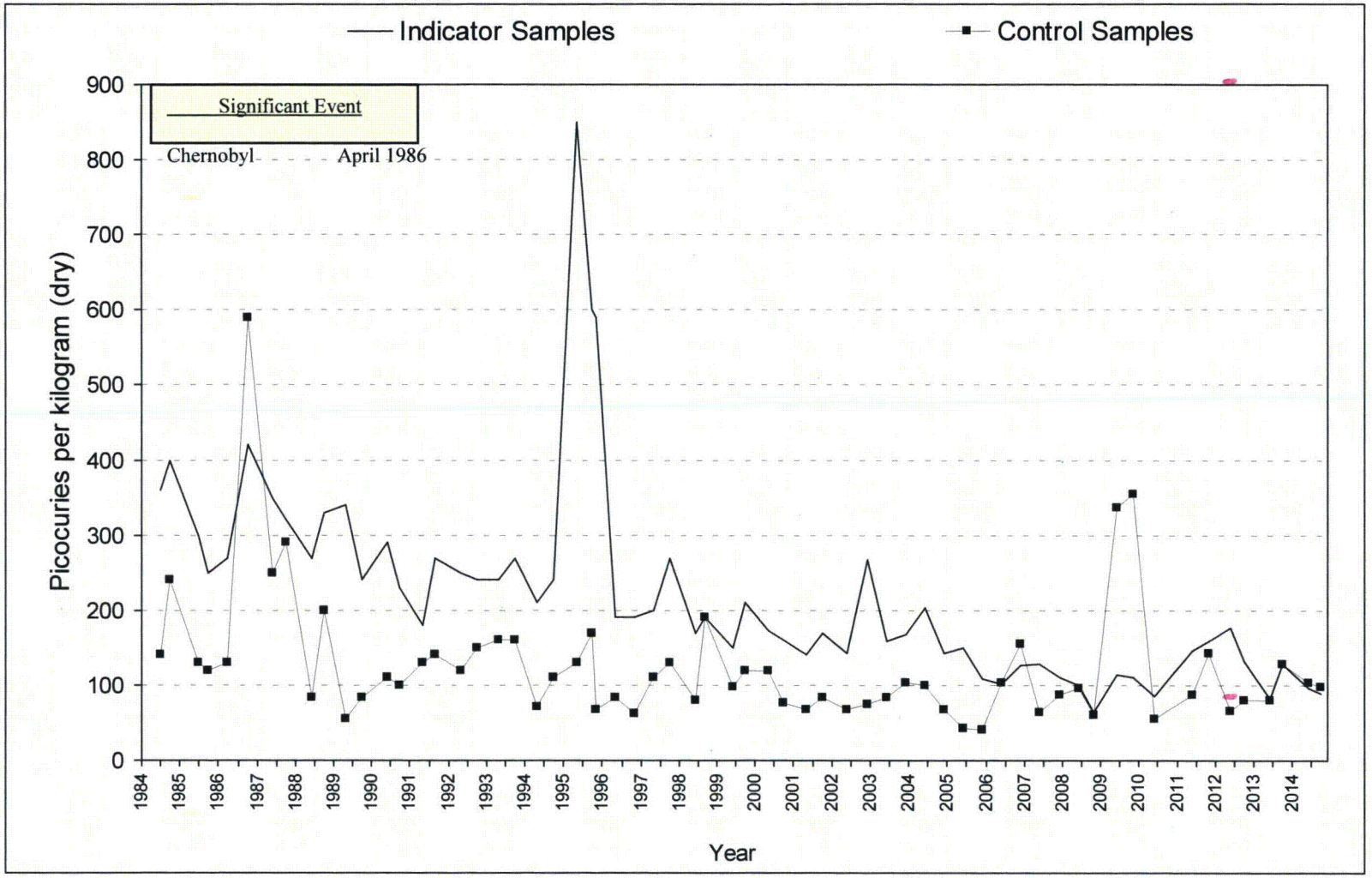


FIGURE C-6
Mean Quarterly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 1972 - 2014

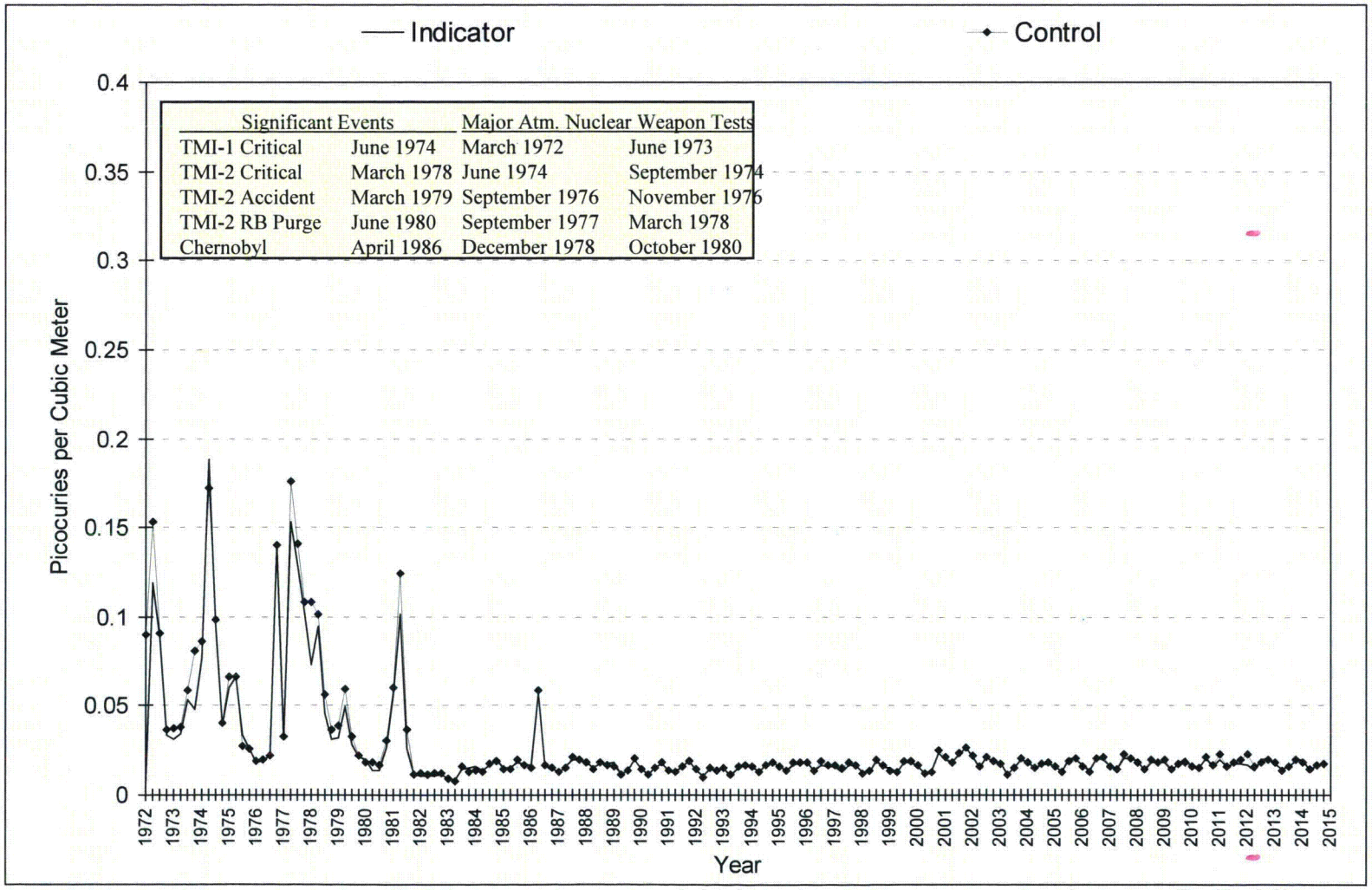
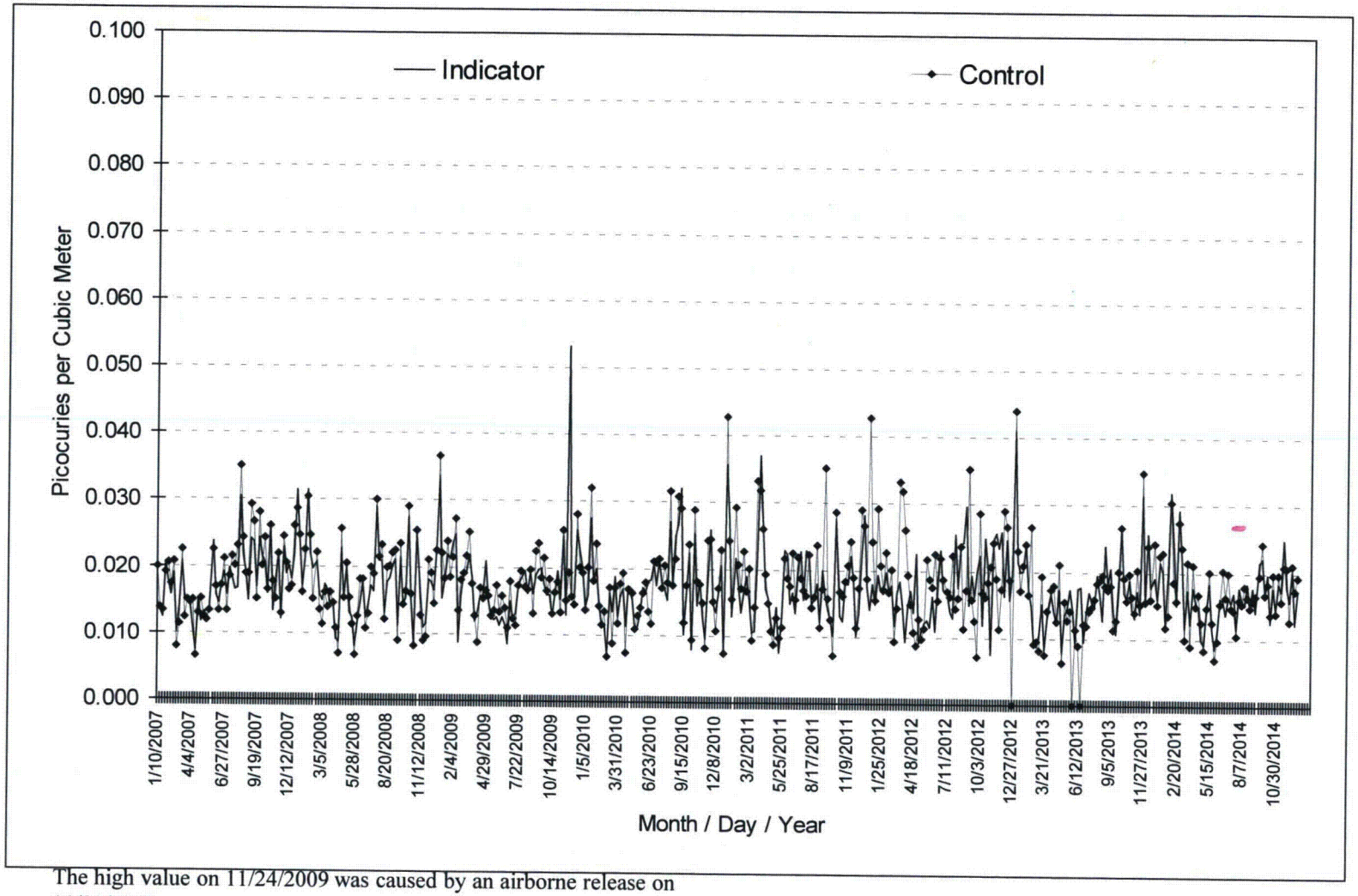
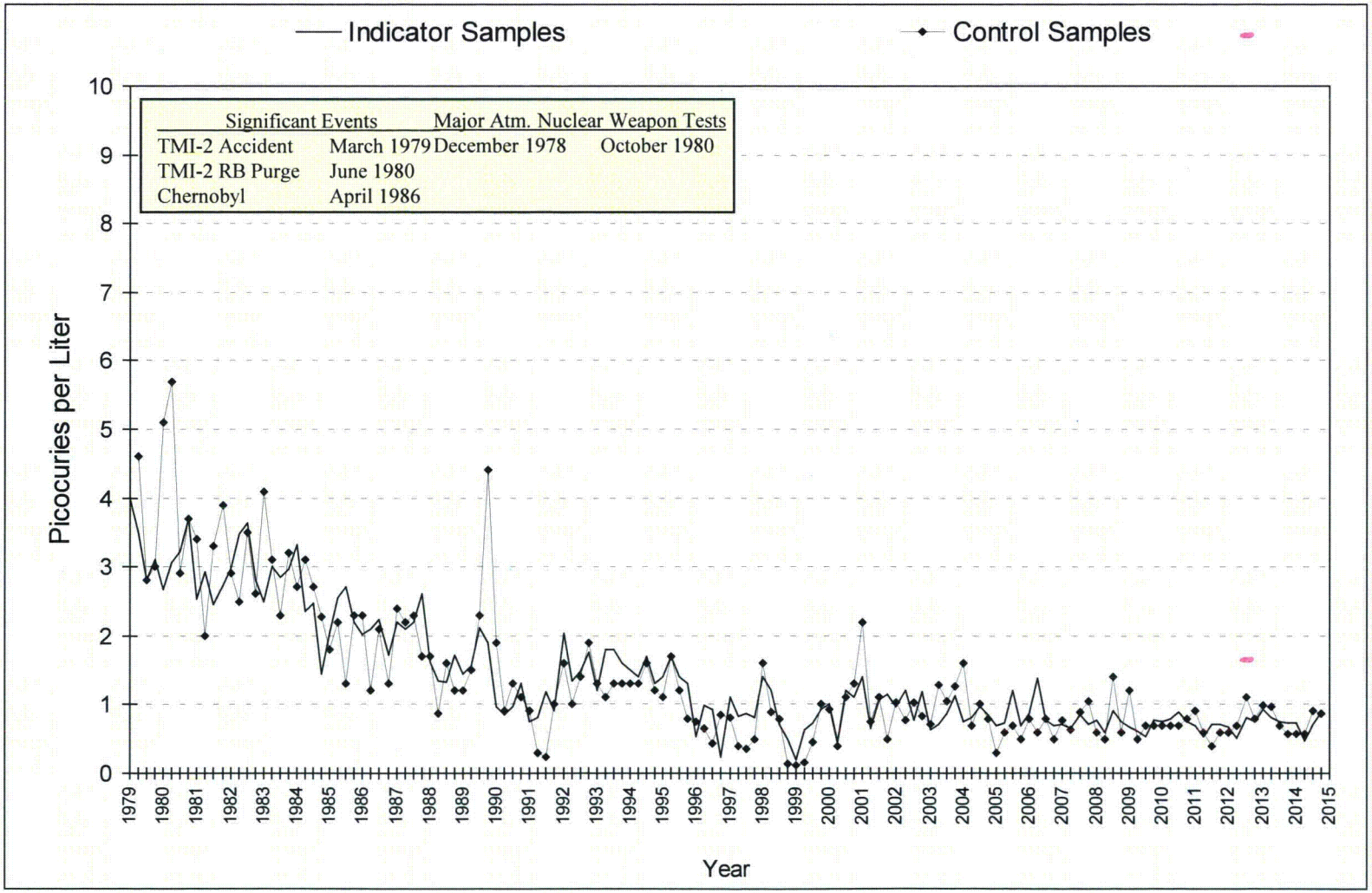


FIGURE C-7
Mean Weekly Gross Beta Concentrations in Air Particulates
Three Mile Island Nuclear Station, 2007 - 2014



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 - 2014



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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, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/13 - 01/28/14	< 1.2
01/28/14 - 02/25/14	1.6 ± 0.7
02/25/14 - 04/01/14	< 1.3
04/01/14 - 04/29/14	< 1.8
04/29/14 - 06/03/14	< 0.8
06/03/14 - 07/01/14	< 1.3
07/01/14 - 07/29/14	< 0.9
07/29/14 - 09/02/14	1.8 ± 0.9
09/02/14 - 09/30/14	2.2 ± 0.8
09/30/14 - 10/28/14	1.3 ± 0.6
10/28/14 - 12/02/14	3.5 ± 1.1
12/02/14 - 12/30/14	1.5 ± 0.7
MEAN	2.0 ± 1.6

TABLE D-I.2 **CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/13 - 01/28/14	< 147
01/28/14 - 02/25/14	< 146
02/25/14 - 04/01/14	< 148
04/01/14 - 04/29/14	< 145
04/29/14 - 06/03/14	< 142
06/03/14 - 07/01/14	< 134
07/01/14 - 07/29/14	< 131
07/29/14 - 09/02/14	< 177
09/02/14 - 09/30/14	< 149
09/30/14 - 10/28/14	< 169
10/28/14 - 12/02/14	< 169
12/02/14 - 12/30/14	< 175
MEAN	-

TABLE D-I.3 **CONCENTRATIONS OF IODINE-131 IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q9-1Q
12/31/13 - 01/28/14	< 0.2
01/28/14 - 02/25/14	< 0.3
02/25/14 - 04/01/14	< 0.3
04/01/14 - 04/29/14	< 0.3
04/29/14 - 06/03/14	< 0.2
06/03/14 - 07/01/14	< 0.4
07/01/14 - 07/29/14	< 0.3
07/29/14 - 09/02/14	< 0.2
09/02/14 - 09/30/14	< 0.3
09/30/14 - 10/28/14	< 0.3
10/28/14 - 12/02/14	< 0.3
12/02/14 - 12/30/14	< 0.2
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, 2014

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	12/31/13 - 01/28/14	< 3	< 4	< 3	< 3	< 4	< 3	< 4	< 2	< 2	< 8	< 2
	01/28/14 - 02/25/14	< 2	< 5	< 2	< 2	< 5	< 4	< 2	< 2	< 3	< 15	< 3
	02/25/14 - 04/01/14	< 2	< 2	< 3	< 1	< 3	< 3	< 3	< 3	< 2	< 16	< 3
	04/01/14 - 04/29/14	< 3	< 3	< 3	< 2	< 3	< 5	< 3	< 2	< 3	< 13	< 3
	04/29/14 - 06/03/14	< 4	< 4	< 3	< 2	< 5	< 4	< 5	< 4	< 3	< 15	< 2
	06/03/14 - 07/01/14	< 3	< 7	< 3	< 4	< 4	< 7	< 4	< 3	< 4	< 17	< 5
	07/01/14 - 07/29/14	< 3	< 6	< 4	< 2	< 5	< 5	< 2	< 2	< 4	< 27	< 7
	07/29/14 - 09/02/14	< 2	< 4	< 2	< 2	< 2	< 5	< 3	< 2	< 2	< 23	< 5
	09/02/14 - 09/30/14	< 3	< 6	< 5	< 3	< 6	< 6	< 4	< 3	< 3	< 14	< 2
	09/30/14 - 10/28/14	< 2	< 2	< 2	< 3	< 3	< 5	< 3	< 2	< 2	< 20	< 5
	10/28/14 - 12/02/14	< 3	< 6	< 3	< 2	< 3	< 5	< 4	< 4	< 4	< 12	< 4
	12/02/14 - 12/30/14	< 3	< 3	< 3	< 3	< 3	< 4	< 2	< 2	< 3	< 15	< 2

TABLE D-II.1 **CONCENTRATIONS OF STRONTIUM AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	09/24/14	< 10	< 7	3210 ± 380	< 13	< 14	< 22	< 17	< 18	< 10	< 14

TABLE D-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	K-40	Cs-134	Cs-137
J2-1	10/31/14	9443 ± 631	< 18	< 26
A1-3	10/31/14	9891 ± 652	< 21	< 24
MEAN		9667 ± 634		

TABLE D-IV.1 CONCENTRATIONS OF GAMMA EMITTERS AND STRONTIUM IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014

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	07/30/14	4580 ± 340	< 22	< 10	< 9	< 15	8 ± 5
B10-2Q	07/23/14	2720 ± 320	< 12	< 11	< 10	< 3	2 ± 1
MEAN		3650 ± 2630	-	-	-	-	-

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, 2014

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

COLLECTION PERIOD	E1-2Q GROSS BETA	E1-2Q I-131
01/02/14 - 01/09/14	25 ± 5	< 17
01/09/14 - 01/15/14	30 ± 5	< 13
01/15/14 - 01/23/14	29 ± 4	< 14
01/23/14 - 01/30/14	24 ± 4	< 19
01/30/14 - 02/06/14	26 ± 4	< 17
02/06/14 - 02/12/14	(1)	(1)
02/12/14 - 02/20/14	27 ± 4	< 17
02/20/14 - 02/27/14	20 ± 5	< 21
02/27/14 - 03/06/14	37 ± 5	< 25
03/06/14 - 03/12/14	28 ± 5	< 18
03/12/14 - 03/20/14	20 ± 4	< 25
03/20/14 - 03/27/14	24 ± 5	< 25
03/27/14 - 04/03/14	17 ± 4	< 15
04/03/14 - 04/10/14	17 ± 4	< 19
04/10/14 - 04/17/14	21 ± 4	< 16
04/17/14 - 04/23/14	26 ± 5	< 21
04/23/14 - 05/01/14	14 ± 3	< 10
05/01/14 - 05/07/14	17 ± 5	< 11
05/07/14 - 05/15/14	21 ± 4	< 20
05/15/14 - 05/22/14	25 ± 4	< 20
05/22/14 - 05/29/14	24 ± 4	< 24
05/29/14 - 06/05/14	15 ± 4	< 26
06/05/14 - 06/11/14	16 ± 5	< 17
06/11/14 - 06/19/14	17 ± 4	< 14
06/19/14 - 06/25/14	16 ± 5	< 19
06/25/14 - 07/03/14	21 ± 4	< 27
07/03/14 - 07/10/14	24 ± 5	< 23
07/10/14 - 07/17/14	25 ± 4	< 25
07/17/14 - 07/24/14	(1)	(1)
07/24/14 - 07/31/14	19 ± 5	< 21
07/31/14 - 08/07/14	24 ± 5	< 28
08/07/14 - 08/14/14	21 ± 5	< 25
08/14/14 - 08/21/14	25 ± 5	< 25
08/21/14 - 08/28/14	26 ± 4	< 33
08/28/14 - 09/04/14	25 ± 4	< 18
09/04/14 - 09/10/14	23 ± 5	< 18
09/10/14 - 09/18/14	21 ± 4	< 25
09/18/14 - 09/25/14	30 ± 5	< 33
09/25/14 - 10/02/14	31 ± 5	< 14
10/02/14 - 10/09/14	23 ± 4	< 23
10/09/14 - 10/16/14	24 ± 4	< 24
10/16/14 - 10/23/14	11 ± 4	< 14
10/23/14 - 10/30/14	28 ± 4	< 12
10/30/14 - 11/06/14	20 ± 4	< 19
11/06/14 - 11/13/14	22 ± 4	< 24
11/13/14 - 11/20/14	24 ± 4	< 30
11/20/14 - 11/26/14	33 ± 6	< 31
11/26/14 - 12/04/14	22 ± 4	< 19
12/04/14 - 12/11/14	25 ± 4	< 14
12/11/14 - 12/17/14	27 ± 5	< 18
12/17/14 - 12/24/14	15 ± 4	< 27
12/24/14 - 01/01/15	21 ± 4	< 18
MEAN	23 ± 10	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE D-V.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014

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

SITE	COLLECTION PERIOD	Be-7	Cs-134	Cs-137
E1-2Q	01/02/14 - 04/03/14	80 ± 16	< 0.9	< 0.7
	04/03/14 - 07/03/14	93 ± 18	< 0.5	< 0.6
	07/03/14 - 10/02/14	87 ± 19	< 1.3	< 1.1
	10/02/14 - 01/01/15	62 ± 16	< 1.0	< 0.9
	MEAN	81 ± 27	-	-

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, 2014

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	01/08/14	< 0.3	1403 ± 103	< 3	< 3	< 22	< 5		
	02/05/14	< 0.3	976 ± 103	< 6	< 4	< 21	< 5		
	03/05/14	< 0.4	863 ± 94	< 5	< 2	< 19	< 4		
	03/19/14	< 0.5	1042 ± 96	< 4	< 4	< 18	< 5	< 0.5	0.5 ± 0.3
	04/02/14	< 0.3	978 ± 95	< 4	< 4	< 21	< 4		
	04/16/14	< 0.3	757 ± 147	< 11	< 4	< 17	< 9		
	04/30/14	< 0.3	1032 ± 96	< 4	< 3	< 19	< 3		
	05/14/14	< 0.5	1082 ± 102	< 3	< 3	< 26	< 4		
	05/28/14	< 0.3	997 ± 115	< 6	< 6	< 17	< 3		
	06/11/14	< 0.4	899 ± 80	< 3	< 2	< 14	< 4	< 1.0	< 0.5
	06/25/14	< 0.4	1023 ± 88	< 3	< 3	< 20	< 5		
	07/09/14	< 0.2	1468 ± 106	< 3	< 3	< 26	< 3		
	07/23/14	< 0.3	1013 ± 88	< 4	< 3	< 34	< 3		
	08/06/14	< 0.2	763 ± 79	< 3	< 3	< 41	< 7		
	08/20/14	< 0.3	1267 ± 107	< 3	< 3	< 31	< 3		
	09/03/14	< 0.4	1314 ± 125	< 2	< 3	< 16	< 2		
	09/17/14	< 0.3	1001 ± 143	< 6	< 4	< 25	< 6	< 0.7	< 0.6
	10/01/14	< 0.4	1230 ± 123	< 5	< 5	< 23	< 2		
	10/15/14	< 0.4	1191 ± 76	< 2	< 2	< 25	< 6		
	10/29/14	< 0.3	759 ± 87	< 3	< 3	< 22	< 4		
	11/12/14	< 0.4	799 ± 64	< 3	< 4	< 24	< 7		
	11/25/14	< 0.2	910 ± 94	< 3	< 4	< 27	< 2		
	12/10/14	< 0.3	988 ± 91	< 3	< 5	< 23	< 3	< 0.8	< 0.5
	MEAN		1033 ± 408	-	-	-	-	-	-

FIGURE D-1
MONTHLY GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED FROM TMINS LOCATION Q9-1Q, 2014

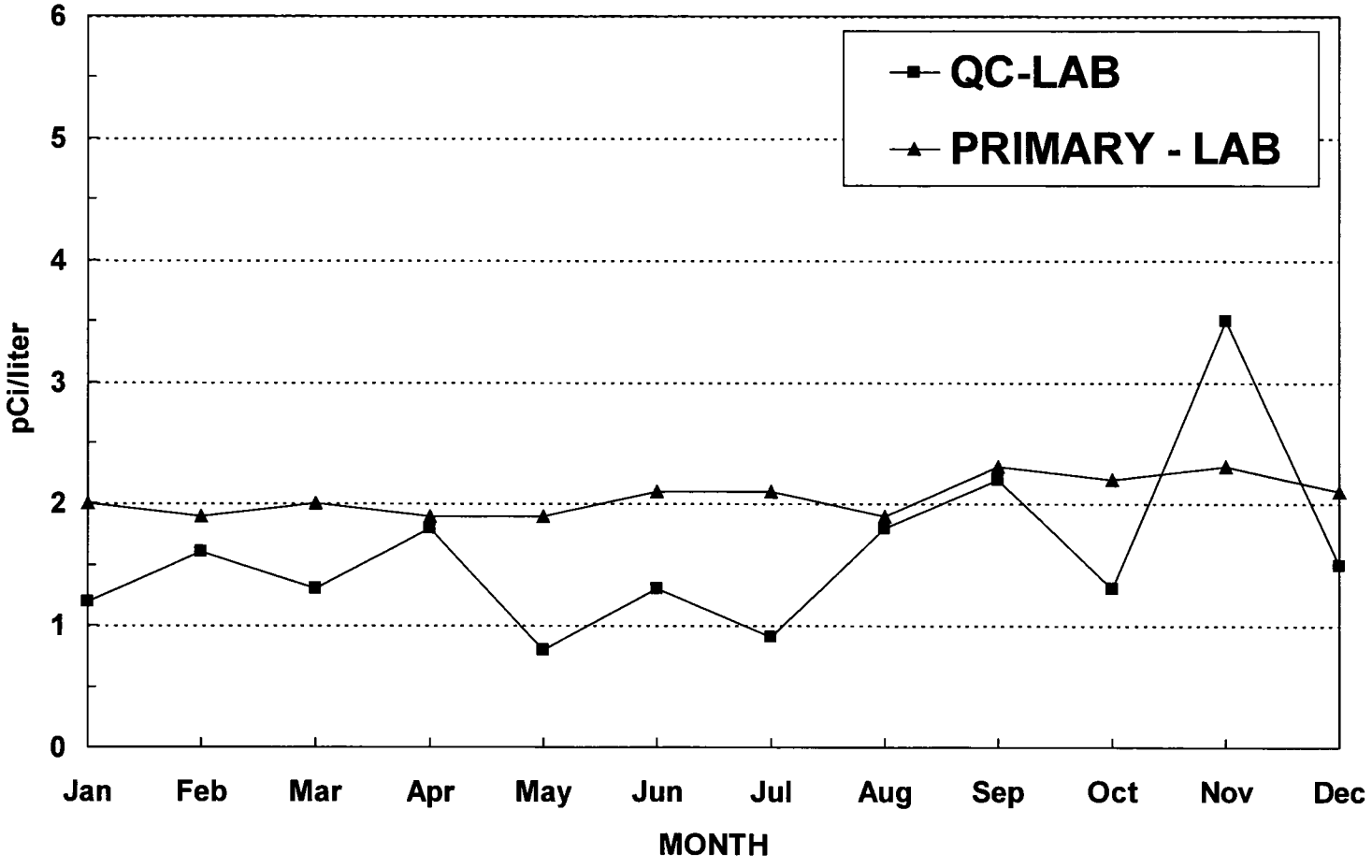
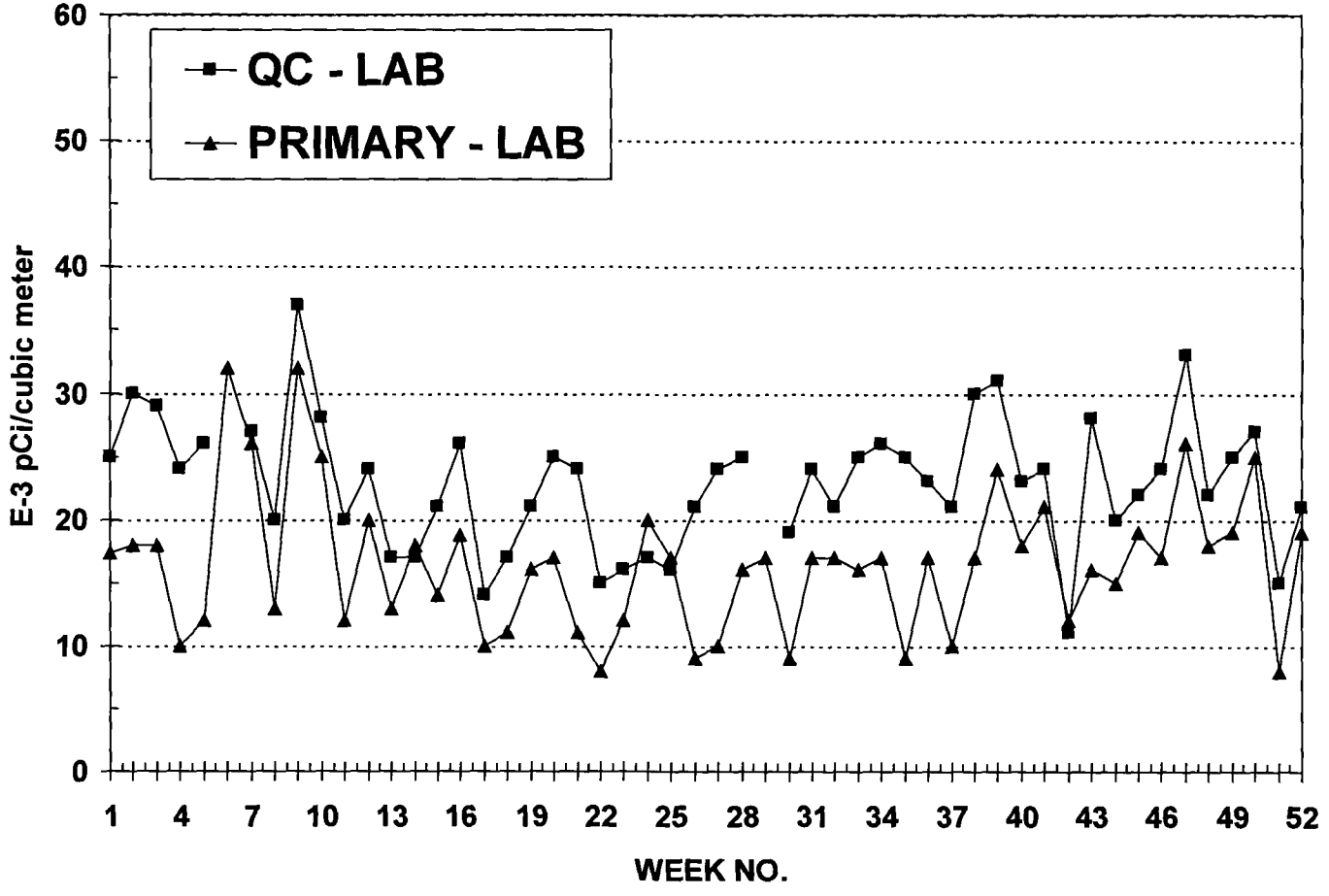


FIGURE D-2
WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM TMINS LOCATION E1-2Q, 2014



APPENDIX E

INTER-LABORATORY COMPARISON PROGRAM

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TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2014	E10854	Milk	Sr-89	pCi/L	95.1	91.7	1.04	A
			Sr-90	pCi/L	10.9	15.1	0.72	W
	E10855	Milk	I-131	pCi/L	96.6	98.5	0.98	A
			Ce-141	pCi/L	112	119	0.94	A
			Cr-51	pCi/L	449	491	0.91	A
			Cs-134	pCi/L	186	210	0.89	A
			Cs-137	pCi/L	250	253	0.99	A
			Co-58	pCi/L	248	268	0.93	A
			Mn-54	pCi/L	292	297	0.98	A
			Fe-59	pCi/L	230	219	1.05	A
			Zn-65	pCi/L	312	323	0.97	A
			Co-60	pCi/L	321	337	0.95	A
	E10857	AP	Ce-141	pCi	53.0	53.9	0.98	A
			Cr-51	pCi	232	223	1.04	A
			Cs-134	pCi	100	95.3	1.05	A
			Cs-137	pCi	122	115	1.06	A
			Co-58	pCi	122	121	1.01	A
			Mn-54	pCi	135	135	1.00	A
			Fe-59	pCi	111	99.3	1.12	A
			Zn-65	pCi	140	147	0.95	A
			Co-60	pCi	187	153	1.22	W
	E10856	Charcoal	I-131	pCi	74.1	76.4	0.97	A
	E10858	Water	Fe-55	pCi/L	2090	1760	1.19	A
June 2014	E10913	Milk	Sr-89	pCi/L	85.9	91.3	0.94	A
			Sr-90	pCi/L	13.8	14.5	0.95	A
	E10914	Milk	I-131	pCi/L	86.5	90.9	0.95	A
			Ce-141	pCi/L	111	124	0.90	A
			Cr-51	pCi/L	255	253	1.01	A
			Cs-134	pCi/L	147	162	0.91	A
			Cs-137	pCi/L	123	120	1.03	A
			Co-58	pCi/L	105	112	0.94	A
			Mn-54	pCi/L	155	156	0.99	A
			Fe-59	pCi/L	106	102	1.04	A
			Zn-65	pCi/L	251	252	1.00	A
			Co-60	pCi/L	218	224	0.97	A
	E10916	AP	Ce-141	pCi	95.1	92.6	1.03	A
			Cr-51	pCi	215	190	1.13	A
			Cs-134	pCi	122	122	1.00	A
			Cs-137	pCi	95.1	89.8	1.06	A
			Co-58	pCi	88.7	84.1	1.05	A
			Mn-54	pCi	115	116	0.99	A
			Fe-59	pCi	72.6	76.7	0.95	A
			Zn-65	pCi	193	189	1.02	A
			Co-60	pCi	179	168	1.07	A
	E10915	Charcoal	I-131	pCi	85.6	85.2	1.00	A
	E10917	Water	Fe-55	pCi/L	1680	1810	0.93	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
September 2014	E10946	Milk	Sr-89	pCi/L	90.7	96.9	0.94	A
			Sr-90	pCi/L	14.0	16.4	0.85	A
	E10947	Milk	I-131	pCi/L	92.0	97.6	0.94	A
			Ce-141	pCi/L	117	126	0.93	A
			Cr-51	pCi/L	281	288	0.98	A
			Cs-134	pCi/L	141	158	0.89	A
			Cs-137	pCi/L	186	193	0.96	A
			Co-58	pCi/L	137	143	0.96	A
			Mn-54	pCi/L	138	142	0.97	A
			Fe-59	pCi/L	162	158	1.03	A
			Zn-65	pCi/L	75.2	73.0	1.03	A
			Co-60	pCi/L	286	297	0.96	A
	E10949	AP	Ce-141	pCi	97.8	82.1	1.19	A
			Cr-51	pCi	212	188	1.13	A
			Cs-134	pCi	106	103	1.03	A
			Cs-137	pCi	131	126	1.04	A
			Co-58	pCi	85.7	93.0	0.92	A
			Mn-54	pCi	92.8	92.3	1.01	A
			Fe-59	pCi	113	103	1.10	A
			Zn-65	pCi	53.2	47.5	1.12	A
			Co-60	pCi	202	193	1.05	A
	E10948	Charcoal	I-131	pCi	83.9	89.8	0.93	A
	E10950	Water	Fe-55	pCi/L	2010	1720	1.17	A
	E10951	Soil	Ce-141	pCi/g	0.208	0.186	1.12	A
			Cr-51	pCi/g	0.398	0.425	0.94	A
			Cs-134	pCi/g	0.216	0.233	0.93	A
			Cs-137	pCi/g	0.398	0.365	1.09	A
			Co-58	pCi/g	0.197	0.211	0.93	A
			Mn-54	pCi/g	0.242	0.209	1.16	A
			Fe-59	pCi/g	0.238	0.233	1.02	A
			Zn-65	pCi/g	0.117	0.108	1.08	A
			Co-60	pCi/g	0.447	0.438	1.02	A
December 2014	E11078	Milk	Sr-89	pCi/L	85.7	95.7	0.90	A
			Sr-90	pCi/L	12.9	15.6	0.83	A
	E11079	Milk	I-131	pCi/L	85.9	95.1	0.90	A
			Ce-141	pCi/L	205	219	0.94	A
			Cr-51	pCi/L	402	406	0.99	A
			Cs-134	pCi/L	156	164	0.95	A
			Cs-137	pCi/L	194	198	0.98	A
			Co-58	pCi/L	122	130	0.94	A
			Mn-54	pCi/L	220	225	0.98	A
			Fe-59	pCi/L	183	175	1.05	A
			Zn-65	pCi/L	287	297	0.97	A
			Co-60	pCi/L	224	235	0.95	A

TABLE E-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2014	E11081	AP	Ce-141	pCi	96.4	102	0.95	A
			Cr-51	pCi	171	190	0.90	A
			Cs-134	pCi	73.1	76.9	0.95	A
			Cs-137	pCi	99.0	92.6	1.07	A
			Co-58	pCi	57.5	60.8	0.95	A
			Mn-54	pCi	107	105	1.02	A
			Fe-59	pCi	74.2	81.6	0.91	A
			Zn-65	pCi	144	139	1.04	A
			Co-60	pCi	114	110	1.04	A
	E11080	Charcoal	I-131	pCi	93.5	98.2	0.95	A
	E11082	Water	Fe-55	pCi/L	1760	1970	0.89	A

(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 **ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2014	RAD-97	Water	Sr-89	pCi/L	38.25	36.7	27.5 - 43.6	A
			Sr-90	pCi/L	24.65	26.5	19.2 - 30.9	A
			Ba-133	pCi/L	89.1	87.9	74.0 - 96.7	A
			Cs-134	pCi/L	45.55	44.3	35.5 - 48.7	A
			Cs-137	pCi/L	91.15	89.1	80.2 - 101	A
			Co-60	pCi/L	65.10	64.2	57.8 - 73.1	A
			Zn-65	pCi/L	244	235	212 - 275	A
			Gr-A	pCi/L	45.65	61.0	31.9 - 75.8	A
			Gr-B	pCi/L	27.95	33.0	21.4 - 40.7	A
			I-131	pCi/L	23.75	25.7	21.3 - 30.3	A
			U-Nat	pCi/L	9.61	10.2	7.95 - 11.8	A
			H-3	pCi/L	8435	8770	7610 - 9650	A
	MRAD-20	Filter	Gr-A	pCi/filter	28.0	46.0	15.4 - 71.4	A
November 2014	RAD-99	Water	Sr-89	pCi/L	30.4	31.4	22.8 - 38.1	A
			Sr-90	pCi/L	18.6	21.8	15.6 - 25.7	A
			Ba-133	pCi/L	46.8	49.1	40.3 - 54.5	A
			Cs-134	pCi/L	88.0	89.8	73.7 - 98.8	A
			Cs-137	pCi/L	99.0	98.8	88.9 - 111	A
			Co-60	pCi/L	92.5	92.1	82.9 - 104	A
			Zn-65	pCi/L	325	310	279 - 362	A
			Gr-A	pCi/L	29.9	37.6	19.4 - 48.1	A
			Gr-B	pCi/L	27.5	27.4	17.3 - 35.3	A
			I-131	pCi/L	15.8	20.3	16.8 - 24.4	N (1)
			U-Nat	pCi/L	5.74	5.80	4.34 - 6.96	A
			H-3	pCi/L	6255	6880	5940 - 7570	A
	MRAD-21	Filter	Gr-A	pCi/filter	27.3	36.9	12.4 - 57.3	A

*(1) The **Iodine-131** was evaluated as failed with a ratio of 0.778. No cause could be found for the slighly low activity. TBE would evaluate this as acceptablle with warning. A rerun was not possible due to I-131 decay. All ERA Iodine-131 evaluations since 2004 have been acceptable. NCR 14-08*

(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-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide*	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2014	14-MaW30	Water	Am-241	Bq/L	0.764	0.720	0.504 - 0.936	A
			Cs-134	Bq/L	20.7	23.1	16.2 - 30 0	A
			Cs-137	Bq/L	28.0	28.9	20.2 - 37.6	A
			Co-57	Bq/L	26.5	27.5	19.3 - 35.8	A
			Co-60	Bq/L	15.6	16.0	11.2 - 20.8	A
			H-3**	Bq/L	NR	321	225 - 417	N (3)
			Mn-54	Bq/L	13.5	13.9	9.7 - 18.1	A
			Ni-63	Bq/L	NR	34.0	23.8 - 44.2	N (3)
			Pu-238	Bq/L	0.911	0.828	0.580 - 1.076	
			Pu-239/240	Bq/L	0.751	0.676	0.473 - 0.879	
			K-40	Bq/L	NR		(1)	N (3)
			Sr-90**	Bq/L	NR	8.51	5.96 - 11.06	N (3)
			U-234/233**	Bq/L	NR	0.225	0.158 - 0.293	N (3)
			U-238**	Bq/L	NR	1.45	1.02 - 1.89	N (3)
			Zn-65	Bq/L	-0.201		(1)	A
	14-MaS30	Soil	Cs-134	Bq/kg	2.02		(1)	A
			Cs-137	Bq/kg	1300	1238	867 - 1609	A
			Co-57	Bq/kg	1069	966	676 - 1256	A
			Co-60	Bq/kg	1.32	1.22	(2)	A
			Mn-54	Bq/kg	1510	1430	1001 - 1859	A
			K-40	Bq/kg	669	622	435 - 809	A
			Sr-90	Bq/kg	4.14		(1)	A
			Zn-65	Bq/kg	763	695	487 - 904	A
	14-RdF30	AP	Cs-134**	Bq/sample	NR	1.91	1.34 - 2.48	N (3)
			Cs-137**	Bq/sample	NR	1.76	1.23 - 2.29	N (3)
			Co-57**	Bq/sample	NR		(1)	N (3)
			Co-60**	Bq/sample	NR	1.39	0.97 - 1.81	N (3)
			Mn-54**	Bq/sample	NR		(1)	N (3)
			Sr-90	Bq/sample	0.8220	1.18	0.83 - 1.53	N (3)
			Zn-65**	Bq/sample	NR		(1)	N (3)
	14-GrF30	AP	Gr-A	Bq/sample	0.606	1.77	0.53 - 3.01	A
			Gr-B	Bq/sample	0.7507	0.77	0.39 - 1.16	A
	14-RdV30	Vegetation	Cs-134	Bq/sample	5.96	6.04	4.23 - 7.85	A
			Cs-137	Bq/sample	5.06	4.74	3.32 - 6.16	A
			Co-57	Bq/sample	11.8	10.1	7.1 - 13.1	A
			Co-60	Bq/sample	7.34	6.93	4.85 - 9.01	A
			Mn-54	Bq/sample	8.95	8.62	6.03 - 11.21	A
			Sr-90	Bq/sample	1.23	1.46	1.02 - 1.90	A
			Zn-65	Bq/sample	8.91	7.86	5.50 - 10.22	A

TABLE E-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2014
(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide*	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
September 2014	14-MaW31	Water	Am-241	Bq/L	0.705	0.88	0.62 - 1.14	A
			Cs-134***	Bq/L	NR		(1)	N (4)
			Cs-137***	Bq/L	NR	18.4	12.9 - 23.9	N (4)
			Co-57***	Bq/L	NR	24.7	17.3 - 32.1	N (4)
			Co-60***	Bq/L	NR	12.4	8.7 - 16.1	N (4)
			Mn-54***	Bq/L	NR	14.0	9.8 - 18.2	N (4)
			Ni-63	Bq/L	24.07	24.6	17.2 - 32.0	A
			Pu-238	Bq/L	0.591	0.618	0.433 - 0.803	A
			Pu-239/240	Bq/L	0.0153	0.0048	(2)	A
			K-40***	Bq/L	NR	161	113 - 209	N (4)
			Zn-65***	Bq/L	NR	10.9	7.6 - 14.2	N (4)
	14-MaS31	Soil	Cs-134***	Bq/kg	NR	622	435 - 809	N (4)
			Cs-137***	Bq/kg	NR		(1)	N (4)
			Co-57***	Bq/kg	NR	1116	781 - 1451	N (4)
			Co-60***	Bq/kg	NR	779	545 - 1013	N (4)
			Mn-54***	Bq/kg	NR	1009	706 - 1312	N (4)
			K-40***	Bq/kg	NR	824	577 - 1071	N (4)
			Sr-90	Bq/kg	694	858	601 - 1115	A
			Zn-65***	Bq/kg	NR	541	379 - 703	N (4)
	14-RdF31	AP	Sr-90	Bq/sample	0.310	0.703	0.492 - 0.914	N (4)
	14-GrF31	AP	Gr-A	Bq/sample	0.153	0.53	0.16 - 0.90	N (4)
			Gr-B	Bq/sample	0.977	1.06	0.53 - 1.59	A
September 2014	14-RdV31	Vegetation	Cs-134	Bq/sample	7.31	7.38	5.17 - 9.59	A
			Cs-137	Bq/sample	8.93	8.14	5.70 - 10.58	A
			Co-57	Bq/sample	10.8	9.2	6.4 - 12.0	A
			Co-60	Bq/sample	6.31	6.11	4.28 - 7.94	A
			Mn-54	Bq/sample	7.76	7.10	4.97 - 9.23	A
			Sr-90	Bq/sample	0.738	0.85	0.60 - 1.11	A
			Zn-65	Bq/sample	7.16	6.42	4.49 - 8.35	A

* The MAPEP cross check isotope list has been reduced due to duplication of effort or analysis not being performed for clients.

** These nuclides are no longer part of the TBE cross check program due to duplication of effort or analysis not being performed for clients. MAPEP evaluates non-reported analyses as failed if they were reported in the previous series.

*** All future gamma cross check samples for these isotopes will be provided by Analytics.

(1) False positive test.

(2) Sensitivity evaluation.

*(3) **Water, Ni-63** overlooked when reporting, but the result of 32.7 +- 1.69 would have passed the acceptance criteria. NCR 14-04*
***Water**, the non-detected **K-40** was overlooked when reporting, but would have passed the false positive test. NCR 14-04*
***AP, Sr-90** rerun was within the low range of the acceptqance criteria. The original and rerun results were statistically the same. No cause could be identified for the slightly low Sr-90 activity. NCR 14-04*
For non reported (NR) analyses, MAPEP evaluates as failed if they were reported in the previous series. NCR 14-04

*(4) **AP, Sr-90** gravimetric yield was very high at 117%. Could indicate larger than normal amounts of calcium in the AP. A second fuming HNO_3 separation would be required to remove the excess calcium. NCR 14-09*
***AP, Gr-Alpha** was counted on the wrong side. When flipped over and recounted the results were acceptable. NCR 14-09*
For non reported (NR) analyses, MAPEP evaluates as failed if they were reported in the previous series. NCR 14-09

(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-4 **ERA (a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**
ENVIRONMENTAL, INC., 2014

Lab Code	Date	Concentration (pCi/L)				
		Analysis	Laboratory Result b	ERA Result c	Control Limits	Acceptance
ERW-1384	04/07/14	Sr-89	40.29 ± 5.76	36.70	27.50 - 43.60	Pass
ERW-1384	04/07/14	Sr-90	24.08 ± 2.35	26.50	19.20 - 30.90	Pass
ERW-1385	04/07/14	Ba-133	78.23 ± 3.93	87.90	74.00 - 96.70	Pass
ERW-1385	04/07/14	Co-60	62.75 ± 3.53	64.20	57.80 - 73.10	Pass
ERW-1385	04/07/14	Cs-134	44.97 ± 3.99	44.30	35.50 - 48.70	Pass
ERW-1385	04/07/14	Cs-137	88.54 ± 4.93	89.10	80.20 - 101.00	Pass
ERW-1385	04/07/14	Zn-65	249.1 ± 10.44	235.0	212.0 - 275.0	Pass
ERW-1388	04/07/14	Gr. Alpha	56.70 ± 2.47	61.00	31.90 - 75.80	Pass
ERW-1388	04/07/14	Gr. Beta	32.10 ± 1.20	33.00	21.40 - 40.70	Pass
ERW-1391	04/07/14	I-131	25.52 ± 1.12	25.70	21.30 - 30.30	Pass
ERW-1394	04/07/14	Uranium	10.76 ± 0.74	10.20	7.95 - 11.80	Pass
ERW-1397	04/07/14	H-3	8982 ± 279	8770	7610 - 9650	Pass
ERW-5382	10/06/14	Sr-89	29.40 ± 5.32	31.40	22.80 - 38.10	Pass
ERW-5382	10/06/14	Sr-90	19.19 ± 1.85	21.80	15.60 - 25.70	Pass
ERW-5385	10/06/14	Ba-133	43.54 ± 4.54	49.10	40.30 - 54.50	Pass
ERW-5385	10/06/14	Cs-134	81.95 ± 7.49	89.80	73.70 - 98.80	Pass
ERW-5385	10/06/14	Cs-137	95.76 ± 5.50	98.80	88.90 - 111.00	Pass
ERW-5385	10/06/14	Co-60	90.25 ± 2.77	92.10	82.90 - 104.00	Pass
ERW-5385	10/06/14	Zn-65	327.4 ± 23.3	310.00	279.0 - 362.0	Pass
ERW-5388	10/06/14	Gr. Alpha	30.88 ± 8.05	37.60	19.40 - 46.10	Pass
ERW-5388	10/06/14	G. Beta	20.47 ± 4.75	27.40	17.30 - 35.30	Pass
ERW-5392	10/06/14	I-131	19.58 ± 2.35	20.30	16.80 - 24.40	Pass
ERW-5394	10/06/14	Uranium	5.51 ± 0.37	5.80	4.34 - 6.96	Pass
ERW-5397	10/06/14	H-3	6876 ± 383	6880	5940 - 7570	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., 2014
(Page 1 of 2)

			Concentration a			
Lab Code b	Date	Analysis	Laboratory result	Known Activity	Control Limits c	Acceptance
MAW-1140	02/01/14	Gr. Alpha	0.77 ± 0.06	0.85	0.26 - 1.44	Pass
MAW-1140	02/01/14	Gr. Beta	4.31 ± 0.08	4.19	2.10 - 6.29	Pass
MAW-1184	02/01/14	Fe-55	0.40 ± 3.20	0.00	-0.01 - 2.00	Pass
MAW-1184	02/01/14	H-3	345.10 ± 10.60	321.00	225.00 - 417.00	Pass
MAW-1184	02/01/14	Ni-63	32.40 ± 3.20	34.00	23.80 - 44.20	Pass
MAW-1184	02/01/14	Pu-238	1.28 ± 0.12	0.83	0.58 - 1.08	Fail (1)
MAW-1184	02/01/14	Pu-239/240	0.91 ± 0.10	0.68	0.47 - 0.88	Fail (1)
MAW-1184	02/01/14	Sr-90	7.00 ± 0.70	8.51	5.96 - 11.06	Pass
MAW-1184	02/01/14	U-233/234	0.20 ± 0.07	0.23	0.16 - 0.29	Pass
MAW-1184	02/01/14	U-238	1.25 ± 0.18	1.45	1.02 - 1.89	Pass
MAW-1184	02/01/14	Co-57	27.86 ± 0.38	27.50	19.30 - 35.80	Pass
MAW-1184	02/01/14	Co-60	15.99 ± 0.27	16.00	11.20 - 20.80	Pass
MAW-1184	02/01/14	Cs-134	21.85 ± 0.54	23.10	16.20 - 30.00	Pass
MAW-1184	02/01/14	Cs-137	28.74 ± 0.49	28.90	20.20 - 37.60	Pass
MAW-1184	02/01/14	K-40	1.80 ± 2.00	0.00	0.00 - 10.00	Pass
MAW-1184	02/01/14	Mn-54	14.06 ± 0.40	13.90	9.70 - 18.10	Pass
MAW-1184	02/01/14	Zn-65	0.00 ± 0.19	0.00	-0.01 - 0.00	Pass
MAVE-1148	02/01/14	Co-57	11.63 ± 0.19	10.10	7.10 - 13.10	Pass
MAVE-1148	02/01/14	Co-60	7.28 ± 0.18	6.93	4.85 - 9.01	Pass
MAVE-1148	02/01/14	Cs-134	6.29 ± 0.29	6.04	4.23 - 7.85	Pass
MAVE-1148	02/01/14	Cs-137	5.18 ± 0.20	4.74	3.32 - 6.16	Pass
MAVE-1148	02/01/14	Mn-54	9.22 ± 0.26	8.62	6.03 - 11.21	Pass
MAVE-1148	02/01/14	Zn-65	8.59 ± 0.40	7.86	5.50 - 10.22	Pass
MAAP-1151	02/01/14	Co-57	1.60 ± 0.05	0.00	NA	Fail (2)
MAAP-1151	02/01/14	Co-60	1.38 ± 0.08	1.39	0.97 - 1.81	Pass
MAAP-1151	02/01/14	Cs-134	1.75 ± 0.11	1.91	1.34 - 2.48	Pass
MAAP-1151	02/01/14	Cs-137	1.81 ± 0.10	1.76	1.23 - 2.29	Pass
MAAP-1151	02/01/14	Mn-54	0.01 ± 0.03	0.00	NA	Pass
MAAP-1151	02/01/14	Zn-65	-0.24 ± 0.09	0.00	-0.50 - 1.00	Pass
MAAP-1151	02/01/14	Sr-90	1.11 ± 0.14	1.18	0.83 - 1.53	Pass
MAAP-1154	02/01/14	Gr. Alpha	0.56 ± 0.06	1.77	0.53 - 3.01	Pass
MAAP-1154	02/01/14	Gr. Beta	0.98 ± 0.06	0.77	0.39 - 1.16	Pass
MASO-1146	02/01/14	Ni-63	4.80 ± 15.30	0.00	NA	Pass
MASO-1146	02/01/14	Co-57	1064.50 ± 3.60	966.00	676.00 - 1256.00	Pass
MASO-1146	02/01/14	Co-60	1.70 ± 0.50	1.22	(3)	Pass
MASO-1146	02/01/14	Cs-134	6.10 ± 1.80	0.00	NA	Fail (4)
MASO-1146	02/01/14	Cs-137	1364.30 ± 5.30	1238.00	867.00 - 1609.00	Pass
MASO-1146	02/01/14	K-40	728.90 ± 15.90	622.00	435.00 - 809.00	Pass
MASO-1146	02/01/14	Mn-54	1588.00 ± 6.00	1430.00	1001.00 - 1859.00	Pass
MASO-1146	02/01/14	Zn-65	763.50 ± 6.80	695.00	487.00 - 904.00	Pass
MASO-1146	02/01/14	Sr-90	1.23 ± 1.37	0.00	NA	Pass

TABLE E-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) ENVIRONMENTAL, INC., 2014

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MASO-4439	08/01/14	Ni-63	771.62 ± 23.29	980.00	686.00 - 1274.00	Pass
MASO-4439	08/01/14	Sr-90	778.34 ± 17.82	858.00	601.00 - 1115.00	Pass
MASO-4439	08/01/14	Cs-134	520.60 ± 7.09	622.00	435.00 - 809.00	Pass
MASO-4439	08/01/14	Co-57	1135.00 ± 7.40	1116.00	781.00 - 1451.00	Pass
MASO-4439	08/01/14	Co-60	768.20 ± 7.70	779.00	545.00 - 1013.00	Pass
MASO-4439	08/01/14	Mn-54	1050.70 ± 12.60	1009.00	706.00 - 1312.00	Pass
MASO-4439	08/01/14	Zn-65	407.89 ± 15.03	541.00	379.00 - 703.00	Pass
MAW-4431	08/01/14	Am-241	0.79 ± 0.08	0.88	0.62 - 1.14	Pass
MAW-4431	08/01/14	Cs-137	18.62 ± 0.54	18.40	12.90 - 23.90	Pass
MAW-4431	08/01/14	Co-57	24.85 ± 0.42	24.70	17.30 - 32.10	Pass
MAW-4431	08/01/14	Co-60	12.27 ± 0.38	12.40	8.70 - 16.10	Pass
MAW-4431	08/01/14	H-3	207.20 ± 10.60	208.00	146.00 - 270.00	Pass
MAW-4431	08/01/14	Fe-55	55.10 ± 14.80	31.50	22.10 - 41.00	Fail (5)
MAW-4431	08/01/14	Mn-54	14.36 ± 0.53	14.00	9.80 - 18.20	Pass
MAW-4431	08/01/14	Zn-65	11.46 ± 0.78	10.90	7.60 - 14.20	Pass
MAW-4493	08/01/14	Gr. Alpha	0.93 ± 0.07	1.40	0.42 - 2.38	Pass
MAW-4493	08/01/14	Gr. Beta	6.31 ± 1.35	6.50	3.25 - 9.75	Pass
MAAP-4433	08/01/14	Sr-90	0.74 ± 0.10	0.70	0.49 - 0.91	Pass
MAAP-4444	08/01/14	Sr-89	7.82 ± 0.52	9.40	6.60 - 12.20	Pass
MAAP-4444	08/01/14	Sr-90	0.76 ± 0.10	0.76	0.53 - 0.99	Pass
MAVE-4436	08/01/14	Cs-134	7.49 ± 0.18	7.38	5.17 - 9.59	Pass
MAVE-4436	08/01/14	Co-57	11.20 ± 0.19	9.20	6.40 - 12.00	Pass
MAVE-4436	08/01/14	Co-60	6.84 ± 0.17	6.11	4.28 - 7.94	Pass
MAVE-4436	08/01/14	Mn-54	8.11 ± 0.26	7.11	4.97 - 9.23	Pass
MAVE-4436	08/01/14	Zn-65	7.76 ± 0.43	6.42	4.49 - 8.35	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.

(1) The high bias on the plutonium crosscheck samples was traced to contamination from a newly purchased standard. The results of reanalysis with replacement tracer purchased from NIST:

MAW-1184	Pu-238	0.68 ± 0.10	Bq / L
MAW-1184	Pu-239/240	0.66 ± 0.10	Bq / L

(2) Interference from Eu-152 resulted in misidentification of Co-57.

(3) Provided in the series for "sensitivity evaluation". MAPEP does not provide control limits.

(4) False positive test. Long sample counting time lead to interference from naturally occuring Bi-214 in sample matrix with a close spectral energy.

(5) Result of reanalysis Fe-55 32.63 ± 16.30 Bq/L

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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 2014

Prepared By

Teledyne Brown Engineering
Environmental Services

Three Mile Island Nuclear Station
Middletown, PA 17057

April 2015

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Table Of Contents

Appendices

Appendix C Data Tables

Tables

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 2014. During that time period 694 analyses were performed on 258 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 groundwater, 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. Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L in 30 of 60 groundwater monitoring locations. The groundwater tritium concentrations ranged from 184 ± 115 pCi/L to 17,700 ± 1,810 pCi/L. Tritium that was detected in groundwater at the Station is believed to be the result of a potential leak, historical releases, the recapture of gaseous tritium releases via rainwater and/or background from external sources greater than 200 pCi/L. Tritium was detected in three of four precipitation water locations. The concentration ranged from 246 ± 83 to 2,470 ± 299 pCi/L. Tritium was not detected at any surface water location. Tritium was detected in two storm water samples. The concentrations ranged from 289 ± 118 to 312 ± 114 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 2014. Gross Alpha (dissolved) was not detected at any of the groundwater locations. Gross Alpha (suspended) was detected at four of 39 groundwater

locations. The concentrations ranged from 3.2 to 4.3 pCi/L. Gross Beta (dissolved) was detected at 38 of 39 groundwater locations. The concentrations ranged from 1.2 to 13.7 pCi/L. Gross Beta (suspended) was detected at six of 39 groundwater locations. The concentrations ranged from 1.9 and 8.2 pCi/L.

Hard-To-Detect analyses were performed on a select group of groundwater locations. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238. All hard-to-detect nuclides were not detected at concentrations greater than their respective MDCs.

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 2014. TMINS groundwater movement is into the Susquehanna River which surrounds the station on all sides.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. (Midwest Labs) on samples collected in 2014.

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.

<u>Groundwater, Surface Water, Storm Water, and Precipitation</u>

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 2014.

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

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 60 locations were analyzed for tritium activity. Tritium values ranged from the detection limit to 17,700 pCi/L (Table B-I.1, Appendix B).

Tritium Split Samples

Tritium values ranged from 186 to 8,916 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 2014. Gross Alpha (dissolved) was not detected at any of the 39 groundwater locations. Gross Alpha (suspended) was detected at four of 39 groundwater locations. The concentrations ranged from 3.2 to 4.3 pCi/L. Gross Beta (dissolved) was detected at 38 of 39 groundwater locations. The concentrations ranged from 1.2 to 13.7 pCi/L. Gross Beta (suspended) was detected at six of 39 groundwater locations. The concentrations were 1.9 and 8.2 pCi/L (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 2014. Gross Alpha was not detected at either groundwater location. Gross beta was detected in both samples analyzed. The concentrations ranged from 2.7 to 3.5 pCi/L (Table C-I.1, Appendix C).

Gamma Emitters

Potassium-40 was detected in four of 78 samples with concentrations ranging from 53 pCi/L to 119 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 2014. No gamma-emitting nuclides were detected in any split samples (Table C-I.2, Appendix C).

Hard-To-Detect

Hard-To-Detect analyses were performed on a select group of groundwater locations. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238. All hard-to-detect nuclides were not detected at concentrations greater than their respective MDCs (Table B-I.3, Appendix B).

Hard-To-Detect Split Samples

Hard to detects were not analyzed on any split samples in 2014 (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 2014. 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 2014. Tritium was not detected above the required detection limit (Table C-II.1, Appendix C).

Strontium

Surface water samples were not analyzed for Sr-90 in 2014 (Table B–II.1, Appendix B).

Gamma Emitters

Three locations were analyzed for gamma-emitting nuclides in 2014. None of the four samples detected gamma-emitting nuclides (Table B–II.2, Appendix B).

Gamma Emitters Split Samples

One location was analyzed for gamma-emitting nuclides in 2014. No gamma emitting nuclides were detected (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 samples above the required detection limit of 200 pCi/L. The concentration ranged from 289 to 312 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 four locations. The following analyses were performed:

Tritium

Samples from five locations were analyzed for tritium activity. Tritium activity was detected at three of four locations. The concentrations ranged from 246 to 2,470 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 three of four samples. The concentrations ranged from 246 to 2,350 pCi/L (Table C–III.1, Appendix C).

Gamma Emitters

Precipitation water was not analyzed for Gamma Emitters in 2014.

Gamma Emitters Split Samples

No gamma-emitting nuclides were analyzed in 2014.

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)

As reported previously a number of potential sources were mitigated in 2013. The Borated Water Storage Tank (BWST) tunnel sump was cleaned and repaired. An active input to the BWST tunnel sump (packing leak-off of a BWST isolation valve) was corrected. A tank leak on CST B and a leaking buried pipe flange were repaired, and BS-T-1 & 2 and ancillary piping were drained and emptied.

In June 2014 an inspection of the BWST external connections revealed that a 24 inch flange was found coated in boron deposits indicating

leakage. The flange was cleaned and the boron deposits removed. The repair of the flange is scheduled during TMI's refueling outage in the Fall of 2015. In December 2014, a follow-up inspection showed additional boron deposits. In January 2015, an enclosure with a catch containment was installed to help in preventing the small amounts of leakage from migrating to the environment.

F. Actions Taken

1. Compensatory Actions

In 2013, TMI installed eight new wells to help isolate and investigate the area of the leak. TMI has an extensive groundwater monitoring program with over 50 monitoring wells. No monitoring wells outside the investigation area have seen elevated tritium concentrations. TMI continues to monitor the BWST area wells closely. The leakage has been mitigated by preventing rain/snow from entering the area of concern and by placement of a catch containment for any moisture that might accumulate. The containment is inspected regularly, and the permanent flange repair is scheduled during TMI's next refueling outage in Fall 2015.

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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, 2014**

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, 2014

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

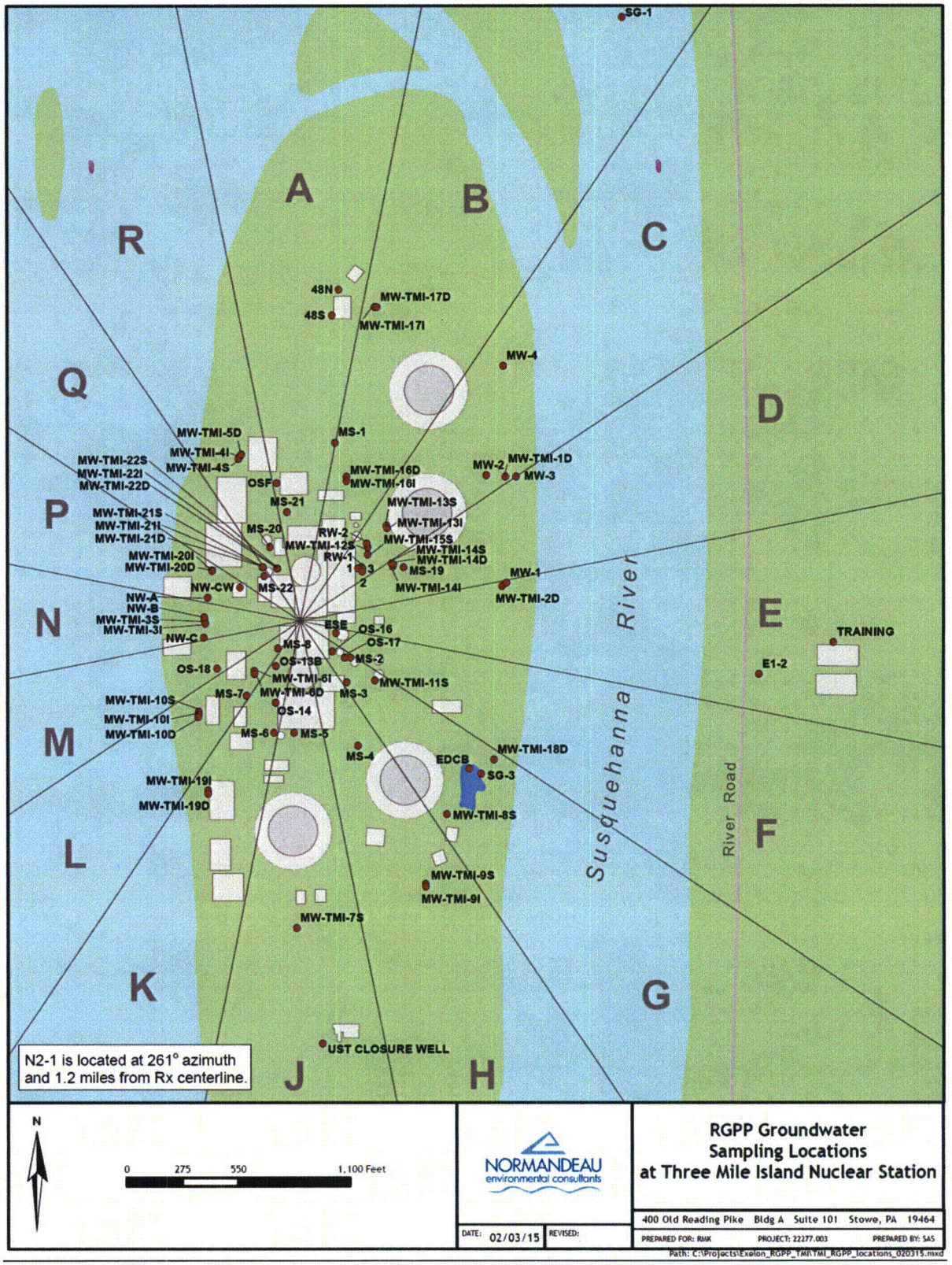

Figure A – 1
Sampling Locations at the Three Mile Island Nuclear Station, 2014

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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, 2014**

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)
3	01/20/14		< 189						
3	04/23/14		< 167	< 4.7	< 0.6	< 0.5	< 0.9	1.6 ± 0.8	< 1.6
3	07/10/14		200 ± 114						
3	10/28/14		195 ± 114						
3	10/28/14		196 ± 114						
48S	01/20/14		< 181						
48S	04/24/14	Original	192 ± 116	< 4.8	< 0.7	< 1.3	< 0.7	3.9 ± 1.1	< 1.4
48S	04/24/14	Recount	196 ± 122						
48S	07/10/14		< 184						
48S	07/10/14		< 184						
48S	10/28/14		< 166						
MS-1	01/21/14		< 184						
MS-1	04/22/14		< 159	< 4.4	< 0.6	< 5.1	< 0.6	6.7 ± 1.6	< 1.3
MS-1	07/09/14		< 183						
MS-1	10/28/14		< 173						
MS-19	01/21/14		< 181						
MS-19	04/22/14		< 169	< 5.2	< 0.7	< 0.9	3.9 ± 1.5	3.4 ± 0.9	6.2 ± 1.5
MS-19	07/09/14		< 183						
MS-19	10/28/14		< 174						
MS-2	01/21/14		312 ± 116						
MS-2	04/23/14	Original	718 ± 141	< 5.8	< 0.8	< 0.8	< 0.9	4.0 ± 1.1	< 1.6
MS-2	04/23/14	Recount	808 ± 163						
MS-2	04/23/14	Original	798 ± 153	< 6.9	< 0.5	< 0.9	< 0.7	5.2 ± 1.1	< 1.4
MS-2	04/23/14	Recount	659 ± 150						
MS-2	07/10/14		513 ± 129						
MS-2	10/29/14		522 ± 125						
MS-20	01/20/14		491 ± 141						
MS-20	01/20/14		418 ± 138						
MS-20	04/21/14		630 ± 133	< 4.9	< 0.7	< 1.2	< 0.6	6.4 ± 1.2	< 1.3
MS-20	07/09/14		630 ± 137						
MS-20	10/27/14	Original	2650 ± 319						
MS-20	10/27/14	Recount	2670 ± 312						
MS-20	10/27/14	Reanalysis	2500 ± 296						
MS-20	12/16/14		298 ± 120						
MS-21	01/20/14		< 163						
MS-21	04/23/14		240 ± 115	< 4.1	< 0.8	< 0.4	< 0.9	1.7 ± 0.7	< 1.6
MS-21	07/09/14		< 165						
MS-21	10/27/14		< 168						
MS-22	01/20/14		2460 ± 292						
MS-22	02/10/14		1930 ± 244						
MS-22	03/07/14		1990 ± 249						
MS-22	04/23/14		4790 ± 524						
MS-22	04/23/14			< 6.9	< 0.6	< 0.8	< 0.7	7.7 ± 1.1	< 1.4
MS-22	05/19/14		3180 ± 364	< 4.9	< 0.5	< 2.7	< 0.6	9.2 ± 1.9	< 2.8
MS-22	06/17/14	Original	5380 ± 578						
MS-22	06/17/14	Recount	5040 ± 553						
MS-22	06/17/14	Reanalysis	5140 ± 558						
MS-22	07/09/14		9850 ± 1030						
MS-22	10/27/14	Original	12900 ± 1330						
MS-22	10/27/14	Recount	14300 ± 1470						
MS-22	10/27/14	Reanalysis	13400 ± 1380						
MS-22	12/16/14		2700 ± 320						
MS-3	01/21/14		< 184						
MS-3	04/23/14	Original	437 ± 129	< 8.5	< 0.6	< 0.8	< 0.9	5.5 ± 1.1	< 1.6
MS-3	04/23/14	Recount	360 ± 140						
MS-3	07/10/14		376 ± 124						
MS-3	10/29/14		251 ± 118						
MS-4	04/23/14		251 ± 117						

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, 2014**

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-5	01/21/14		< 183						
MS-5	04/23/14		< 167	< 3.3	< 0.7	< 0.6	< 0.9	5.0 ± 1.1	< 1.6
MS-5	07/10/14	Original	336 ± 133						
MS-5	07/10/14	Recount	190 ± 107						
MS-5	07/10/14	Reanalysis	244 ± 111						
MS-5	10/29/14		< 167						
MS-7	01/21/14		< 190						
MS-7	04/22/14		< 160	< 3.1	< 0.6	< 0.9	4.0 ± 1.7	3.4 ± 1.4	5.2 ± 1.9
MS-7	07/09/14		< 184						
MS-7	07/09/14		< 192						
MS-7	10/29/14		< 175						
MS-8	01/21/14		< 183						
MS-8	01/21/14		< 190						
MS-8	04/23/14		276 ± 120	< 3.8	< 0.5	< 0.7	< 0.9	4.3 ± 0.9	< 1.6
MS-8	07/10/14		281 ± 117						
MS-8	10/29/14		< 171						
MS-8	10/29/14		< 172						
MW-1	04/24/14		< 191						
MW-2	04/24/14		< 191						
MW-TMI-10D	01/20/14		197 ± 111						
MW-TMI-10D	04/22/14		218 ± 113						
MW-TMI-10D	04/22/14		226 ± 114						
MW-TMI-10D	10/28/14		< 171						
MW-TMI-10I	01/20/14		903 ± 146						
MW-TMI-10I	04/22/14		741 ± 138	< 4.8	< 0.6	< 1.2	< 0.6	5.2 ± 1.1	< 1.3
MW-TMI-10I	07/09/14		733 ± 155						
MW-TMI-10I	10/28/14		705 ± 138						
MW-TMI-10S	01/20/14		741 ± 140						
MW-TMI-10S	01/20/14		643 ± 148						
MW-TMI-10S	04/22/14		741 ± 142	< 4.1	< 0.7	< 0.7	< 0.9	4.5 ± 1.1	< 1.6
MW-TMI-10S	07/09/14		1710 ± 225						
MW-TMI-10S	07/09/14		1630 ± 216						
MW-TMI-10S	10/28/14		1570 ± 214						
MW-TMI-12S	01/21/14		< 189						
MW-TMI-12S	04/23/14		< 170	< 3.5	< 0.5	< 0.9	< 0.9	9.4 ± 1.4	< 1.6
MW-TMI-12S	07/10/14		< 161						
MW-TMI-12S	10/28/14		< 169						
MW-TMI-13I	01/20/14		348 ± 135						
MW-TMI-13I	04/22/14		382 ± 121						
MW-TMI-13I	07/09/14		212 ± 123						
MW-TMI-13I	10/28/14		< 170						
MW-TMI-13I	10/28/14		< 171						
MW-TMI-13S	01/20/14		223 ± 128						
MW-TMI-13S	04/22/14		< 150	< 5.5	< 0.7	< 0.8	< 0.6	3.4 ± 0.8	< 1.3
MW-TMI-14D	01/22/14		293 ± 128						
MW-TMI-14D	04/22/14		226 ± 111						
MW-TMI-14D	07/09/14		274 ± 131						
MW-TMI-14D	10/28/14		184 ± 115						
MW-TMI-14I	01/21/14		< 180						
MW-TMI-14I	01/21/14		< 190						
MW-TMI-14I	04/22/14		207 ± 113						
MW-TMI-14S	01/21/14		< 179						
MW-TMI-14S	04/22/14		< 161	< 5.4	< 0.8	< 0.7	< 0.6	1.2 ± 0.7	1.9 ± 1.0
MW-TMI-16D	01/21/14		905 ± 165						
MW-TMI-16D	04/22/14		620 ± 121						
MW-TMI-16D	10/29/14		634 ± 136						
MW-TMI-16I	01/21/14		< 180						
MW-TMI-16I	04/22/14	Original	224 ± 108						

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, 2014**

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-16I	04/22/14	Recount	211 ± 124						
MW-TMI-17I	04/24/14		< 179						
MW-TMI-18D	04/24/14		273 ± 128						
MW-TMI-18D	04/24/14		331 ± 133						
MW-TMI-19I	04/22/14		< 167						
MW-TMI-1D	04/24/14		190 ± 114						
MW-TMI-20D	01/20/14		287 ± 118						
MW-TMI-20D	04/22/14		303 ± 119	< 5.3	< 0.6	< 2.3	< 0.6	5.9 ± 1.3	< 1.3
MW-TMI-20I	01/20/14		407 ± 124						
MW-TMI-20I	04/22/14		611 ± 124	< 6.0	< 0.7	< 7.6	< 1.2	34.0 ± 3.4	< 2.3
MW-TMI-21D	01/20/14		3120 ± 359						
MW-TMI-21D	02/10/14		2760 ± 323						
MW-TMI-21D	03/07/14		2810 ± 331						
MW-TMI-21D	04/21/14		3450 ± 395						
MW-TMI-21D	05/19/14		4010 ± 447	< 5.1	< 0.5	< 0.9	< 0.6	1.5 ± 0.9	< 2.8
MW-TMI-21D	06/17/14		3740 ± 412						
MW-TMI-21D	07/09/14		3660 ± 403						
MW-TMI-21D	10/27/14		3960 ± 440						
MW-TMI-21D	12/16/14		3480 ± 397						
MW-TMI-21I	01/20/14	Original	3480 ± 396						
MW-TMI-21I	01/20/14	Recount	3930 ± 439						
MW-TMI-21I	02/10/14		2980 ± 344						
MW-TMI-21I	03/07/14		2090 ± 259						
MW-TMI-21I	04/21/14	Original	5250 ± 574						
MW-TMI-21I	04/21/14	Recount	5130 ± 563						
MW-TMI-21I	04/21/14	Reanalysis	4630 ± 510						
MW-TMI-21I	05/19/14		5660 ± 607	< 3.8	< 0.5	< 2.5	< 1.1	4.1 ± 1.4	< 2.5
MW-TMI-21I	06/17/14		3250 ± 368						
MW-TMI-21I	07/09/14		3510 ± 389						
MW-TMI-21I	07/09/14		3130 ± 350						
MW-TMI-21I	10/27/14	Original	10400 ± 1080						
MW-TMI-21I	10/27/14	Recount	11300 ± 1170						
MW-TMI-21I	10/27/14	Reanalysis	10500 ± 1090						
MW-TMI-21I	12/16/14		5720 ± 618						
MW-TMI-21S	01/20/14	Original	454 ± 130						
MW-TMI-21S	01/20/14	Recount	546 ± 147						
MW-TMI-21S	02/10/14		359 ± 115						
MW-TMI-21S	03/07/14		502 ± 136						
MW-TMI-21S	04/21/14		594 ± 155						
MW-TMI-21S	05/19/14		326 ± 134	< 3.8	< 0.5	< 2.6	< 1.1	7.3 ± 1.6	< 2.5
MW-TMI-21S	06/17/14		489 ± 147						
MW-TMI-21S	07/09/14		502 ± 132						
MW-TMI-21S	10/27/14	Original	4020 ± 444						
MW-TMI-21S	10/27/14	Recount	4900 ± 534						
MW-TMI-21S	10/27/14	Reanalysis	4650 ± 511						
MW-TMI-21S	12/16/14		923 ± 154						
MW-TMI-22D	01/20/14		4690 ± 515						
MW-TMI-22D	02/10/14		4470 ± 492						
MW-TMI-22D	03/11/14		4430 ± 490						
MW-TMI-22D	04/21/14		5280 ± 576						
MW-TMI-22D	05/19/14		6630 ± 705	< 4.0	< 0.4	< 2.4	< 1.1	2.3 ± 1.3	< 2.5
MW-TMI-22D	06/17/14		5410 ± 581						
MW-TMI-22D	07/09/14		5680 ± 602						
MW-TMI-22D	10/27/14		4100 ± 453						
MW-TMI-22D	12/16/14		4130 ± 461						
MW-TMI-22I	01/20/14		7890 ± 834						
MW-TMI-22I	02/10/14		7490 ± 789						
MW-TMI-22I	03/11/14		8430 ± 887						

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, 2014**

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	04/21/14		9230 ± 968						
MW-TMI-22I	05/19/14		9430 ± 985	< 5.4	< 0.5	< 1.6	< 1.1	4.4 ± 1.1	< 2.5
MW-TMI-22I	06/17/14		8400 ± 878						
MW-TMI-22I	07/09/14		8590 ± 893						
MW-TMI-22I	10/27/14		7540 ± 794						
MW-TMI-22I	12/16/14		8890 ± 932						
MW-TMI-22S	01/20/14		3210 ± 369						
MW-TMI-22S	02/10/14	Original	5100 ± 553						
MW-TMI-22S	02/10/14	Recount	5860 ± 631						
MW-TMI-22S	03/11/14	Original	7740 ± 819						
MW-TMI-22S	03/11/14	Reanalysis	7030 ± 755						
MW-TMI-22S	04/21/14		8660 ± 904	< 8.2	< 0.9	< 0.6	< 0.7	7.2 ± 0.9	< 1.4
MW-TMI-22S	04/21/14		8380 ± 883						
MW-TMI-22S	05/19/14		7440 ± 787	< 3.6	< 0.4	< 2.4	< 1.1	8.2 ± 1.5	< 2.5
MW-TMI-22S	06/17/14	Original	17200 ± 1760						
MW-TMI-22S	06/17/14	Recount	17200 ± 1760						
MW-TMI-22S	06/17/14	Reanalysis	17700 ± 1810						
MW-TMI-22S	07/09/14		12900 ± 1320						
MW-TMI-22S	10/27/14		12300 ± 1270						
MW-TMI-22S	12/16/14		3780 ± 427						
MW-TMI-2D	01/22/14		< 161						
MW-TMI-2D	04/24/14		412 ± 137	< 5.0	< 0.7	< 0.4	< 0.8	13.7 ± 1.0	2.2 ± 1.1
MW-TMI-2D	04/24/14	Original	319 ± 134						
MW-TMI-3I	01/22/14	Recount	309 ± 132						
MW-TMI-3I	04/24/14		290 ± 126	< 6.2	< 0.9	< 1.8	4.3 ± 1.4	6.0 ± 1.3	8.2 ± 1.6
MW-TMI-3I	07/10/14		272 ± 127						
MW-TMI-3I	10/29/14		193 ± 113						
MW-TMI-3I	10/29/14		241 ± 117						
MW-TMI-4I	04/22/14		< 165						
MW-TMI-4I	04/22/14		< 180						
MW-TMI-4S	04/22/14		< 158						
MW-TMI-6D	01/21/14		< 189						
MW-TMI-6D	04/22/14		< 165	< 5.0	< 0.6	< 1.0	< 0.6	1.9 ± 0.9	< 1.3
MW-TMI-6I	01/21/14		< 187						
MW-TMI-6I	04/22/14		< 165	< 3.6	< 0.7	< 0.5	3.2 ± 1.6	< 1.6	4.4 ± 1.8
MW-TMI-7S	04/24/14		< 186						
MW-TMI-8S	04/24/14	Original	281 ± 131						
MW-TMI-8S	04/24/14	Recount	224 ± 129						
MW-TMI-9I	04/24/14	Original	248 ± 130						
MW-TMI-9I	04/24/14	Recount	241 ± 133						
MW-TMI-9S	04/24/14		< 186						
N2-1	04/25/14		< 175						
NW-A	02/20/14		588 ± 133						
NW-A	04/25/14		723 ± 145	< 6.5	< 0.7	< 0.8	< 0.7	2.2 ± 0.9	< 1.4
NW-A	07/08/14		663 ± 152						
NW-A	10/28/14		850 ± 149						
NW-B	02/20/14		261 ± 121						
NW-B	04/25/14		337 ± 136	< 5.9	< 0.5	< 0.7	< 0.7	2.6 ± 0.9	< 1.4
NW-B	07/08/14		< 185						
NW-B	10/28/14		185 ± 109						
NW-C	02/20/14		897 ± 154						
NW-C	04/25/14		1020 ± 166	< 4.6	< 0.5	< 0.7	< 0.7	1.5 ± 0.8	< 1.4
NW-C	07/08/14		1260 ± 183						
NW-C	10/28/14		820 ± 146						
NW-CW	01/24/14		403 ± 132						
NW-CW	04/24/14	Original	579 ± 139	< 2.8	< 0.5	< 0.7	< 0.7	2.5 ± 0.9	< 1.4
NW-CW	04/24/14	Recount	474 ± 140						
NW-CW	07/08/14		494 ± 143						

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, 2014

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)
NW-CW	10/28/14		447 ± 128						
OS-14	01/21/14		< 180						
OS-14	04/23/14		< 170	< 8.3	< 0.5	< 1.0	< 0.9	9.3 ± 1.3	< 1.6
OS-14	07/10/14		< 167						
OS-14	10/29/14		< 170						
OS-16	01/21/14		443 ± 125						
OS-16	04/23/14		651 ± 139	< 4.5	< 0.7	< 0.6	< 0.9	5.9 ± 0.9	< 1.6
OS-16	07/10/14		445 ± 125						
OS-16	10/29/14		463 ± 124						
OS-18	01/21/14		< 186						
OS-18	04/22/14	Original	347 ± 113	< 6.2	< 0.7	< 1.4	< 0.6	6.6 ± 1.2	< 1.3
OS-18	04/22/14	Recount	327 ± 129						
OSF	01/20/14		494 ± 141						
OSF	04/24/14		258 ± 108	< 6.6	< 0.5	< 1.8	< 0.7	6.1 ± 1.3	< 1.4
OSF	07/10/14		294 ± 131						
OSF	10/28/14		220 ± 116						
RW-1	01/20/14		< 163						
RW-1	04/24/14		< 181	< 3.4	< 0.6	< 1.1	< 0.7	8.5 ± 1.3	< 1.4
RW-1	07/10/14		< 163						
RW-1	10/28/14		< 170						
RW-2	01/21/14		< 186						
RW-2	01/21/14		< 162						
RW-2	04/23/14		< 168	< 4.4	< 0.6	< 0.8	< 0.9	11.5 ± 1.4	< 1.6
TRAINING CENTER	04/23/14		< 168						

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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
3	04/23/14	< 41	< 72	< 4	< 4	< 10	< 5	< 8	< 5	< 9	< 4	< 5	< 31	< 10
48S	04/24/14	< 37	< 72	< 3	< 4	< 8	< 4	< 8	< 4	< 6	< 4	< 3	< 24	< 8
MS-1	04/22/14	< 44	< 43	< 5	< 5	< 10	< 5	< 8	< 5	< 9	< 5	< 5	< 32	< 10
MS-19	04/22/14	< 35	< 74	< 4	< 3	< 5	< 4	< 6	< 4	< 6	< 4	< 3	< 27	< 5
MS-2	04/23/14	< 42	107 ± 49	< 5	< 5	< 11	< 4	< 9	< 5	< 9	< 5	< 5	< 27	< 12
MS-2	04/23/14	< 35	< 32	< 3	< 4	< 8	< 3	< 6	< 4	< 6	< 3	< 4	< 29	< 8
MS-20	04/21/14	< 32	< 34	< 3	< 4	< 7	< 3	< 6	< 4	< 6	< 3	< 4	< 26	< 7
MS-21	04/23/14	< 32	< 65	< 4	< 4	< 8	< 4	< 7	< 5	< 8	< 4	< 4	< 24	< 8
MS-22	04/23/14	< 39	< 83	< 4	< 4	< 9	< 4	< 8	< 5	< 8	< 4	< 4	< 32	< 8
MS-22	05/19/14	< 20	< 33	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 21	< 8
MS-3	01/21/14	< 32	< 27	< 4	< 4	< 8	< 3	< 6	< 4	< 6	< 3	< 4	< 27	< 6
MS-3	04/23/14	< 39	< 36	< 4	< 4	< 8	< 4	< 8	< 5	< 7	< 4	< 5	< 30	< 7
MS-3	07/10/14	< 45	< 47	< 4	< 5	< 10	< 4	< 9	< 5	< 8	< 4	< 5	< 27	< 8
MS-3	10/29/14	< 58	< 135	< 6	< 7	< 11	< 6	< 15	< 7	< 16	< 6	< 8	< 31	< 10
MS-4	04/23/14	< 41	< 44	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 27	< 9
MS-5	01/21/14	< 46	< 86	< 4	< 5	< 11	< 5	< 9	< 5	< 10	< 4	< 5	< 34	< 12
MS-5	04/23/14	< 45	< 80	< 5	< 4	< 9	< 5	< 7	< 5	< 9	< 4	< 4	< 30	< 12
MS-5	07/10/14	< 39	< 69	< 4	< 5	< 8	< 4	< 8	< 5	< 9	< 4	< 5	< 25	< 9
MS-5	10/29/14	< 50	< 112	< 5	< 6	< 13	< 5	< 11	< 6	< 10	< 6	< 6	< 27	< 9
MS-7	04/22/14	< 41	< 83	< 4	< 5	< 9	< 5	< 9	< 5	< 8	< 4	< 4	< 29	< 9
MS-8	01/21/14	< 35	< 71	< 4	< 4	< 8	< 3	< 8	< 4	< 7	< 4	< 3	< 27	< 8
MS-8	01/21/14	< 37	< 32	< 4	< 4	< 9	< 4	< 7	< 4	< 8	< 4	< 4	< 26	< 10
MS-8	04/23/14	< 42	119 ± 51	< 4	< 5	< 9	< 4	< 10	< 5	< 8	< 5	< 5	< 31	< 9
MS-8	07/10/14	< 37	< 82	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 22	< 7
MS-8	10/29/14	< 56	< 102	< 8	< 5	< 17	< 9	< 15	< 8	< 11	< 5	< 8	< 29	< 14
MS-8	10/29/14	< 56	< 97	< 6	< 5	< 14	< 6	< 15	< 7	< 12	< 6	< 7	< 31	< 11
MW-1	04/24/14	< 41	< 85	< 4	< 5	< 10	< 4	< 8	< 5	< 7	< 4	< 5	< 31	< 9
MW-2	04/24/14	< 40	< 34	< 4	< 4	< 8	< 3	< 6	< 4	< 7	< 4	< 4	< 26	< 6
MW-TMI-10D	10/28/14	< 43	< 55	< 5	< 5	< 10	< 3	< 10	< 5	< 8	< 5	< 4	< 27	< 7
MW-TMI-10I	04/22/14	< 39	< 80	< 4	< 4	< 10	< 4	< 8	< 5	< 8	< 4	< 4	< 29	< 10
MW-TMI-10S	04/22/14	< 43	< 42	< 4	< 4	< 12	< 5	< 9	< 4	< 9	< 4	< 4	< 30	< 9
MW-TMI-12S	04/23/14	< 43	< 35	< 5	< 5	< 10	< 4	< 8	< 5	< 9	< 5	< 5	< 30	< 9
MW-TMI-13S	04/22/14	< 43	< 45	< 5	< 5	< 10	< 5	< 10	< 5	< 8	< 4	< 5	< 32	< 11
MW-TMI-14S	04/22/14	< 43	< 46	< 4	< 5	< 10	< 5	< 7	< 4	< 9	< 4	< 4	< 33	< 9
MW-TMI-16D	10/29/14	< 70	< 70	< 8	< 7	< 15	< #	< 17	< 7	< 12	< 8	< 8	< 41	< 10
MW-TMI-17I	04/24/14	< 44	< 93	< 4	< 5	< 13	< 5	< 10	< 5	< 11	< 4	< 5	< 31	< 11
MW-TMI-18D	04/24/14	< 38	< 37	< 4	< 5	< 8	< 4	< 8	< 4	< 8	< 4	< 4	< 28	< 9
MW-TMI-18D	04/24/14	< 44	< 39	< 4	< 3	< 8	< 3	< 8	< 4	< 7	< 4	< 4	< 25	< 10
MW-TMI-19I	04/22/14	< 32	< 24	< 4	< 4	< 5	< 3	< 8	< 4	< 6	< 3	< 4	< 22	< 5
MW-TMI-1D	04/24/14	< 40	< 93	< 4	< 4	< 10	< 6	< 9	< 5	< 8	< 4	< 4	< 28	< 8
MW-TMI-20D	04/22/14	< 40	< 77	< 4	< 5	< 9	< 5	< 9	< 4	< 8	< 4	< 4	< 28	< 11
MW-TMI-20I	04/22/14	< 41	< 74	< 4	< 5	< 9	< 5	< 7	< 5	< 8	< 4	< 4	< 29	< 10

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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-21D	05/19/14	< 23	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 22	< 6
MW-TMI-21I	05/19/14	< 18	< 14	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 2	< 2	< 19	< 6
MW-TMI-21S	05/19/14	< 21	< 22	< 2	< 2	< 6	< 2	< 5	< 3	< 4	< 2	< 2	< 21	< 7
MW-TMI-22D	05/19/14	< 21	< 45	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 22	< 7
MW-TMI-22I	05/19/14	< 21	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 22	< 7
MW-TMI-22S	04/21/14	< 30	< 39	< 4	< 3	< 8	< 4	< 7	< 4	< 6	< 3	< 3	< 26	< 10
MW-TMI-22S	05/19/14	< 18	< 32	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 2	< 2	< 19	< 7
MW-TMI-2D	04/24/14	< 44	< 112	< 4	< 5	< 7	< 4	< 9	< 5	< 9	< 4	< 5	< 30	< 11
MW-TMI-3I	04/24/14	< 41	< 89	< 4	< 4	< 8	< 4	< 8	< 4	< 8	< 4	< 4	< 29	< 9
MW-TMI-4I	04/22/14	< 44	96 ± 55	< 5	< 5	< 10	< 5	< 10	< 6	< 9	< 5	< 5	< 32	< 9
MW-TMI-4I	04/22/14	< 39	< 63	< 4	< 4	< 9	< 3	< 7	< 4	< 7	< 3	< 4	< 31	< 9
MW-TMI-4S	04/22/14	< 45	< 35	< 4	< 4	< 9	< 4	< 9	< 4	< 8	< 4	< 4	< 30	< 8
MW-TMI-6D	04/22/14	< 42	< 36	< 4	< 4	< 10	< 5	< 8	< 5	< 7	< 4	< 4	< 32	< 9
MW-TMI-6I	04/22/14	< 40	< 25	< 5	< 4	< 8	< 4	< 9	< 5	< 8	< 4	< 6	< 30	< 8
MW-TMI-7S	04/24/14	< 49	< 36	< 4	< 4	< 11	< 5	< 7	< 4	< 9	< 5	< 5	< 35	< 7
MW-TMI-8S	04/24/14	< 39	< 48	< 4	< 5	< 10	< 5	< 9	< 5	< 7	< 4	< 4	< 27	< 8
MW-TMI-9I	04/24/14	< 42	< 86	< 4	< 6	< 9	< 4	< 11	< 5	< 7	< 4	< 5	< 28	< 11
MW-TMI-9S	04/24/14	< 45	< 91	< 4	< 5	< 10	< 5	< 10	< 5	< 9	< 4	< 4	< 32	< 10
N2-1	04/25/14	< 16	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 1	< 2	< 13	< 5
NW-A	04/25/14	< 42	< 92	< 5	< 5	< 10	< 4	< 10	< 5	< 9	< 5	< 5	< 33	< 10
NW-B	04/25/14	< 43	< 76	< 4	< 5	< 11	< 4	< 11	< 5	< 8	< 4	< 4	< 28	< 8
NW-C	04/25/14	< 49	< 49	< 5	< 5	< 10	< 4	< 9	< 5	< 8	< 4	< 5	< 36	< 10
NW-CW	04/24/14	< 45	< 50	< 5	< 5	< 12	< 5	< 10	< 5	< 9	< 5	< 5	< 32	< 7
OS-14	01/21/14	< 35	< 60	< 3	< 4	< 7	< 4	< 7	< 4	< 6	< 3	< 4	< 27	< 9
OS-14	04/23/14	< 41	< 41	< 4	< 5	< 10	< 5	< 9	< 5	< 10	< 4	< 5	< 33	< 7
OS-14	07/10/14	< 34	< 51	< 3	< 3	< 5	< 3	< 5	< 4	< 5	< 3	< 3	< 19	< 5
OS-14	10/29/14	< 80	< 165	< 7	< 8	< 18	< 9	< 15	< 8	< 15	< 6	< 8	< 41	< 11
OS-16	01/21/14	< 39	< 42	< 4	< 4	< 9	< 4	< 9	< 5	< 8	< 4	< 4	< 31	< 8
OS-16	04/23/14	< 37	< 46	< 4	< 5	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 28	< 9
OS-16	07/10/14	< 48	< 56	< 5	< 6	< 13	< 6	< 10	< 6	< 10	< 5	< 5	< 32	< 10
OS-16	10/29/14	< 58	< 65	< 6	< 7	< 15	< 6	< 10	< 7	< 13	< 6	< 6	< 29	< 10
OS-18	04/22/14	< 45	< 110	< 4	< 5	< 9	< 4	< 8	< 5	< 7	< 4	< 5	< 32	< 8
OSF	04/24/14	< 44	< 46	< 4	< 4	< 11	< 4	< 9	< 5	< 9	< 4	< 5	< 29	< 9
RW-1	04/24/14	< 39	53 ± 35	< 4	< 4	< 9	< 4	< 8	< 4	< 8	< 4	< 4	< 26	< 8
RW-2	04/23/14	< 43	< 34	< 4	< 5	< 7	< 4	< 7	< 4	< 7	< 4	< 4	< 28	< 9
TRAINING CENTER	04/23/14	< 44	< 86	< 4	< 5	< 11	< 5	< 9	< 6	< 9	< 5	< 5	< 31	< 11

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, 2014**

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
MW-TMI-10I	04/22/14	< 0.04	< 0.04	< 0.05	< 0.03	< 0.02	< 0.04	< 0.02	< 0.04	< 140	< 4.8
MW-TMI-10S	04/22/14	< 0.10	< 0.02	< 0.03	< 0.02	< 0.03	< 0.08	< 0.14	< 0.18	< 94	< 4.8

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, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
SW-E-1	01/20/14	< 181
SW-E-1	04/24/14	< 179
SW-E-1	07/10/14	< 176
SW-E-1	10/28/14	< 170
SW-E-2	01/22/14	< 181
SW-E-2	04/23/14	< 165
SW-E-2	07/10/14	< 181
SW-E-2	10/28/14	< 172
SW-E-3	01/22/14	< 182
SW-E-3	04/23/14	< 156
SW-E-3	04/23/14	< 170
SW-E-3	07/10/14	< 182
SW-E-3	10/28/14	< 170

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014**

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	04/24/14	< 41	< 46	< 4	< 5	< 12	< 4	< 9	< 5	< 7	< 3	< 4	< 28	< 8	L586
SW-E-2	04/23/14	< 36	< 32	< 3	< 3	< 8	< 4	< 8	< 4	< 7	< 4	< 3	< 27	< 7	L586
SW-E-3	04/23/14	< 51	< 95	< 5	< 6	< 12	< 4	< 10	< 6	< 8	< 5	< 5	< 38	< 10	L586
SW-E-3	04/23/14	< 40	< 102	< 4	< 4	< 10	< 4	< 7	< 4	< 7	< 4	< 4	< 31	< 7	L586

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, 2014**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
EDCB	02/04/14	289 ± 118
EDCB	04/29/14	< 176
EDCB	07/29/14	< 157
EDCB	10/28/14	312 ± 114

TABLE B-III.2 CONCENTRATIONS OF GAMMA EMITTERS IN STORM WATER SAMPLES COLLECTED IN THE VICINITY OF THREE MILE ISLAND NUCLEAR STATION, 2014

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	02/04/14	< 19	< 45	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 2	< 2	< 14	< 5
EDCB	04/29/14	< 48	< 108	< 6	< 5	< 10	< 6	< 12	< 6	< 10	< 5	< 5	< 29	< 9
EDCB	07/29/14	< 41	< 40	< 5	< 5	< 8	< 4	< 8	< 5	< 9	< 4	< 5	< 26	< 6
EDCB	10/28/14	< 43	< 69	< 4	< 5	< 9	< 6	< 9	< 5	< 7	< 4	< 5	< 23	< 8

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, 2014

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3
TM-PR-ESE	03/10/14	Original	2140 ± 266
TM-PR-ESE	03/10/14	Recount	2180 ± 273
TM-PR-ESE	03/10/14	Reanalysis	2470 ± 299
TM-PR-ESE	05/10/14		< 182
TM-PR-ESE	08/08/14		< 194
TM-PR-ESE	10/08/14	Original	741 ± 153
TM-PR-ESE	10/08/14	Recount	721 ± 152
TM-PR-ESE	10/08/14	Reanalysis	502 ± 145
TM-PR-MS-1	03/10/14		< 191
TM-PR-MS-1	05/10/14		< 188
TM-PR-MS-1	08/08/14		< 194
TM-PR-MS-1	10/08/14		< 177
TM-PR-MS-2	03/10/14	Original	2210 ± 272
TM-PR-MS-2	03/10/14	Recount	2200 ± 275
TM-PR-MS-2	03/10/14	Reanalysis	2070 ± 260
TM-PR-MS-2	05/10/14		< 191
TM-PR-MS-2	08/08/14		< 196
TM-PR-MS-2	10/08/14	Original	459 ± 135
TM-PR-MS-2	10/08/14	Recount	357 ± 131
TM-PR-MS-2	10/08/14	Reanalysis	300 ± 132
TM-PR-MS-4	03/10/14	Original	1060 ± 173
TM-PR-MS-4	03/10/14	Recount	1010 ± 175
TM-PR-MS-4	03/10/14	Reanalysis	838 ± 163
TM-PR-MS-4	05/10/14		< 187
TM-PR-MS-4	08/08/14		< 194
TM-PR-MS-4	10/08/14	Original	318 ± 128
TM-PR-MS-4	10/08/14	Recount	324 ± 131
TM-PR-MS-4	10/08/14	Reanalysis	353 ± 144

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APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

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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, 2014

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A	Gr-B
3	10/28/14	431 ± 110				
48S	07/10/14	< 136				
MS-2	04/23/14	860 ± 110	< 0.5	< 0.4	< 1.4	2.7 ± 0.7
MS-20	01/20/14	568 ± 101				
MS-7	07/09/14	186 ± 76				
MS-8	01/21/14	295 ± 90				
MW-TMI-10D	04/22/14	293 ± 87				
MW-TMI-10S	01/20/14	795 ± 110				
MW-TMI-10S	07/09/14	1695 ± 133				
MW-TMI-13I	10/28/14	284 ± 102				
MW-TMI-14I	01/20/14	< 144				
MW-TMI-18D	04/24/14	305 ± 88				
MW-TMI-21I	07/09/14	3540 ± 182				
MW-TMI-22S	04/21/14	8916 ± 278	< 0.7	< 0.6	< 0.9	3.5 ± 0.7
MW-TMI-3I	10/29/14	404 ± 109				
MW-TMI-4I	04/22/14	186 ± 82				
RW-2	01/21/14	< 144				

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, 2014**

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
MS-2	04/23/14	< 32	< 73	< 4	< 5	< 2	< 2	< 5	< 4	< 3	< 2	< 4	< 16	< 5
MS-8	01/21/14	< 43	< ##	< 4	< 4	< 2	< 3	< 8	< 7	< 6	< 3	< 3	< 16	< 2
MW-TMI-18D	04/24/14	< 30	< 35	< 2	< 3	< 2	< 3	< 7	< 4	< 2	< 4	< 3	< 16	< 3
MW-TMI-22S	04/21/14	< 34	< 53	< 2	< 4	< 1	< 2	< 3	< 3	< 4	< 3	< 3	< 15	< 4
MW-TMI-4I	04/22/14	< 28	< 63	< 2	< 6	< 3	< 2	< 5	< 5	< 3	< 3	< 2	< 13	< 3

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, 2014

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 2014

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, 2014

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
SW-E-3	04/23/14	< 146

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, 2014**

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
SW-E-3	04/23/14	< 32	< 65	< 3	< 4	< 2	< 3	< 3	< 4	< 2	< 3	< 2	< 17	< 3

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, 2014

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
TM-PR-MS-2Q	03/31/14	2350 ± 158
TM-PR-MS-2Q	06/06/14	246 ± 83
TM-PR-MS-2Q	08/29/14	< 177
TM-PR-MS-2Q	11/07/14	599 ± 111